9th Interventional Symposium on High Risk & Innovative Cardiac Interventions

Meet the Experts - Lugano 21-23 June 2016

ACUTE CORONARY SYNDROME

ANTIPLATELET THERAPY & BLEEDING

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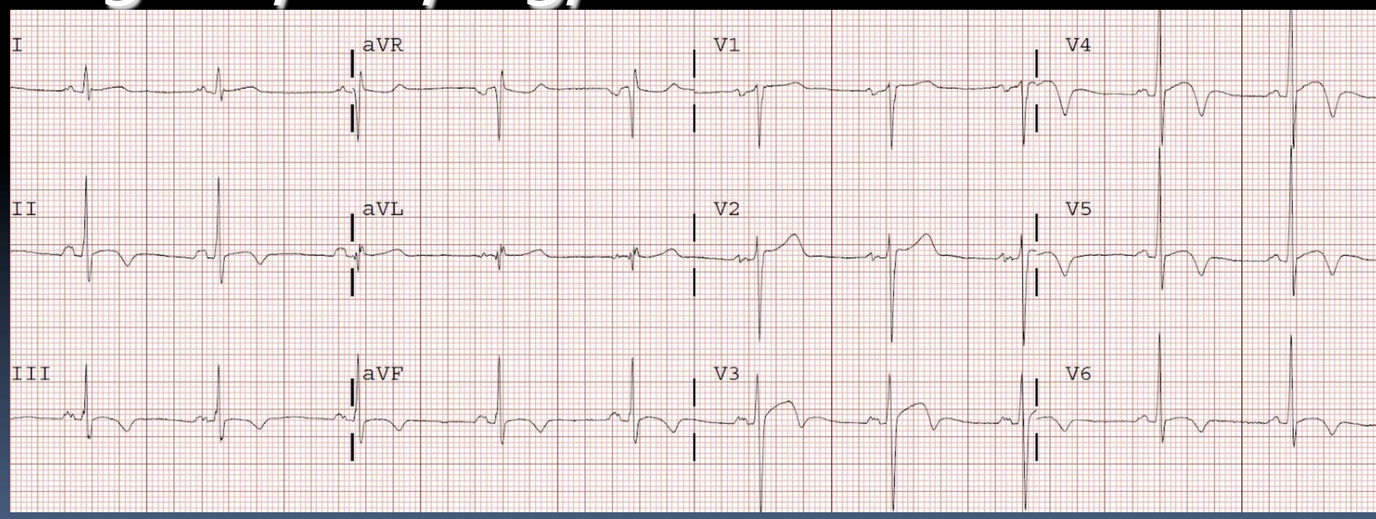
Clinical case

- 80 yr male
  - Smoker
  - Hypertension , diabetes

I. H-0 : Chest pain → ☎ 144

II. H-1h : District Hospital
  - ECG : sinus R, T neg in V3-V6, D2, D3, aVF
  - BP 145/75
  - Creat 95 mM/L
  - Tp-I 15 ng/L



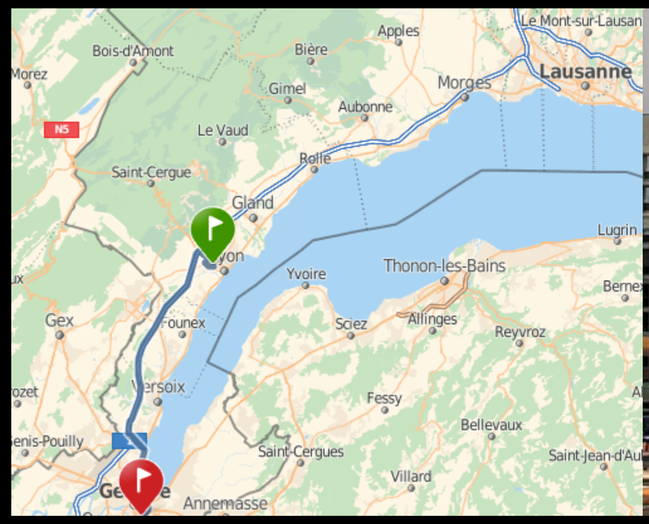
⇨ ***Acute Coronary Syndr.***

R/ ASA 250 mg, clopidrogel 300 mg, enoxaparine 85mg bid
Metoprolol

Clinical case: *80 yr M*

III. H-12h : **Transfer to HUG**

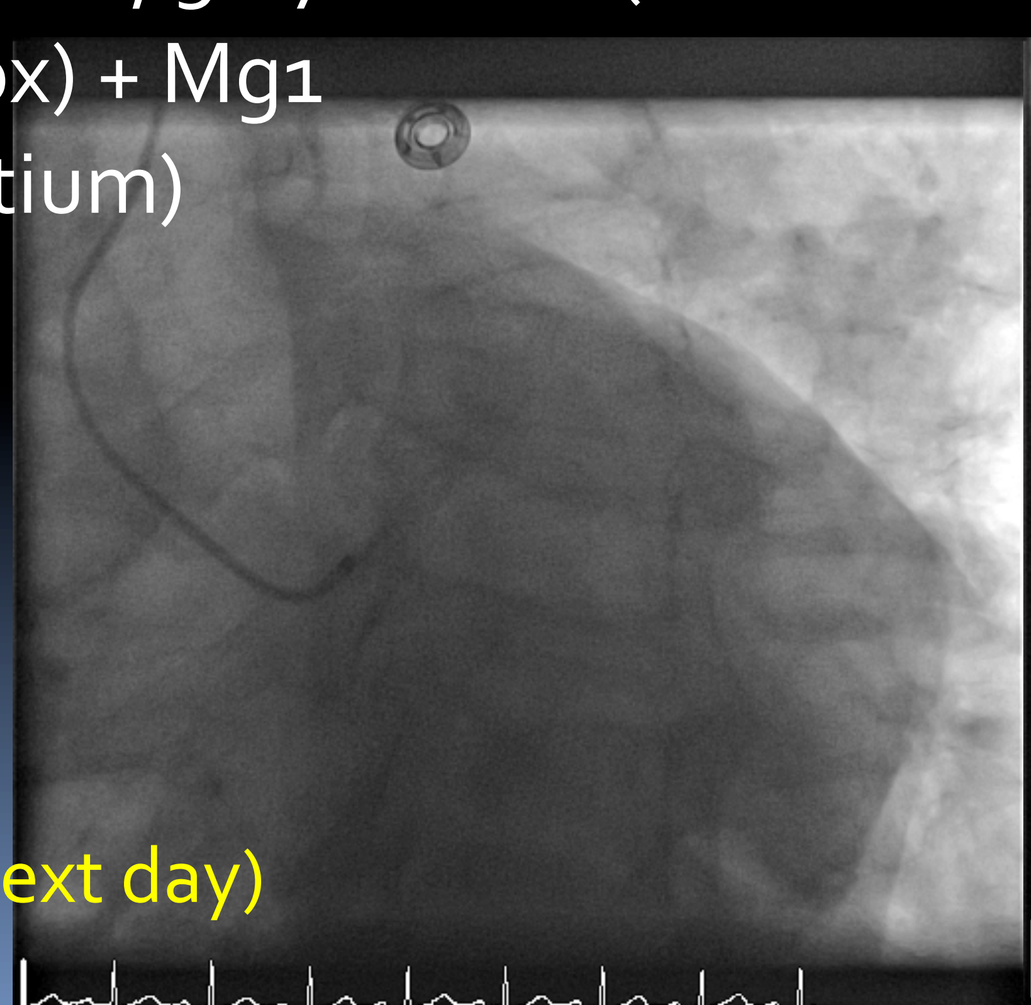
- ECG changes
- Tp-I 15 → 25ng/l



Cath Lab:

- 90% LMA stenosis, 50-70% IVA (+ bifurcation D2)
- 70-90% Cx (prox) + Mg1
- 70-90% CD (ostium)

TIMI score 4



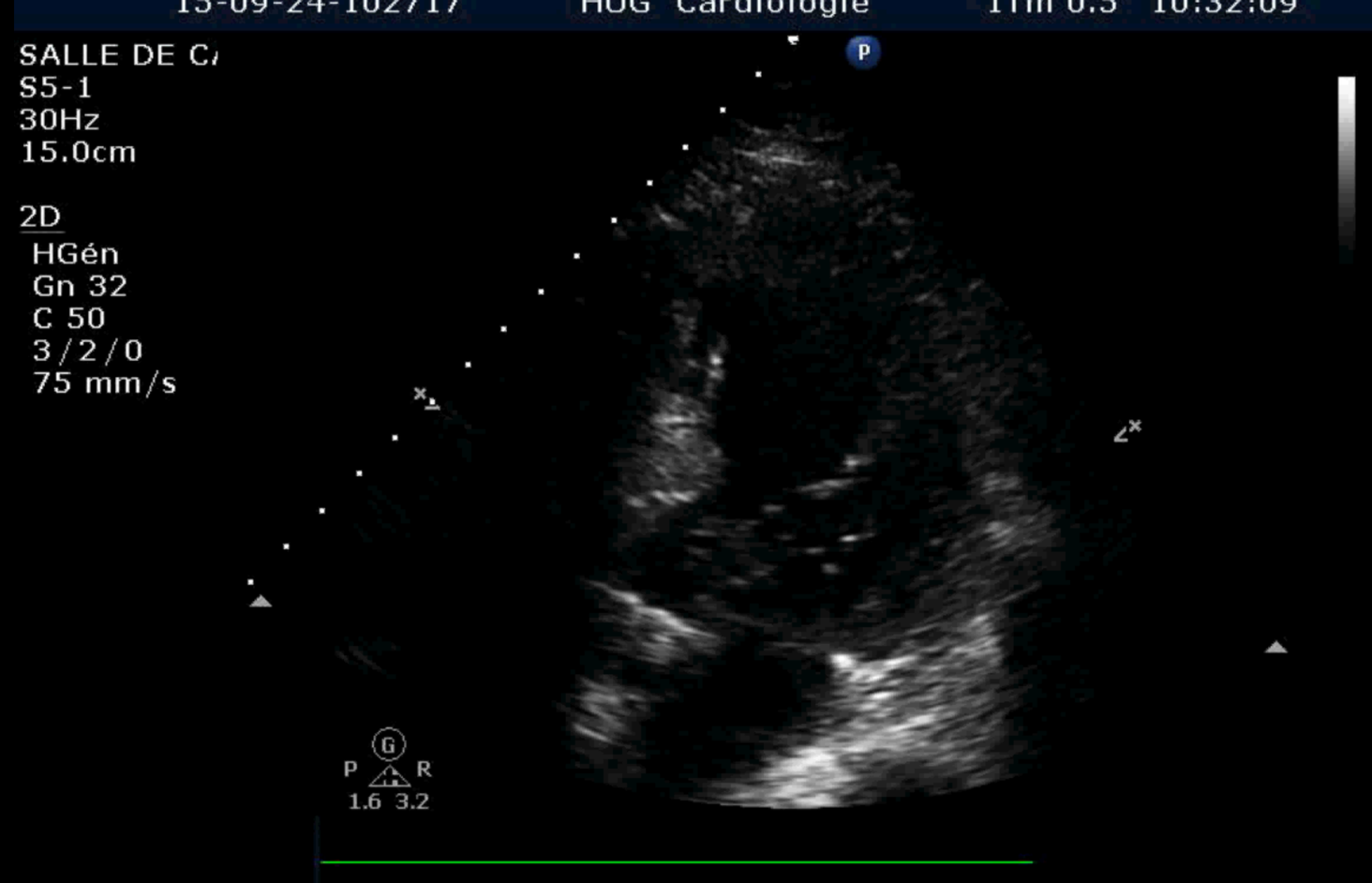
Treatment:

- UF Heparin iv
- CABG surgery (next day)

Clinical case

80 yr M

- TT Echo :
  - LVEF 55%
  - RV normal
  - Valves ∅



- US-Doppler (Carotid-Vert)
  - RICA 50%
- Lung function
  - CVF 90% pred
  - FEV1 85% pred

Question 1

For the management of Acute Coronary Syndrome

1. **Aspirin and an P2Y12 antagonist** should be administered in the emergency room

2. **Aspirin and heparin IV** should be administered in the emergency room

3. **Aspirin, an P2Y12 antagonist and heparin (or enoxaparin)** should be administered in the emergency room

4. **Aspirin** should be administered first, - and based on the coronary anatomy -, **P2Y12 antagonist** (clopidrogel or ticagrelor) should be given (or not) later

Question 2

In hemodynamically stable patients with ACS who have received dual APT, CABG surgery:

1. can be scheduled regardless of antiplatelet therapy
2. should be postponed for > 5 days (if possible)

2014 AHA/ACC Guideline for the Management of Patients With Non–ST-Elevation Acute Coronary Syndromes: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

2014 AHA/ACC Guideline

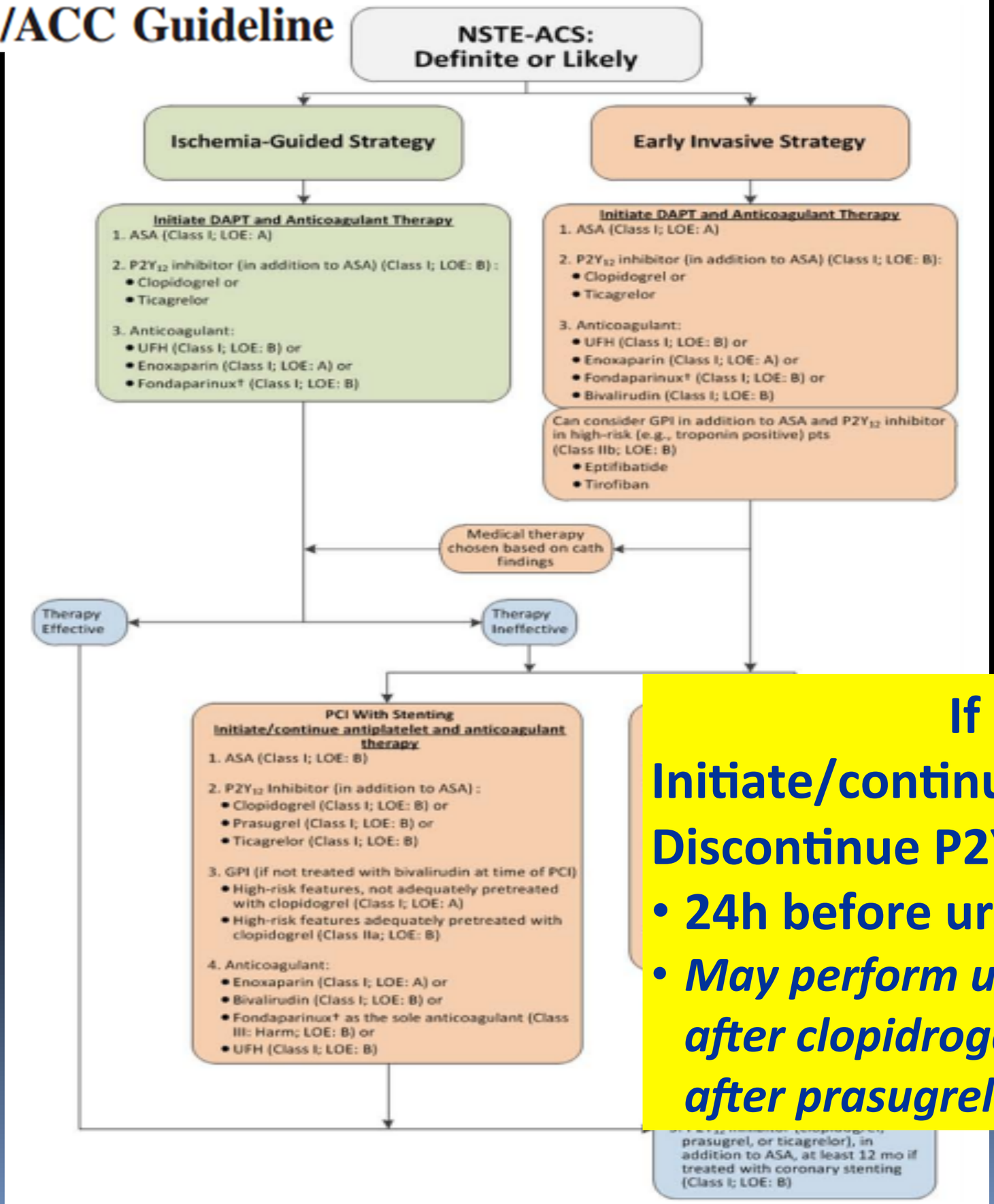
	Dosing and Special Considerations	COR	LOE
Aspirin			
Non–enteric-coated aspirin to *all* patients promptly after presentation	162 mg–325 mg	I	A
Aspirin maintenance dose continue			
P2Y$_{12}$ inhibitors			
Clopidogrel loading dose followed b 75 mg dose in patients unable to ta			
P2Y$_{12}$ inhibitor, in addition to aspirin, for up to 12 mo for patients treated initially with either an early invasive or initial ischemia-	300-mg or 600-mg loading dose, then 75 mg/d	I	B
Ticagrelor in preference to clopidogrel for patients treated with an early invasive or ischemia-guided strategy	N/A	IIa	B
GP IIb/IIIa inhibitors			
GP IIb/IIIa inhibitor in patients treated with an early invasive strategy and DAPT with intermediate/high-risk features (eg, positive troponin)	• Preferred options are eptifibatide or tirofiban	IIb	B
Parenteral anticoagulant and fibrinolytic therapy			
SC enoxaparin for duration of hospitalization or until PCI is performed	• 1 mg/kg SC every 12 h (reduce dose to 1 mg/kg/d SC in patients with CrCl <30 mL/min) • Initial 30 mg IV loading dose in selected patients	I	A
Bivalirudin until diagnostic angiography or PCI is performed in patients with early invasive strategy only	• Loading dose 0.10 mg/kg loading dose followed by 0.25 mg/kg/h	I	B
SC fondaparinux for the d is performed			
Administer additional anti is performed while patien			
IV UFH for 48 h or until P	(max 4000 IU) with initial infusion 12 IU/kg/h (max 1000 IU/h) • Adjusted to therapeutic aPTT range		
IV fibrinolytic treatment not recommended in patients with NSTE-ACS	N/A	III: Harm	A

ASA promptly! 162-325 mg IA
Clopidrogel 300 mg IB

4. A loading dose of a P2Y$_{12}$ receptor inhibitor should be given before the procedure in patients undergoing PCI with stenting.[27,147,170,172,194–197] ***(Level of Evidence:***

Enoxaparin (hospitalisation, until PCI) IA
Fondaparinus (hospitalisation, until PCI) IA
UF Heparin (48h, until PCI) IB

2014 AHA/ACC Guideline



If CABGS

Initiate/continue ASA IB

Discontinue P2Y12 antag

- **24h before urgent CABG IB**
- ***May perform urgent CABG if < 5d after clopidrogel/ticagrelor and <7 d after prasugrel discontinued***

Who should receive antiplatelet therapy?

