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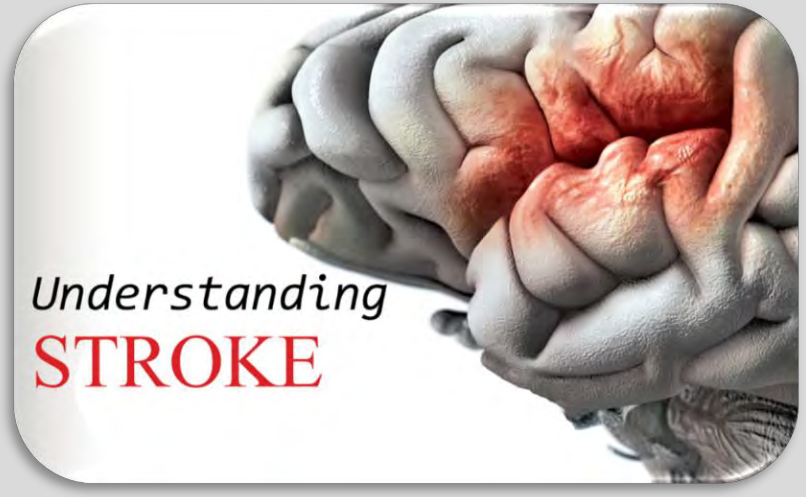
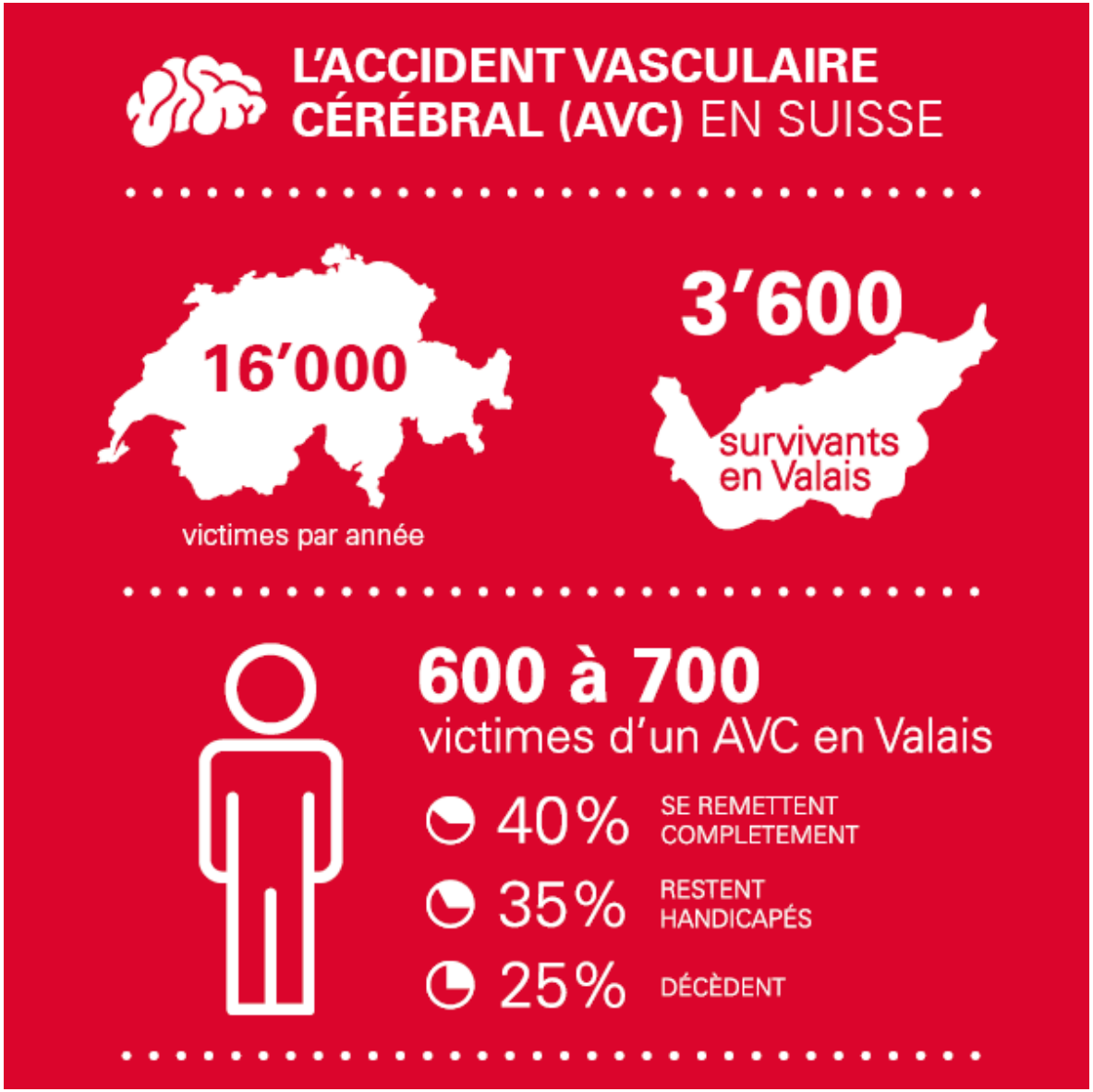


AVC

nouveautés 2019

Dr Christophe Bonvin
Directeur de l'Unité cérébrovasculaire du Valais (UCV)
Médecin adjoint – Service de neurologie – Hôpital du Valais
christophe.bonvin@hopitalvs.ch

Chiffres en Suisse et Valais

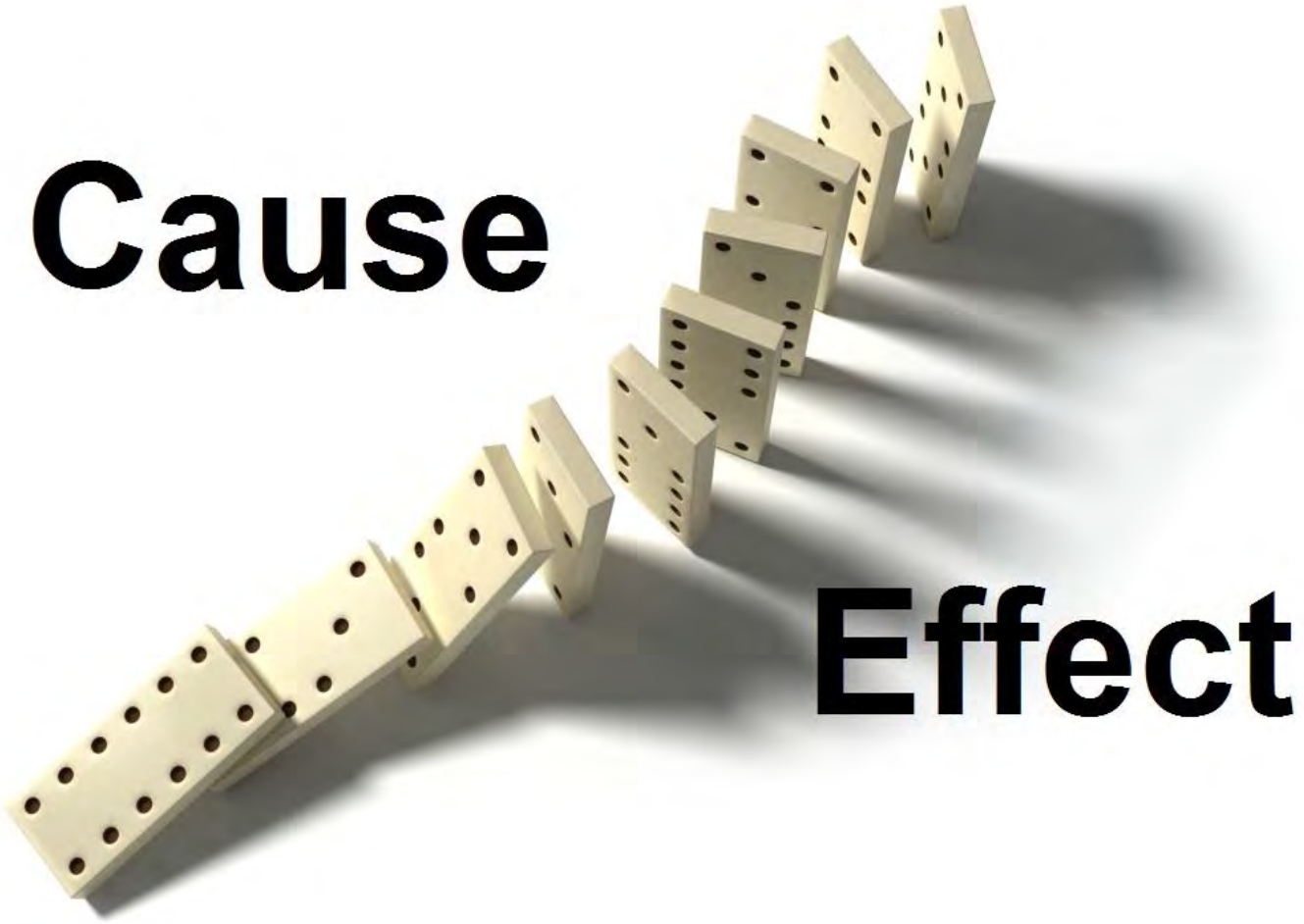


www.attaquecerebrale.ch

Séquelles après AVC : la face cachée

Paralysie et troubles des mouvements
Troubles sensitifs
Douleurs
Trouble du langage
Troubles visuels

Fatigue
Vertiges
Maux de tête (céphalées)
Impulsivité et agressivité
Changement de personnalité
Troubles de la concentration
Problèmes de planification
Troubles émotionnels
Troubles du sommeil
Dépression
Démence
Epilepsie


Cause
Effect

Les facteurs de risques cardiovasculaires

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Global and regional effects of potentially modifiable risk factors associated with acute stroke in 32 countries (INTERSTROKE): a case-control study

90%
facteurs de risques

90% des AVC dépendent de **10 principaux facteurs de risques à connaître !** La prévention des AVC est une réalité. Agissez dès aujourd'hui !

1. Hypertension artérielle
2. Tabagisme actif ou passif
3. Cholestérol et excès de lipides
4. Régime alimentaire déséquilibré
5. Surpoids et obésité
6. Diabète
7. Manque d'activité physique
8. Excès d'alcool
9. Fibrillation auriculaire
10. Pauvreté et manque d'instruction

Lancet 2016;388:761

Prévention … style de vie !

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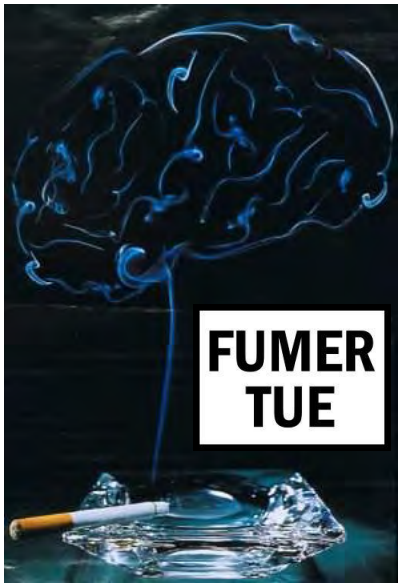

STOP !!!

Attention !

Encore et encore

Sans excès :

♂ 2 verres/j ♀ 1 verre/j

Question de choix !

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Chocolate ♥ NOIR ! Bon pour le cœur et le cerveau

Facteurs de risque et AVC

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Spital Wallis

Agir !!!

Non modifiables

- **Antécédents familiaux**
- **Antécédents personnels (AIT ou AVC)**
- **Sexe masculin (sténoses carotidiennes)**
- **Âge (surtout si > 60)**
- **Génétique (CADASIL, Fabry, troubles de la coagulations, ...)**

- **Migraine avec aura** ♀

Modifiables

- **HTA** ♀
  - Associé à 60% des AVC
  - Plus la TA augmente, plus le risque augmente
- **Diabète** ♀
- **Hyperlipidémie (LDL)**
- **Surcharge pondérale** ♀
- **Sédentarité**
- **Tabagisme (y.c. cannabis)**
- **OH**
- **Apnée du sommeil**

- **Fibrillation auriculaire** ♀

Law MR, BMJ 2002;324:1570

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TA < 130/80

TA < 140/80

Normaliser la pression artérielle

Anti-hypertenseurs

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Spital Wallis

ESC/ESH 2018 Guidelines

NEW

Table 23 **Office blood pressure treatment target range**

Age group	Office SBP treatment target ranges (mmHg)					Office DBP treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke[a]/TIA	
18 - 65 years	**Target to 130** *or lower if tolerated* Not <120	**Target to 130** *or lower if tolerated* Not <120	**Target to <140 to 130** *if tolerated*	**Target to 130** *or lower if tolerated* Not <120	**Target to 130** *or lower if tolerated* Not <120	70–79
65 - 79 years[b]	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	70–79
≥80 years[b]	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	70–79
Office DBP treatment target range (mmHg)	70–79	70–79	70–79	70–79	70–79	

©ESC/ESH 2018

CAD = coronary artery disease; CKD = chronic kidney disease (includes diabetic and non-diabetic CKD); DBP = diastolic blood pressure; SBP = systolic blood pressure; TIA = transient ischaemic attack.
[a]Refers to patients with previous stroke and does not refer to blood pressure targets immediately after acute stroke.
[b]Treatment decisions and blood pressure targets may need to be modified in older patients who are frail and independent.

https://academic.oup.com/eurheartj/article-abstract/39/33/3021/5079119

Anti-hypertenseurs

Cause d'AVC inutile

- **BUT:**
  - **TA < 130/80 (< 60 ans)**
  - **TA 130-140/80 (> 60 ans)**

- **Préférer … les médics qui baissent la TA:**
  - **Combinaison plus efficace !**
  - **IEC (perindopril notamment)**
  - **Sartans**

- **Adaptation des cibles selon ...**
  - Effets secondaires
  - Atteinte carotidienne bilatérale sévère
  - Démence vasculaire

HTA non compliquée

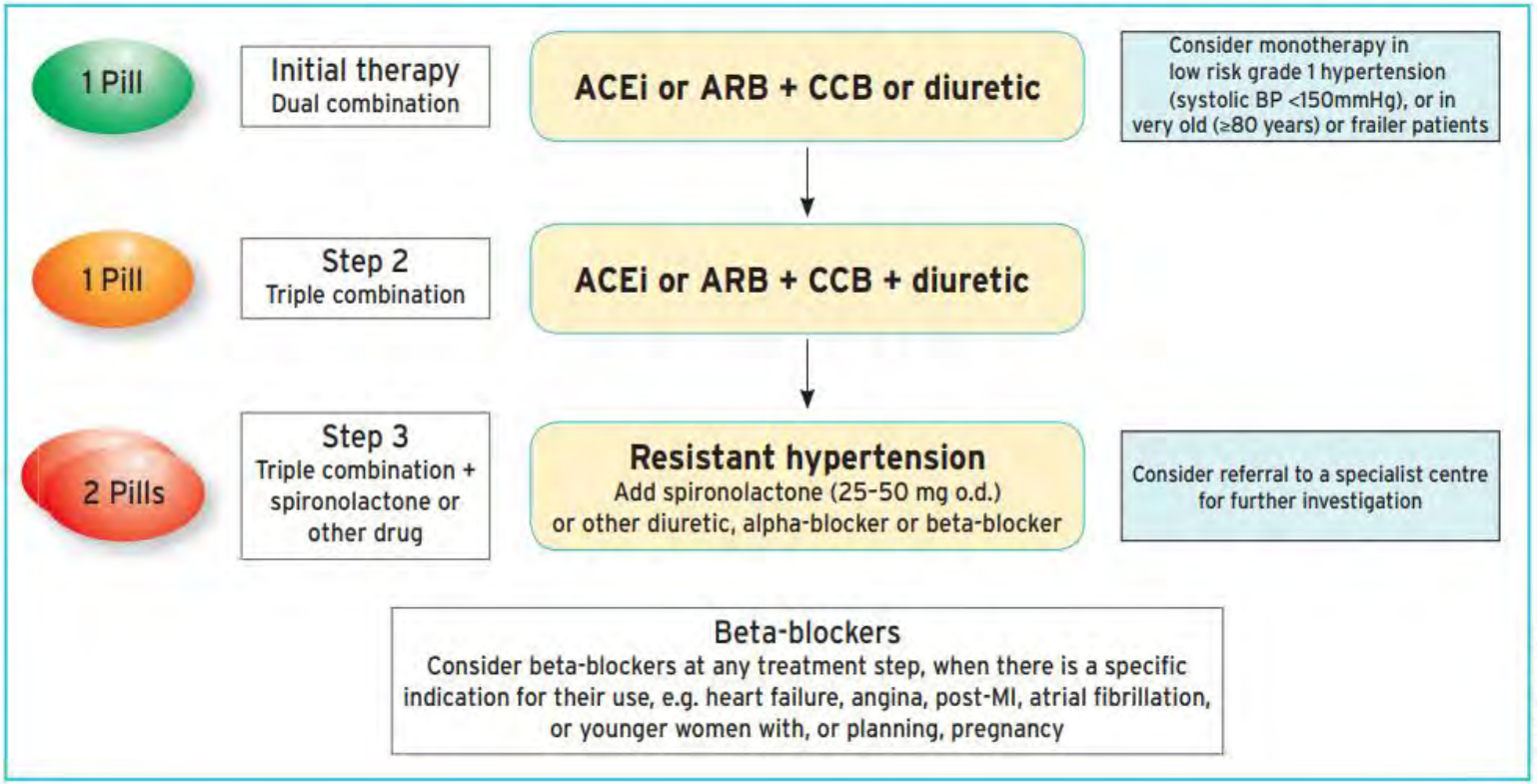


Figure 4 Core drug treatment strategy for uncomplicated hypertension. The core algorithm is also appropriate for most patients with HMOD, cerebrovascular disease, diabetes, or PAD. ACEi = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; CCB = calcium channel blocker; HMOD = hypertension-mediated organ damage; MI = myocardial infarction; o.d. = omni die (every day); PAD = peripheral artery disease.

HTA et FA

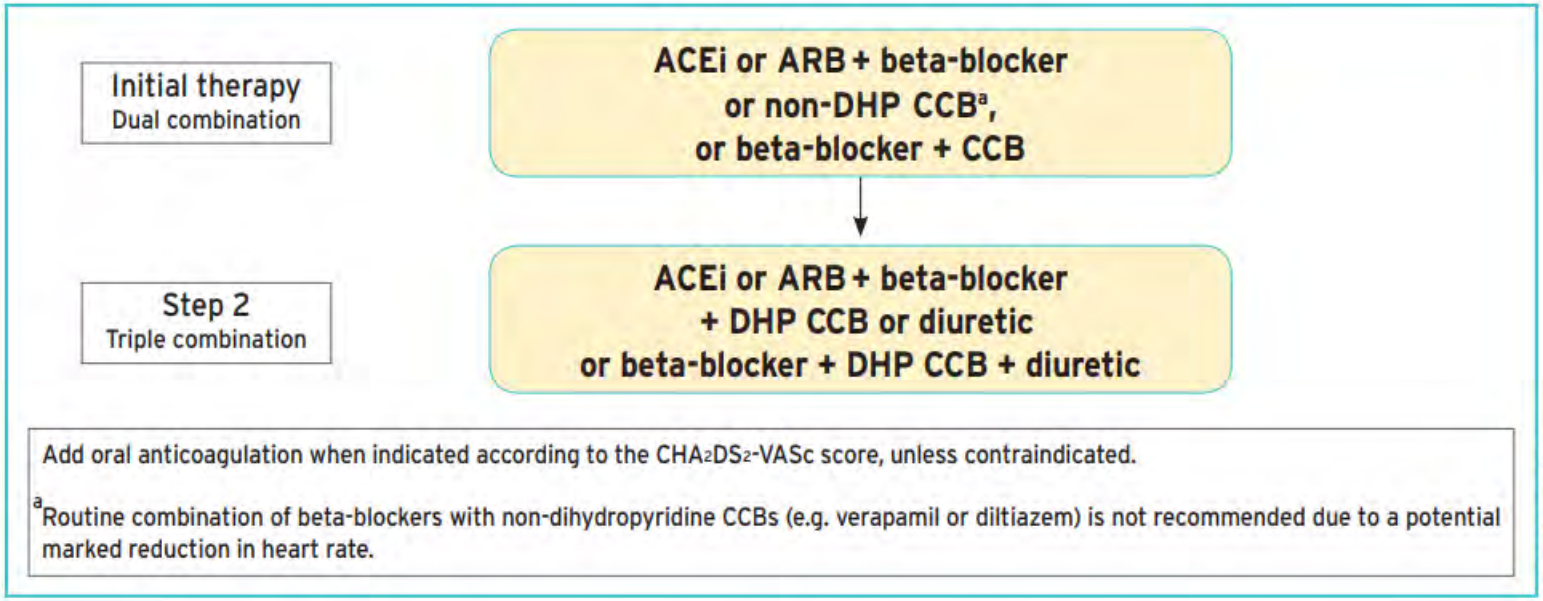


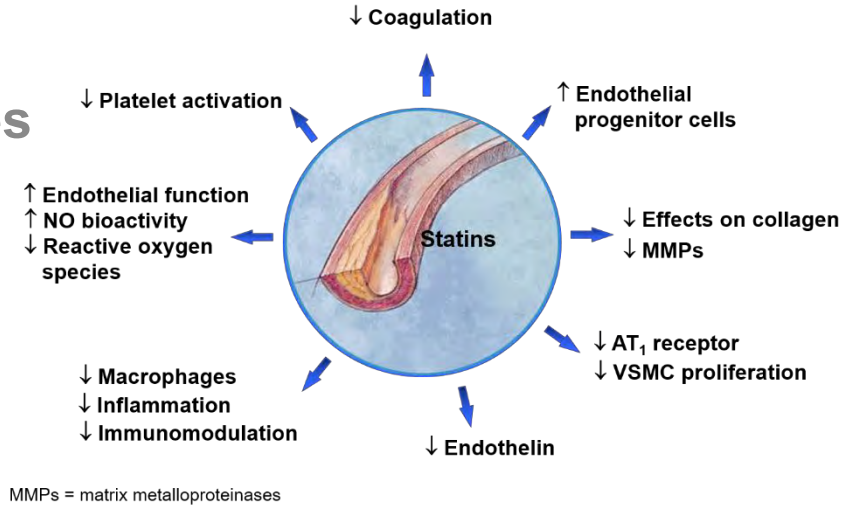
Figure 8 Drug treatment strategy for hypertension and atrial fibrillation. ACEi = angiotensin-converting enzyme inhibitor; AF = atrial fibrillation; ARB = angiotensin receptor blocker; CCB = calcium channel blocker; CHA_2DS_2-VASc = CHA_2DS_2-VASc = Cardiac failure, Hypertension, Age ≥75 (Doubled), Diabetes, Stroke (Doubled) – Vascular disease, Age 65–74 and Sex category (Female); DHP = dihydropyridine. [a]Non-DHP CCB (non-DHP CCB, e.g. verapamil or diltiazem).

Cholestérol total < 5
LDL < 1.8 (2.5 si Ø FRCV)

Diminuer le cholestérol
Eviter la formation de plaques

Statines

Polémique stupide !



