RHYTHM 2015

Arrhythmias & Heart Failure: New Insights & Technological Advances

Palais du Pharo, Marseille, France May 28-30, 2015

NOACs before, during and after ablation

Sok-Sithikun BUN, Decebal Gabriel Latçu, Nadir Saoudi

Princess Grace Hospital, MONACO

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NOACs before, during and after ablation

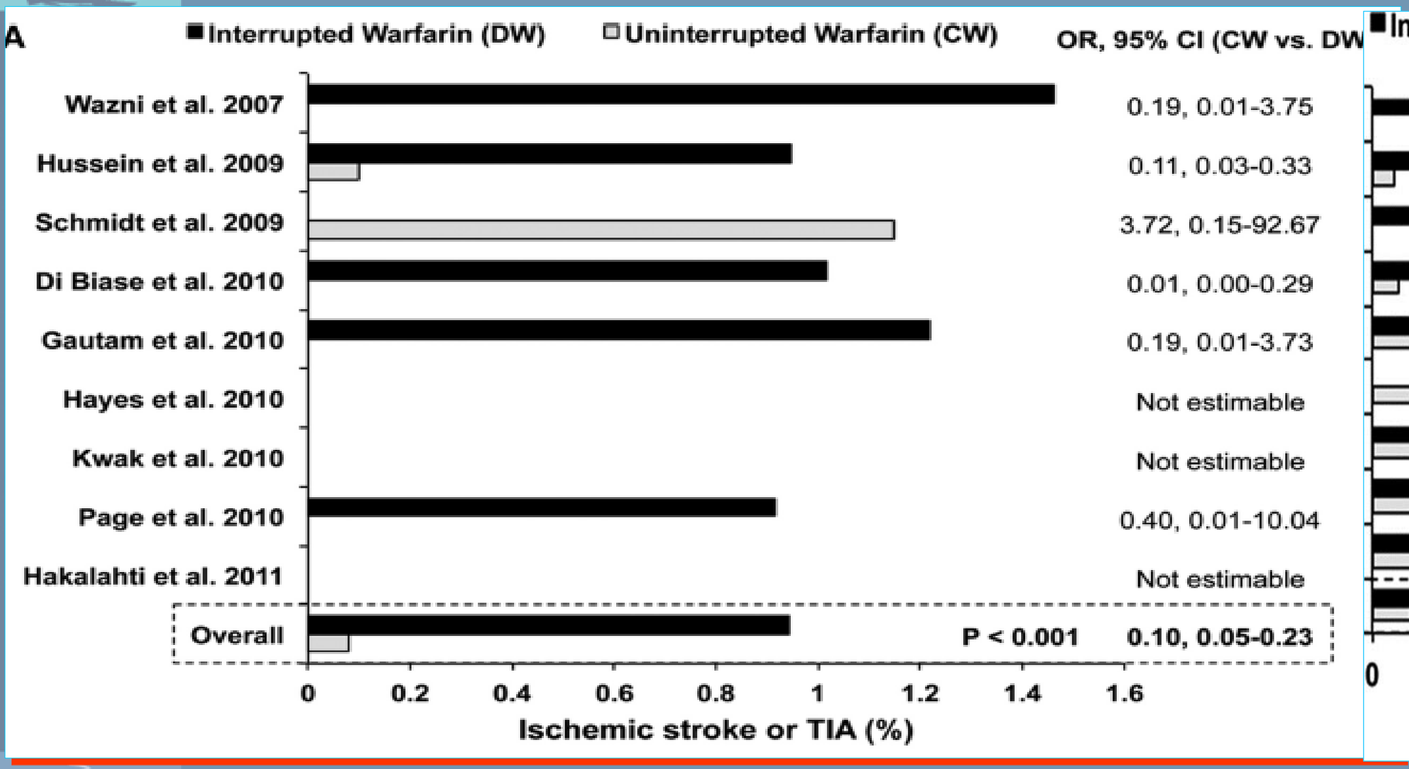
Conflicts of interest:

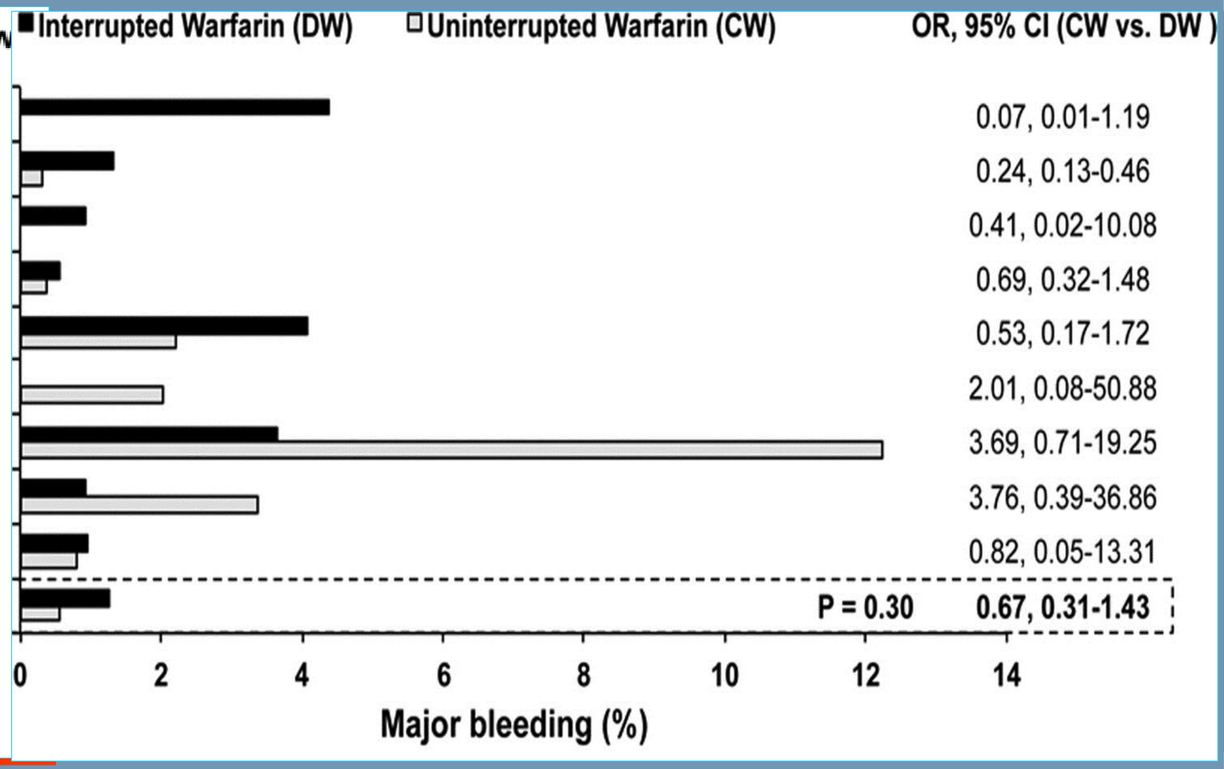
Consultant fees for Daiichi Sankyo / Bayer