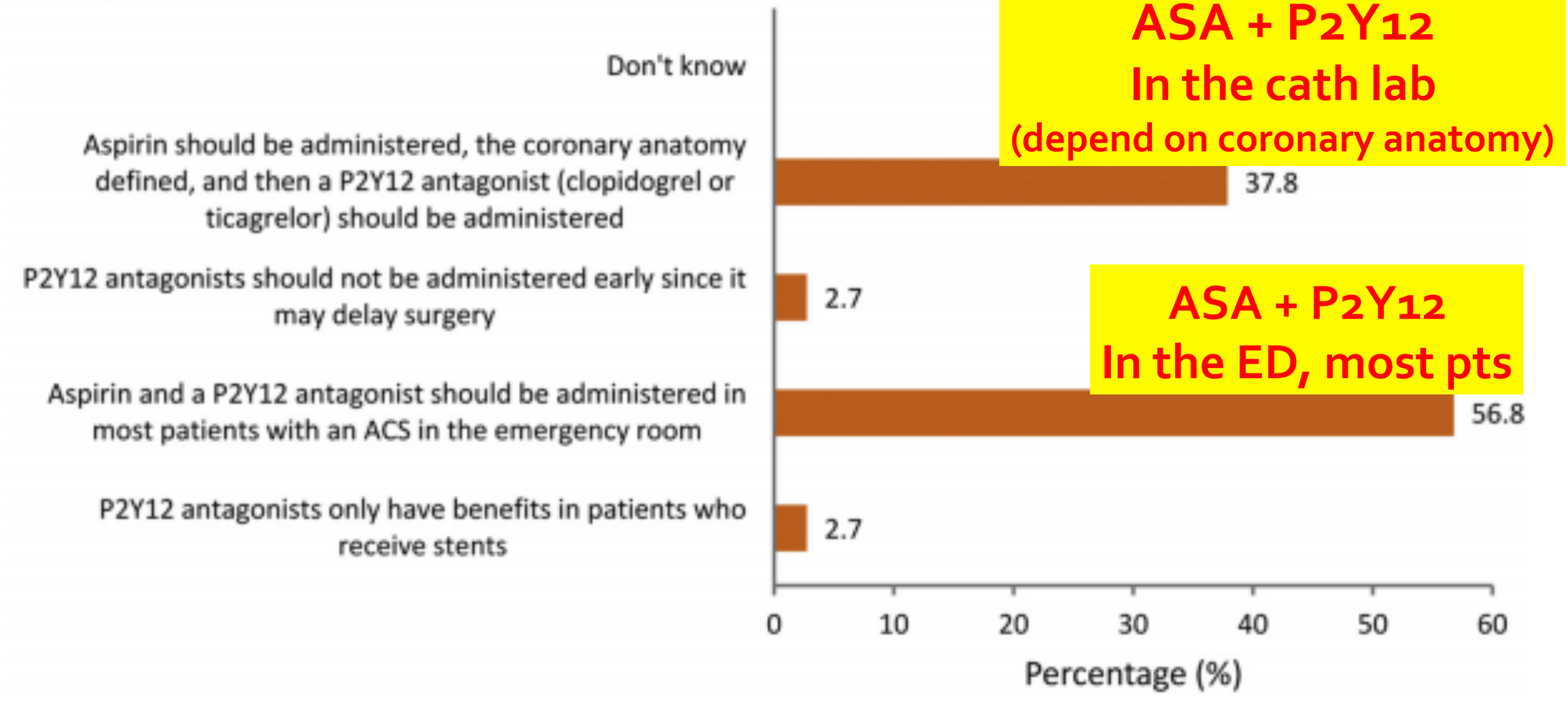
THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY

2015;150:1548-54

Dual antiplatelet therapy use by Canadian cardiac surgeons

Bobby Yanagawa, MD, PhD, FRCSC,[a] Marc Ruel, MD, PhD, FRCSC,[c] Christopher Bonneau,[a] Myunghyun M. Lee, MD,[a] Jennifer Chung, MD,[d] Sadek Al Shouli, MBBS, MPH,[e] Andrew Fagan, MD,[f] Abdulwahab Al Khalifa, MD,[a] Christopher W. White, MD,[g] Michael H. Yamashita, MDCM, MPH, CPH,[h] Maria E. Currie, MD,[i] Hwee Teoh, PhD,[a,b] Holly E. M. Mewhort, MD,[j] and Subodh Verma, MD, PhD, FRCSC[a]

In your opinion, what statement about antiplatelet therapy is correct in the management of ACS?



ASA + P2Y12
In the cath lab
(depend on coronary anatomy)

ASA + P2Y12
In the ED, most pts

Clopidrogel before CABGS

Stop or continue ?

Guideline	Year	Elective CABG	Urgent CABG
Society of Thoracic Surgeons	2012	Cease "a few days" before elective CABG	"A delay of a day or two is reasonable"
American College of Che		**Cease > 5 d, « a few days »**	No specific recommendations, anticipate use of platelet transfusion and antifibrinolytic drugs if clopidogrel given <5 d before CABG
American College of Cardiology Foundation/ American Heart Association	2011	Cease ≥5 d	Cease ≥1 d; "reasonable to perform CABG <5 d after clopidogrel"
Canadian Cardiovascular Society	2009	Cease 5-7 d	If at high risk of fatal ischemic event or with high-risk coronary anatomy, continue clopidogrel; if high ischemic risk and high bleeding risk, cease at 3-5 d
European Association for Cardio-Thoracic Surgery	2008	5-7 d "if condition allows"	5-7 d "if condition allows"

Anticipate platelets transfusion

Clinical case *80 yr M*

- H-26h :
  - ***Neurological deficit***

Paralysis of 2 lower limbs, paresis of left upper limb, no sensitivity on the trunk

- H-28 MRI :
  Compressive cervical epidural hematoma C2-T3

ACS – Dual antiplatelet therapy
→ *Bleeding = iatrogenic complication*

What should we done?

1. Discontinue clopidrogel and wait …
2. Surgery : decompressive laminectomy + medical ttt
3. Combined S. : decompressive laminectomy + CABGS
   - On-pump vs off-pump ?
   - Heparin-coated CPB & canulas

European Heart Journal (2016) **37**, 189–197
doi:10.1093/eurheartj/ehv381

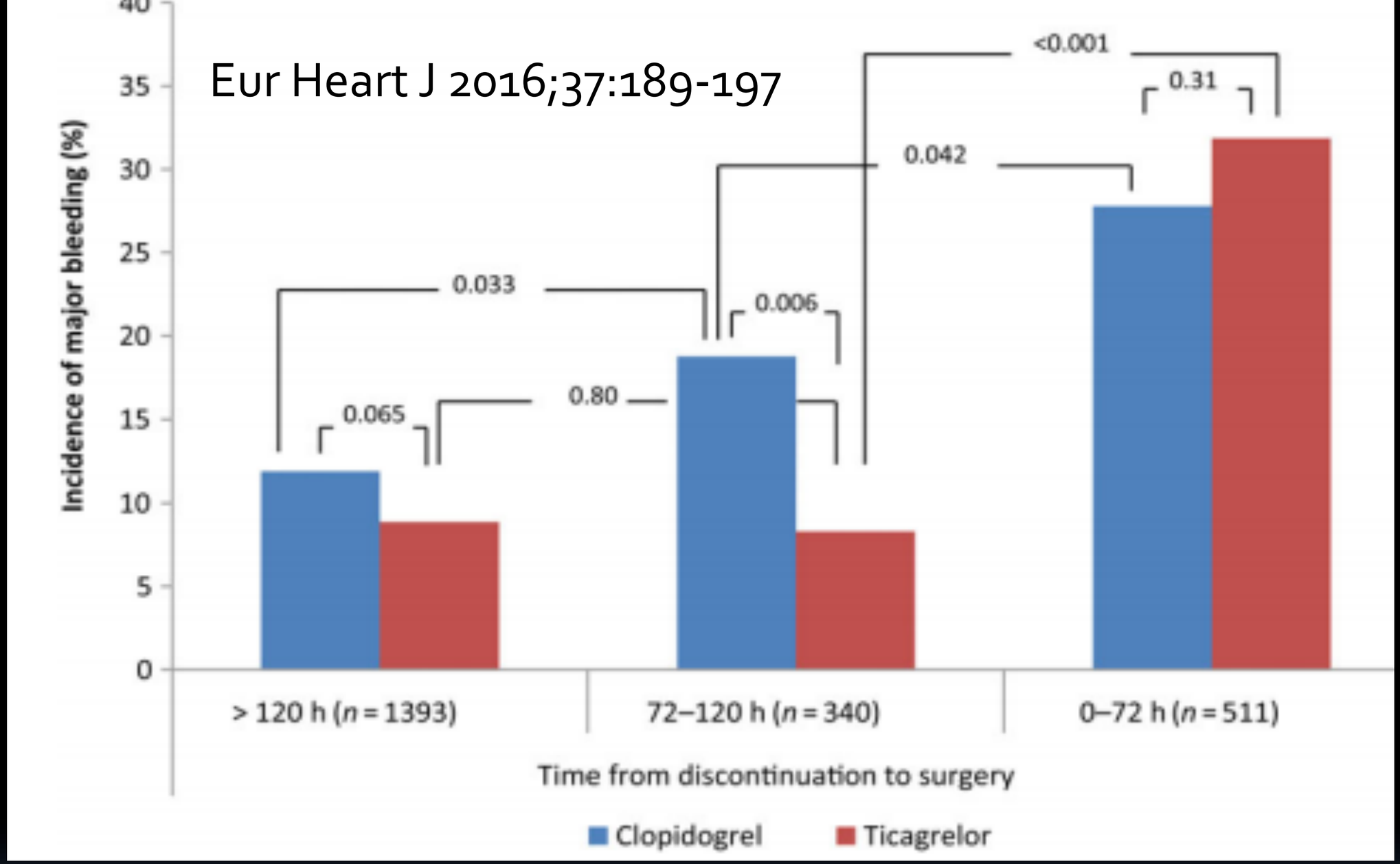
EUROPEAN SOCIETY OF CARDIOLOGY®

FASTTRACK
ESC Clinical Registry

Coronary artery bypass grafting-related bleeding complications in patients treated with ticagrelor or clopidogrel: a nationwide study

- All acute coronary syndrome patients in Sweden on dual antiplatelet therapy with aspirin and ticagrelor (n = 1’266) or clopidogrel (n = 978) who underwent CABG during 2012–13