MMPs = matrix metalloproteinases

Liao JK, Am J Cardiol 2005;96(suppl 1):24F

Réduction du LDL-c et incidence d'AVC

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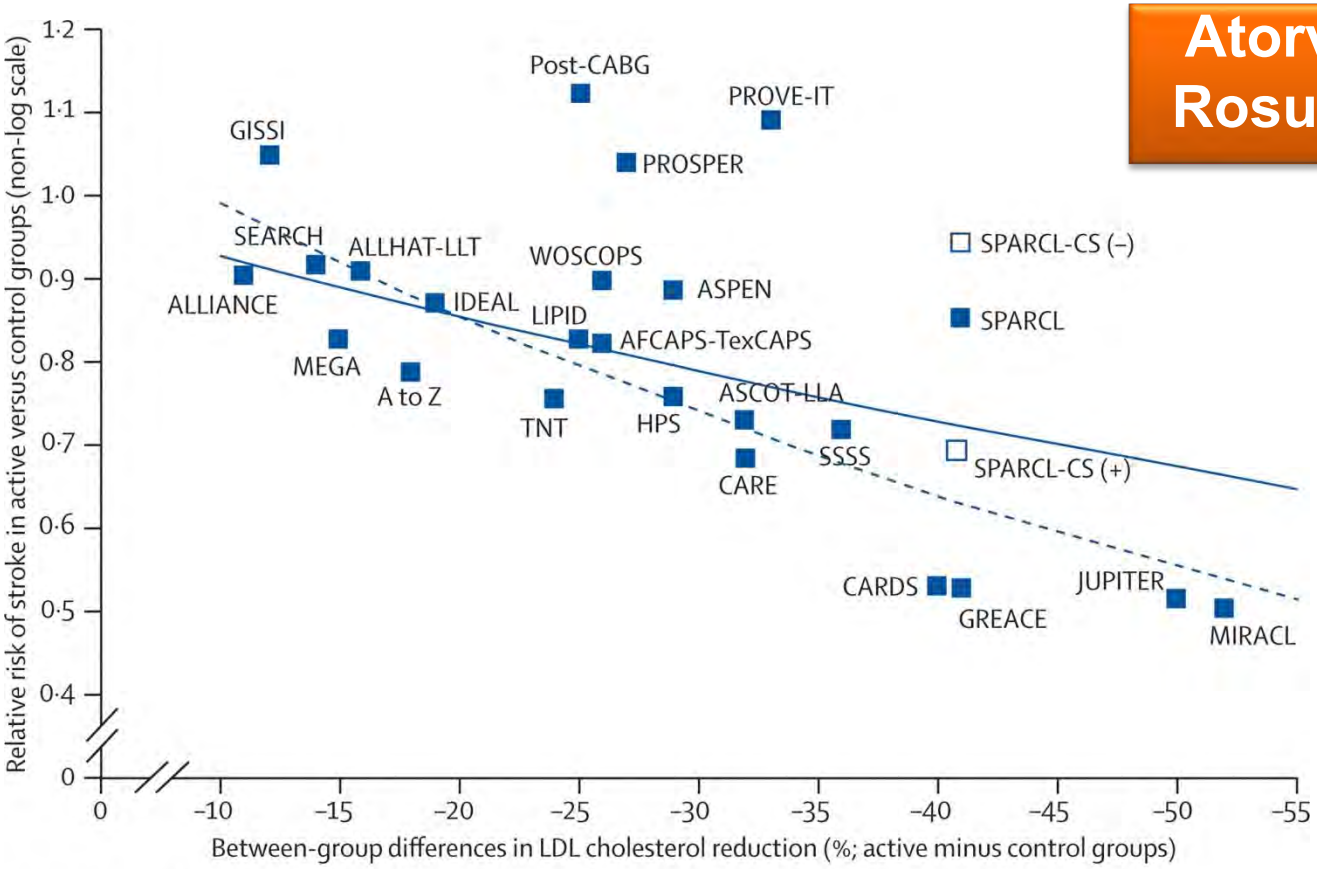
Atorvastatine
Rosuvastatine



Estimates of relative risk reduction

- 10% LDL reduction: relative risk reduction 7·5% (2·3–12·5) overall
  relative risk reduction 13·5% (7·7–18·8) for primary prevention of stroke
- 1 mmol/L (39 mg/dL) LDL reduction: relative risk reduction 21·1% (6·3–33·5) overall
  relative risk reduction 35·9% (21·7–47·6) for primary prevention of stroke

Amarenco P, Lancet Neurol. 2009 May;8(5):453

Bénéfices coronariens à 5 ans de baisser le LDL-cholestérol

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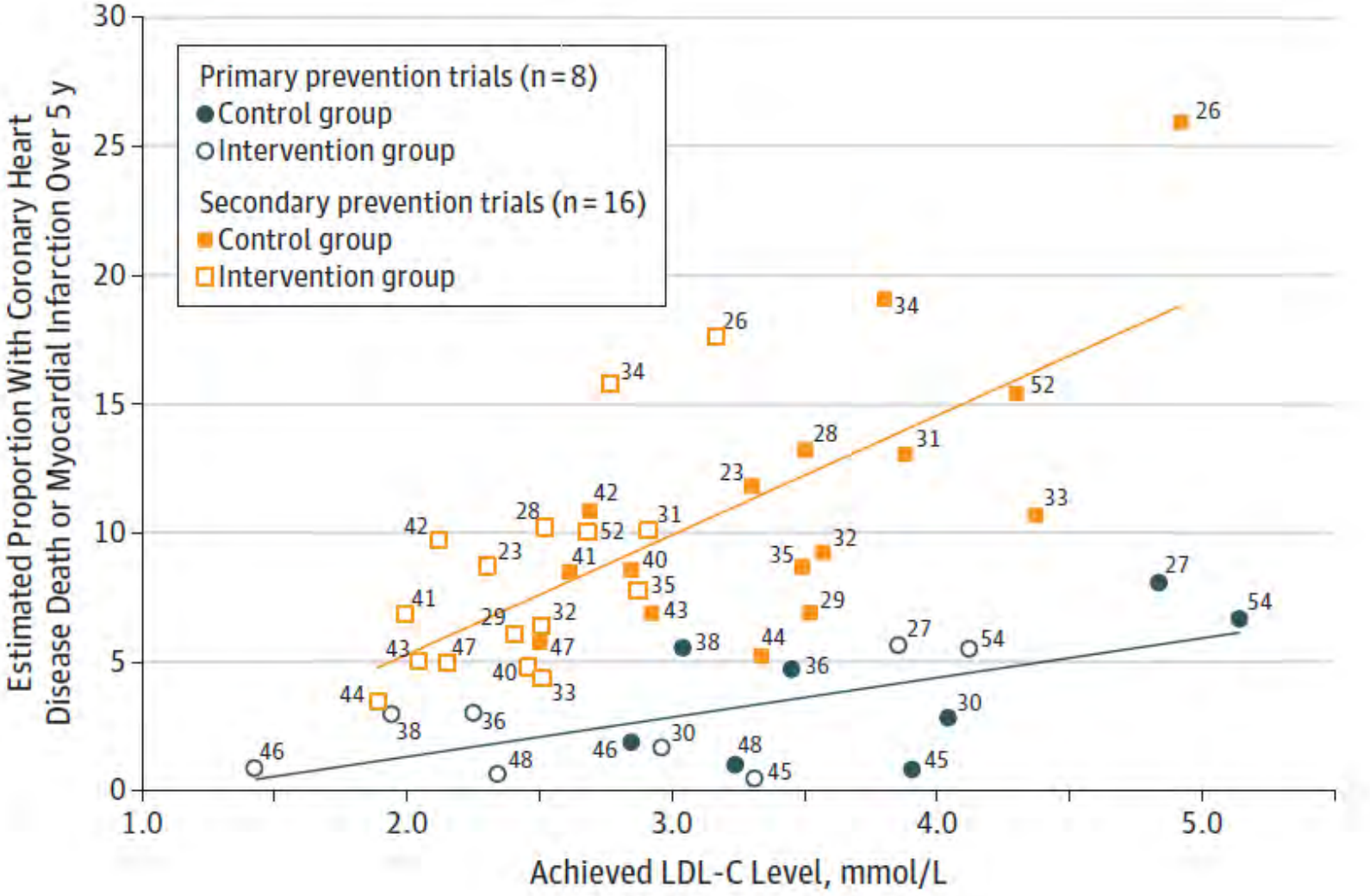

JAMA. 2016;316(12):1289-1297. doi:10.1001/jama.2016.13985

Place de l'EZETIMIBE

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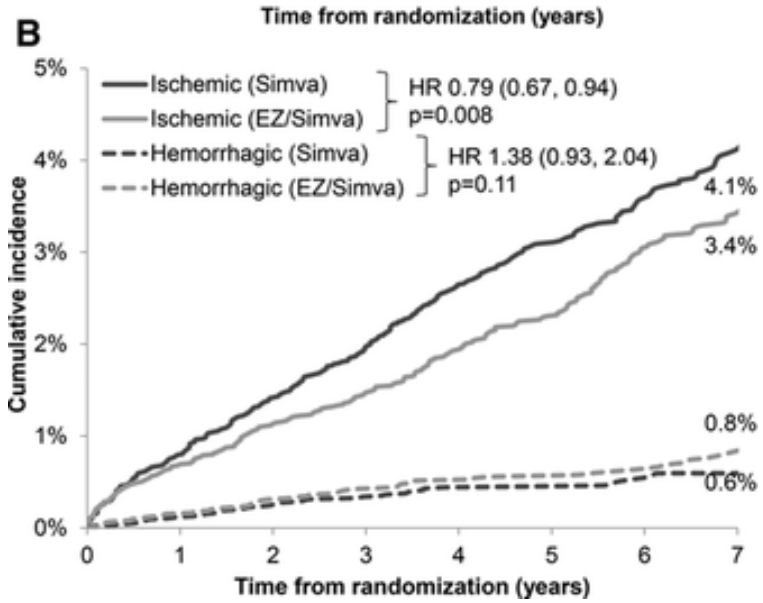
Prevention of Stroke with the Addition of Ezetimibe to Statin Therapy in Patients With Acute Coronary Syndrome in IMPROVE-IT

NEW



L'ajout de l'Ezetimibe à une statine chez un coronarien stable réduit le risque d'AVC

Atozet, Inegy, …

Circulation. 2017;136:2440–2450. DOI: 10.1161/CIRCULATIONAHA.117.029095

Dyslipidémies induites

Elévation du LDL	Hypertriglycéridémie	Diminution du HDL
• Hypothyroïdie • Hépatopathies cholestatiques • Syndrome néphrotique • Anorexie nerveuse • Grossesse	• Diabète sucré de type 2 • Insuffisance rénale chronique • Obésité • Médicaments : œstrogènes, thiazidiques, bêtabloquants, inhibiteurs de la protéase, corticostéroïdes, rétinoïdes, cyclosporine • Alcool • Consommation excessive de sucreries	• Diabète sucré de type 2 • Tabagisme • Obésité • Sédentarité

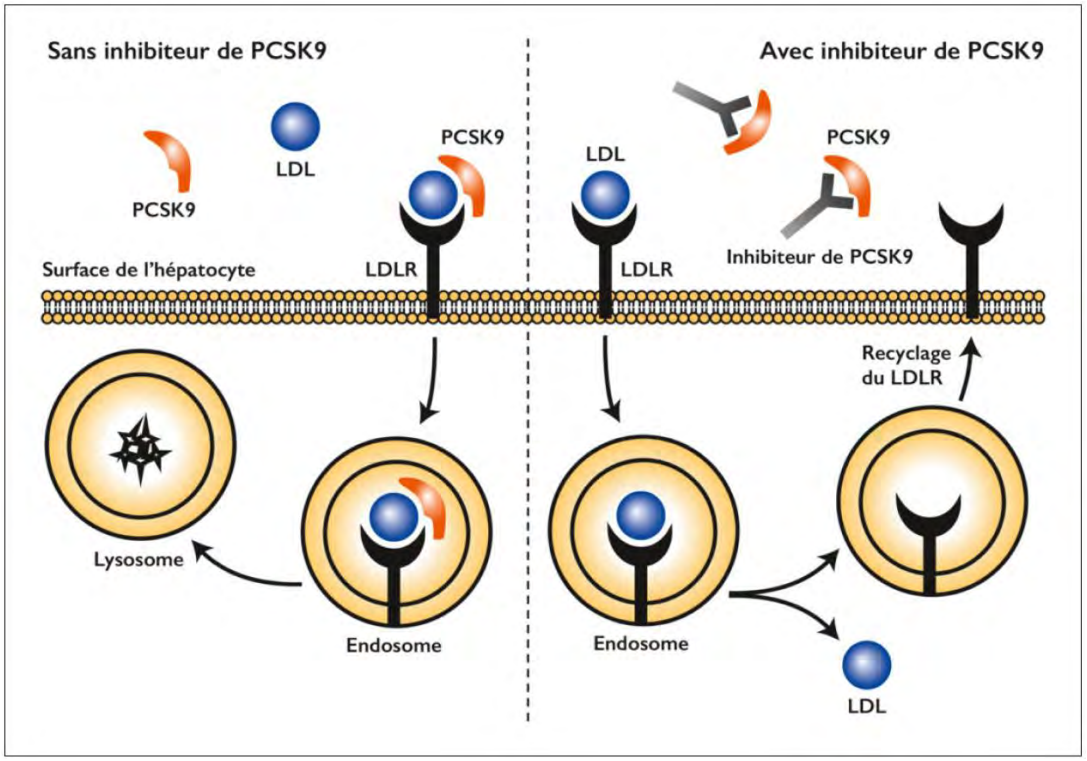
www.gsla.ch

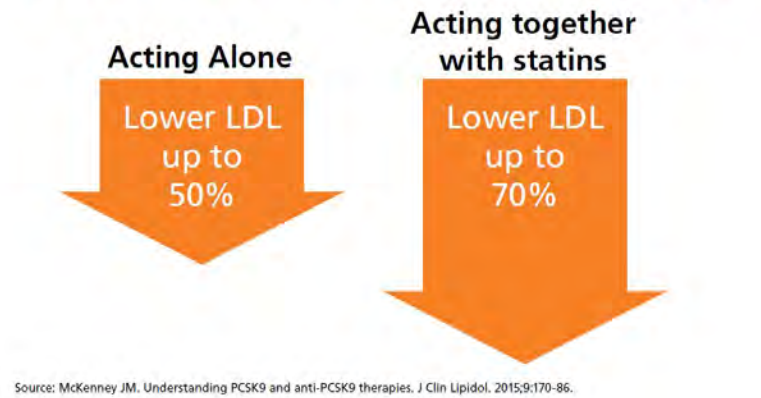
Prévalence 1/200-300

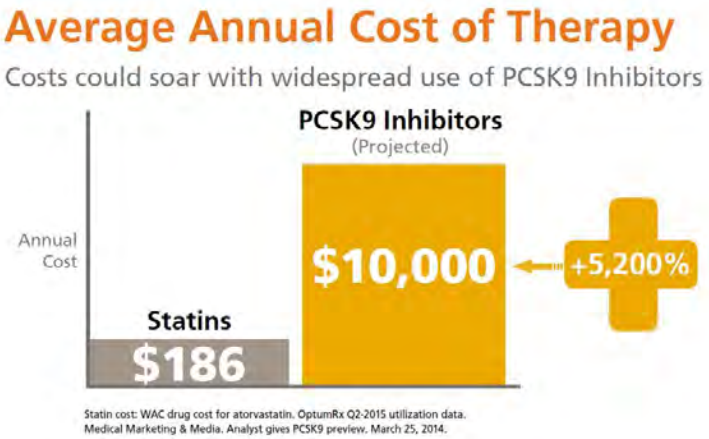
- hypercholestérolémie familiale
- hyperlipidémie familiale combinée
- hypertriglycéridémie familiale

Site HUG

Inhibiteurs de la PCSK9







SMF 2017;17(45):979–986 + SITE

Inhibiteurs de la PCSK9

FOURIER (evolovumab)

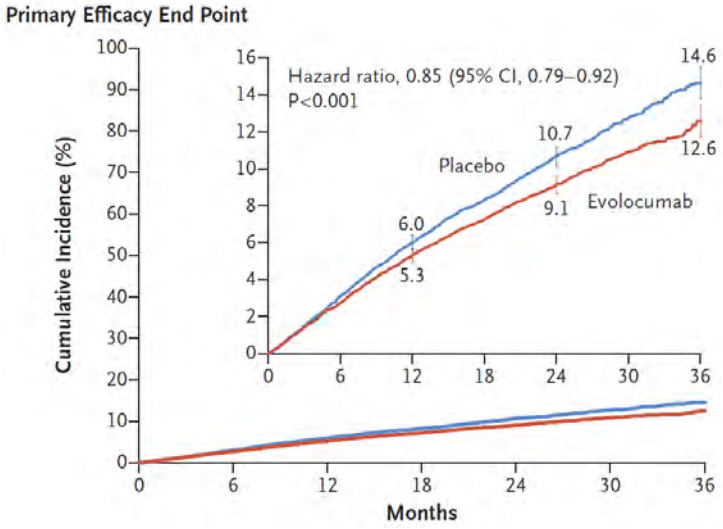
Stable ATS disease

Primary outcome of MCE

- ↓nonfatal MI, stroke, coronary revascularization by 20%
- NNT=75 over 2 yrs
- Mean LDL: 0.78*

Secondary Outcomes

- No ↓ overall or CV mortality
- CV death low (< 2%) in both grps
- **SE:** injection-site reactions (2%)



ODYSSEY OUTCOME (alirocumab)

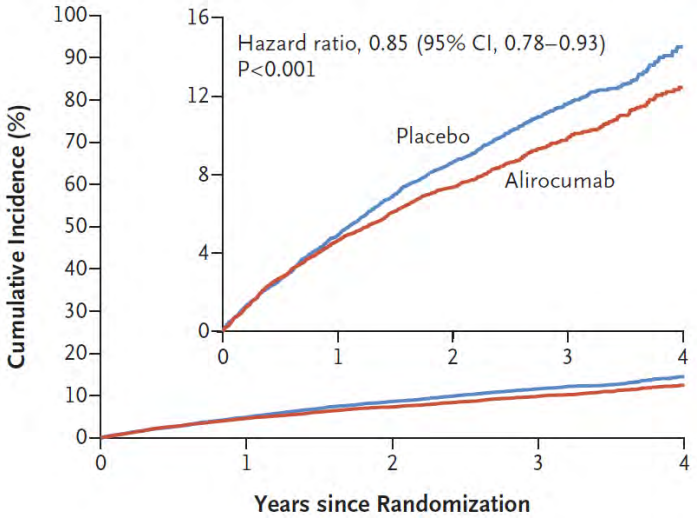
Post-ACS

Primary outcome of MCE

- ♥ death, MI, ischemic stroke, unstable angina requiring H
- NNT=63 over 4 yrs
- Mean LDL: 0.78*

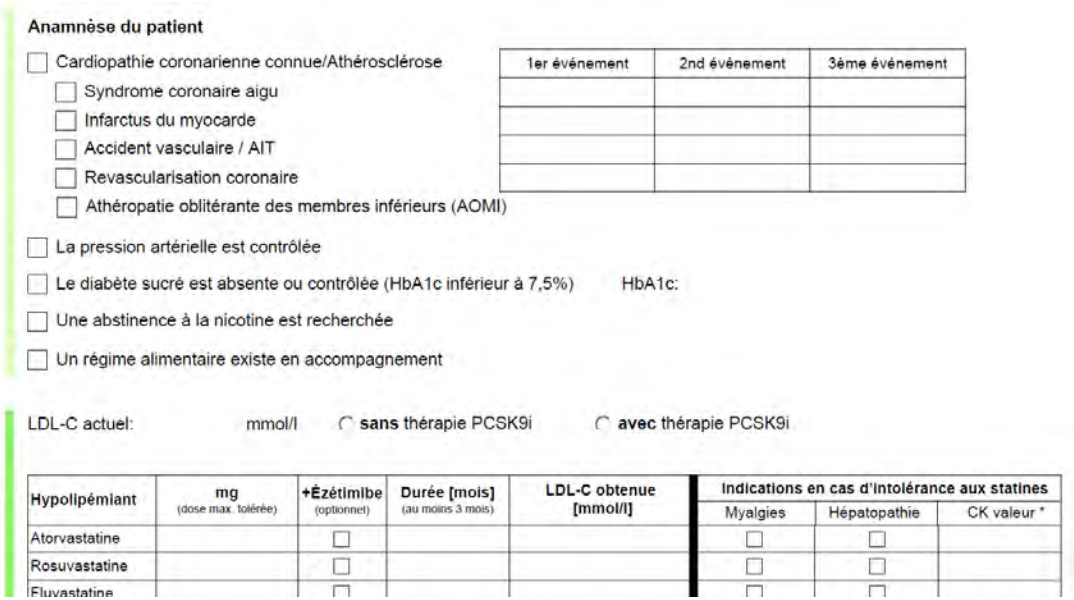
Secondary Outcomes

- ↓ all-cause and CV mortality, major and any coronary event
- CV death (2.5 vs 2.9%)
- **SE:** injection-site reactions (3.8%)



Prescription des inhibiteurs PCSK9 limitée

- **Prescription limitée : angiologie, diabétologie, endocrinologie, cardiologie, néphrologie, neurologie, + lipidologue**
- www.medforms.ch



Anamnèse du patient

☐ Cardiopathie coronarienne connue/Athérosclérose

	1er événement	2nd événement	3ème événement
☐ Syndrome coronaire aigu			
☐ Infarctus du myocarde			
☐ Accident vasculaire / AIT			
☐ Revascularisation coronaire			

☐ Athéropatie oblitérante des membres inférieurs (AOMI)

☐ La pression artérielle est contrôlée

☐ Le diabète sucré est absente ou contrôlée (HbA1c inférieur à 7,5%) HbA1c:

☐ Une abstinence à la nicotine est recherchée

☐ Un régime alimentaire existe en accompagnement

LDL-C actuel: mmol/l ○ **sans** thérapie PCSK9i ○ **avec** thérapie PCSK9i

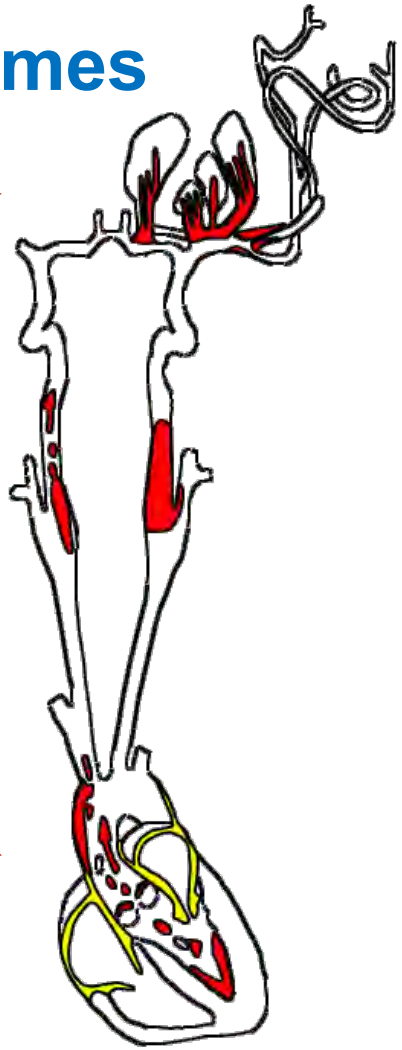
Hypolipémiant	mg (dose max. tolérée)	+Ézétimibe (optionnel)	Durée [mois] (au moins 3 mois)	LDL-C obtenue [mmol/l]	Indications en cas d'intolérance aux statines		
					Myalgies	Hépatopathie	CK valeur *
Atorvastatine		☐			☐	☐	
Rosuvastatine		☐			☐	☐	
Fluvastatine		☐			☐	☐	

Adressez-nous les patients à risque pour une prescription d'i-PCSK9

Causes de l'AVC

70% sont expliqués par 3 mécanismes

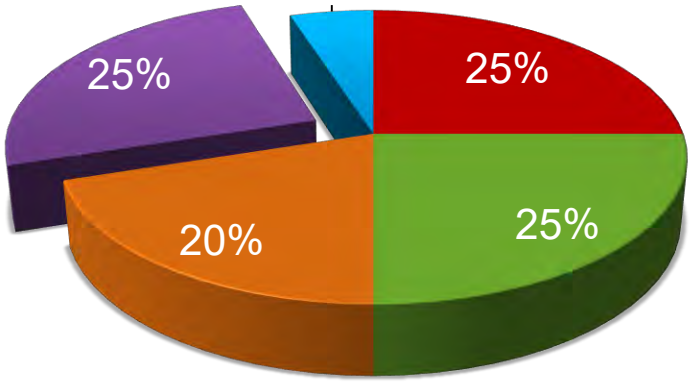
- **Microangiopathie**
  - Infarctus lacunaires
- **Macroangiopathie**
  - Athéromatose/sténose carotidienne et des artères majeures
- **Cardioembolique**
  - FA et flutter auriculaire
  - FOP
  - Infarctus (↓FE, dyskinésie, thrombus cardiaque)
  - Valvulopathies (végétations, tumeurs, …)
  - Athéromatose aortique



Mumenthaler, Mattle Thieme 2002

Classification des causes d'AVC

- **Cardioembolique (FA, ...)**
- **Microangiopathie (HTA, diabète, …)**
- **Athéromatose (cholestérol, Tabac, HTA, …)**
- ***Indéterminée***
- **Autres (dissection, vasculite, état procoagulant, génétique, iatrogène etc.)**



Adams, Stroke 1993;24:35

AVC cryptogénique

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Spital Wallis

Cryptogenic Stroke

Jeffrey L. Saver, M.D.