Introduction

- Guidelines ?
- Feasibility / Safety / Advantages ?
- Modalities: Uninterruption ? When to resume ?
- How to manage complications ?

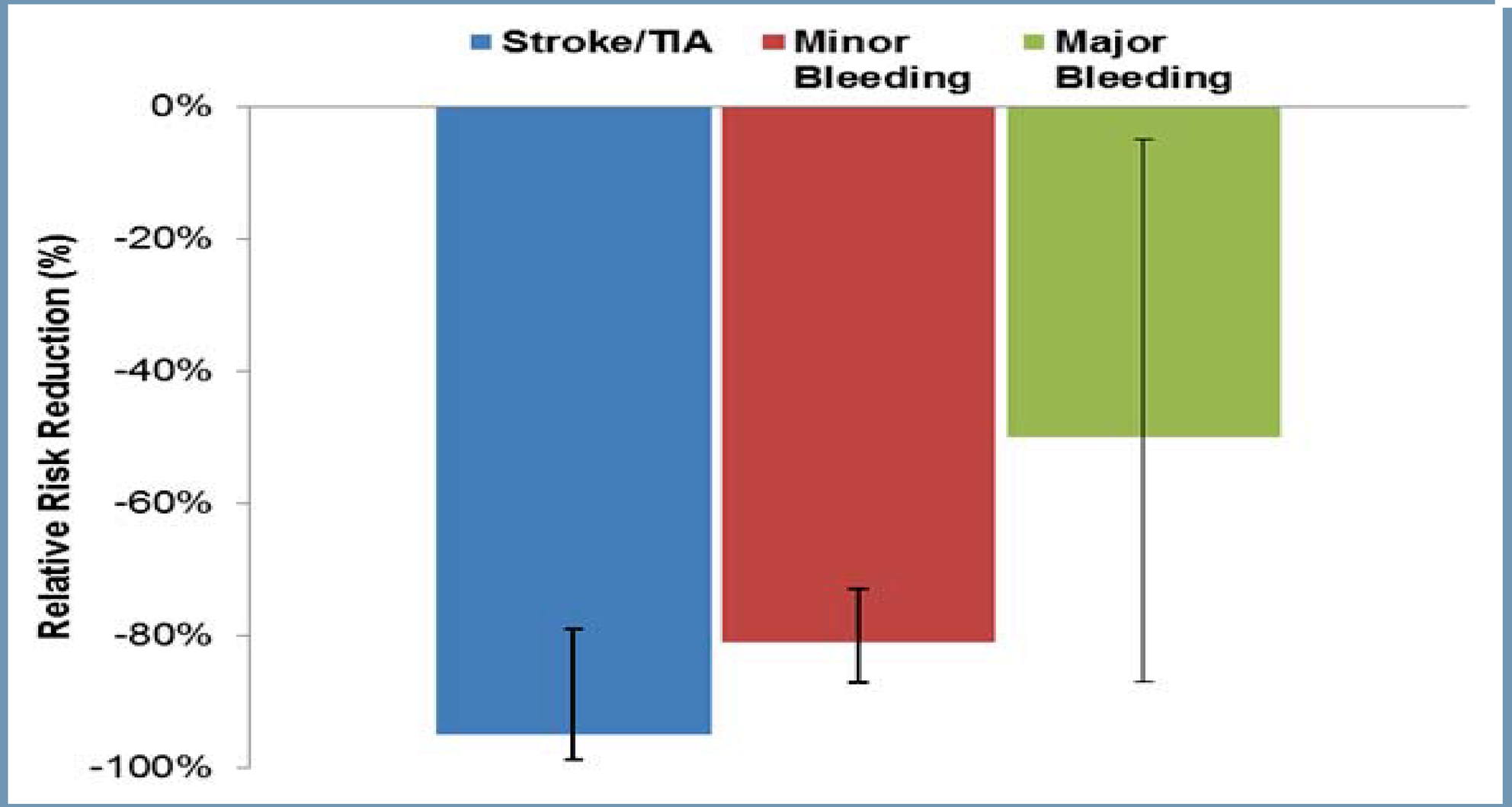
Ablation of Atrial Fibrillation Under Therapeutic Warfarin Reduces Periprocedural Complications: Evidence From a Meta-Analysis