Eur Heart J 2016;37:189-197



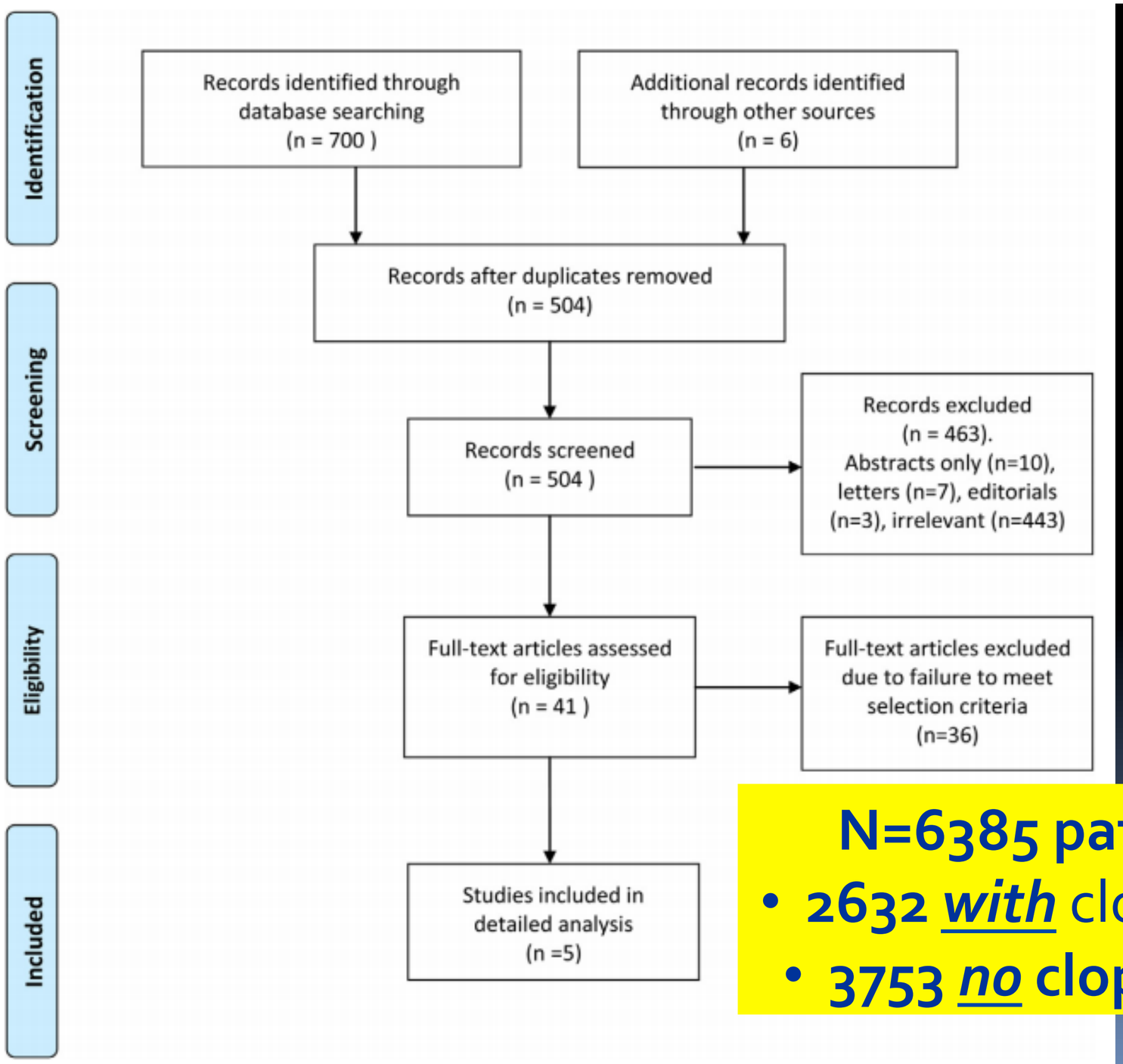
- **Postoperative period**
  - 30-day mortality : 1.7% (ticagrelor) and 2.7% (clopidogrel)
  - **9.9%** vs 0.7% **mortality in pts with** vs without **major bleeding**
  - Thrombotic events : 2.3% (ticagrelor) and **2.8%** (clopidrogel)

THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY

2014;148:3092-8

Should clopidogrel be discontinued before coronary artery bypass grafting for patients with acute coronary syndrome? A systematic review and meta-analysis

Christopher Cao, MBBS,[a,b,c] Praveen Indraratna, MBBS,[a] Su C. Ang, MBBS,[a] Con Manganas, MBBS,[c] John Park, MBBS,[a] Paul G. Bannon, MBBS, PhD,[a,b,d] and Tristan D. Yan, MBBS, MD, PhD[a,b,d]



N=6385 patients

- **2632 *with* clopidogrel**
- **3753 *no* clopidrogel**

THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY

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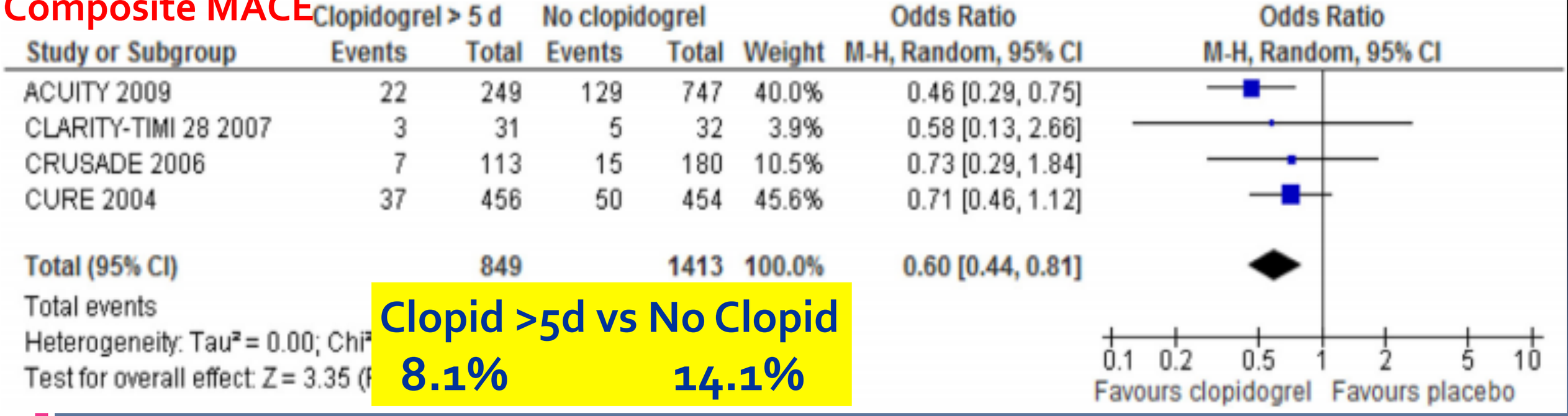
Study	Study type	Publication year	Enrolling period	Indication	Urgent CABG (%)	OPCAG (%)	Clopidogrel >5 d	Clopidogrel <5 d	Placebo >5 d†	Placebo <5 d†
ACUITY[12]	RCT*	2009	2003-2005	NSTE-ACS	100	12.7	249	524	747	
CLARITY-TIMI-28[4]	RCT*	2007	2003-2004	STE-ACS	100	NR	31	35	32	38
CRUSADE[5]	Observational	2006	2003-2004	NSTE-ACS	100	NR	113	739	180	1826
Akowuah[13]	RCT	2005	2002-2003	NSTE-ACS	100	0	24	25	NR	NR
CURE[11]	RCT*	2004	1998-2000	NSTE-ACS	48	NR	456	436	454	476

Composite MACE



Clopid >5d vs No Clopid

8.1% 14.1%

Time from discontinuation clopidrogel

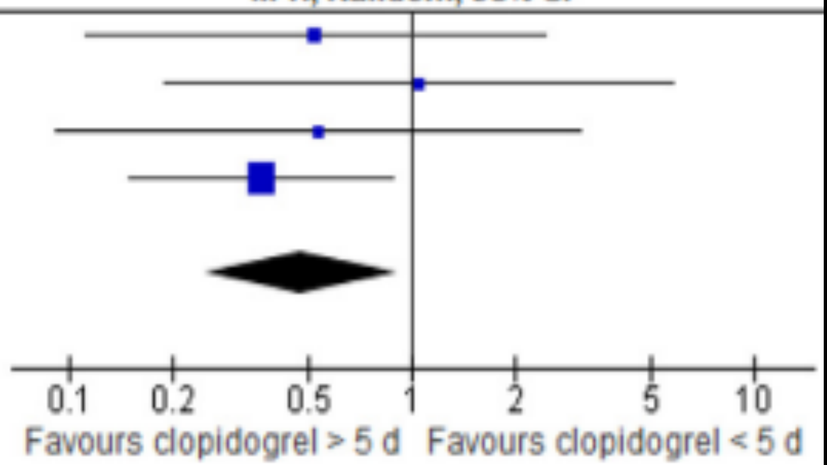
Wait > 5 days

Reoperation

Study or Subgroup	Clopidogrel > 5 d Events	Total	Clopidogrel < 5 d Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
ACUITY 2009	2	249	8	524	17.5%	0.52 [0.11, 2.48]
Akowuah 2005	3	24	3	25	14.5%	1.05 [0.19, 5.78]
CLARITY-TIMI 28 2007	2	31	4	35	13.5%	0.53 [0.09, 3.14]
CURE 2004	7	456	18	436	54.4%	0.36 [0.15, 0.88]
Total (95% CI)		**760**		**1020**	**100.0%**	**0.47 [0.25, 0.91]**
Total events	14		33			

Heterogeneity: Tau² = 0.00; Chi² = 1.22, df = 3 (P = 0.75); I² = 0%

Test for overall effect: Z = 2.24 (P = 0.03)