KEY CLINICAL POINTS

CRYPTOGENIC STROKE

- One quarter of patients with ischemic stroke have no probable cause found after standard workup, including echocardiography, inpatient cardiac telemetry or 24-hour Holter monitoring, magnetic resonance imaging or computed tomographic (CT) imaging of topographic features of the infarct in the brain, and magnetic resonance or CT angiographic assessment of neck and brain arteries. Additional investigation identifies a likely mechanism in more than half these patients.
- Most cryptogenic ischemic strokes are embolic in origin, arising from proximal arterial sources, the heart, or venous sources (with right-to-left shunts).
- Investigation in patients with cryptogenic stroke typically includes evaluation for atherosclerotic and nonatherosclerotic arteriopathies, cardiac sources of embolism (structural and rhythm abnormalities), and disturbances of coagulation.
- Patent foramen ovale is found in up to half of young adults with cryptogenic stroke but is also found in one quarter of healthy persons.
- Occult, low-burden, paroxysmal atrial fibrillation is increasingly recognized as a source of cryptogenic stroke, especially in older patients.

N Engl J Med 2016;374:2065-74. DOI: 10.1056/NEJMcp1503946

ESUS : embolic stroke of undetermined source

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EMBOLIC STROKE OF UNDETERMINED SOURCE

Cryptogenic ischemic strokes that are superficial, or deep but large, are almost always due to emboli arriving in the brain from an arterial, cardiac, or transcardiac source. Intrinsic large artery diseases, such as in situ thrombosis or vasospasm, are uncommon causes. Recently, this long-standing clinical insight was formalized as the clinical construct "embolic stroke of undetermined source." Embolic strokes of undetermined source are operationally defined as nonlacunar brain infarcts without substantial proximal arterial stenosis or major cardioembolic sources,[7] and they represent 80 to 90% of all cryptogenic ischemic strokes.

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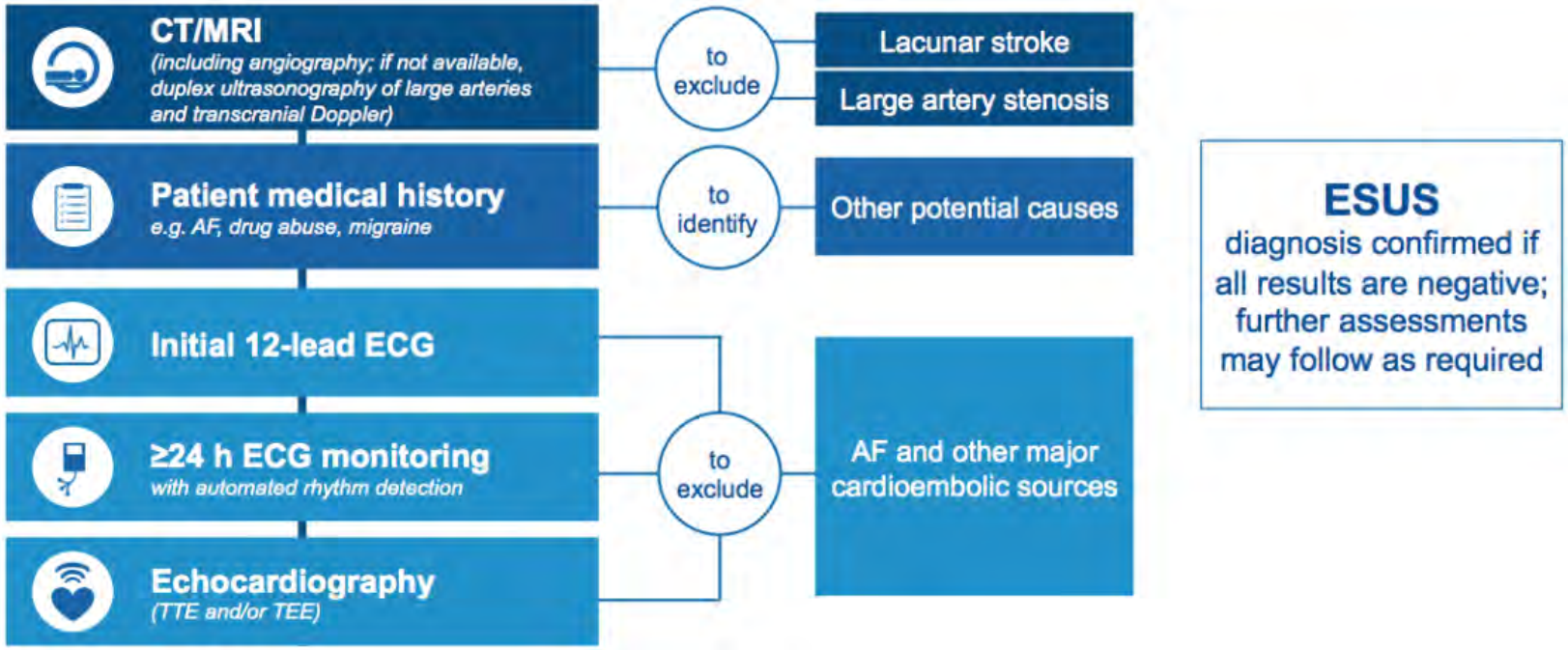
Quels examens pour **confirmer ESUS**

ESUS can be confirmed after few diagnostic steps



CNS 2018, 4(July), 98–105.

AVC cryptogéniques … en partie cardioemboliques

- **FA présente chez 15 à 25% des AVC cryptogéniques**
  si monitoring cardiaque prolongé.

➔ Rechercher activement la FA


EDITORIAL

Occult atrial fibrillation in ischemic stroke

Seek and you shall find

Ashis H. Tayal, MD
David J. Callans, MD

Stollberger C, Eur J Neurol. 2009;16:160; Elijovich L, J Stroke Cerebrovasc Dis. 2009;18:185; Amarenco P, Cerebrovasc Dis. 2009;27(suppl 1):97
Tayal AH, Neurology 2010;74:1662; http://www.boehringer-ingelheim.com

ECG ➔ Holter ➔ R-test

➔ Monitoring prolongé implanté

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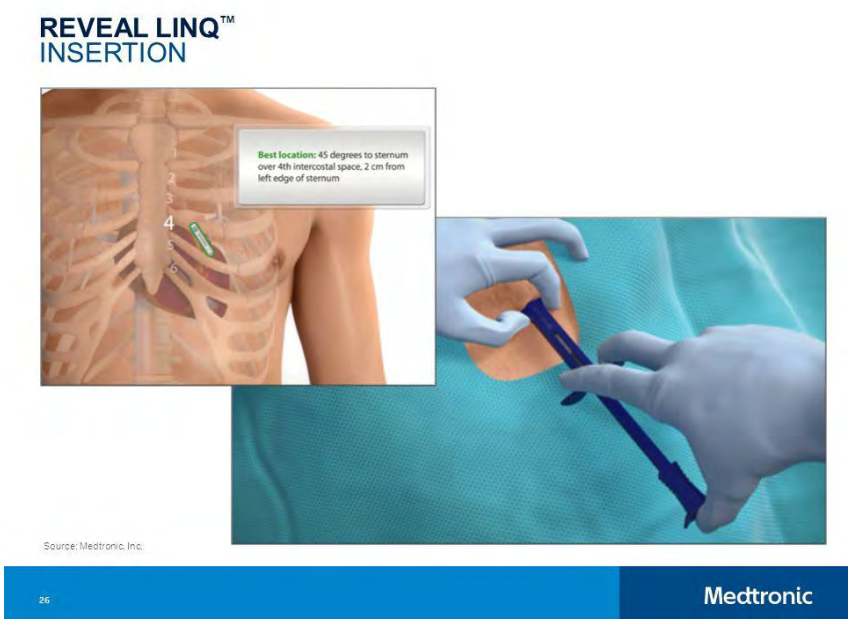

Evolution 2009 ➔ 2014

Infos Medtronic

AVC cryptogénique : Antiagrégant ou Anticoaguation ?

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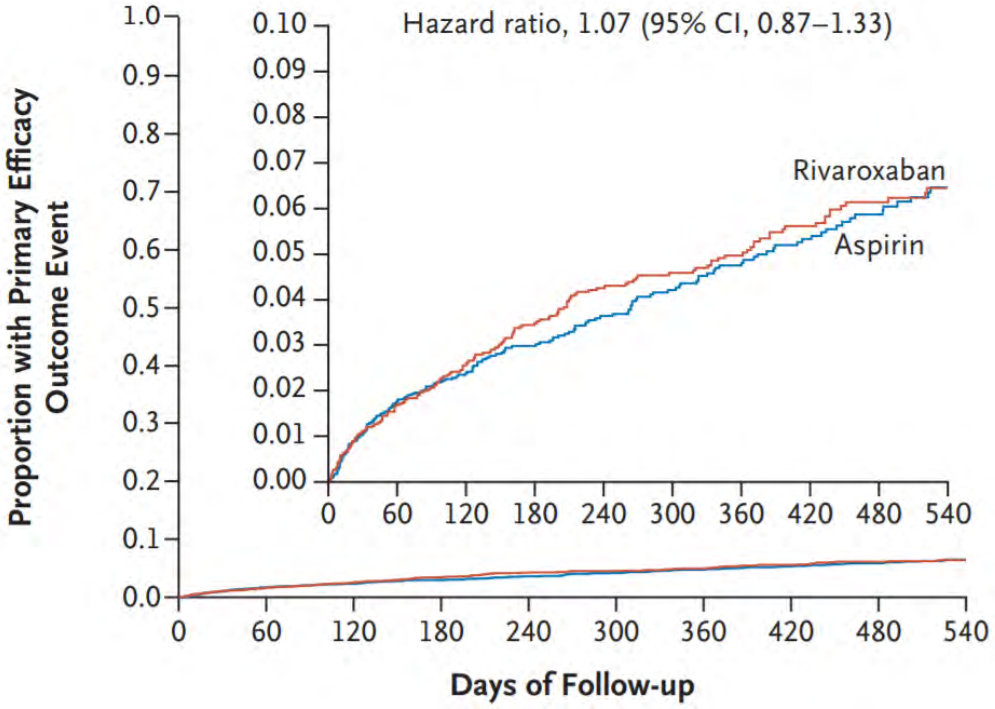
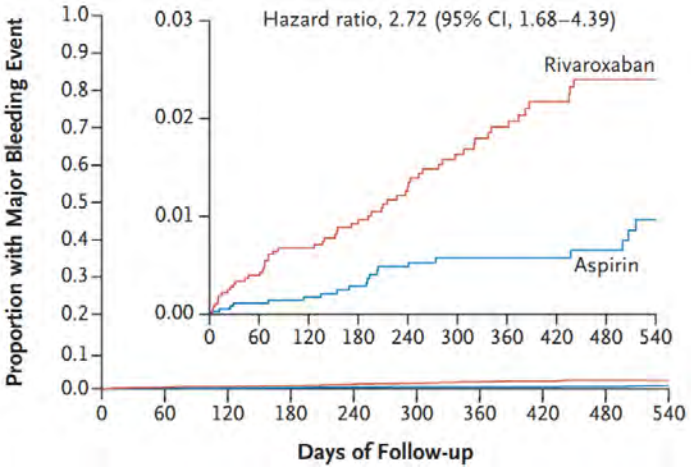
- **NAVIGATE-ESUS** (rivaroxaban 15mg vs Aspirine 100mg)
- 7213 p
- HR 1.07, (P=0.52), pas de différence, risque hémorragique



Négatif !



AVC cryptogénique : Antiagrégant ou Anticoaguation ?

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Spital Wallis

- **RE-SPECT ESUS** (Dabigatran 150/110mg vs Aspirine 100mg)
- **5390 p**
- **HR 0.85 (0.69-1.03, P=0.1)** ***en faveur*** **du Dabigatran**
- **Séparation des courbes**
- ***Publication à venir***

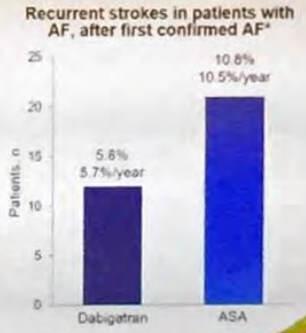
Presque positif !

Conclusions

- In patients with ESUS, who had at least 20 hours of baseline monitoring, dabigatran was not superior to ASA for prevention of recurrent stroke, and did not significantly increase the risk of major bleeding compared with ASA
- There is no significant heterogeneity of treatment effect according to duration of baseline monitoring for AF
- AF was detected (by cardiac monitoring, adverse event reporting, etc.) in around 7.5% (430/5390) of patients over the average 19 months of study follow-up
- Among patients with detection of AF, in an exploratory analysis, there were numerically fewer recurrent strokes with dabigatran

Recurrent strokes according to AF confirmed during the trial

Characteristic	Dabigatran (N = 2695)	ASA (N = 2695)
Patients with AF, n (%)	208 (7.7)	195 (7.2)
Time of first AF onset since randomization, days		
Mean (SD)	308 (276)	284 (285)
Median (range)	232 (0–1117)	196 (0–1088)
Patients with AF and recurrent stroke, n (%)	20 (9.6)	30 (15.4)



*Recurrent strokes after first AF confirmed could also be second or third stroke. Covariates in Cox proportional hazards model: age (< or ≥ 75 years); creatinine clearance (< or ≥ 50 mL/min); prior stroke or transient ischemic attack (yes or no).

DOAC dans les AVC cryptogéniques

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Spital Wallis

RE-SPECT ESUS

enrolment completed in
December 2017 after
randomization of 5,390 patients

dabigatran 150 mg twice daily

1:1 randomization, double-blinded

aspirin 100 mg once daily

primary endpoint: time to first recurrent stroke (ischemic, hemorrhagic, or unspecified)

NAVIGATE ESUS

terminated in
October 2017 due to
futility for the primary endpoint
after enrolment of 7,214 patients

rivaroxaban 15 mg once daily

1:1 randomization, double-blinded

aspirin 100 mg once daily

primary endpoint: time to first recurrent stroke (ischemic, hemorrhagic, or unspecified), magnetic resonance imaging-positive transient ischemic attack, or systemic embolism

ATTICUS

active, up to 600 patients with
embolic stroke of undetermined
source and additional risk factors
for subclinical atrial fibrillation;
continuous or daily ECG monitoring

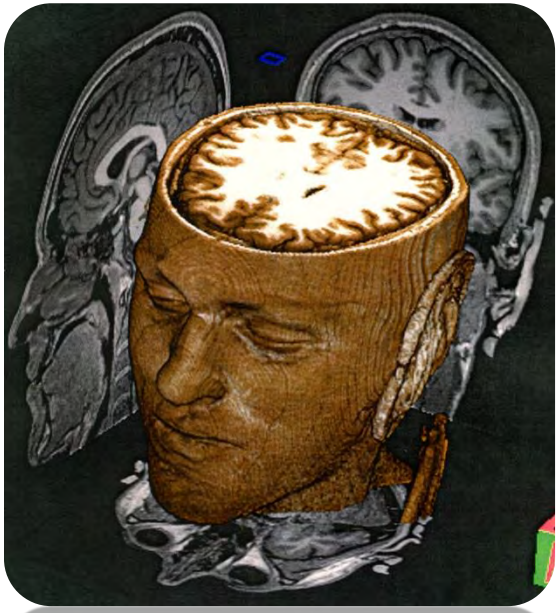
apixaban 5 mg twice daily

1:1 randomization, open-label

aspirin 100 mg once daily

primary endpoint: new ischemic lesions on magnetic resonance imaging after 12 months

Hôpital du Valais
Spital Wallis

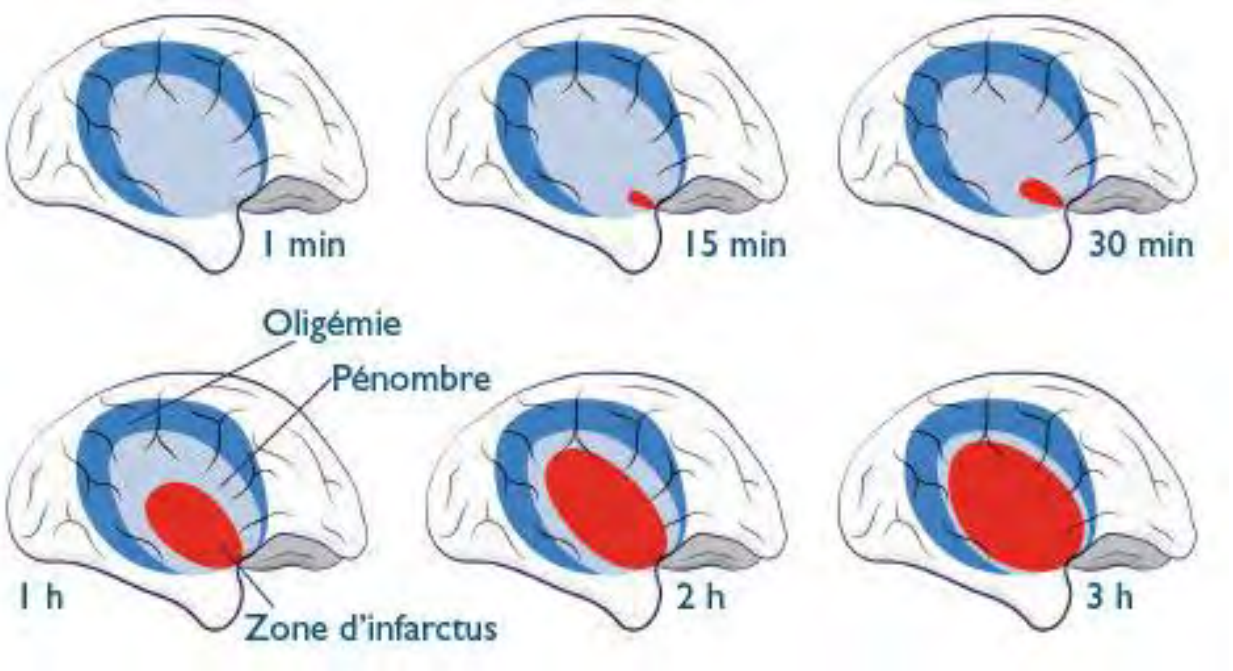


Progrès incroyables de l'imagerie cérébrale

La pénombre: un phénomène *dynamique* dans *le temps* et *l'espace*

Hôpital du Valais
Spital Wallis

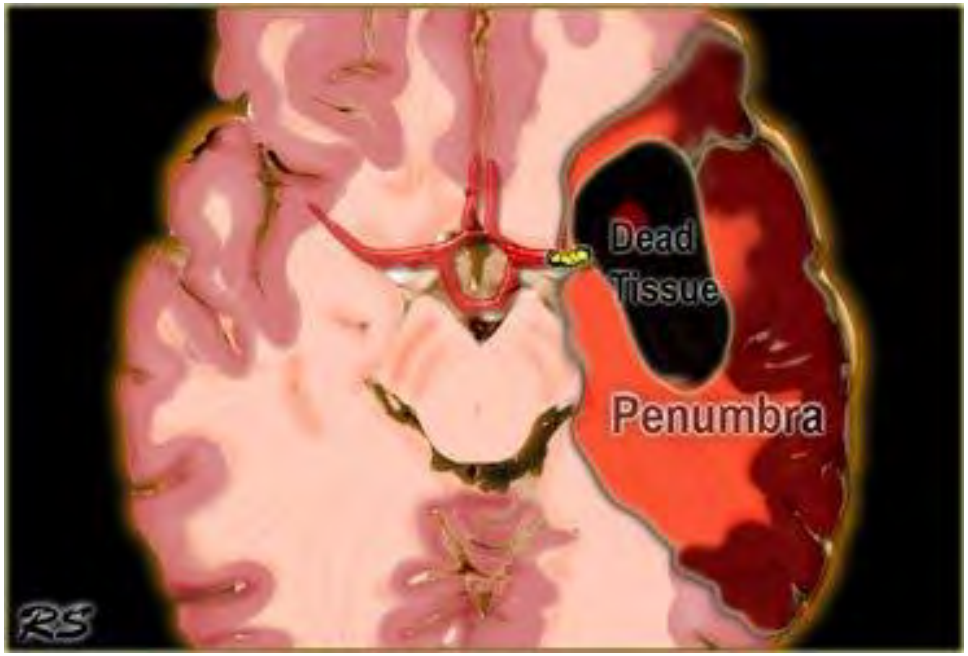
- **Lorsqu'un AVC survient, chaque minute, le cerveau perd environ 2 millions de neurones !**