Santangeli P *et al. Circ Arrhythm Electrophysiol. 2012;5:302-311c*

COMPARE Study



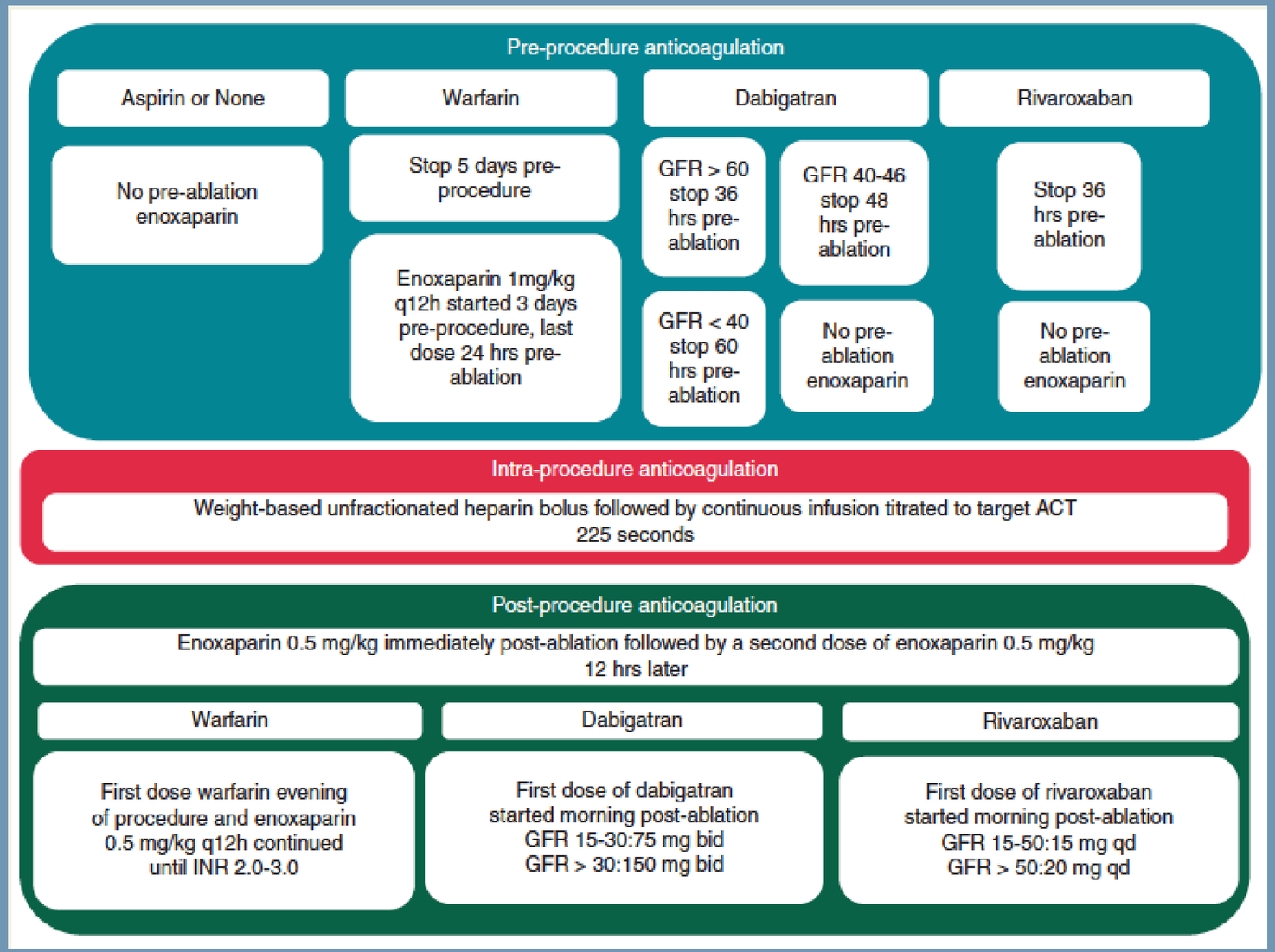
Di Biase L *et al. Circulation 2014 April*

CHA_2DS_2-VASc = 0

- 214 patients
- LMWH 10 days before and 10 days after
- Long-term Aspirin
- TEE (3 %)
- 1.4 % vascular complications / No TE event

Duytschaever M, *et al*. *JCE* 2013;24(8): 855-60

Aspirin / CHA_2DS_2-VASc = 0



Winkle RA, *et al*. *Europace* 2014;16: 1443-49

EHRA practical guide on the use of NOACs in patients with non valvular AF

Table 9 Last intake of drug before elective surgical intervention

	Dabigatran		Apixaban		Edoxaban[a]		Rivaroxaban	
	No important bleeding risk and/or adequate local haemostasis possible: perform at trough level (i.e. ≥12 h or 24 h after last intake)							
	Low risk	High risk	Low risk	High risk	Low risk	High risk	Low risk	High risk
CrCl ≥80 ml/min	≥24 h	≥48 h	≥24 h	≥48 h	No data	No data	≥24 h	≥48 h
CrCl 50–80 ml/min	**≥36 h**	**≥72 h**	≥24 h	≥48 h	No data	No data	≥24 h	≥48 h
CrCl 30–50 ml/min[b]	**≥48 h**	**≥96 h**	≥24 h	≥48 h	No data	No data	≥24 h	≥48 h
CrCl 15–30 ml/min[b]	Not indicated	Not indicated	**≥36 h**	**≥48 h**	No data	No data	**≥36 h**	**≥48 h**
CrCl <15 ml/min	No official indication for use							

Heidbuchel H, *et al*. *Europace* 2013;15: 625-51

Is AF ablation associated with a risk of « major bleeding ?»