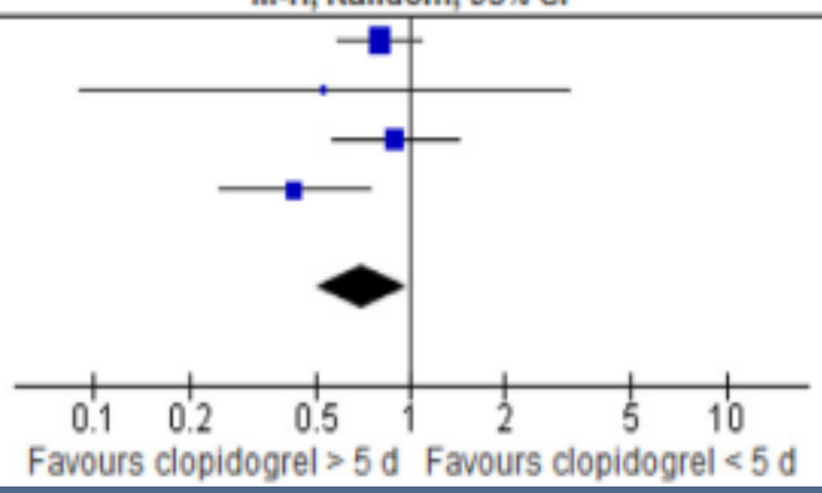


Major Bleeding

Study or Subgroup	Clopidogrel > 5 d Events	Total	Clopidogrel < 5 d Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
ACUITY 2009	116	249	273	524	43.2%	0.80 [0.59, 1.08]
CLARITY-TIMI 28 2007	2	31	4	35	3.3%	0.53 [0.09, 3.14]
CRUSADE 2006	29	113	205	739	29.9%	0.90 [0.57, 1.41]
CURE 2004	20	456	42	436	23.6%	0.43 [0.25, 0.75]
Total (95% CI)		**849**		**1734**	**100.0%**	**0.71 [0.51, 0.98]**
Total events	167		524			

Heterogeneity: Tau² = 0.04; Chi² = 4.86, df = 3 (P = 0.18); I² = 38%

Test for overall effect: Z = 2.06 (P = 0.04)

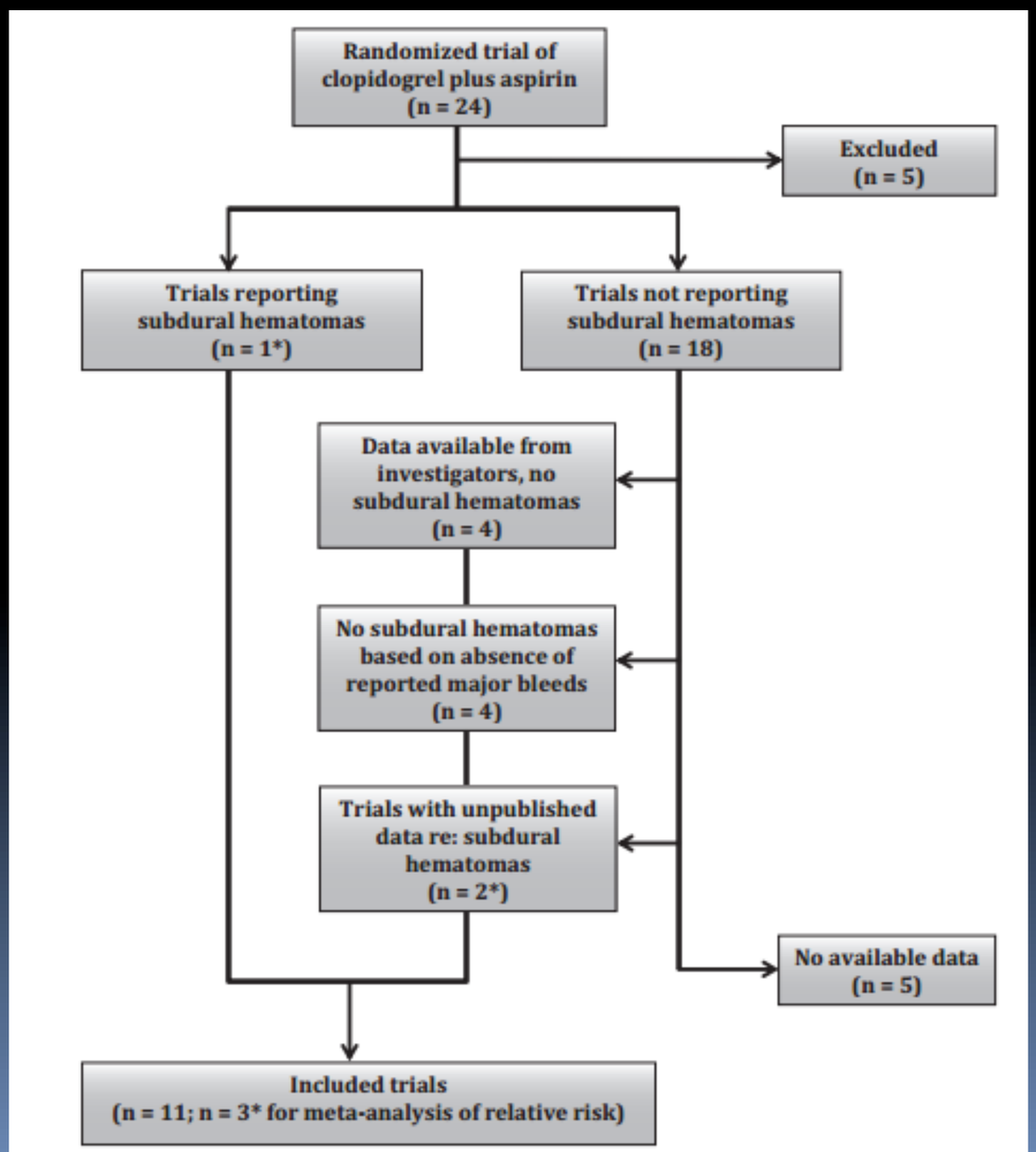


ACS – DAPT– spinal/epidural hematoma

Risk of spontaneous spinal hematoma

Bakheet MF et al. 2015 Jun;10(4):501-5

International Journal of Stroke



11 RCTs from 1990 to 2014, ASA alone vs ASA + Clopidrogel

- 8 RCTs did not identify any subdural hematoma (SDH)
- 3 RCTS identify SDH
  - 23,136 pts (mean age 66 y)
  - AP to treat stroke, ACR or AF
  - 39 SDH during a mean follow-up 2.1 years/pt
  - Low Incidence: 1.2 (95% CI 0.7-1.6) per 1000 pt – years

ACS – DAPT– spinal/epidural hematoma

Risk of spontaneous spinal hematoma

Bakheet MF et al. 2015 Jun;10(4):501-5 International Journal of Stroke

Table 2 Subdural hematomas by treatment assignment in randomized trials comparing clopidogrel plus aspirin with aspirin with subdural hematomas

		# subdural hematomas/# patients			RR (95%CI)
Trial*	Population	clopidogrel & aspirin	aspirin	rate on dual antiplatelets (n/1000 pt-yrs)	
CURE (2001) (16)	acute coronary syndrome	1/6259	0/6303	0·2	–
ACTIVE A (2009) (17)	atrial fibrillation	18/3772	7/3782	1·5	–
SPS3 (2012) (15)	recent lacunar stroke	7/1517	6/1503	1·3	–
Pooled	–	**26/11548**	**13/11588**	**1·2** (0·8,1·7)‡	**2·0 (1·0,3·8)**†

- **Higher risk of SDH with Clopidrogel + ASA vs ASA alone**
- The magnitude of increased risk cannot be precisely characterized due to a paucity of RCTs reporting SDH

ACS – DAPT– spinal/epidural hematoma

What should be done?

Conservative ttt

- 73-yr-W with an ACS
- → PCI with DES in Cx + LAD
- ASA + Clopidrogel
- Developed paraplegia (24h)
- MRI: thor epidural hematoma
- Discussion with neurosurgeons <u>conservative ttt</u>
- Complications secondary to her immobility