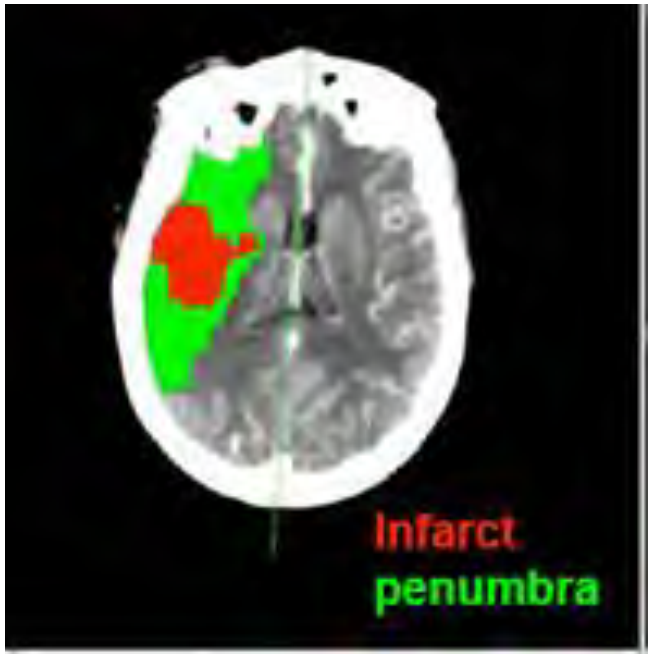


Rev Med Suisse 2015; volume 11.1476 – Jones, J Neurosurg 1981;54:773 – Baron, Cerebrovasc Dis 1999;9:193

La pénombre ischémique

- La pénombre est remplacée par l'infarctus en cas de non-recanalisation de l'artère





Adapté de Michel

Softwares automatiques pour la sélection des patients (détermination du core et de la pénombre)

Hôpital du Valais
Spital Wallis

NEW

iSchemaView RAPID

Brainomix®
e-STROKE SUITE

RAPID automated neurovascular imaging platform
at your fingertips

www.i-rapid.com https://brainomix.com/e-stroke-suite

Hôpital du Valais
Spital Wallis

Traitements : 20 ans de progrès significatifs

1. Hospitalisation en **Stroke Unit**
2. **Revascularisation** (thrombolyse IV et traitement endovasculaire)

Interventions bénéfiques AVC aigus

Hôpital du Valais
Spital Wallis

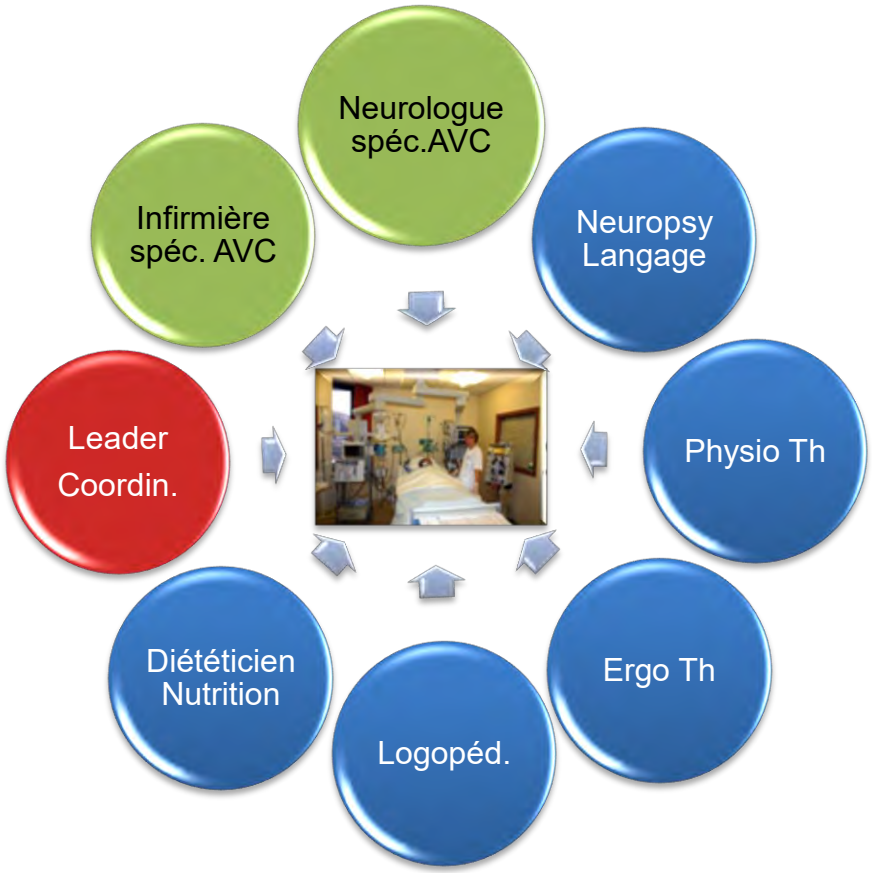
Stroke Unit / Stroke Center

Prise en charge spécialisée et centralisée pour tous les AVC !

Bénéfice d'une Stroke Unit (unité cérébrovasculaire)

Hôpital du Valais
Spital Wallis

- **Approche coordonnée et multidisciplinaire**
- **Equipe spécialisée**
- **Monitoring continu**

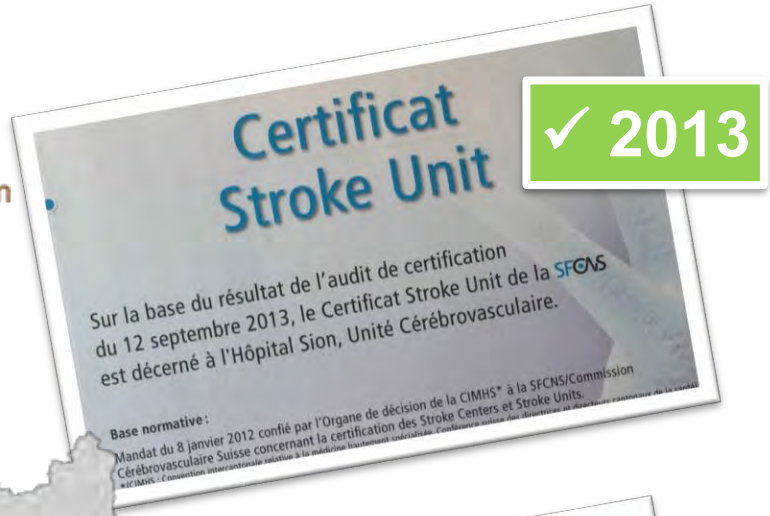


↓ Mortalité
↓ Déficit / Handicap
↓ Institutionnalisation
↓ Coûts de santé

← Urgences
← Radiologie
← Soins intensifs
← Cardiologie
← Chirurgie vasculaire
← Neurochirurgie
← Rehabilitation / Gériatrie
← Médecine interne

14 Stroke Units et 10 Stroke Centers suisses
un *réseau intégré* d'unités *certifiées*

Hôpital du Valais
Spital Wallis



Unité cérébrovasculaire du Valais

www.neurovasc.ch

Evolution des AVC hospitalisés

Hôpital du Valais
Spital Wallis

Engagement du Dr C. Bonvin
spéc. maladies cérébrovasculaires

1e certification Stroke Unit

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AVC	**39**	**146**	**238**	**328**	**388**	**410**	**440**	**450**	**475**	**510**	**532**	**550**	**579**
TIV / TEV	0	14	14	36	51	83	61	85	80	103	112	141	**164**
% recan.	0%	10%	6%	11%	13%	20%	14%	19%	17%	20%	23%	25%	**28%**

Première thrombolyse à Sion
Prof. J. Ghika

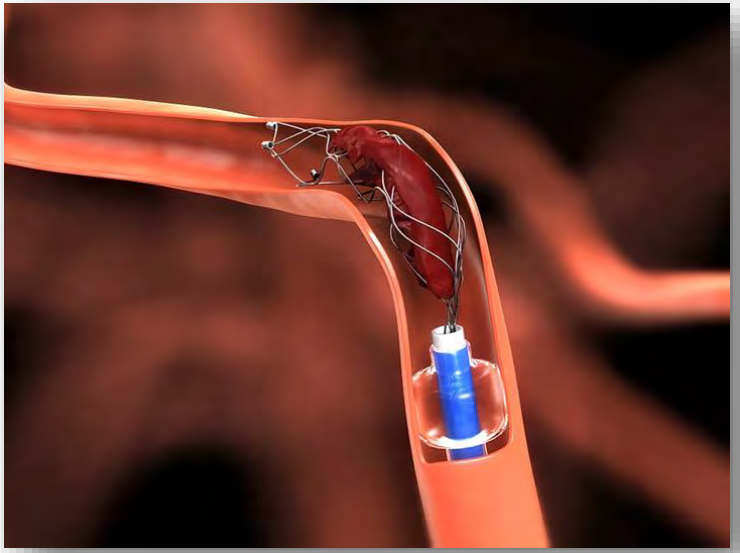
Mise en place de la Stroke Unit

Activation de la filière AVC avec OCVS/Urg
Information des services préhospitaliers

Etudes d'évidence
ttt endovasculaire

OCVS/Urg : organisation cantonale valaisanne de secours / Urgences de l'hôpital de Sion, ttt : traitement - Database locale 2018

Actilyse®
alteplase

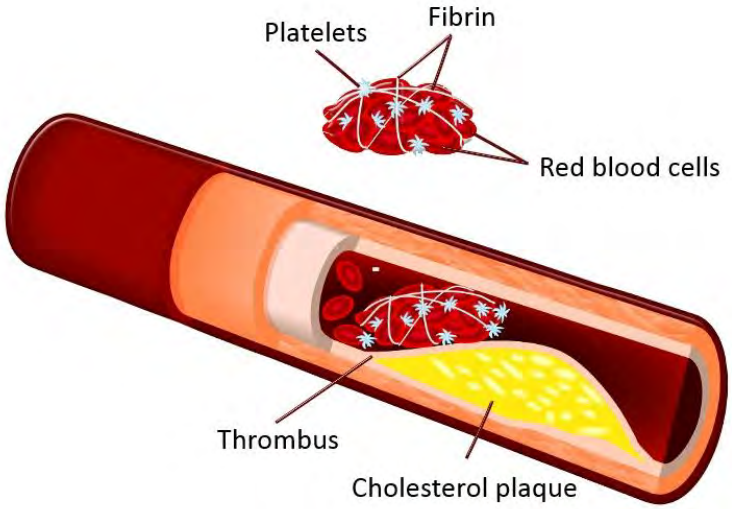


Evidence depuis 1995

Revascularisation

Thrombolyse (TIV) : «dissoudre» le caillot
Evidence depuis 1995

Hôpital du Valais
Spital Wallis



- streptokinase
- urokinase
- altéplase
- retéplase
- ténectéplase (2017-2018)

Hôpital du Valais
Spital Wallis

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 26, 2018 VOL. 378 NO. 17

NEW

Tenecteplase versus Alteplase before Thrombectomy for Ischemic Stroke

B.C.V. Campbell, P.J. Mitchell, L. Churilov, N. Yassi, T.J. Kleinig, R.J. Dowling, B. Yan, S.J. Bush, H.M. Dewey, V. Thijs, R. Scroop, M. Simpson, M. Brooks, H. Asadi, T.Y. Wu, D.G. Shah, T. Wijeratne, T. Ang, F. Miteff, C.R. Levi, E. Rodrigues, H. Zhao, P. Salvaris, C. Garcia-Esperon, P. Bailey, H. Rice, L. de Villiers, H. Brown, K. Redmond, D. Leggett, J.N. Fink, W. Collecutt, A.A. Wong, C. Muller, A. Coulthard, K. Mitchell, J. Clouston, K. Mahady, D. Field, H. Ma, T.G. Phan, W. Chong, R.V. Chandra, L.-A. Slater, M. Krause, T.J. Harrington, K.C. Faulder, B.S. Steinfort, C.F. Bladin, G. Sharma, P.M. Desmond, M.W. Parsons, G.A. Donnan, and S.M. Davis, for the EXTEND-IA TNK Investigators*

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Tenecteplase versus Alteplase for Acute Ischemic Stroke

Mark Parsons, M.D., Neil Spratt, M.D., Andrew Bivard, B.Sc., Bruce Campbell, M.D., Kong Chung, M.D., Ferdinand Miteff, M.D., Bill O'Brien, M.D., Christopher Bladin, M.D., Patrick McElduff, Ph.D., Chris Allen, M.D., Grant Bateman, M.D., Geoffrey Donnan, M.D., Stephen Davis, M.D., and Christopher Levi, M.D.

N Engl J Med 2012;366:1099-107

Tenecteplase versus alteplase for management of acute ischaemic stroke (NOR-TEST): a phase 3, randomised, open-label, blinded endpoint trial

Nicola Logallo, Vojtech Novotny, Jörg Assmus, Christopher E Kvistad, Lars Alteheld, Ole Morten Rønning, Bente Thommessen, Karl-Friedrich Amthor, Hege Ihle-Hansen, Martin Kurz, Håkon Tobro, Kamaljit Kaur, Magdalena Stankiewicz, Maria Carlsson, Åse Morsund, Titto Idicula, Anne Hege Aamodt, Christian Lund, Halvor Næss, Ulrike Waje-Andreassen, Lars Thomassen

Summary

Background Tenecteplase is a newer thrombolytic agent with some pharmacological advantages over alteplase. Previous phase 2 trials of tenecteplase in acute ischaemic stroke have shown promising results. We aimed to investigate the safety and efficacy of tenecteplase versus alteplase in patients with acute stroke who were eligible for intravenous thrombolysis.

Lancet Neurol 2017

Published Online August 2, 2017

http://dx.doi.org/10.1016/S1474-4422(17)30253-3

Meilleure méthode …

Traitement endovasculaire (TEV)
Evidence depuis 2015

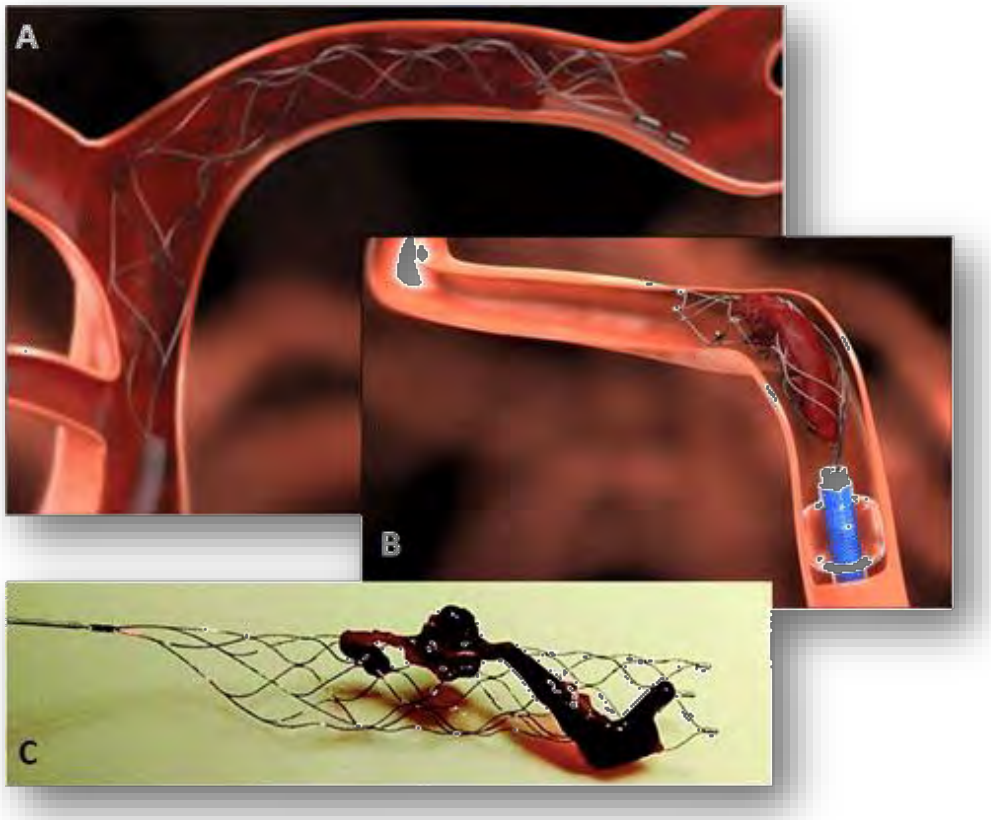
Hôpital du Valais
Spital Wallis

- Cas bien **sélectionnés, vaisseaux accessible**
  PAS POUR TOUT LE MONDE !!!

- En bonne santé

- **Geste ultra-spécialisé**
- Neuroradiologie interventionnelle

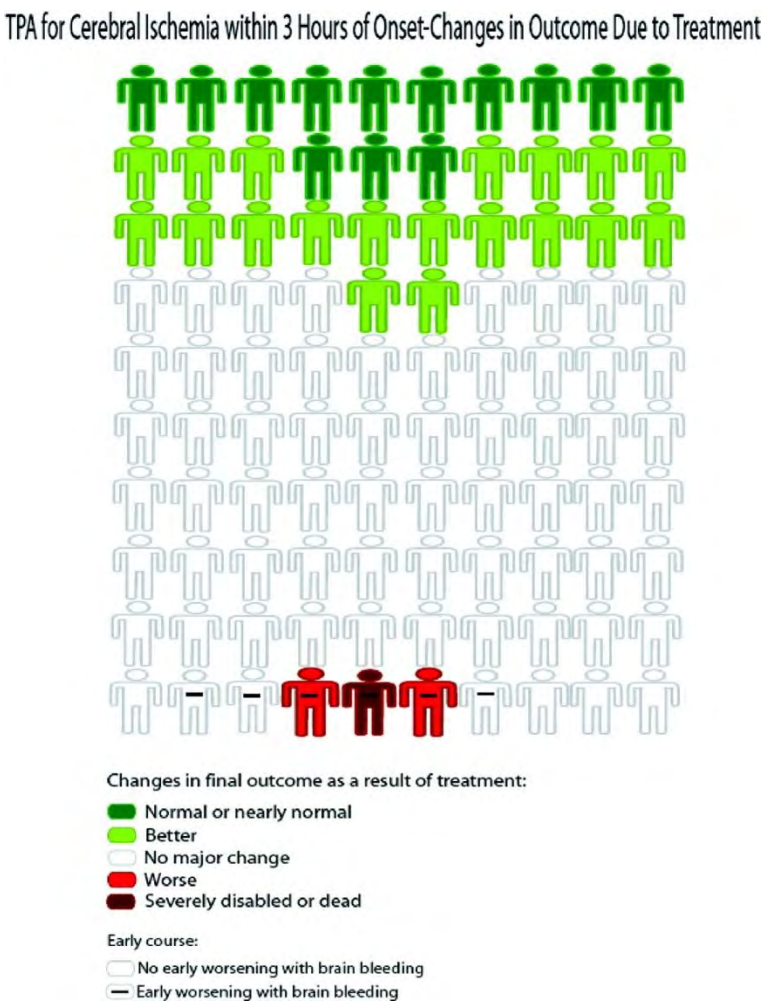
- **MHS ➔ Stroke Center**



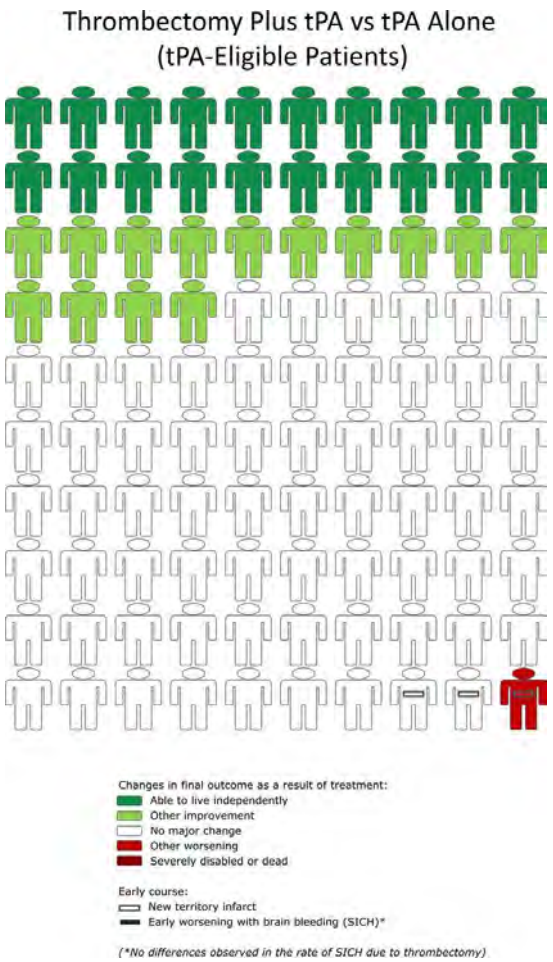
Bénéfice et risque de la TIV et TEV

Hôpital du Valais
Spital Wallis

Thrombolyse (TIV)



Thrombectomie (TEV)

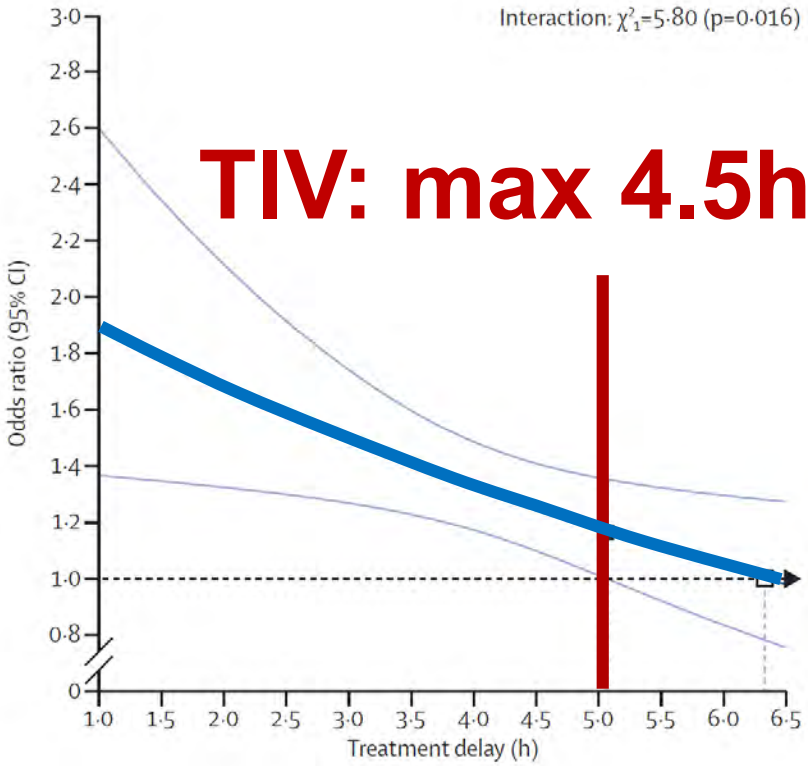


https://doi.org/10.1161/STROKEAHA.109.566935 - Stroke. 2010;41:300-306
https://doi.org/10.1161/STROKEAHA.117.018715 - Stroke. 2018;49:90-97

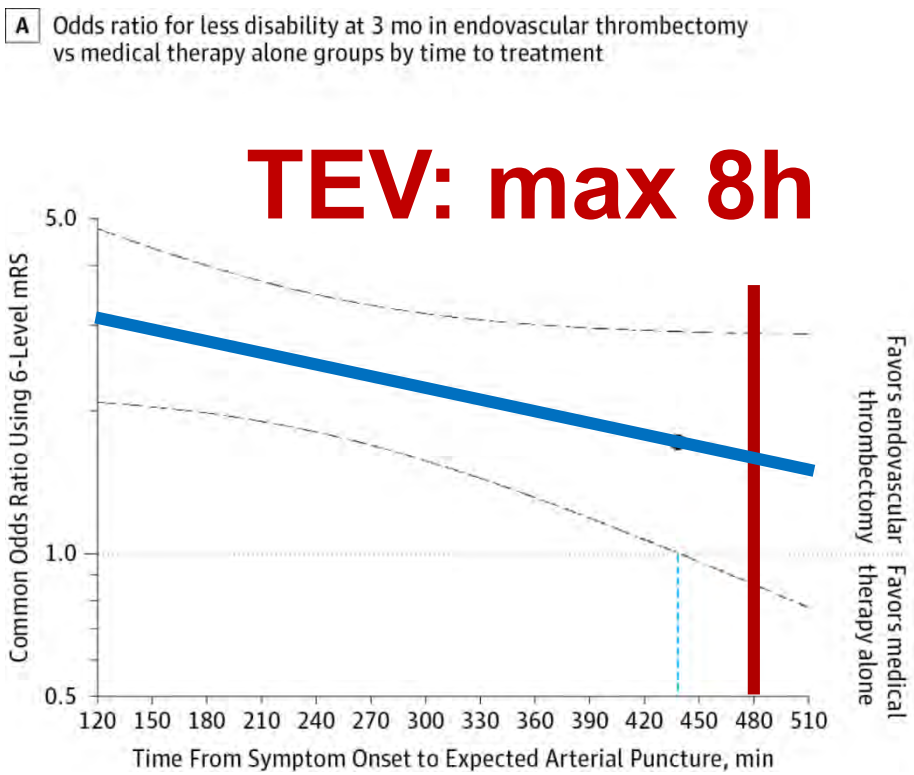
L'AVC est une urgence !