Table 10 Classification of elective surgical interventions according to bleeding risk

Interventions not necessarily requiring discontinuation of anticoagulation
Dental interventions
Extraction of 1 to 3 teeth
Paradontal surgery
Incision of abscess
Implant positioning
Ophthalmology
Cataract or glaucoma intervention
Endoscopy without surgery
Superficial surgery (e.g. abscess incision; small dermatologic excisions; . . .)
Interventions with low bleeding risk
Endoscopy with biopsy
Prostate or bladder biopsy
Electrophysiological study or radiofrequency catheter ablation for supraventricular tachycardia (including left-sided ablation via single transseptal puncture)
Angiography
Pacemaker or ICD implantation (unless complex anatomical setting, e.g. congenital heart disease)
Interventions with high bleeding risk
Complex left-sided ablation (pulmonary vein isolation; VT ablation)
Spinal or epidural anaesthesia; lumbar diagnostic puncture
Thoracic surgery
Abdominal surgery
Major orthopedic surgery
Liver biopsy
Transurethral prostate resection
Kidney biopsy

For each patient, individual factors relating to bleeding and thrombo-embolic risk need to be taken into account, and be discussed with the intervening physician.

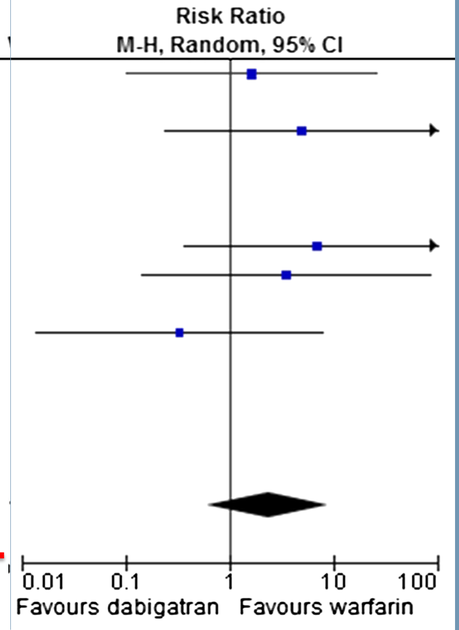
For procedures 'with a minor bleeding risk' (of which some have been listed in *Table 10*), it is recommended to discontinue NOACs 24 h before the elective procedure in patients with a normal kidney function (*Table 9*). In case of procedures that carry a 'risk for major bleeding',[66] it is recommended to take the last NOAC 48 h before.

Should catheter atrial fibrillation ablation be considered as a « high risk » intervention ?
Bun SS, *et al*. *Europace* 2014;16(1): 150

Dabigatran vs VKA

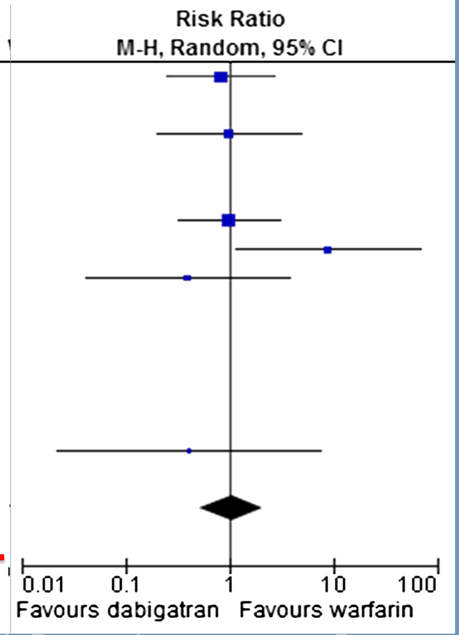
Stroke

Study or Subgroup	Dabigatran Events	Dabigatran Total	Warfarin Events	Warfarin Total
Bassiouny 2013	1	376	1	623
Bernard 2013	0	155	0	44
Haines 2012	2	222	0	222
Ichiki 2012	0	30	0	180
Kaseno 2012	0	110	0	101
Kim 2012	0	191	0	572
Lakkireddy 2012	3	145	0	145
Maddox 2013	1	212	0	251
Mendoza 2012	0	60	1	58
Nin 2012	0	45	1	45
Pavaci 2012	1	27	0	27
Rowley 2012	2	113	2	169
Snipelsky 2012	0	31	0	125
Yamaji 2012	0	106	0	397
Total (95% CI)		**1328**		**2380**
Total events	7		2	



Major bleedings

Study or Subgroup	Dabigatran Events	Dabigatran Total	Warfarin Events	Warfarin Total
Bassiouny 2013	4	376	8	623
Bernard 2013	2	155	2	44
Haines 2012	3	222	3	222
Ichiki 2012	4	30	4	180
Kaseno 2012	0	110	2	101
Kim 2012	4	191	12	572
Lakkireddy 2012	9	145	1	145
Maddox 2013	1	212	3	251
Mendoza 2012	0	60	0	58
Nin 2012	0	45	0	45
Pavaci 2012	0	27	0	27
Rowley 2012	0	113	1	169
Snipelsky 2012	0	31	0	125
Yamaji 2012	0	106	4	397
Total (95% CI)		**1328**		**2380**
Total events	21		31	