BMJ Case Reports 2015 Jul 22;2015

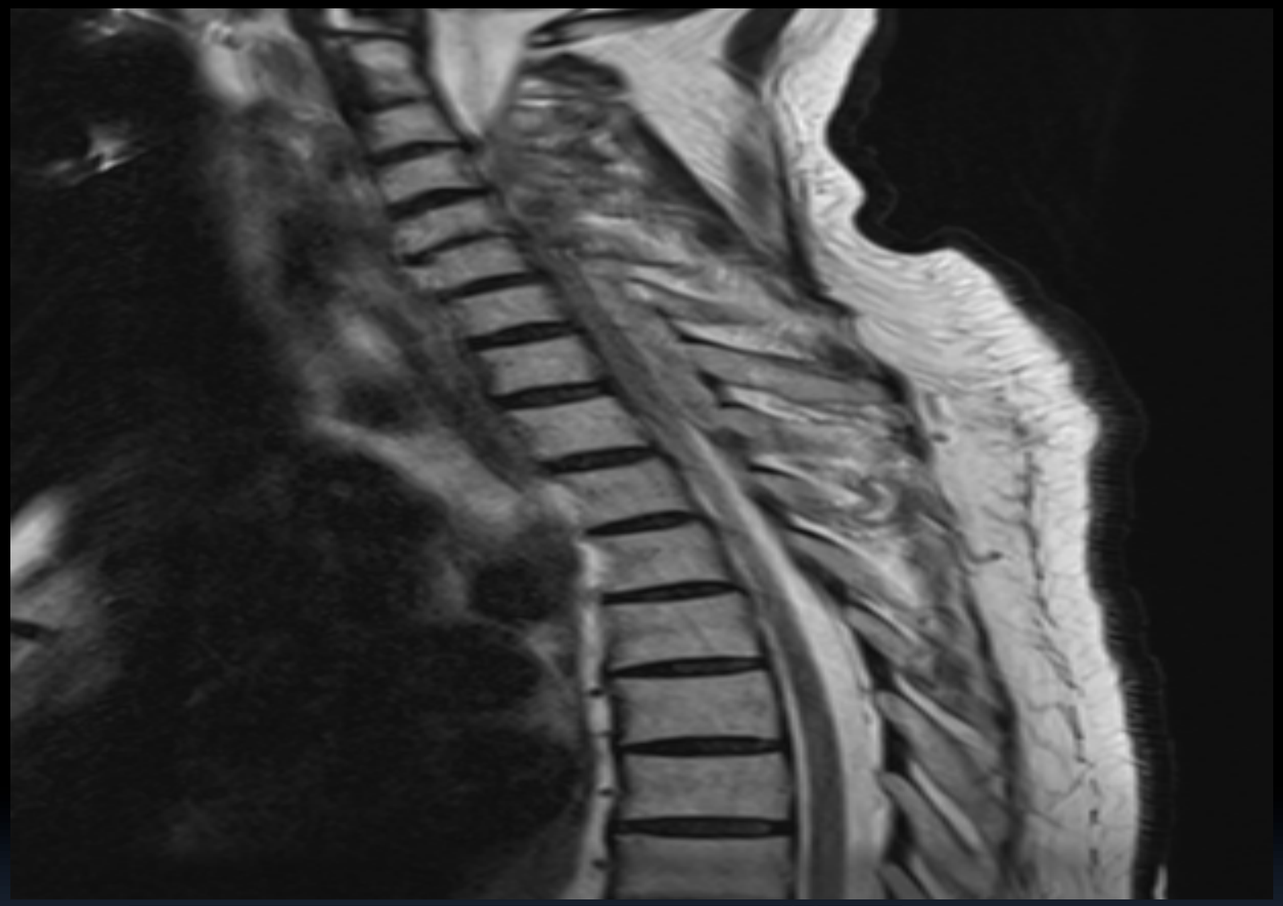
Interventional ttt

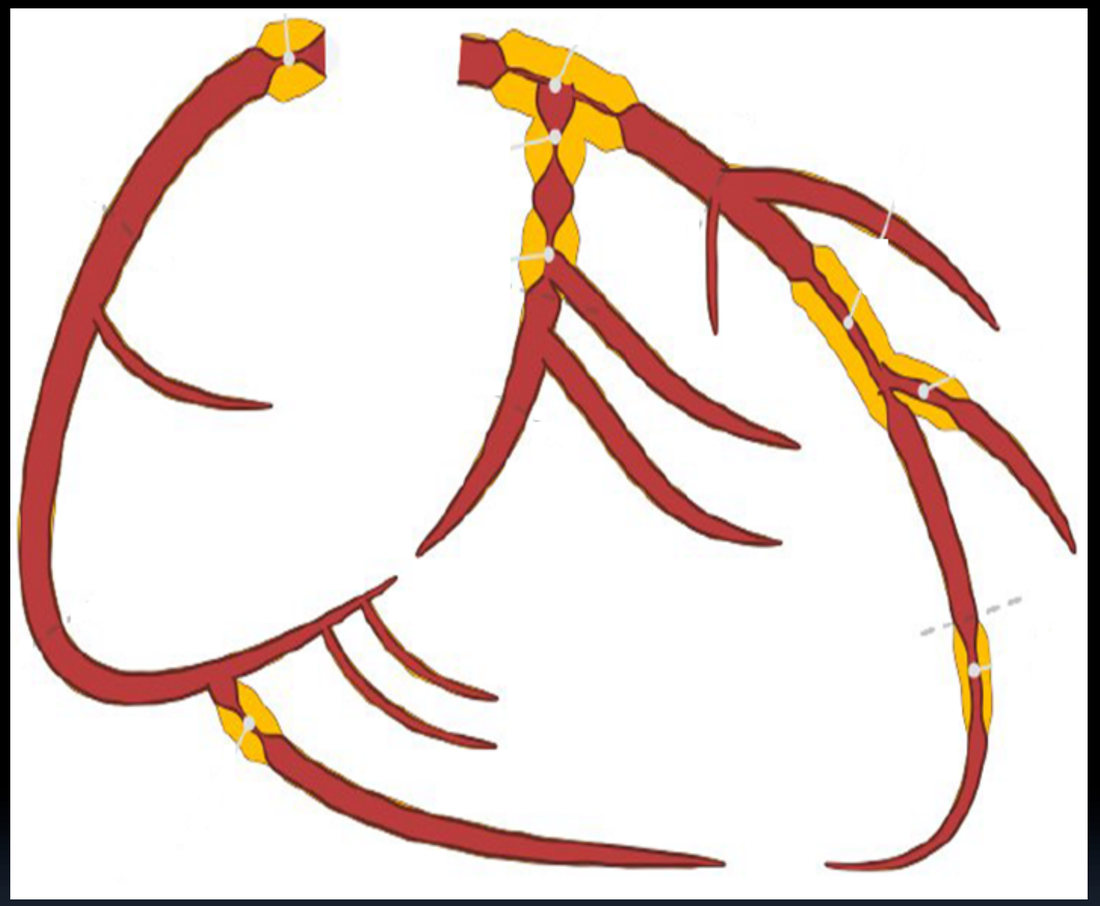
- 56-yr M, stable
- → PCI + DES
- ASA + Clopidrogel after PCI
- Severe back pain, left leg weakness (48h)
- MRI : lumbar epidural hematoma
- <u>Emergent surgical evacuation</u> of spinal epidural hematoma
- ***Incomplete functional recovery***