Hôpital du Valais
Spital Wallis

Le pronostic dépend de la rapidité de traitement



TIV: max 4.5h



TEV: max 8h

Emberson, Lees, Lyden et al, The Lancet 2014 – JL Saver, JAMA. 2016;316(12):1279

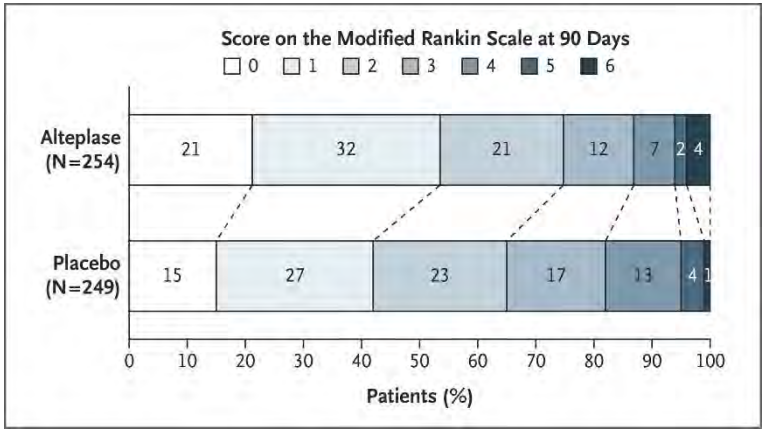
La prise en charge urgente (P1) des AVC doit être étendue à 24h depuis le début des symptômes

Hôpital du Valais
Spital Wallis

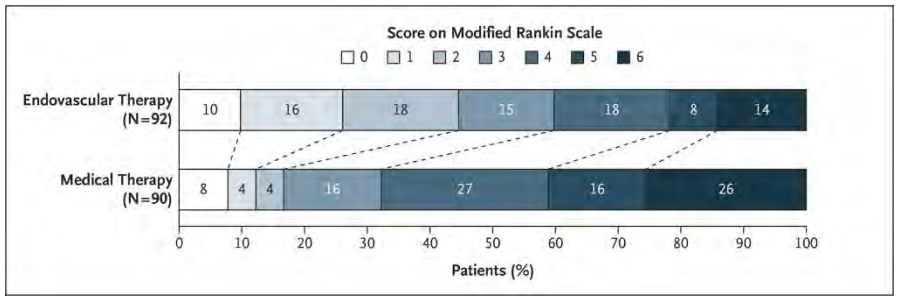
TIV et TEV possible ➔ 24h (*cas sélectionnés*)

Nouvelles études 2018: DAWN, DEFUSE 3, WAKE-UP

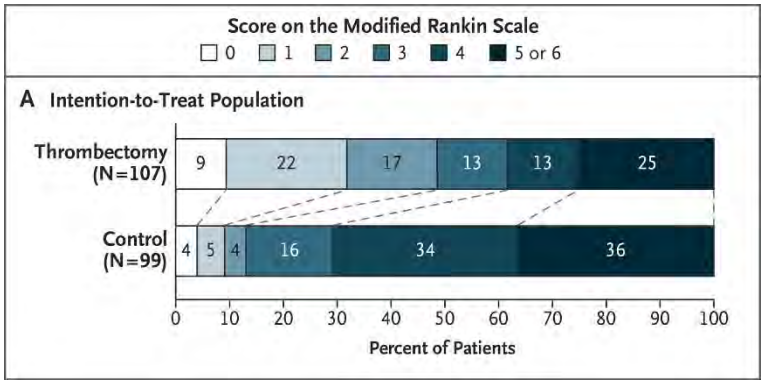
WAKE-UP (TIV)



DEFUSE 3 (TEV)



DAWN (TEV)



NEW

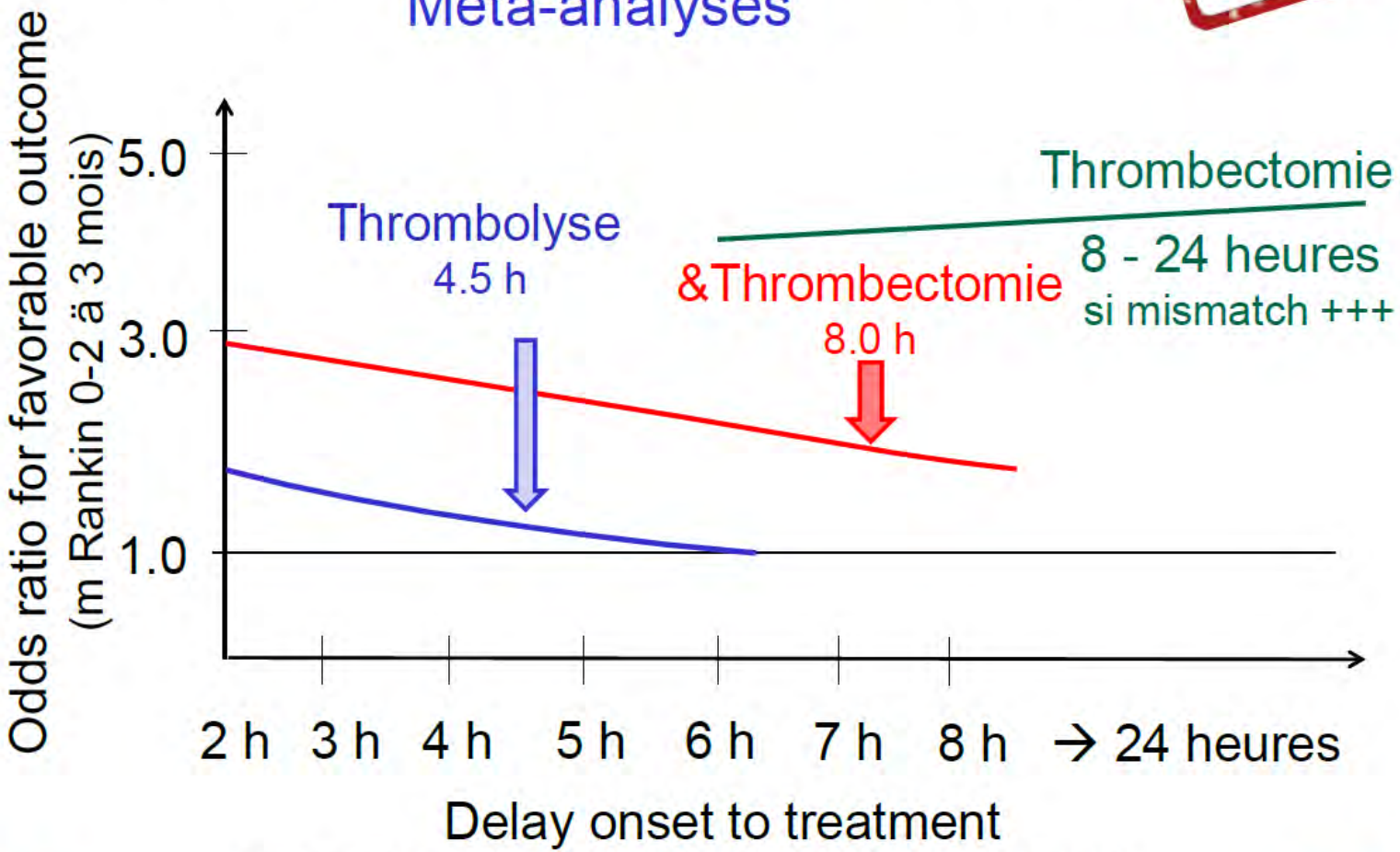
DAWN: https://www.nejm.org/doi/full/10.1056/NEJMoa1706442, DEFUSE 3: https://www.nejm.org/doi/full/10.1056/NEJMoa1713973, WAKE-UP: https://www.nejm.org/doi/full/10.1056/NEJMoa1804355

Hôpital du Valais
Spital Wallis

Efficacy of acute recanalisation

NEW

Meta-analyses



Emberson/STTC Lancet 2004; Saver/HERMES JAMA 2016
Jobin/AURORA ESOC 2018; Thomalla/WAKEUP NEJM 2018

CHUV

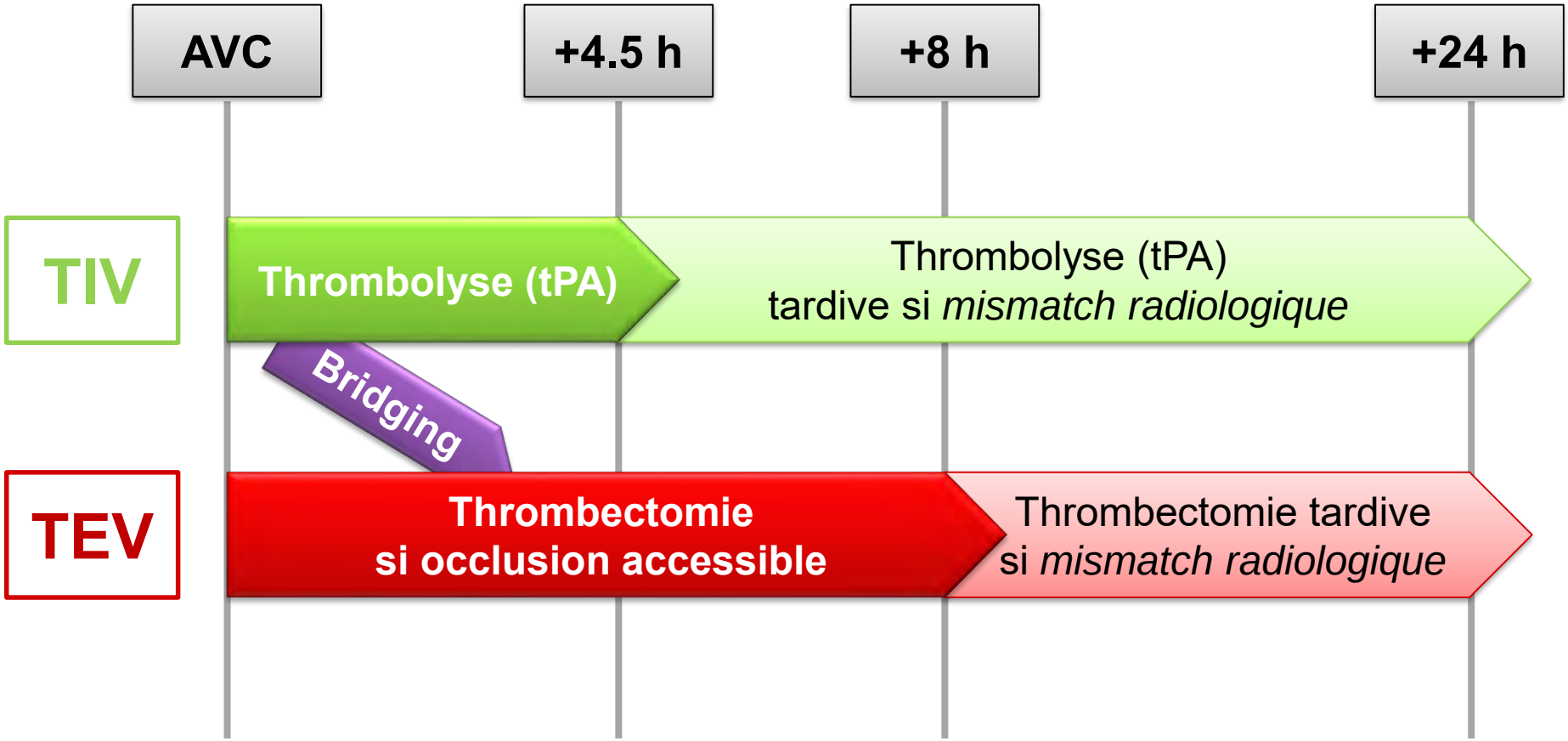
UNIL | Université de Lausanne

De Patrik Michel, CHUV

Revascularisation des AVC : résumé
nouveautés 2018

Hôpital du Valais
Spital Wallis

NEW



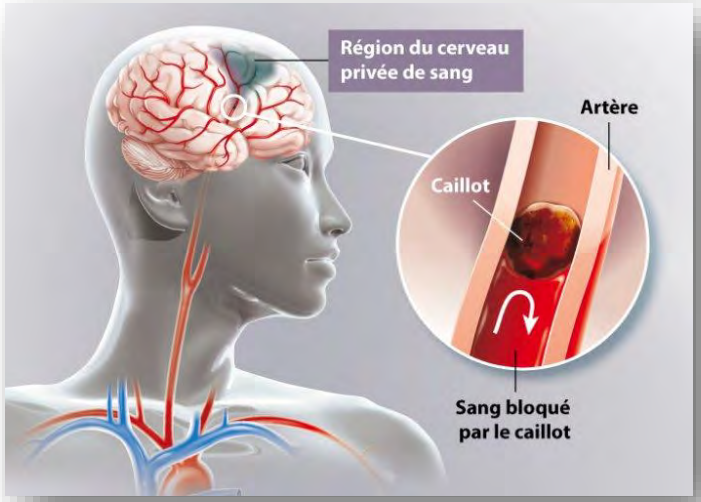
TIV = Thrombolyse intraveineuse, TEV = Traitement endovasculaire (Stroke Center), Bridging = TIV puis TEV, mismatch radiologique = imagerie spécialisée

Thrombolyse intraveineuse (TIV)
Thrombectomie endovasculaire (TEV)

Hôpital du Valais
Spital Wallis

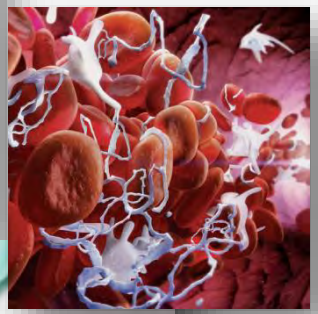
Stroke Unit ou Center

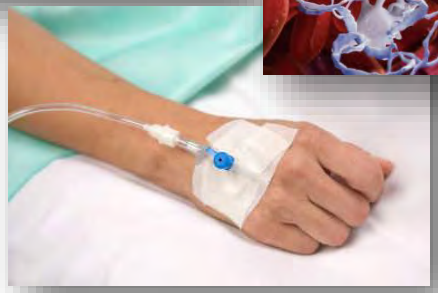
1995 (TIV)

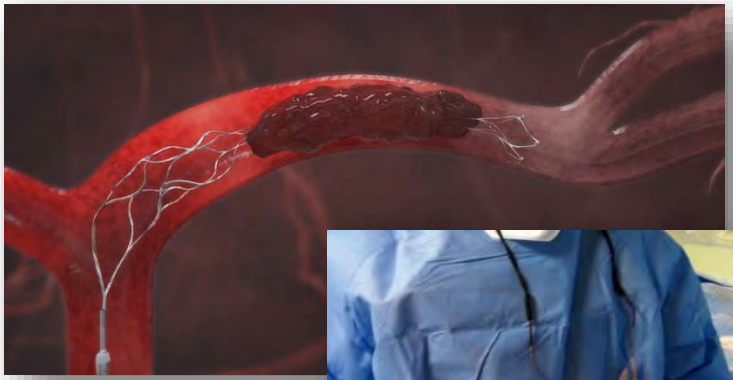


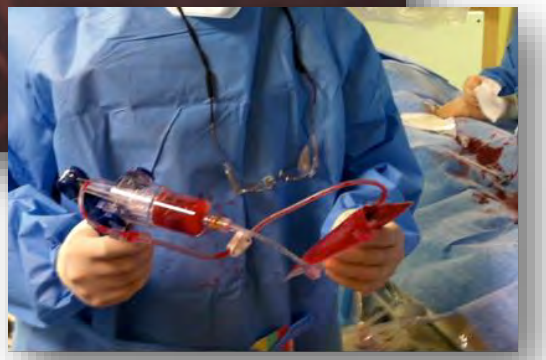
MHS : Stroke Center

2015 (TEV)









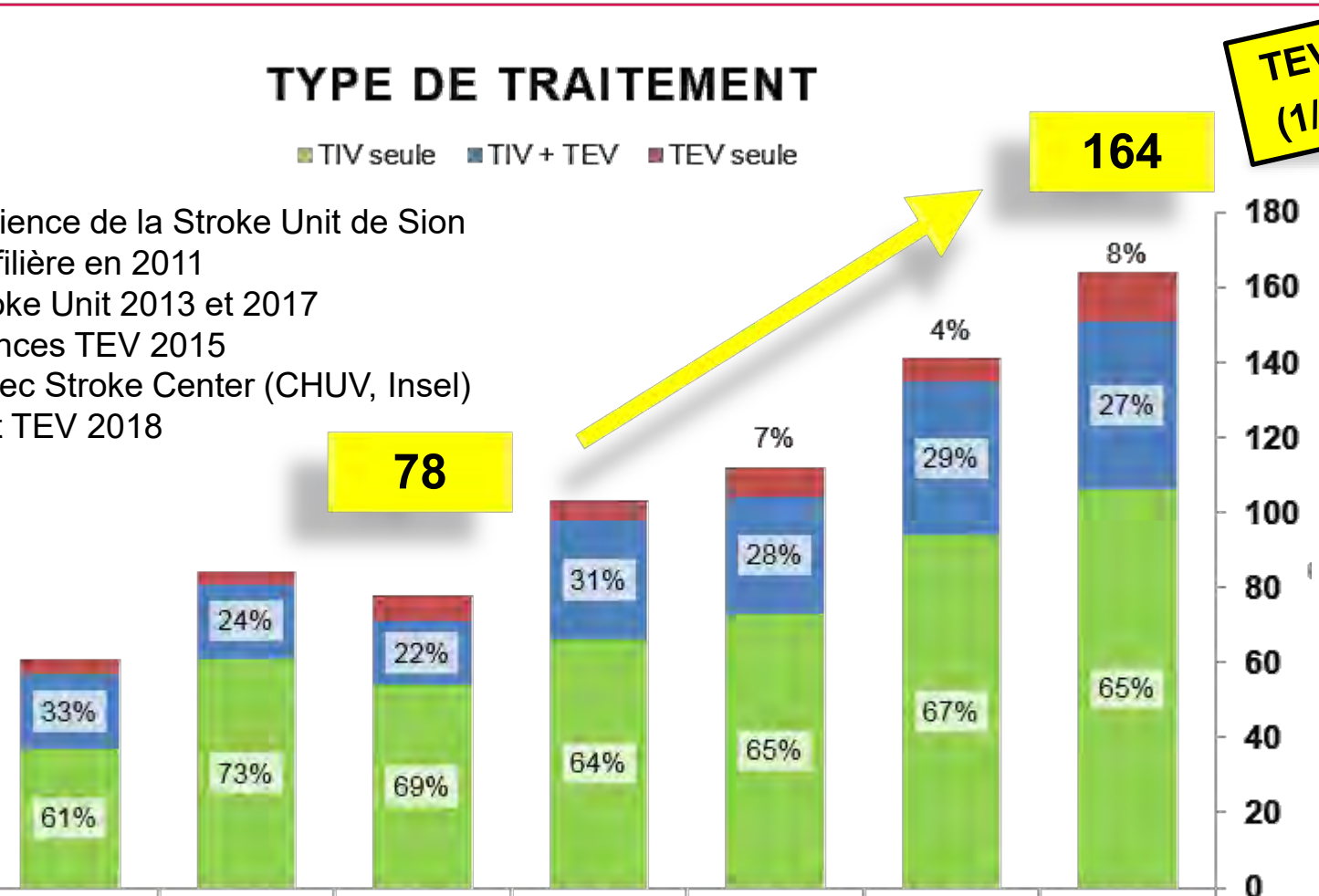
1/3

Evolution des traitements CHVR 2012 – 2018

Doublement en 4 ans !

Hôpital du Valais
Spital Wallis

- Volume et expérience de la Stroke Unit de Sion
- Activation de la filière en 2011
- Certification Stroke Unit 2013 et 2017
- Nouvelles évidences TEV 2015
- Collaboration avec Stroke Center (CHUV, Insel)
- Extension TIV et TEV 2018

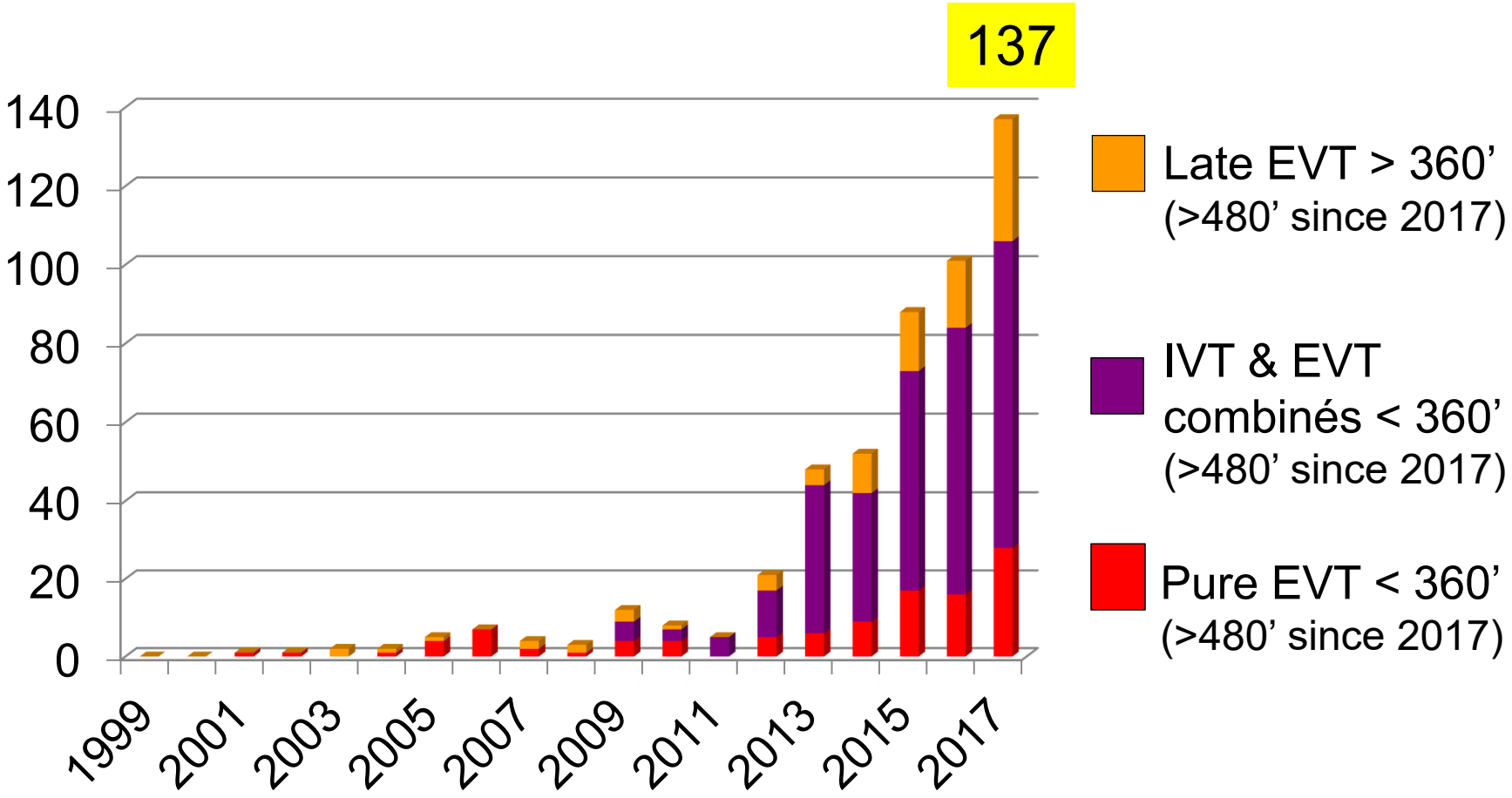


	2012	2013	2014	2015	2016	2017	2018
% TEV	39%	27%	31%	36%	35%	33%	35%
TEV seule	4	3	7	5	8	6	13
TIV + TEV	20	20	17	32	31	41	45
TIV seule	37	61	54	66	73	94	106

Database locale 2018

Number of endovascular treatments

for acute ischemic stroke at CHUV (N=360)



Only endovascular treatments effectively performed

Source: ASTRA P. Michel / A. Eskandari

CHUV

UNIL | Université de Lausanne

Nouvelles filières pour les cas particuliers ?