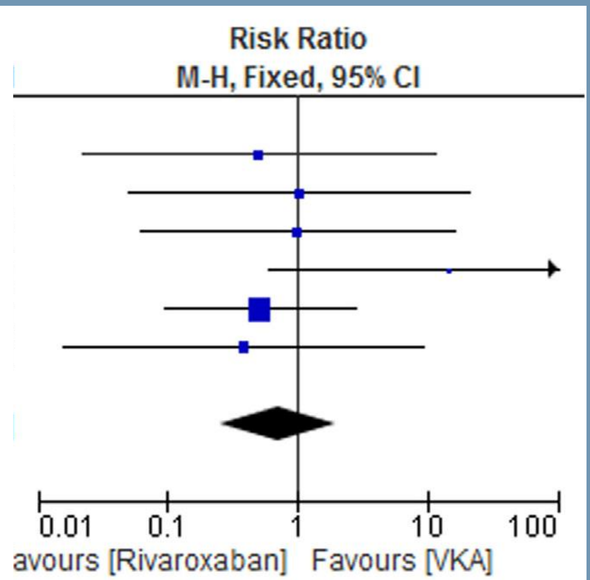
Providencia R *et al. Heart 2014*;100:324-35

Rivaroxaban vs VKA

Embolic events

A

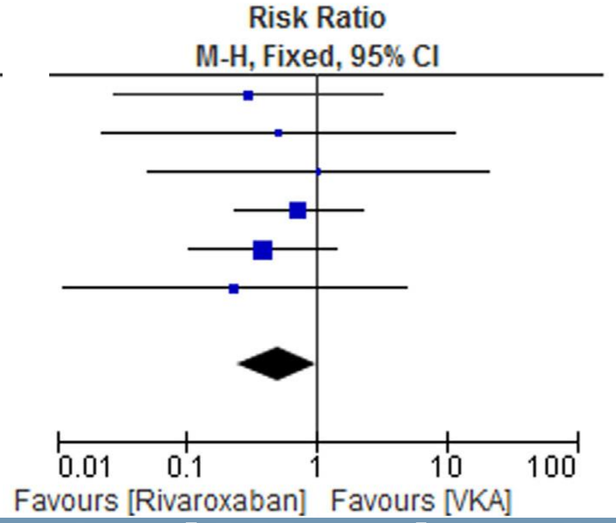
Study or Subgroup	Rivaroxaban Events	Rivaroxaban Total	VKA Events	VKA Total
Bernard 2013	0	75	0	44
Eitel 2013	0	13	1	20
Gadiyaram 2013	0	54	2	284
Lakkireddy 2014	1	321	1	321
Murakawa 2013	0	40	1	1811
Providencia 2014	2	188	4	192
Stepanyan 2014	0	98	1	114
Total (95% CI)		**789**		**2786**
Total events	3		10	



Bleeding complications

B

Study or Subgroup	Rivaroxaban Events	Rivaroxaban Total	VKA Events	VKA Total
Bernard 2013	1	75	2	44
Eitel 2013	0	13	1	20
Gadiyaram 2013	0	54	2	284
Lakkireddy 2014	5	321	7	321
Providencia 2014	3	188	8	192
Stepanyan 2014	0	98	2	114
Total (95% CI)		**749**		**975**
Total events	9		22	

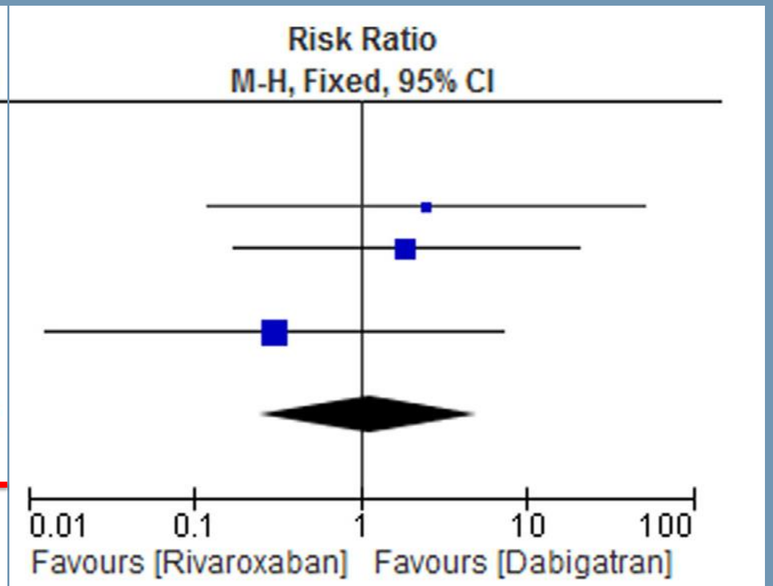


Aryal MR *et al. Am J Cardiol 2014;*114:577-82

Rivaroxaban vs Dabigatran

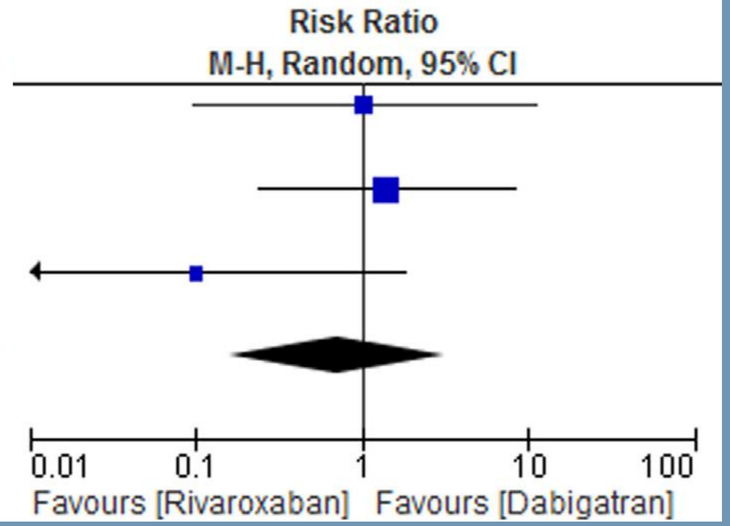
Embolic events

Study or Subgroup	Rivaroxaban Events	Rivaroxaban Total	Dabigatran Events	Dabigatran Total
Bernard 2013	0	75	0	155
Eitel 2013	0	13	0	41
Murakawa 2013	0	40	2	504
Providencia 2014	2	188	1	176
Sairaku 2013	0	30	0	30
Stepanyan 2014	0	98	1	89
Total (95% CI)		**444**		**995**
Total events	2		4	