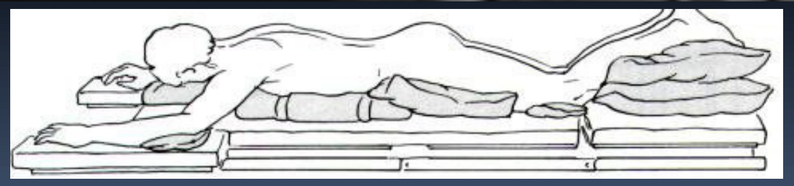
Neurol Sci 2011 Aug;32(4):687-9

Clinical case : ACS + compressive epidural hematoma

Emergent combined surgical procedure







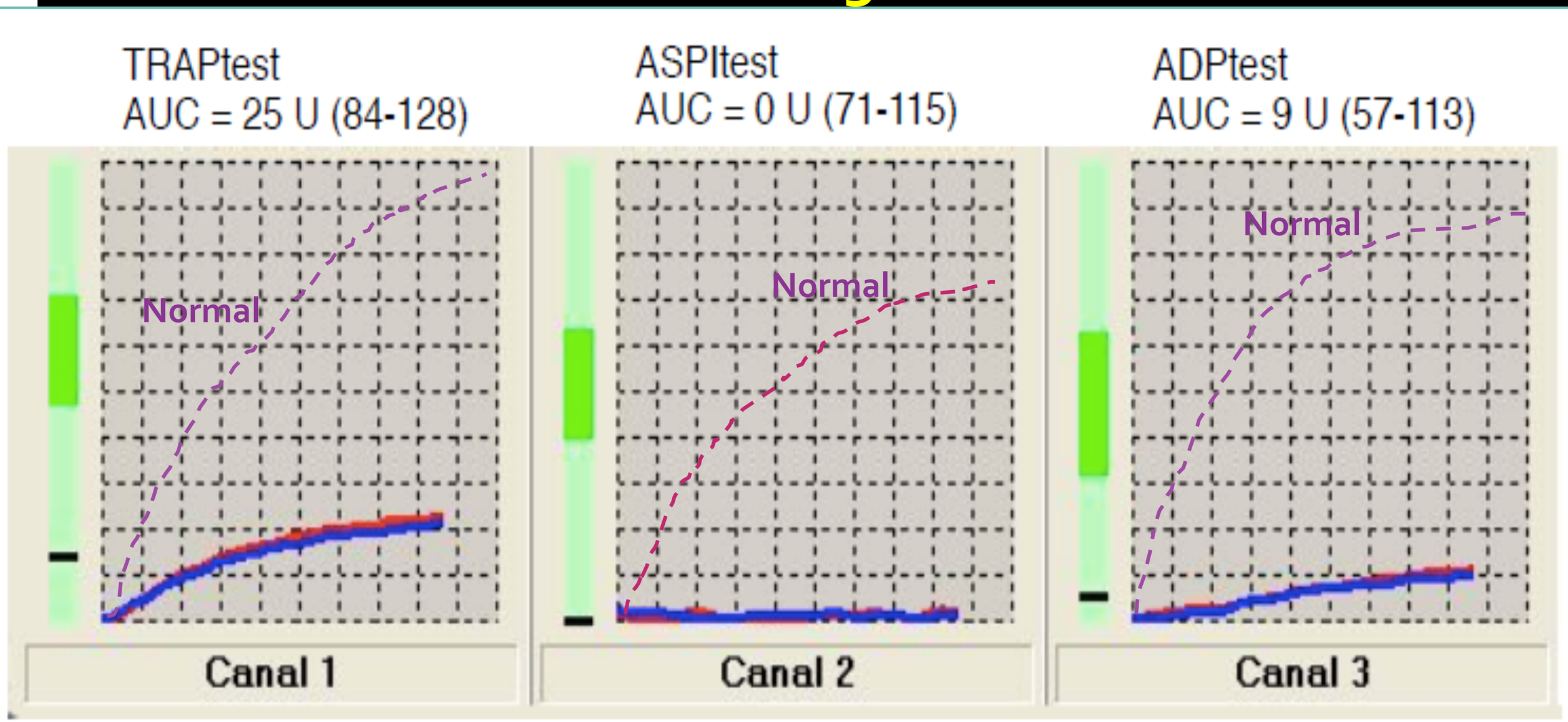
1. Decompressive ½ laminectomy

2. Off-pump CABGS

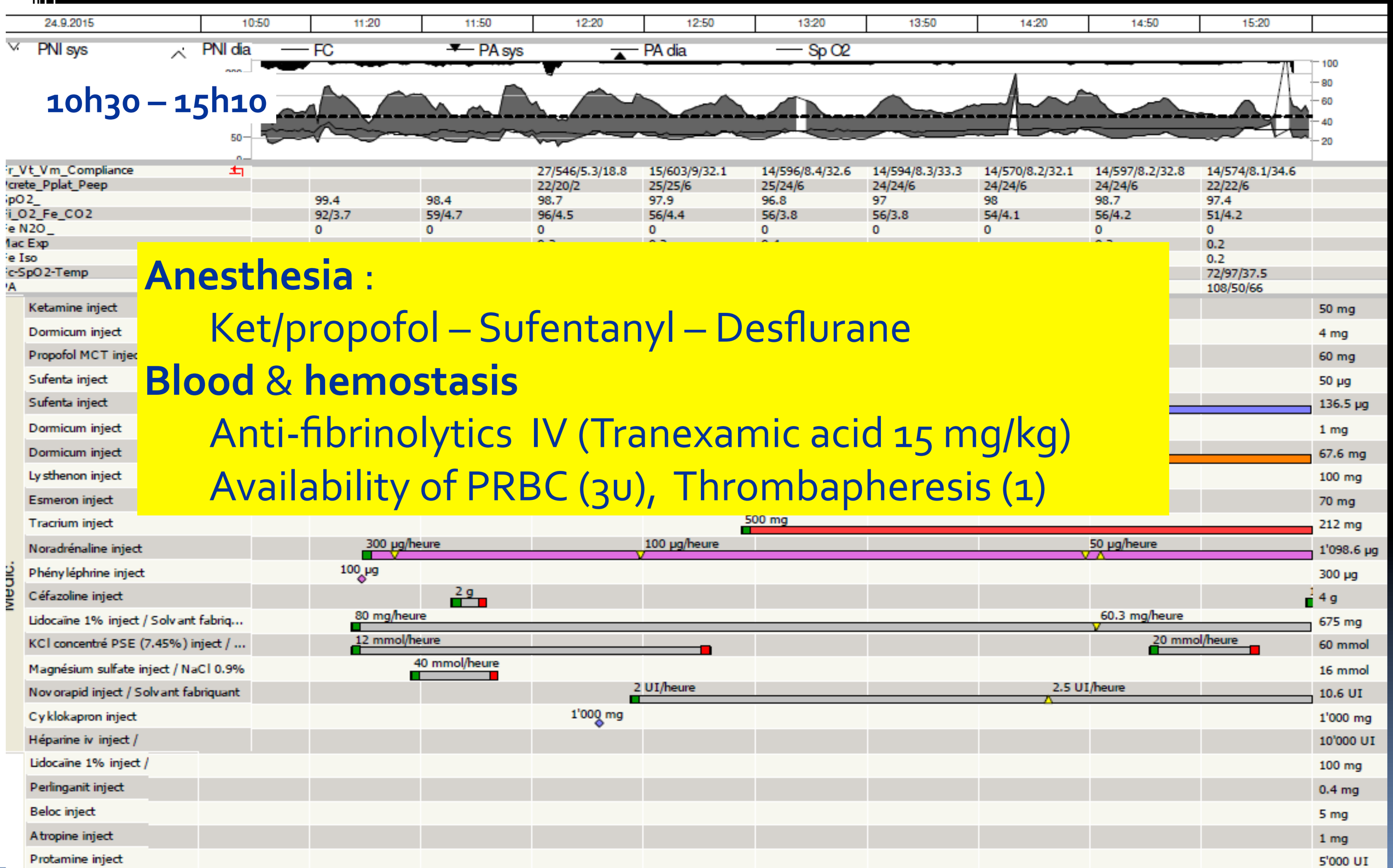
Preop Lab Results

Hb 123g/L; Platelets 178; Quick 100%;Fibrinogen 3.1 g/L

Point-Of-Care Monitoring of Platelet function



Surgery–Anesthesia (1rst neurosurgery)



Anesthesia :

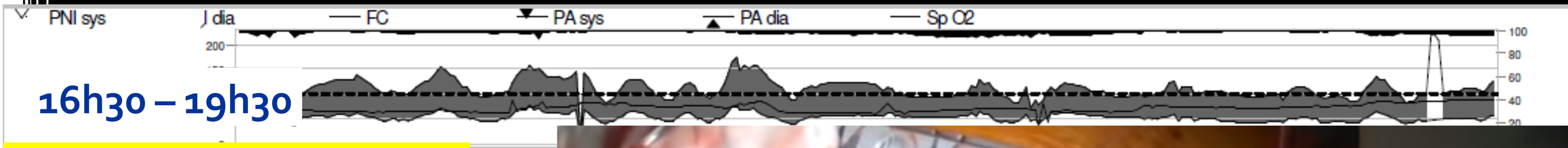
Ket/propofol – Sufentanyl – Desflurane

Blood & **hemostasis**

Anti-fibrinolytics IV (Tranexamic acid 15 mg/kg)

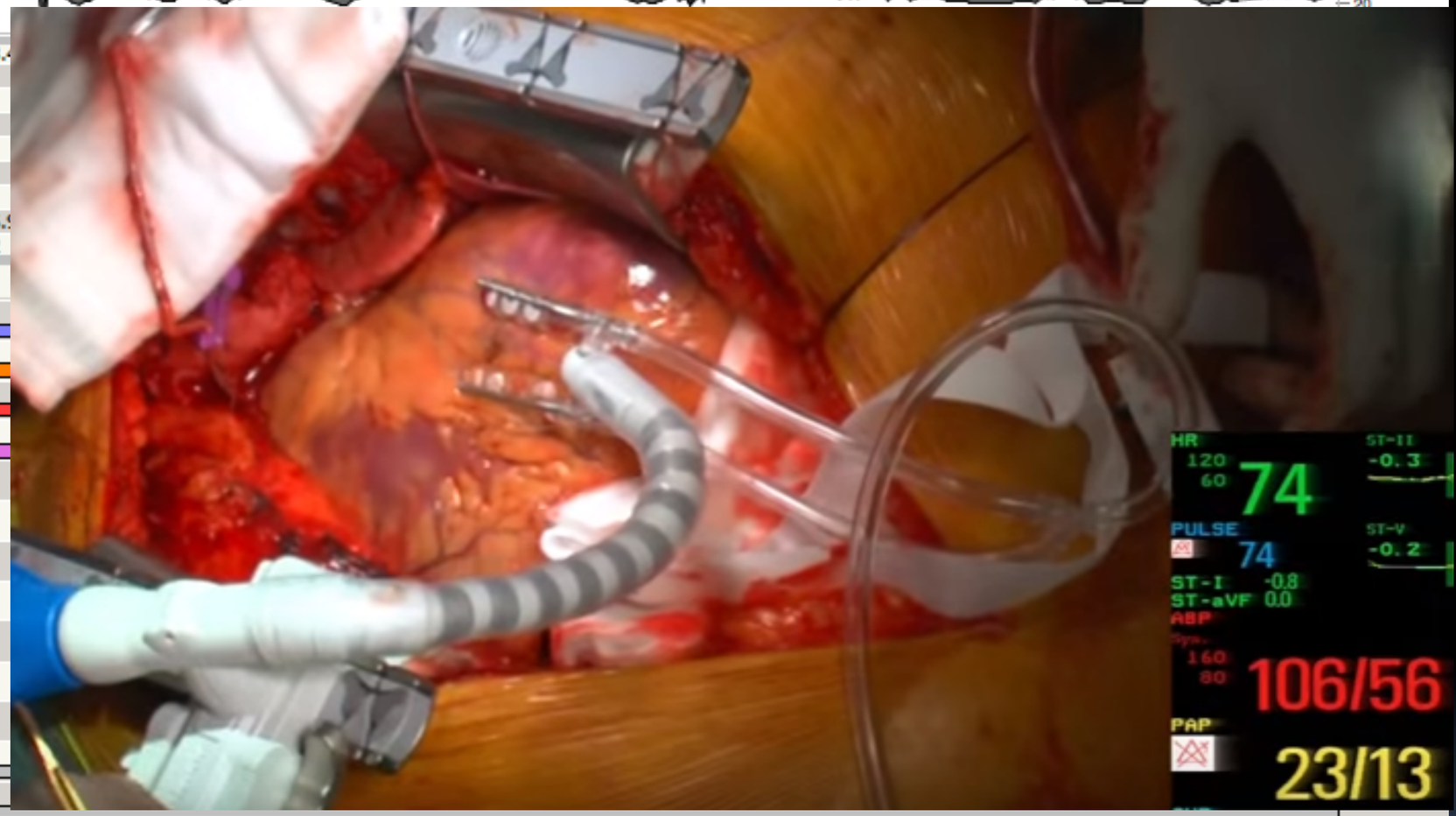
Availability of PRBC (3u), Thrombapheresis (1)