Hôpital du Valais
Spital Wallis

Mobile stroke unit

«drip & drive»

AVC en Valais

«drip & ship»

«mothership»

«reverse»

Stroke Unit Sion

1/3 patients thrombolysés

Stroke Center CHUV, Insel, HUG

Filière AVC 2019 (ne pas diffuser)

Hôpital du Valais
Spital Wallis

PLAN PROVISOIRE

Suspicion d'AVC
Annonce au 144

Nouveau déficit neurologique

Etat préalable du patient
à relativiser !

Bonne qualité de vie
(mRS ≤ 3)

relatif !

Qualité de vie limitée
(mRS ≥ 4)

Délai depuis le début de l'AVC

≤ 24h ou au réveil

24 – 72h

OU

> 72h

G-FAST *

P1

P2

P2 **P3**

Annonce (checklist)
Acheminement

027 603 1888
Neuro + Urg

027 603 8568
Urg

décision

Pas filière

1 99 88
Filière interne

repêchage !

Destination

H Hôpital de Sion
Stroke Unit

S1

Hôpital de proximité

027 603 1888
Neuro + Urg

Annonce du cas au neuro dans les 24h

* par l'ambulancier

Neuro garde 24h/24
027 603 44 55

Transfert
Stroke Center

Nouvelle filière valaisanne des AVC 2019

Hôpital du Valais
Spital Wallis

THE STROKE CENTER

CHUV
HUG
INSELSPITAL

coopération

Sion
Unité cérébovasculaire du Valais

Sierre
CRR - SUVA
Berner Klinik

Reha Brig

Sensibilisation du public	Prévention l'AVC	Prise en charge hyperaiguë (Préhospitalier)	Prise en charge aiguë (Stroke Unit)	Prise en charge subaiguë et Réadaptation	Réintégration dans la communauté
Médias	Médecin traitant	OCVS	Urgences H	Hôpitaux et cliniques de soins	Domicile
Campagnes d'information	Médecins spécialistes	Urgences H	**Stroke Unit Sion** (Service de neuro)	CRR	CMS
Médecin	Patient	Services infirmiers	Soins intensifs	CTR	EMS
Famille			Stroke Center	Hôpitaux de gériatrie	CTR
					Soins palliatifs

www.attaquecerebrale.ch

Adapté des recommandations canadiennes pour la pratique optimale de soins de l'AVC

1. Antithrombotiques
2. Statines
3. Anti-hypertenseurs

Les 3 lignes thérapeutiques principales

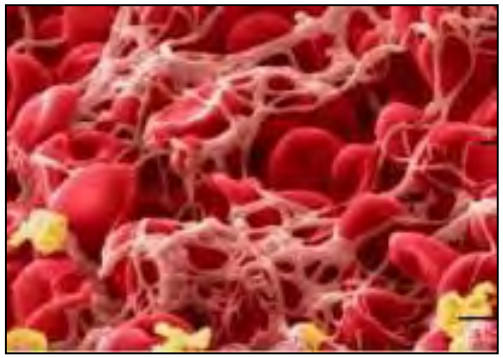
Aspirine… le traitement des 100 dernières années

Hôpital du Valais
Spital Wallis

Traiter 100 patients pour en améliorer 1 !

Antiplaquettaire ou anticoagulation ?

- **Antiplaquettaires**
  - AVC sur athéromatose
  - AVC lacunaires (microangiopathie)
  - AVC d'origine indéterminée (y.c ESUS)



- **Anticoagulation**
  - AVC avec source cardiaque définie
  - AVC
    - à haut risque (FA, valves mécaniques, …)
    - à bas risque mais AVC récidivant (évidence limitée)
    - sténose ou dissection subocclusive aiguë (évidence limitée)

AHA/Sacco Stroke 2007; ESO 2008

Choix des antithrombotiques après AVC

- **La plupart du temps y.c ESUS ➔ antiagrégants**
  - **Clopidogrel (Plavix)**
  - Aspirine (si pas de FRCV)
  - Combinaison ASA+Clopi
    - **3 mois** si athéromatose complexe vulnérable
    - **21 jours** si AVC mineur ou AIT à haut risque (Etude POINT et CHANCE)
  - Autres dans de très rares cas

- **Certains AVC spéciaux (d'origine cardiaque, états hypercoagulabes, …) ➔ anticoagulants**
  - **Sintrom** / Marcoumar
  - **Nouveaux anticoagulants oraux (DOAC)**

ESPS-2, ESPRIT, CAPRIE, MATCH, CHARISMA, PROFESS, CHANCE, POINT

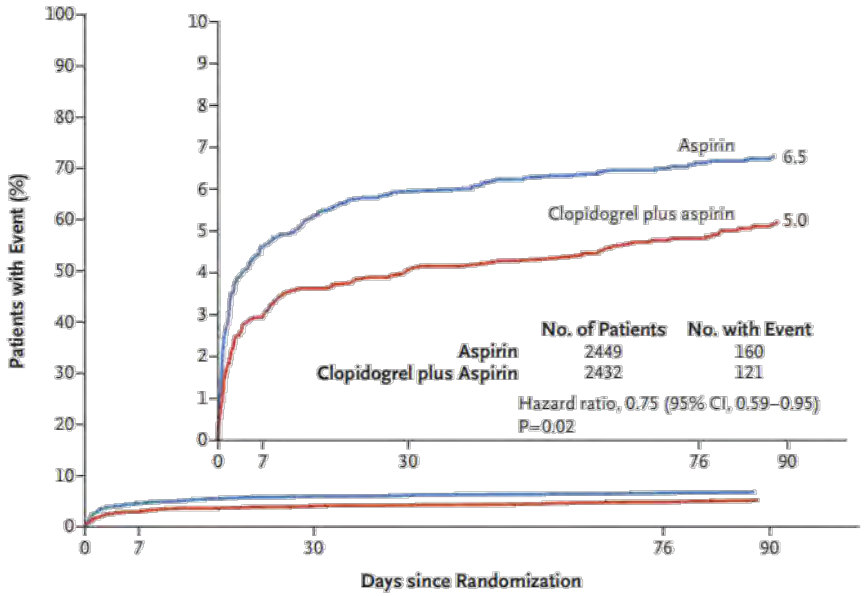
AVC mineur et AIT à haut risque

NEW

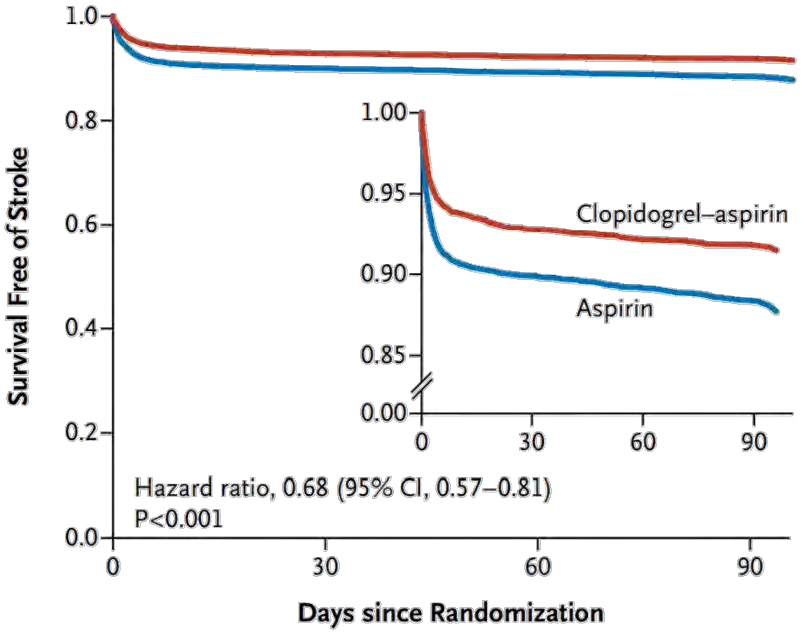
21 JOURS (3 semaines)

Combinaison
ASA 100 + Clopi 75 meilleure !!!

Etude POINT 2018



Etude CHANCE 2013



N Engl J Med 2018;379:215-25. DOI: 10.1056/NEJMoa1800410
N Engl J Med 2013;369:11-19. DOI: 10.1056/NEJMoa1215340

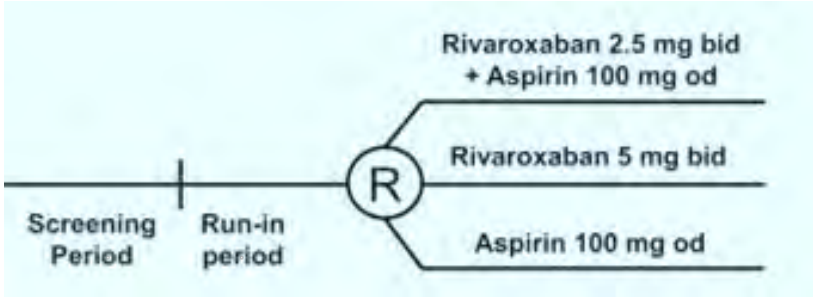
Quelle protection optimale chez patient athéromateux ou vasculopathe stable?

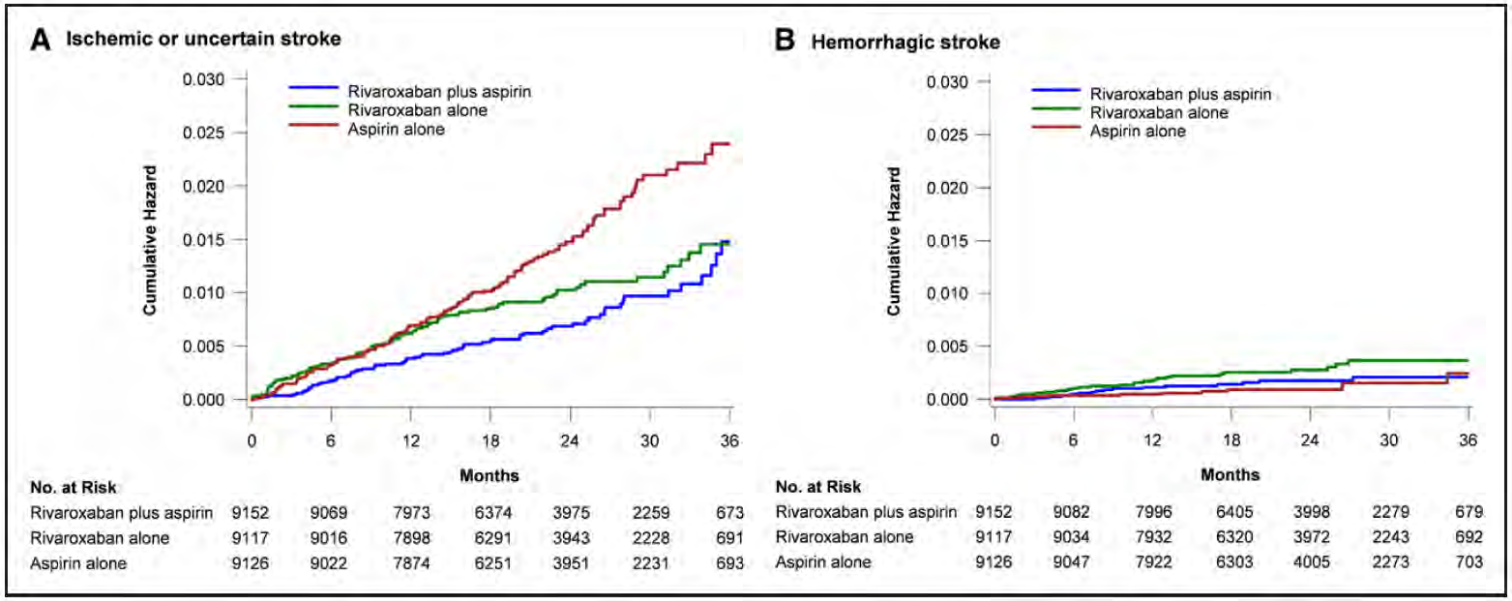
Hôpital du Valais
Spital Wallis

NEW

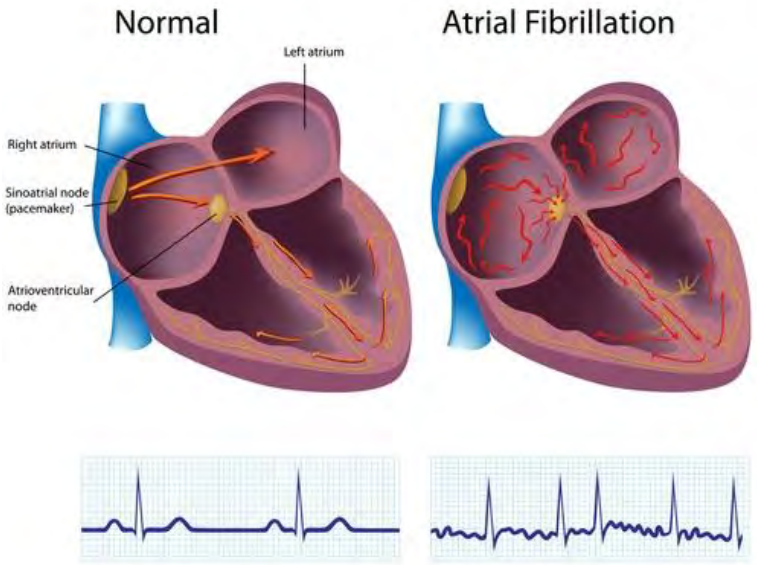
- **COMPASS trial, 27'000 patients**
- **Pas de FA mais athéromatose vasculaire stable (CAD, PAD, ATS carotidienne)**

Combinaison
ASA 100 + Rivaro 2x2.5 meilleure !!!





Circulation. 2019;139:1134–1145. DOI: 10.1161/CIRCULATIONAHA.118.035864

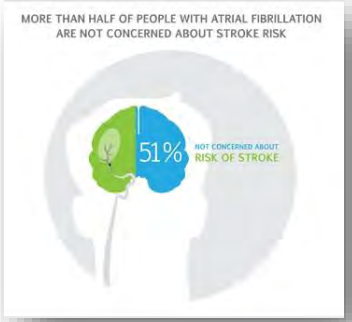


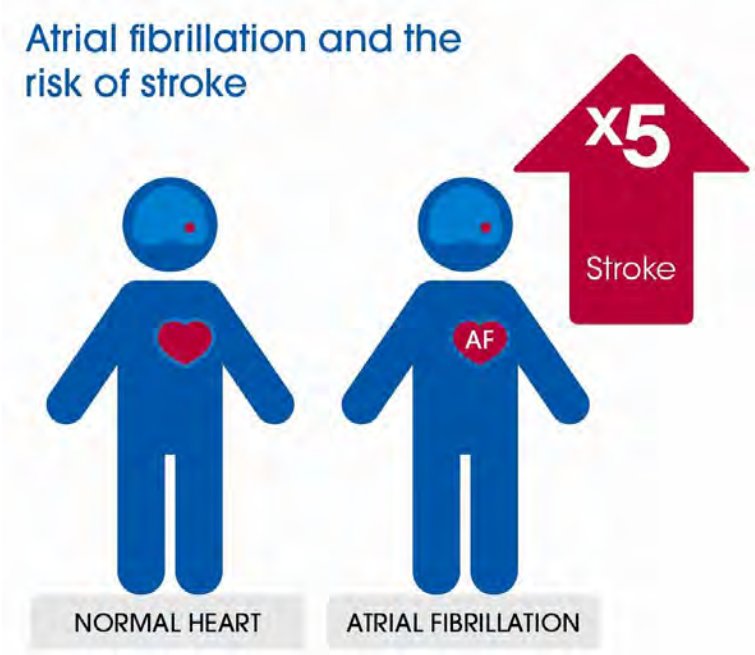
AVC cryptogénique

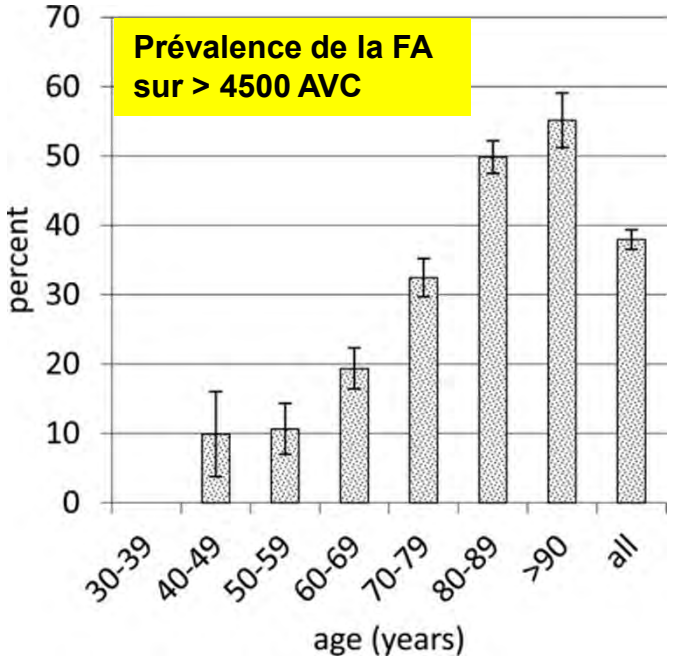
Fibrillation auriculaire

Accident vasculaire cérébral et FA

- Parfois **transitoire**
- 9x sur 10 : **asymptomatique !!!**
- **Mortalité double** à 10ans
- **Responsable de 25-30% de tous les AVC**





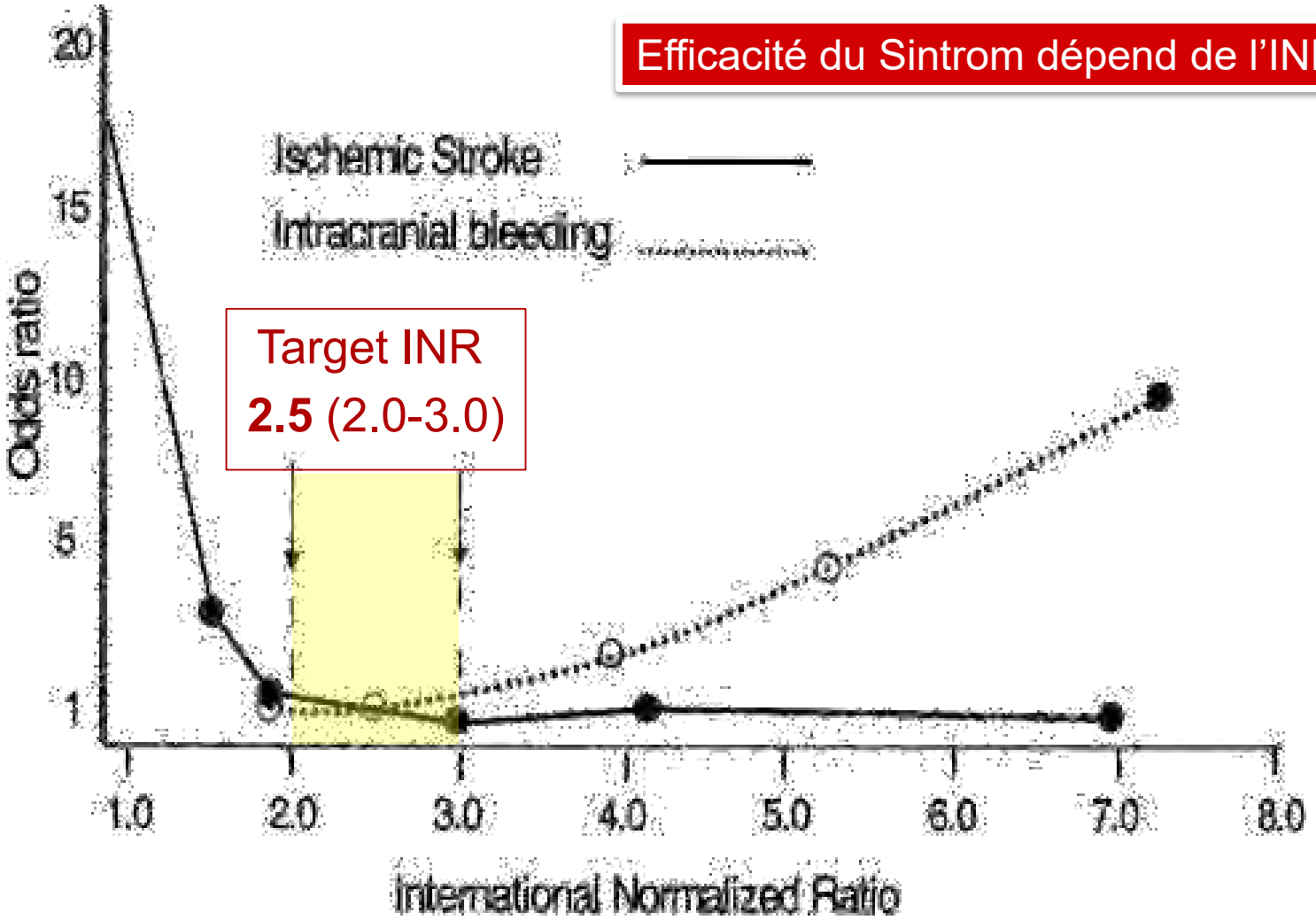


https://doi.org/10.1161/STROKEAHA.113.002329 Stroke. 2013;44:3103-3108 - Boehringer Ingelheim

Du Sintrom aux Anticoagulants directs (DOAC)

Hôpital du Valais
Spital Wallis

Efficacité du Sintrom dépend de l'INR



EAFT trial, NEJM 1995;333:5 – AHA Guidelines, Circul2006;114:700

Bénéfices des DOAC vs Sintrom

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DOACs:

- ↓15% **récidive** d'AVC
- ↓15% **mortalité**
- ↓10-15% **hémorragies** majeures
- ↓**55%** **hémorragies intracérébrales**

Cause d'AVC inutile !