Bleeding complications

Study or Subgroup	Rivaroxaban Events	Rivaroxaban Total	Dabigatran Events	Dabigatran Total
Bernard 2013	1	75	2	155
Eitel 2013	0	13	0	41
Providencia 2014	3	188	2	176
Sairaku 2013	0	30	0	30
Stepanyan 2014	0	98	4	89
Total (95% CI)		**404**		**491**
Total events	4		8	



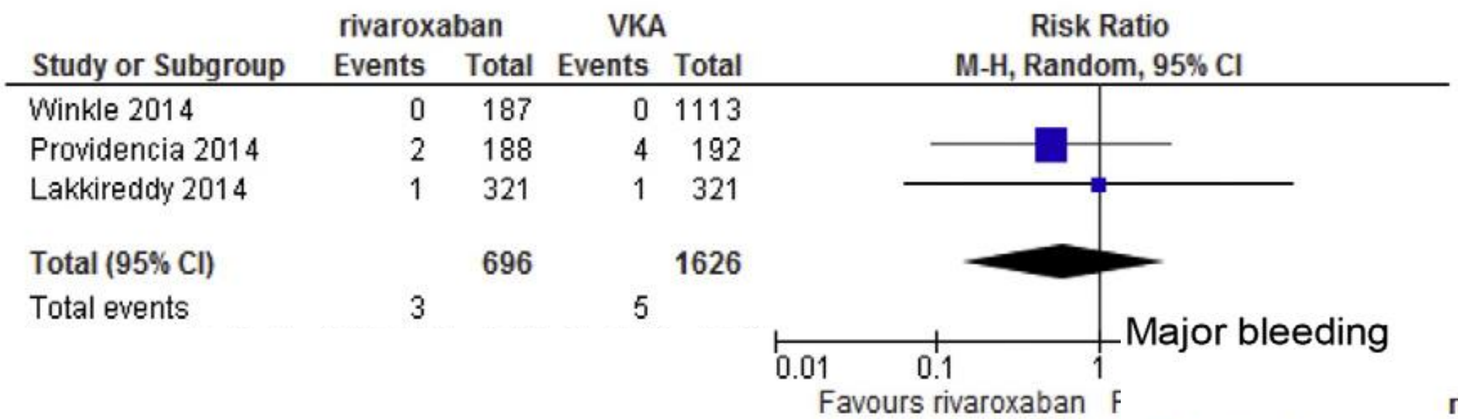
Aryal MR *et al. Am J Cardiol 2014;*114:577-82

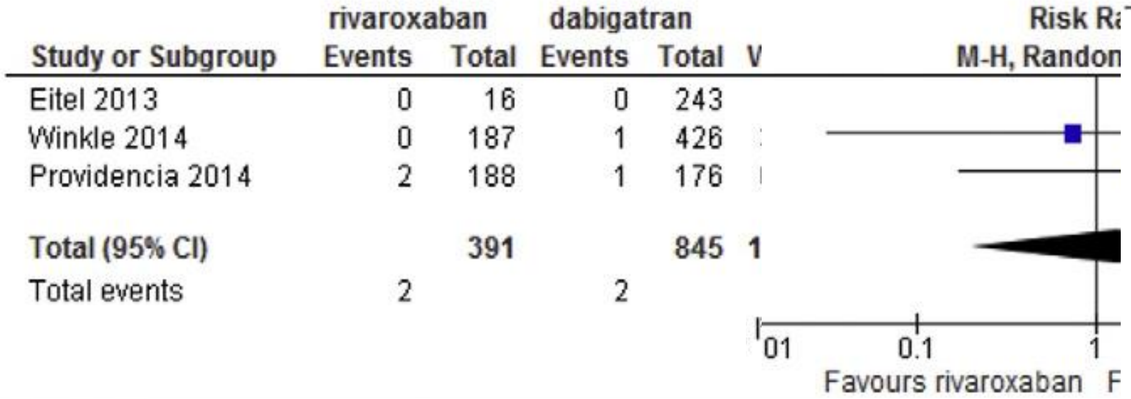
Different protocols

First author	Year	Study design	n (rivaroxaban)	n (VKA)	Timing of first held dose of rivaroxaban	Time interval for restarting after procedure	Target ACT (s)
Dillier	2014	R, OS	272	272	36 h prior	Morning after procedure	270–300
Winkle	2014	R, OS	187	113	36 h prior	Morning after procedure	225
Stepenyan	2014	R, OS	98	114	24 h prior	Morning after procedure	>350
Providencia	2014	P, OS	188	192	24–48 h prior	4–6 h after procedure	>300
Lakkireddy	2014	P, OS	321	321	Evening prior procedure	Evening of procedure	300–400
Piccini	2013	P, RCT	160	161	NR	NR	NR
Winkle	2014	R, OS	187	426	36 h prior	Morning after procedure	225
Stepenyan	2014	R, OS	98	89	2 days prior	Morning after procedure	>350
Providencia	2014	P, OS	188	176	24–48 h prior	4–6 h after procedure	>300
Sairaku	2013	P, RCT	30	30	24 h prior	4 h after procedure	300–400
Eitel	2013	P, OS	16	243	Day prior	Evening of procedure	300–350

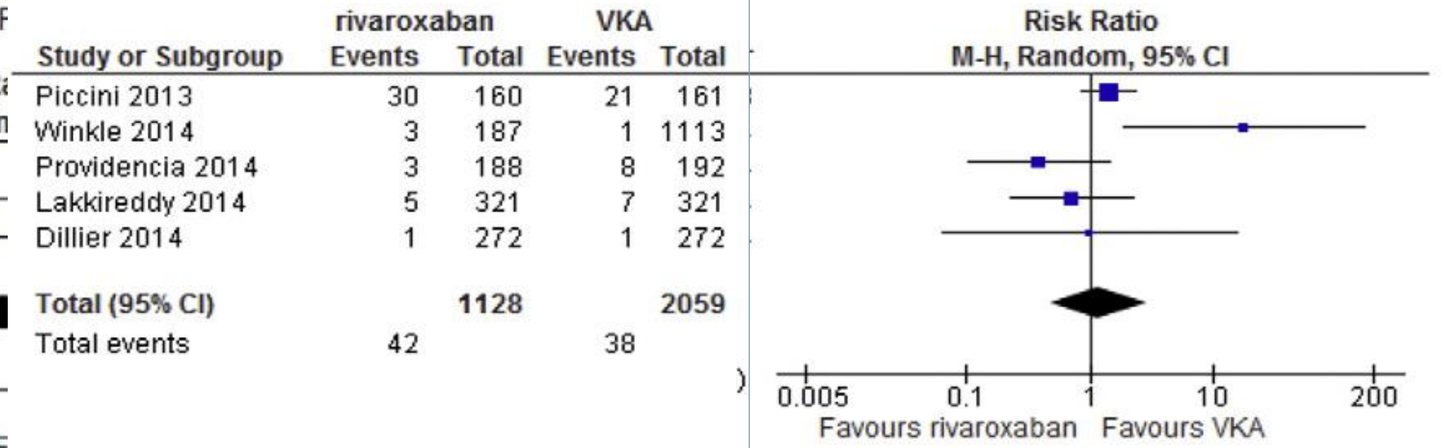
Phan K *et al. Int J Cardiol 2015;*185:209-13

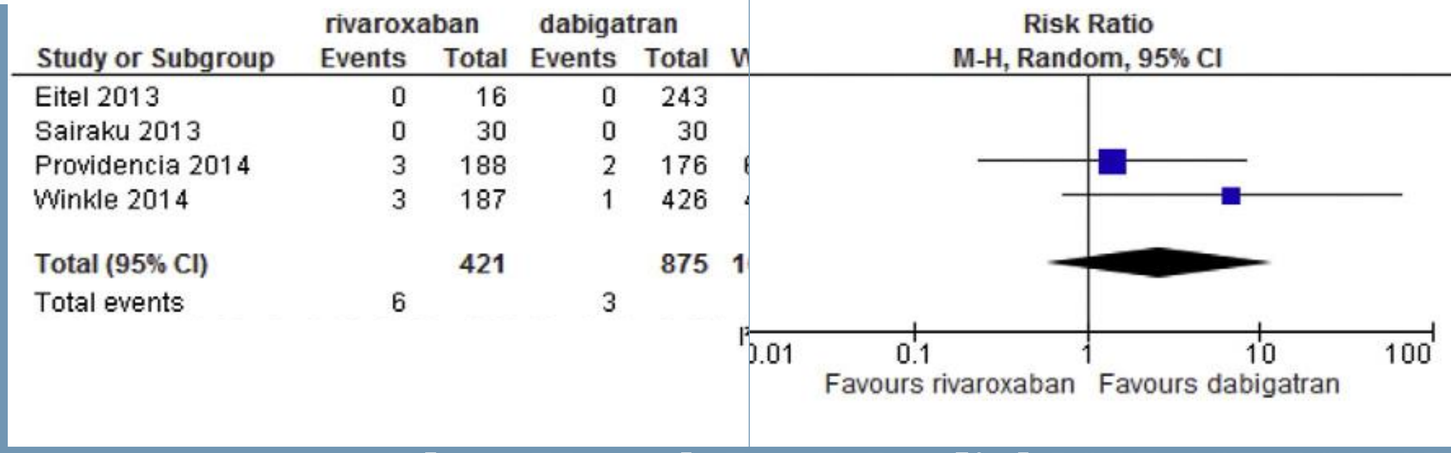
Thrombo-Embolic events





Major bleeding





Phan K *et al. Int J Cardiol 2015*;185:209-13

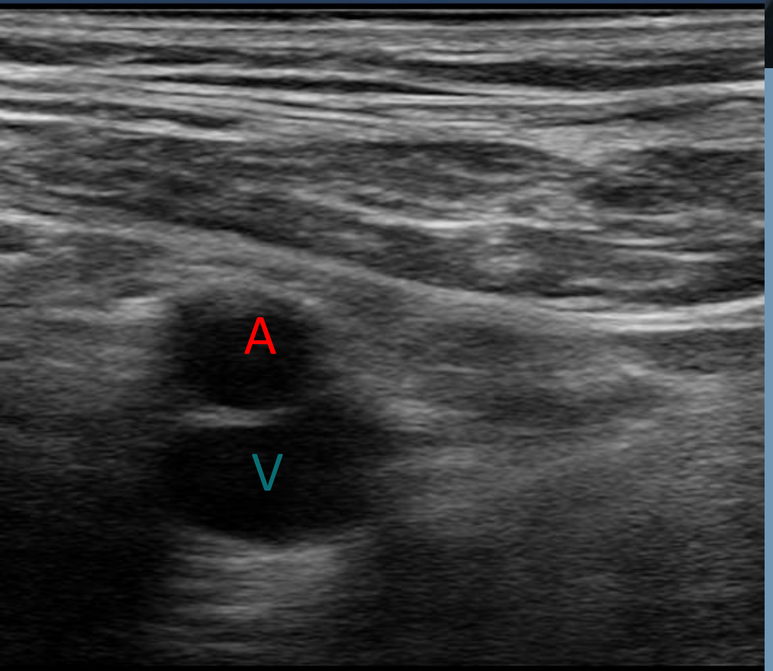
Apixaban / Edoxaban

- 105 Apixaban / 210 VKA: Retrospective
  - Morning dose of 2.5 mg / Resumption in the evening
  - No difference for TE/bleeding events (10.5 vs 12.3 %)

Kaess BM *et al. Am J Cardiol* 2015;115:47-51.