Eliquis ®
Pradaxa ®
Xarelto ®
Lixiana ®

Hans-Christoph Diener, www.medscape.com/viewarticle/854665

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Tous les DOAC ne sont pas égaux !!!

Protection contre les AVC

Risque hémorragique digestif en particulier

Interactions

Gestion des 3 points clés : **WAR !**

W=Weight, A=Age, R=Renal function

DOAC et risque d'hémorragie digestive
Meilleur profil = Apixaban (Eliquis®)

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In nonvalvular AF, DOAC-related risk for GI bleeding was lower with apixaban than dabigatran or rivaroxaban

Relative association of different direct oral anticoagulant drugs with gastrointestinal bleeding*

Comparisons (median follow-up)	N	*Events/100 patient-y*	*HR (95% CI)†*
Rivaroxaban (113 d) vs dabigatran (120 d)	31 574	2.74 vs 2.02	1.20 (1.00 to 1.45)
Apixaban (89 d) vs rivaroxaban (106 d)	13 130	1.34 vs 3.54	0.33 (0.22 to 0.49)
Apixaban (89 d) vs dabigatran (120 d)	13 084	1.38 to 2.73	0.39 (0.27 to 0.58)

*HR = hazard ratio; CI defined in Glossary. Groups were matched using propensity scores based on sociodemographic variables, comorbid conditions, and previous warfarin use.

†Treatment x age interaction: rivaroxaban vs dabigatran, P = 0.10; apixaban vs rivaroxaban, P = 0.36; apixaban vs dabigatran, P = 0.54.

SYSTEMATIC REVIEWS AND META-ANALYSES

Siddharth Singh, Section Editor

Risk of Gastrointestinal Bleeding in Patients Taking Non–Vitamin K Antagonist Oral Anticoagulants: A Systematic Review and Meta-analysis

Corey S. Miller,[*,a] Alastair Dorreen,[‡,a] Myriam Martel,[§] Thao Huynh,[‖] and Alan N. Barkun[§,¶]

	Studies, n	ITT patients	OR (95% CI)
Primary outcome			
Major GI bleeding	28	129,357	0.98 (0.80–1.21)
Secondary outcomes			
Total GI bleeding	3	3390	1.47 (0.97–2.22)
CRNM GI bleeding	8	16,969	0.93 (0.64–1.36)
Minor GI bleeding	1	222	3.32 (0.25–44.34)
Upper GI bleeding	4	23,224	0.96 (0.77–1.20)
Lower GI bleeding	4	23,211	0.88 (0.67–1.15)
Subgroup analyses			
Individual NOAC			
Apixaban	9	43,647	0.81 (0.64–1.02)
Dabigatran	5	27,485	1.27 (1.04–1.55)
Edoxaban	6	31,050	0.93 (0.78–1.11)
Rivaroxaban	8	27,175	1.40 (1.15–1.70)
Comparator			
Warfarin	14	95,311	0.96 (0.75–1.21)
Enoxaparin	9	23,167	0.99 (0.47–2.05)
Aspirin	1	5599	0.85 (0.39–1.84)
Placebo	4	5280	2.50 (0.61–10.16)

http://dx.doi.org/10.7326/ACPJC-2017-167-4-021
Clinical Gastroenterology and Hepatology 2017;15:1674–1683 http://dx.doi.org/10.1016/j.cgh.2017.04.031.

ORIGINAL RESEARCH

Hôpital du Valais
Spital Wallis

American Heart Association | American Stroke Association

Received January 16, 2018; accepted March 21, 2018.

Effectiveness and Safety of Apixaban, Dabigatran, and Rivaroxaban Versus Warfarin in Frail Patients With Nonvalvular Atrial Fibrillation

Brandon K. Martinez, PharmD; Nitesh A. Sood, MD; Thomas J. Bunz, PharmD, PhD; Craig I. Coleman, PharmD

Conclusions—Our study found rivaroxaban but not apixaban or dabigatran to be associated with reduced SSE versus warfarin in frail nonvalvular atrial fibrillation patients. No direct-acting oral anticoagulants demonstrated a significant difference in major bleeding versus warfarin. **(*J Am Heart Assoc*. 2018;7:e008643. DOI: 10.1161/JAHA.118.008643.)**

Table 2. Baseline Characteristics of Propensity Score–Matched Frail Direct-Acting Oral Anticoagulant and Warfarin Patients With Nonvalvular Atrial Fibrillation

Variable	Apixaban (n=1392)	Warfarin (n=1392)	Absolute Standardized Difference (%)	Dabigatran (n=1350)	Warfarin (n=1350)	Absolute Standardized Difference (%)	Rivaroxaban (n=2635)	Warfarin (n=2635)	Absolute Standardized Difference (%)
Age, y, median (IQR)*	86 (83, 89)	86 (83, 89)	0.00	85 (82, 88)	86 (82, 89)	0.01	85 (82, 89)	86 (82, 89)	0.01
65 to 74 y, %	1.4	1.7	0.01	2.5	2.1	0.03	2.1	2.4	0.02
≥75 y, %	98.4	98.3	0.01	97.5	97.9	0.02	97.8	97.5	0.02
Male sex, %	63.7	62.8	0.01	64.7	62.7	0.02	65.2	64.4	0.02
JHCFI score, median (IQR)	0.30 (0.24, 0.40)	0.30 (0.24, 0.39)	0.00	0.28 (0.23, 0.35)	0.28 (0.24, 0.37)	0.00	0.28 (0.24, 0.38)	0.29 (0.24, 0.38)	0.00
Receiving reduced dose, %	56.1	NA	NA	41.3	NA	NA	56.5	NA	NA

Coleman, C. JAHA 2018. https://doi.org/10.1016/S0735-1097(18)30831-3

Hypersélection !

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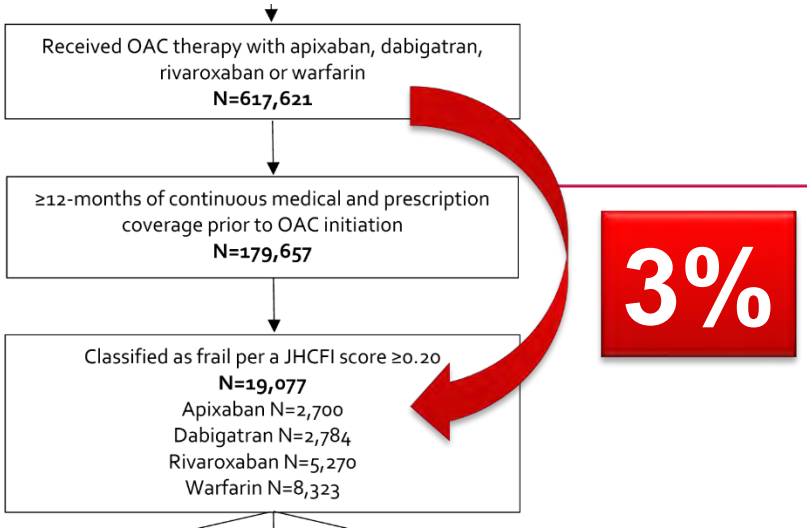
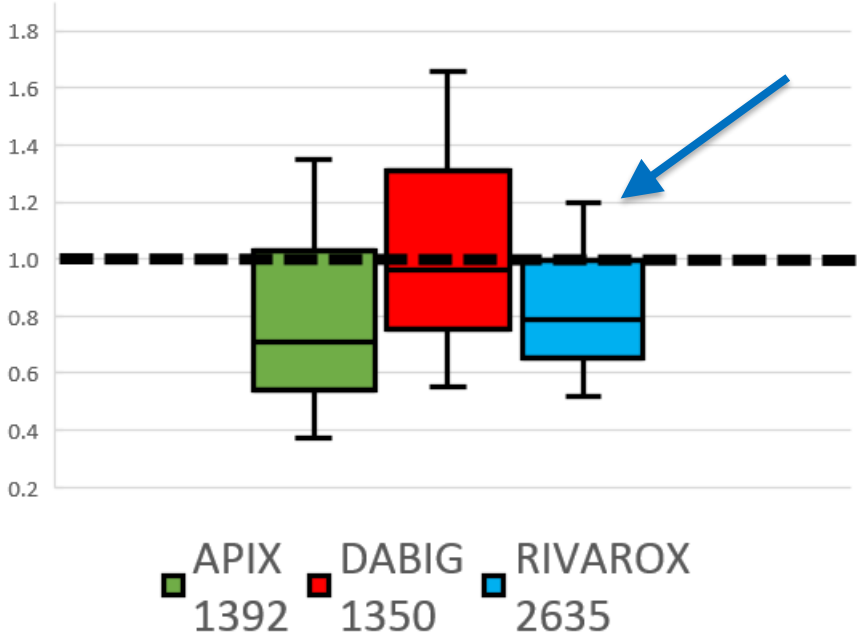
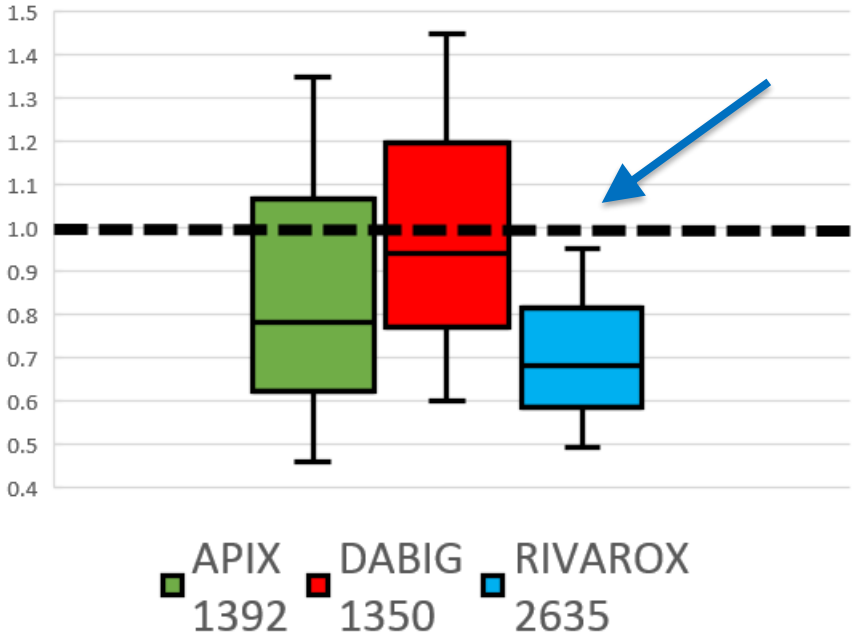


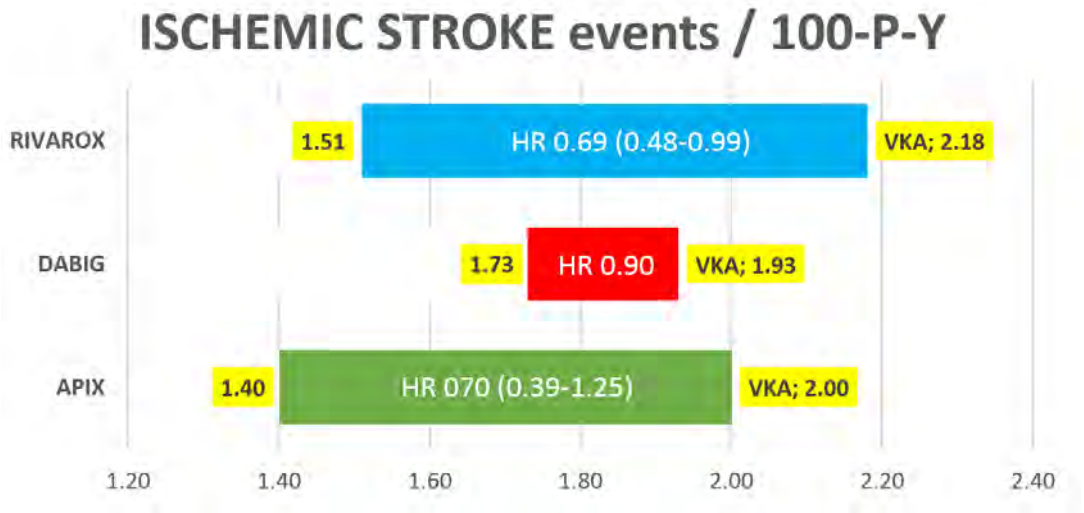
SSE at 1y (HR), DOAC vs VKA

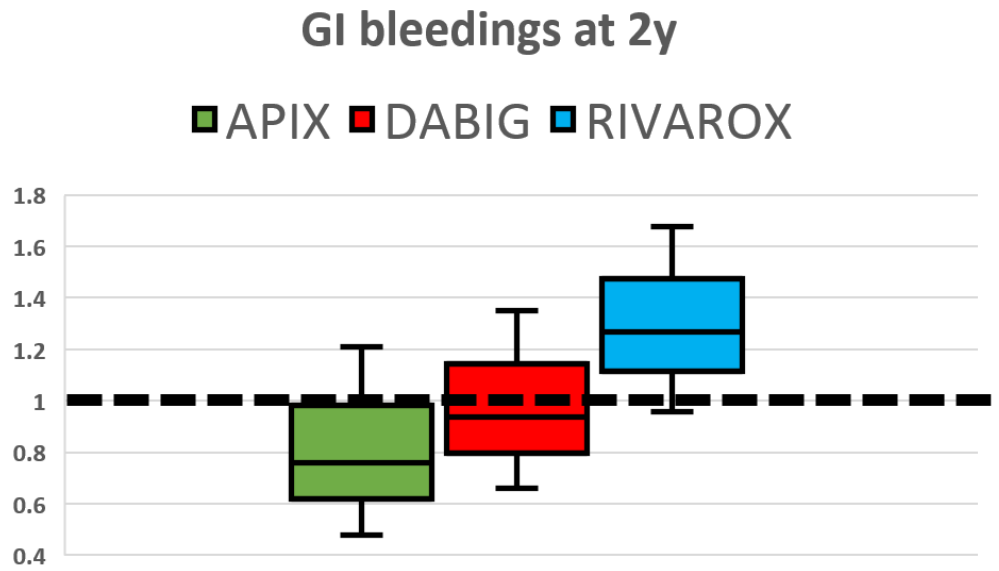


SSE at 2y (HR), DOAC vs VKA



Stroke and GI bleedings





Poster session ACC.18 … pas les mêmes résultats !

Hôpital du Valais
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ACC.18

290
JACC March 20, 2018
Volume 71, Issue 11

Arrhythmias and Clinical EP

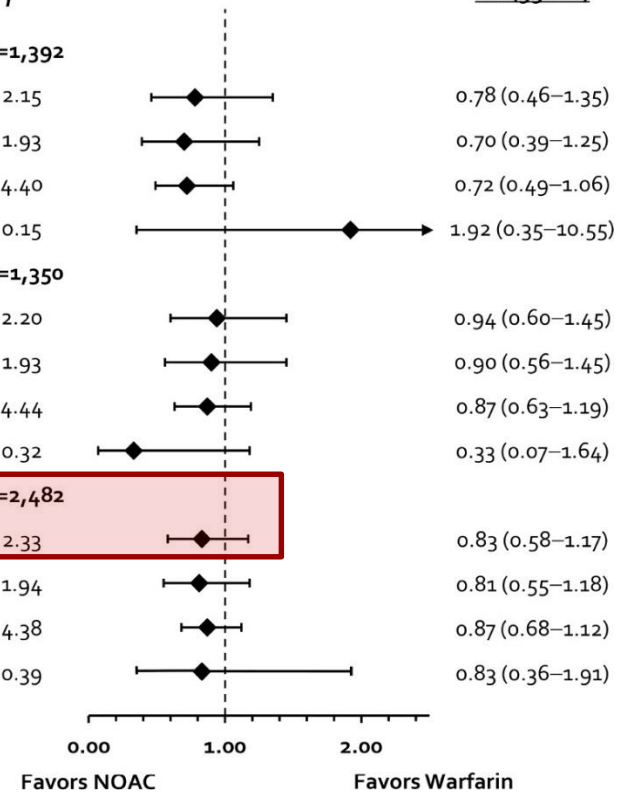
EFFECTIVENESS AND SAFETY OF APIXABAN, DABIGATRAN AND RIVAROXABAN VERSUS WARFARIN IN FRAIL PATIENTS WITH NONVALVULAR ATRIAL FIBRILLATION

Moderated Poster Contributions
Arrhythmias and Clinical EP Moderated Poster Theater, Poster Hall, Hall A/B
Sunday, March 11, 2018, 10:00 a.m.-10:10 a.m.

Sources of Funding

This study was supported by Bayer AG, Berlin, Germany. The sponsor had no role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

	Events/100 PY		HR (95%CI)
Apixaban vs. Warfarin	**N=1,392**	**N=1,392**	
Stroke/Systemic Embolism	1.68	2.15	0.78 (0.46–1.35)
Ischemic Stroke	1.73	1.93	0.70 (0.39–1.25)
Major Bleeding	3.11	4.40	0.72 (0.49–1.06)
Hemorrhagic Stroke	0.28	0.15	1.92 (0.35–10.55)
Dabigatran vs. Warfarin	**N=1,350**	**N=1,350**	
Stroke/Systemic Embolism	2.06	2.20	0.94 (0.60–1.45)
Ischemic Stroke	1.73	1.93	0.90 (0.56–1.45)
Major Bleeding	3.82	4.44	0.87 (0.63–1.19)
Hemorrhagic Stroke	0.10	0.32	0.33 (0.07–1.64)
Rivaroxaban vs. Warfarin	**N=2,482**	**N=2,482**	
Stroke/Systemic Embolism	1.92	2.33	0.83 (0.58–1.17)
Ischemic Stroke	1.56	1.94	0.81 (0.55–1.18)
Major Bleeding	3.79	4.38	0.87 (0.68–1.12)
Hemorrhagic Stroke	0.32	0.39	0.83 (0.36–1.91)



https://doi.org/10.1016/S0735-1097(18)30831-3

Vous devriez savoir

➔ informez vos patients

Hôpital du Valais
Spital Wallis

- **Eliquis ®**
  - **Pas de restriction** particulière pour la prise
- **Xarelto ®**
  - Toujours **durant les repas**
  - ➢sinon absorption du médicament diminue !!!
  - ➢risque de sous-anticoagulation !!!
- **Dabigatran ®**
  - **Ne jamais ouvrir les capsules**
  - ➢sinon biodisponibilité augmente de 80%
  - ➢risque de sur-anticoagulation !!!

Hôpital du Valais
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Traitement ?
Faut-il intervenir ?

"La vérité d'aujourd'hui
n'est pas forcément
celle de demain"

Foramen Ovale Perméable

FOP un facteur de risque pour les AVC ?

- **Prévalence du FOP dans la population générale = 25%**

➔le FOP n'est pas une maladie !

- **Risque d'AVC chez les personnes en BSH avec FOP : HR 1.5**
- **Prévalence du FOP chez les AVC cryptogénique = 40%**
- **Sur l'ensemble des AVC, l'implication du FOP est mineure**
- **Causalité ? (embolie paradoxale, thrombus local, …)**
- **Facteurs favorisant controversés (taille RLS, ASIA, TVP…)**
- **Récidive faible ~1 % par an, (idem AVC cryptogéniques)**
- **Autre étiologie retrouvée chez 40% des récidives**

➔ PRUDENCE DANS L'ATTITUDE, *primum non nocere*

RoPE score

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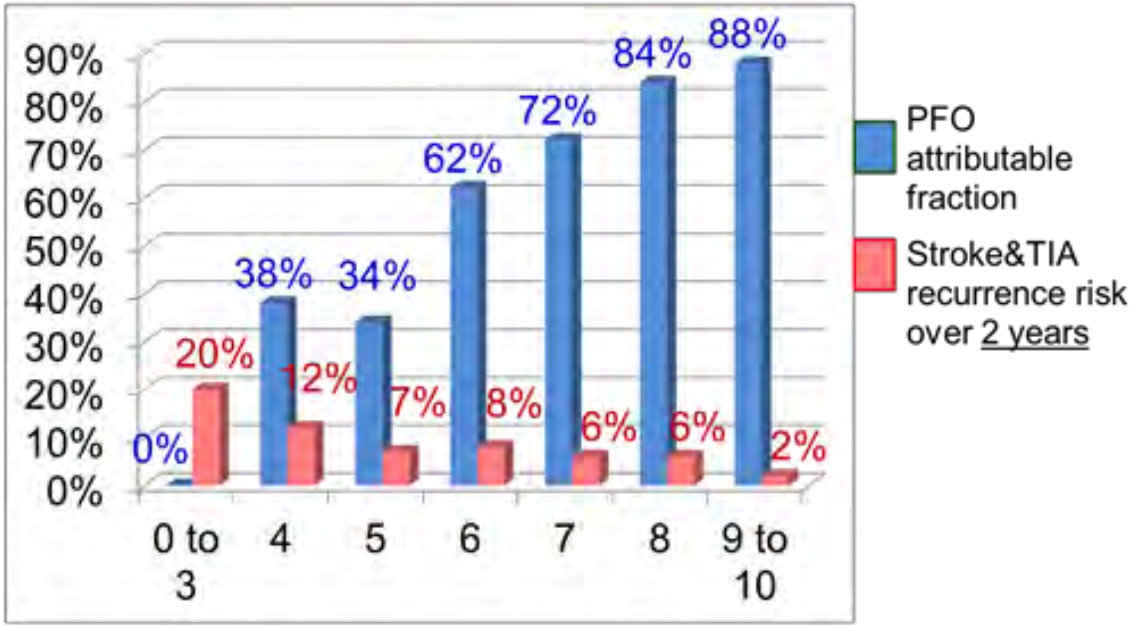
RoPE score		
No history of hypertension		1
No history of diabetes		1
No history of stroke or TIA		1
Non - smoker		1
Cortical infarct on imaging		1
Age	18 - 29 years	5
	30 - 39 years	4
	40 - 49 years	3
	50 - 59 years	2
	60 - 69 years	1
	≥ 70 years	0
Score 0-10 (10 = maximal risk)		

Increasing RoPE score

→ Increasing « PFO attributable fraction »