- Edoxaban: No data yet !

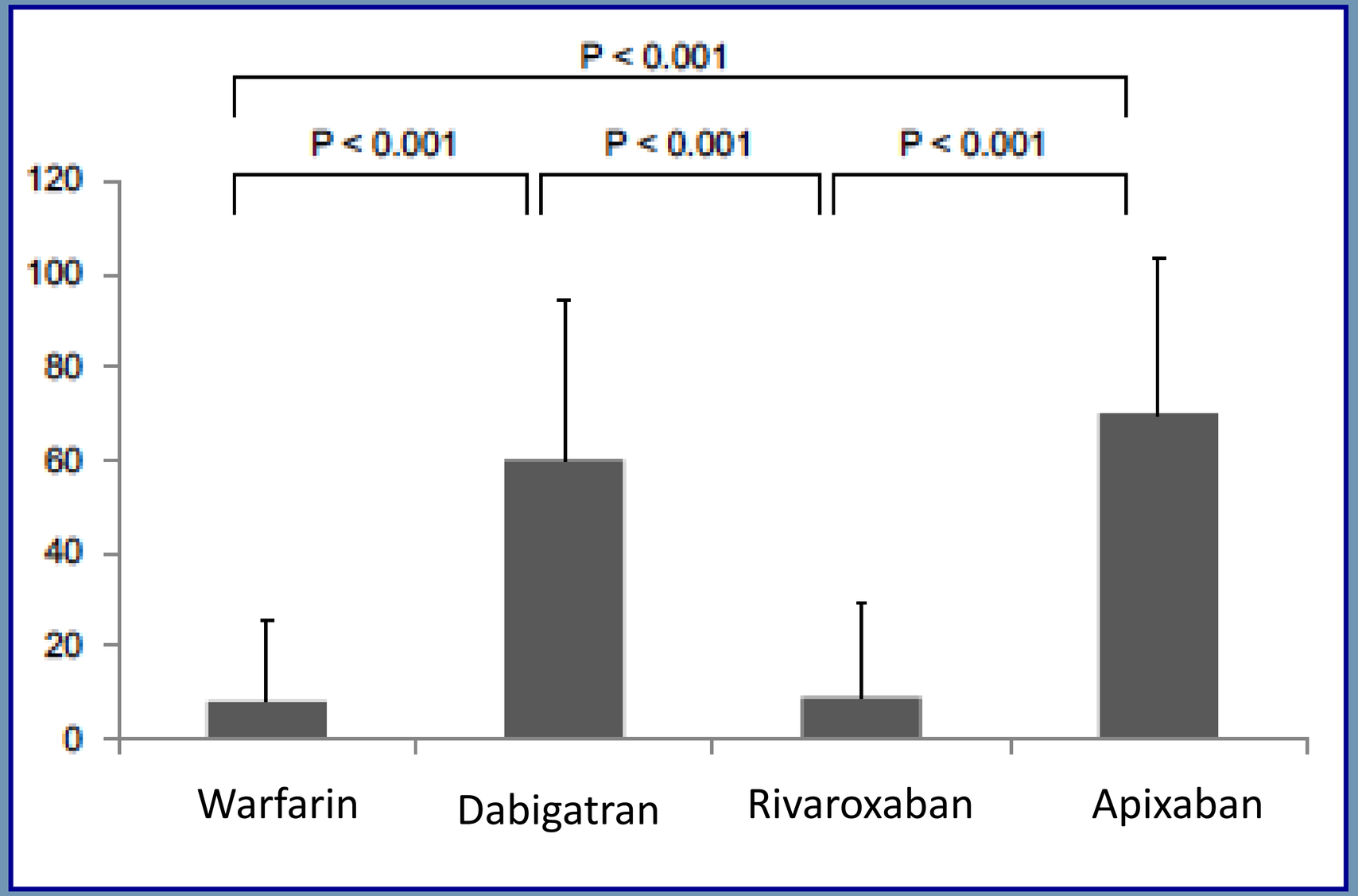
Ultrasound-guided venous puncture



	UGVP (n=150)	No UGVP (n=150)	P
VKA (n) NOAC (n) No anticoagulation (n)	82 18 50	88 3 6	
Mean INR	2.49 ± 0.54		
Mean puncture time (s)	324 ± 145		
Mean number of sheets	3.0 ± 0.7		
Minor complications	1 minor hematoma **0.66 %**	**7 (4.6 %)**	**0.031**
Major complications	**0**	**4 (2 %)**	**0.042**

Errahmouni A, Bun SS, Latcu DG, Saoudi N. *PACE* 2014 Mar

Time to achieve ACT > 300 s



Nagao T *et al. Heart Rhythm 2015*. In press

Conclusion

- **Feasible and safe / Not superior to VKA**
  - Several studies / Few RCTs
  - Variable protocols but same results
- When to stop NOACs before ablation ?
- Need for reversal agents ?
- Ongoing studies (RE-CIRCUIT / VENTURE-AF/AXAFA)

Welcome to the Monaco USA Arrhythmia Course 2016, March 17-19th

http://muacmonaco.wix.com/monacousaarrhythmiacourse