→ Decreasing TIA/Stroke recurrence risk



Kent, Neurology 2013

Méta-analyse : Fermeture de FOP supérieure au traitement antithrombotique

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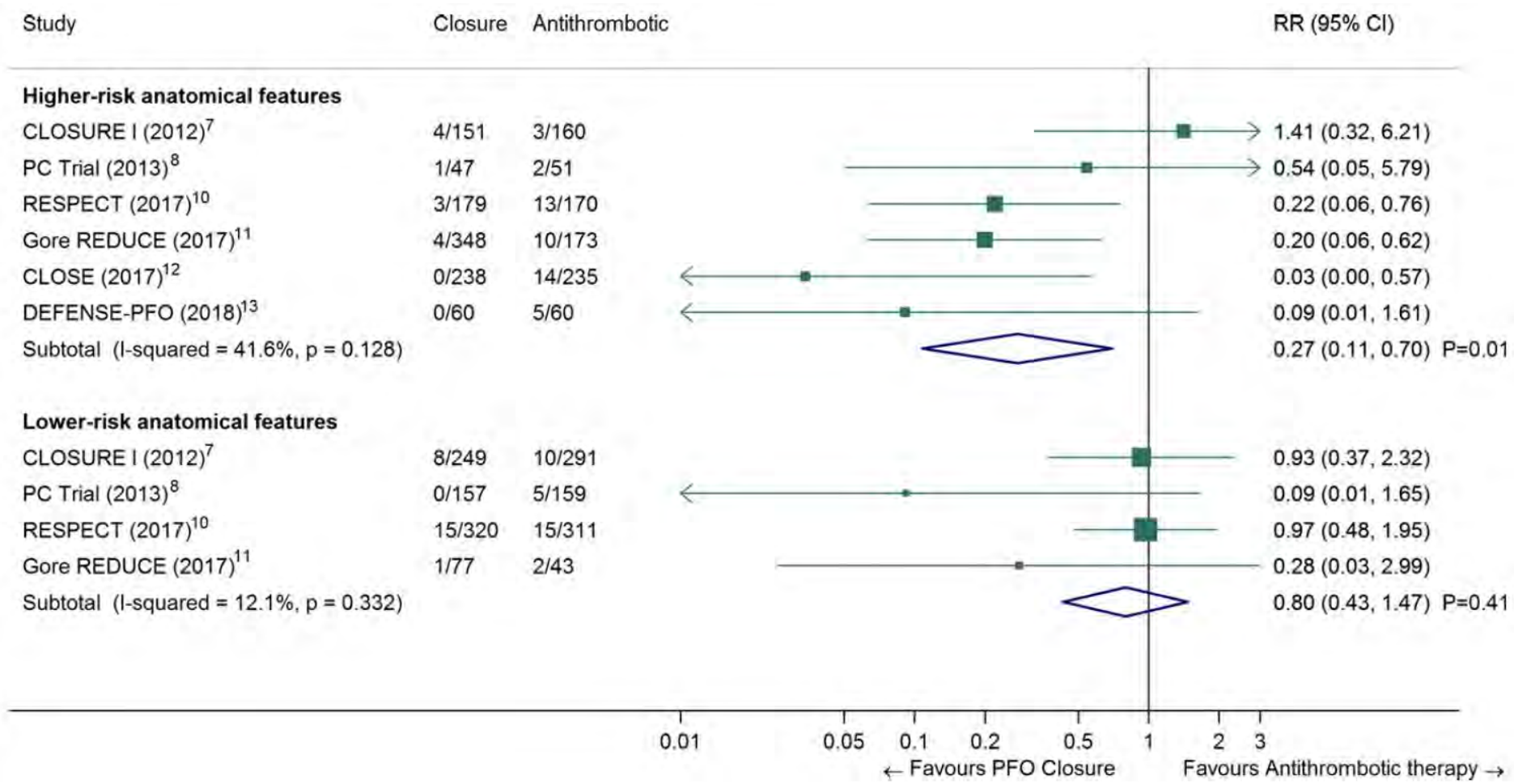
- **Pour les FOP à risque (modérés/larges et/ou ASIA)**



https://doi.org/10.1161/JAHA.117.008356

Méta-analyse : Fermeture de FOP augmente de 4.3x le risque de FA nouvelle

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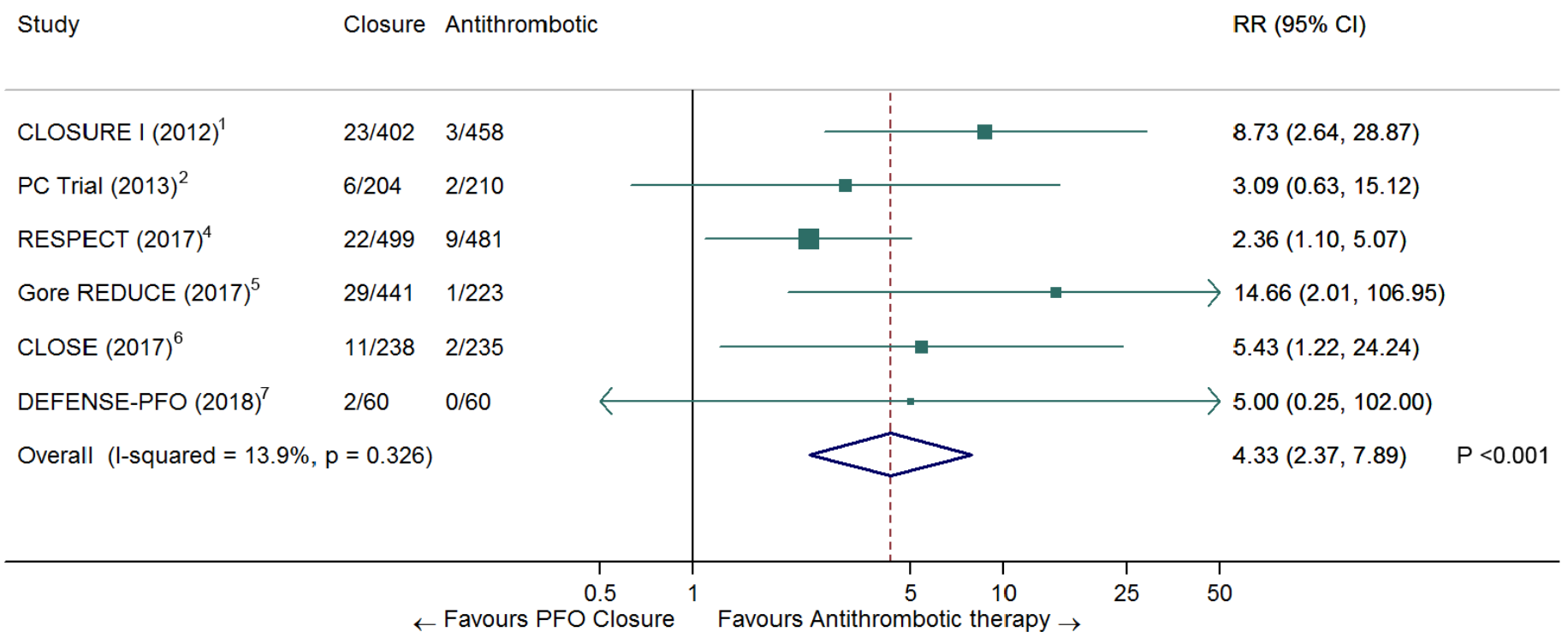
- **certains devices font mieux (Amplatzer)**



https://doi.org/10.1161/JAHA.117.008356

Risques liés à la fermeture du FOP :

- **7% dans cette analyse rétrospective de 1887 patients (10.9% > 60 ans vs 4.9% ≤ 60 ans)**
- **2.6% dans la méta-analyse des études**

Table 2. Risk of Adverse Outcomes During Hospitalization for Patent Foramen Ovale Closure

Characteristic*	Rate of Adverse Outcomes (95% CI)
Total adverse outcomes	7.0% (5.9%–8.2%)
Individual adverse outcomes†	
Atrial fibrillation/flutter	3.7% (2.9%–4.6%)
Vascular complication	3.0% (2.3%–3.9%)
Hematoma/hemorrhage only	2.7% (2.0%–3.5%)
Cardiac tamponade/perforation	0.5% (0.2%–0.9%)
Death	0.3% (0.1%–0.6%)
Pneumothorax/hemothorax	0.1% (0%–0.3%)

CI indicates confidence interval.
*Data are presented as % (95% CI), unless otherwise specified.
†Numbers do not sum to group totals because some patients had multiple outcomes.

Stroke. 2017;48:3073-3077. DOI: 10.1161/STROKEAHA.117.018501 et https://doi.org/10.1161/JAHA.117.008356

Fermeture de FOP : *mes* recommandations 2018

- Les études ne permettent pas de conclure si dans certains cas, l'anticoagulation pourrait être supérieure à la fermeture

> In conclusion, there is now enough evidence to reasonably conclude that PFO closure is superior to antithrombotic therapy with regard to the risk of stroke recurrence in patients with cryptogenic stroke. Patients with an associated atrial septal aneurysm or a large shunt may benefit more from PFO closure. This is a step forward that will benefit many patients.

Clinique	FOP	Traitement
Asymptomatique	FOP ± ASIA	aucun
AVC cryptogénique	FOP léger et/ou absence d'ASIA	Aspirine 100mg
	FOP modéré/sévère et/ou ASIA	***Proposer*** fermeture FOP ➔ colloque multidisciplinaire

Opinion personnelle et https://doi.org/10.1161/JAHA.117.008356

Attitude pragmatique et conseillée

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At the systems level, the management of patients with PFO and cryptogenic stroke requires close coordination between neurologists and cardiologists expert in the evaluation and treatment of neurocardiovascular disease.[40] An emerging model is a jointly

- **Colloque neurovasculaire multidisciplinaire**
  - Neurologues
  - Cardiologues
  - (Hématologues)
  - *Vous*

Email: **neurovasc@hopitalvs.ch**

Secrétariat: **027 603 18 40**

FAX: **027 603 40 93**

Saver, J *Stroke*, *49*(6), 1541–1548. https://doi.org/10.1161/STROKEAHA.117.018153

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Endartériectomie ? Stenting? Traitement conservateur ?

Sténose carotidienne

Endartériectomie et stenting carotidien

Hôpital du Valais
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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

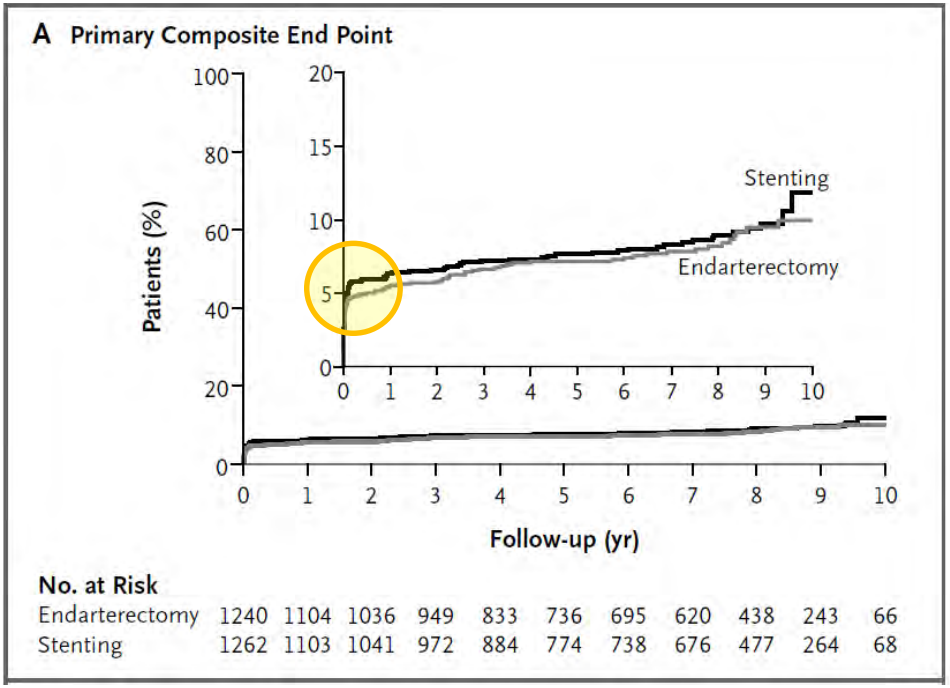
Long-Term Results of Stenting versus Endarterectomy for Carotid-Artery Stenosis

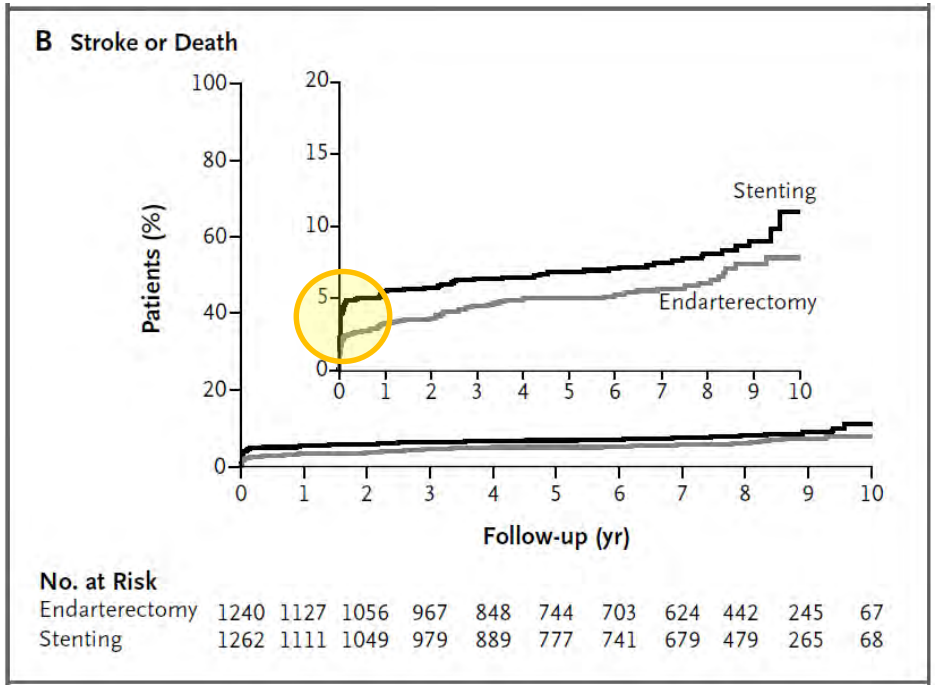
Thomas G. Brott, M.D., George Howard, Dr.P.H., Gary S. Roubin, M.D., Ph.D.,

N Engl J Med 2016;374:1021-31. DOI: 10.1056/NEJMoa1505215

Pas de différence majeure à 10 ans, **mais ….**

- **Les courbes se suivent étroitement jusqu'à 10 ans, mais il y a une divergence initiale qui perdure, liée à la surmortalité et un risque augmenté d'AVC x3 périprocédural (30 jours)**





In the case of stenting, more than half the ipsilateral-vessel strokes over a 10-year period occurred within the first month

Idem pour sympto vs asymptomatique. La divergence est surtout initiale !

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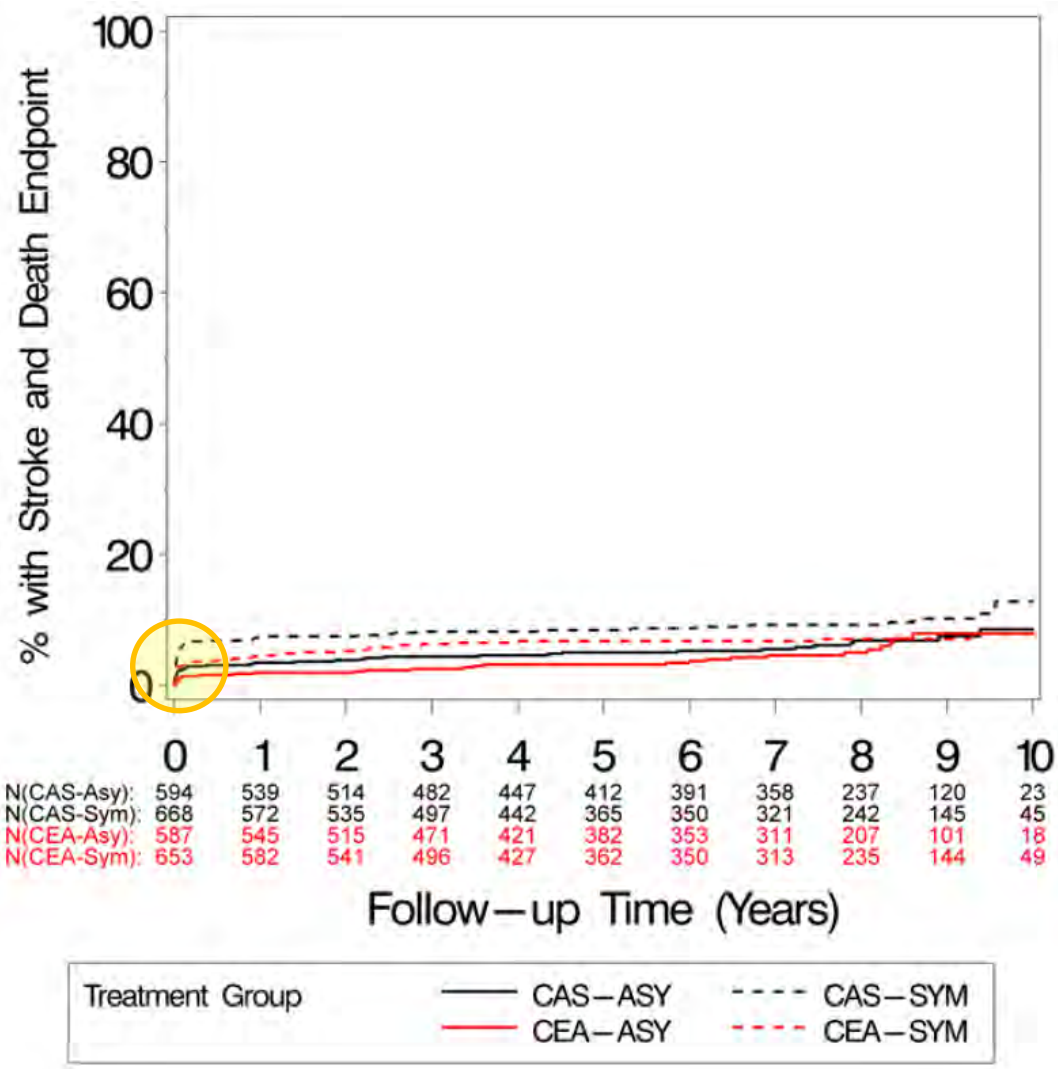

The Stroke and Death endpoint included any stroke or death from any cause during the periprocedural period or ipsilateral stroke within 10 years after randomization. The Kaplan–Meier curves are for asymptomatic (ASY) and symptomatic (SYM) patients undergoing carotidartery stenting (CAS) and those undergoing carotid endarterectomy (CEA) in whom the strokeand death endpoint occurred, according to year of follow-up

CREST 10 years, supplementary appendix

Les patients âgés avec sténose symptomatique et les hommes bénéficient plus de l'endartériectomie

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B Stroke or Death

Subgroup	No. of Events/No. of Patients	Hazard Ratio (95% CI)	P Value for Interaction
All patients	169/2502		
Age			0.12
39–64 yr	43/791		
65–74 yr	67/1025		
≥75 yr	59/686		
Sex			0.71
Male	106/1630		
Female	63/872		
Status			0.67
Symptomatic	105/1321		
Asymptomatic	64/1181		
Stenosis type			0.27
Severe	141/2152		
Moderate	28/350		

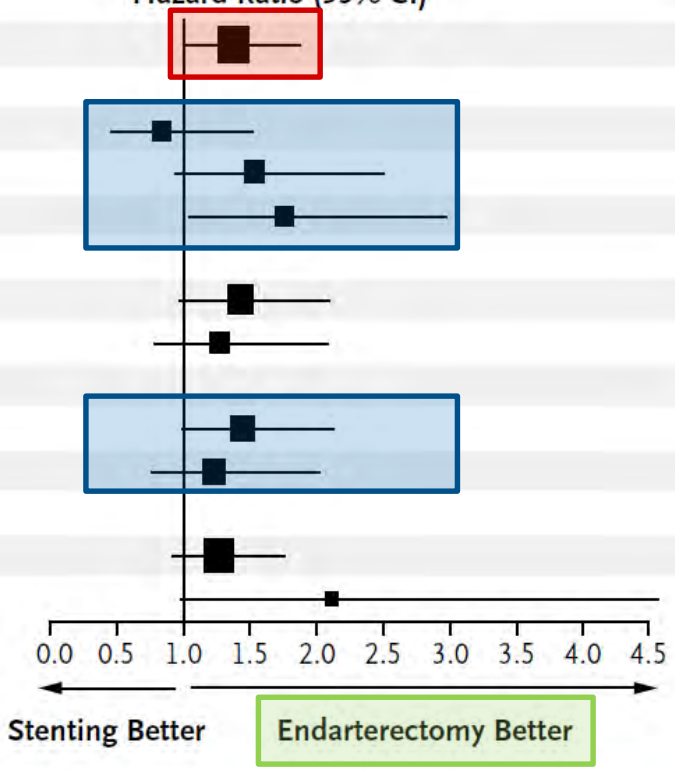


Figure 2. Subgroup Analyses of the Primary Composite End Point and the End Point of Stroke or Death.

Colloque multidisciplinaire des sténoses

Hôpital du Valais
Spital Wallis

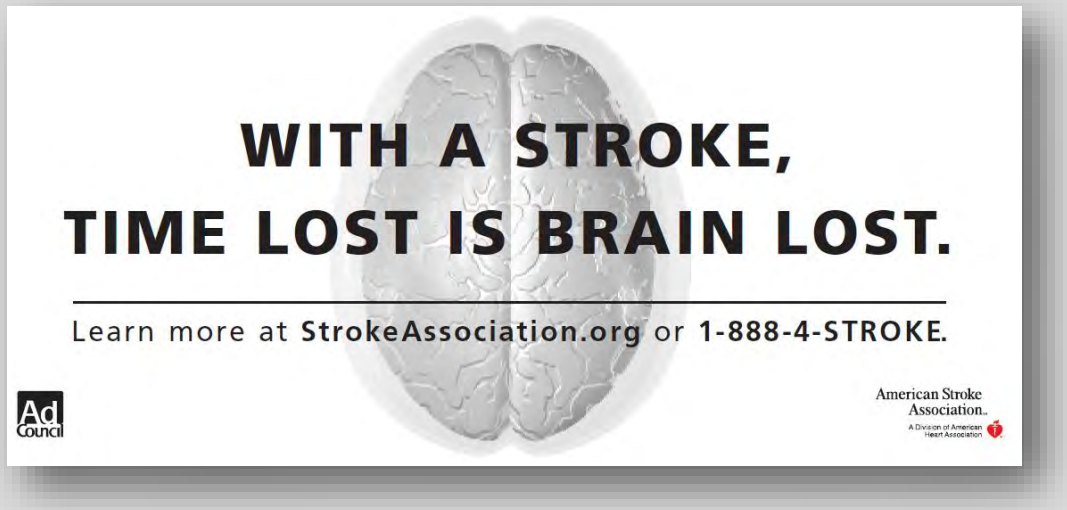
- **Neurologues, chirurgiens vasculaires, neuroradiologues**
- **Colloque hebdo: LUNDI 17:00 salle de radiologie étage B**
- **neurovasc@hopitalvs.ch**
- **Recommandations générales (à individualiser !) :**

Sexe	Âge	Sympto		Asympto
		50-69%	70-99%	70-99%
Homme	< 70	CEA (CAS)	CEA (CAS)	NON (CEA)
	≥ 70	CEA	CEA	NON (CEA)
Femme	< 70	CEA (NON)	CEA (CAS)	NON (CEA)
	≥70	CEA (NON)	CEA	NON

CEA : endartériectomie, CAS : stenting, NON : traitement conservateur, () : 2e choix

Questions?

Merci
pour
votre
attention



Hôpital du Valais
Spital Wallis

Mon téléphone : 027 603 85 63 **Neuro garde : 027 603 44 55**