2d cardiac surgery

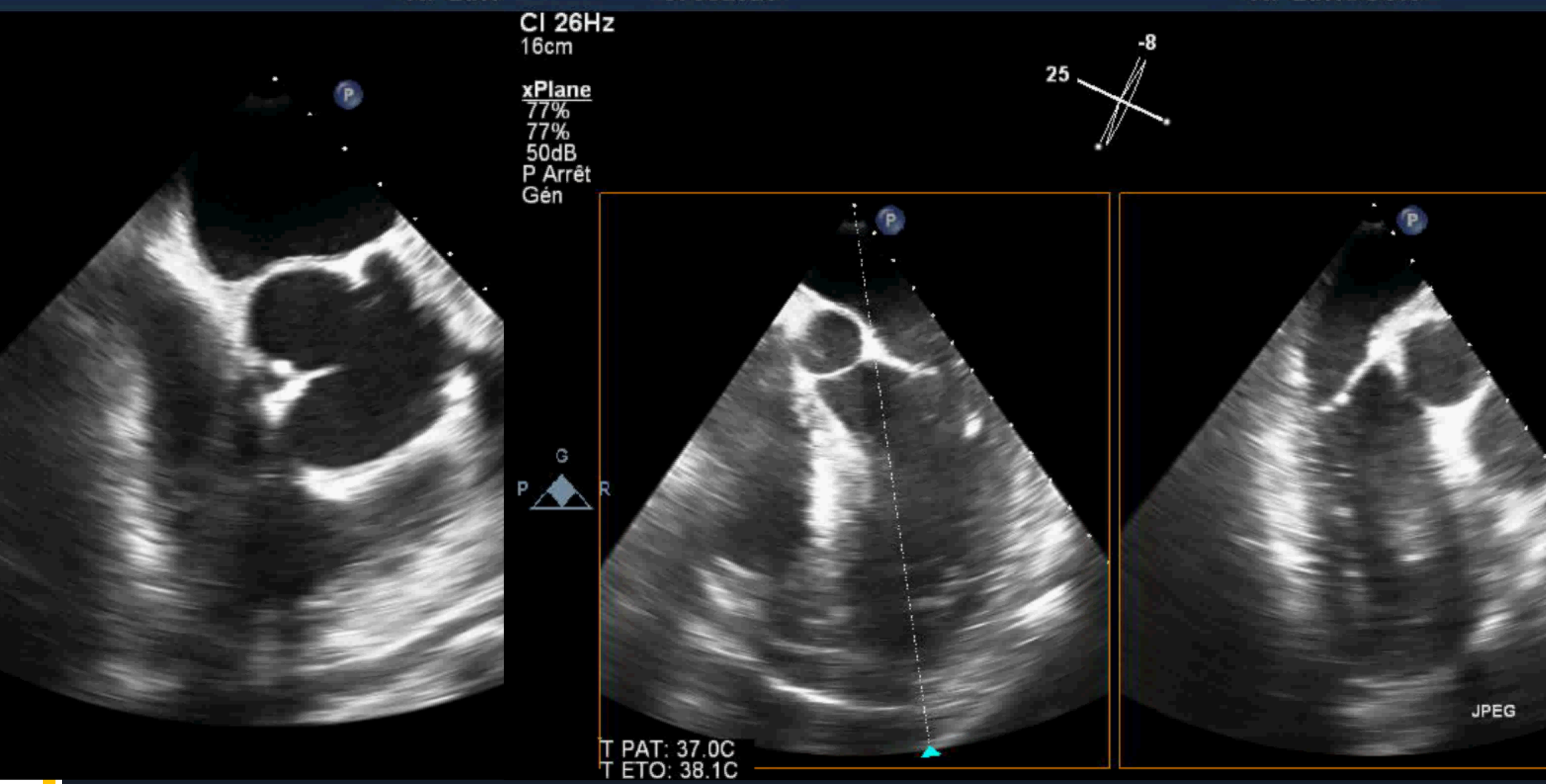


16h30 – 19h30

- Heparin 150 U/kg
- 3-grafts
  - LIMA → LAD
  - SVG → Mg1
  - VG → Cx



		14/561/8.4	
		22/21/7	
		98	
		44/3.6	
		0	
		0.4	
		0.4	
		64/98/36.5	
		96/47/62	
Médic.	Noradrénaline inject	100 µg/heure	
	Phényléphrine inject		
	Perlinganit inject		
	Beloc inject		
	Atropine inject		
	Céfazoline inject	1 g	
	Héparine iv inject /		
	Lidocaïne 1% inject /		
	Lidocaïne 1% inject / Solvq...	60.3 mg/heure	
	Novorapid inject / Solvant	2.5 UI/heure → 0.5 UI/heure	
	KCl concentré PSE (7.45%/ ...	20 mmol/heure	60 mmol
	KCl concentré PSE (7.45%/ ...	13 mmol/heure	
	Protamine inject		5'000 UI
	Tracrium inject		20 mg
Analg.	Sufenta inject	10	50 µg
	Sufenta inject	250	136.5 µg
Perf.	Ringer Acétate inject	1'000	5'000 mL
	Ringer Acétate inject	1'000 1'000 1'000 1'000	
	Glucose 5% perf inject	250 250	750 mL



Hemodynamic Stable
Preserved Ventric. Fct
No valve dysfunction

a race against time ....

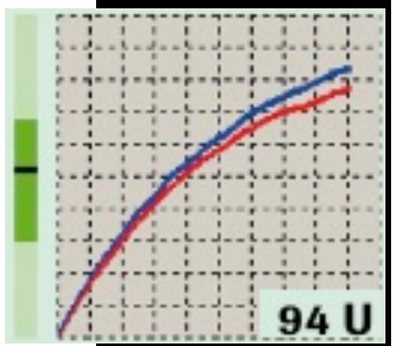
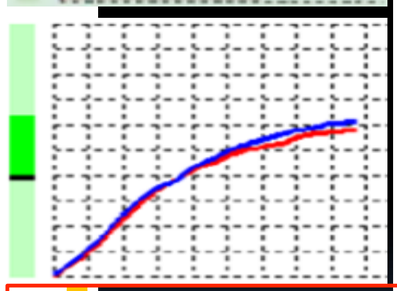
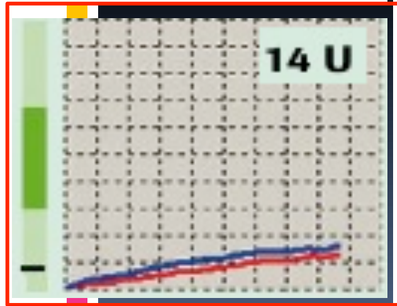
1. H0: Acute coronary Syndrome
2. H2: ASA + Clopidrogel + Heparine
3. H26: Tetraplegia, compressive SDH
4. H33: Spinal decompression + OPCAB

Extubated 3 h after surgery
Spend 2 days in ICU
No blood transfusion
Rehabilitation → Home (independent)

Consensus recommendations for using the Multiplate® for platelet function monitoring before cardiac surgery Int Jnl Lab Hem 2015;37:143–7

R. KONG*, A. TRIMMINGS*, N. HUTCHINSON*, R. GILL†, S. AGARWAL‡, S. DAVIDSON§, M. ARCARI¶

Perform ADPtest and TRAPtest in Hirudin sample tubes

	Pre-OP				Post-OP	
	ADPtest Result[U]	Interpretation	Action			
	AUC >50	Platelets normal	No platelets required	Heparin reversed	→	Bleeding unlikely to be due to platelet dysfunction. Consider other causes. Consider retesting.
	AUC 30–50	Some evidence of platelet inhibition	Reserve/ order platelets*	Significant bleeding post protamine ? ***	→	Transfuse platelets
	AUC <30	Platelet severely inhibited transfusion likely to be required.	Consider postponing operation**/ Order platelets		→	Transfuse platelets

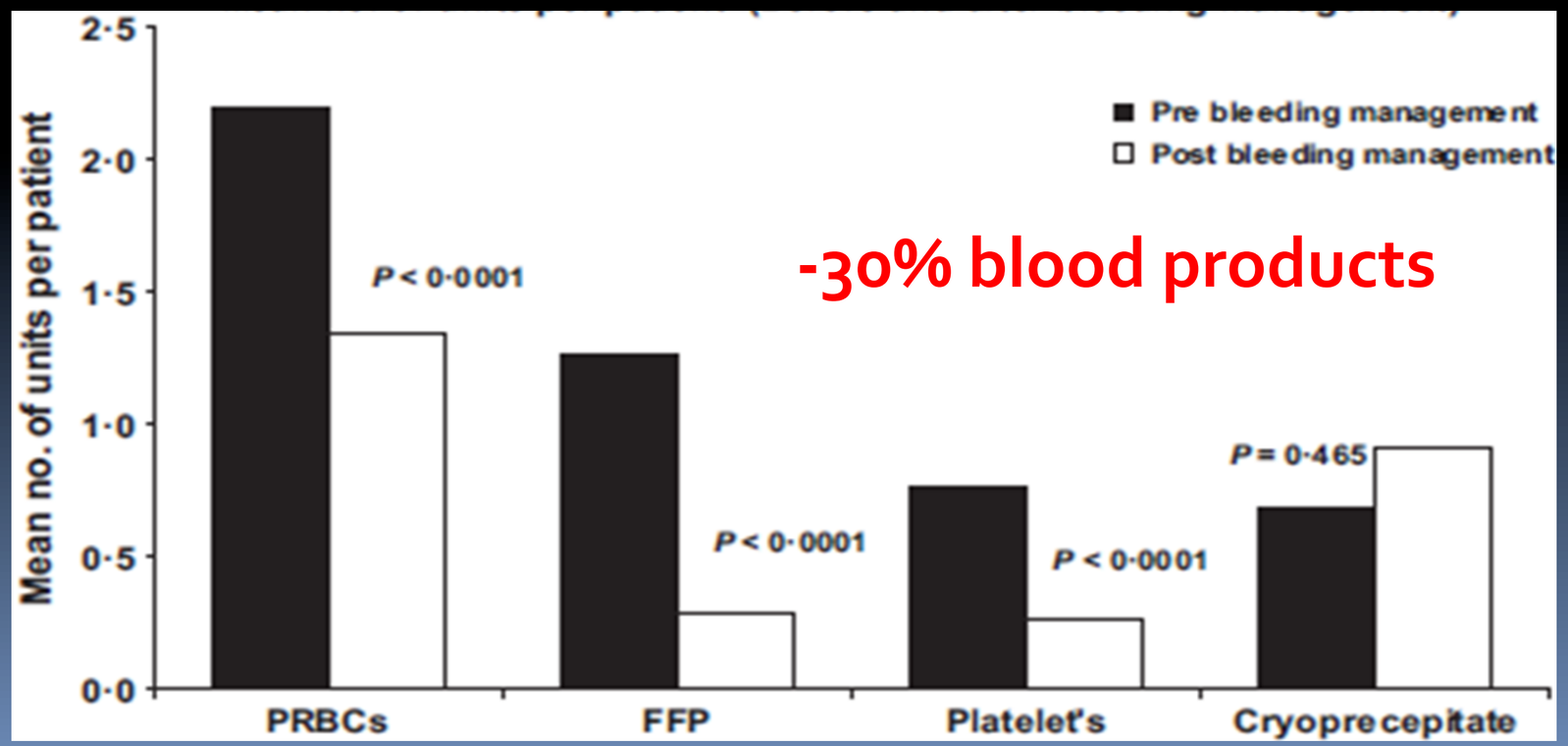
platelet transfusion are poorly effective in pts treated with ticagrelor

VoxSanguinis 2015; 109, 267–279

Protocol guided bleeding management improves cardiac surgery patient outcomes

B. L. Pearse,[1,2,3,4] I. Smith,[1] D. Faulke,[1] D. Wall,[2] J. F. Fraser,[3,5] E. G. Ryan,[6,7] L. Drake,[8] I. L. Rapchuk,[1] P. Tesar,[2] M. Ziegenfuss[3,5] & Y. L. Fung[4,9]

- cardiac surgical center in Australia, 15 months
- Implementation of a transfusion protocol guided by viscoelastic test and platelet agregometry
- 1295 pts before vs 1265 pts with protocol



-30% blood products

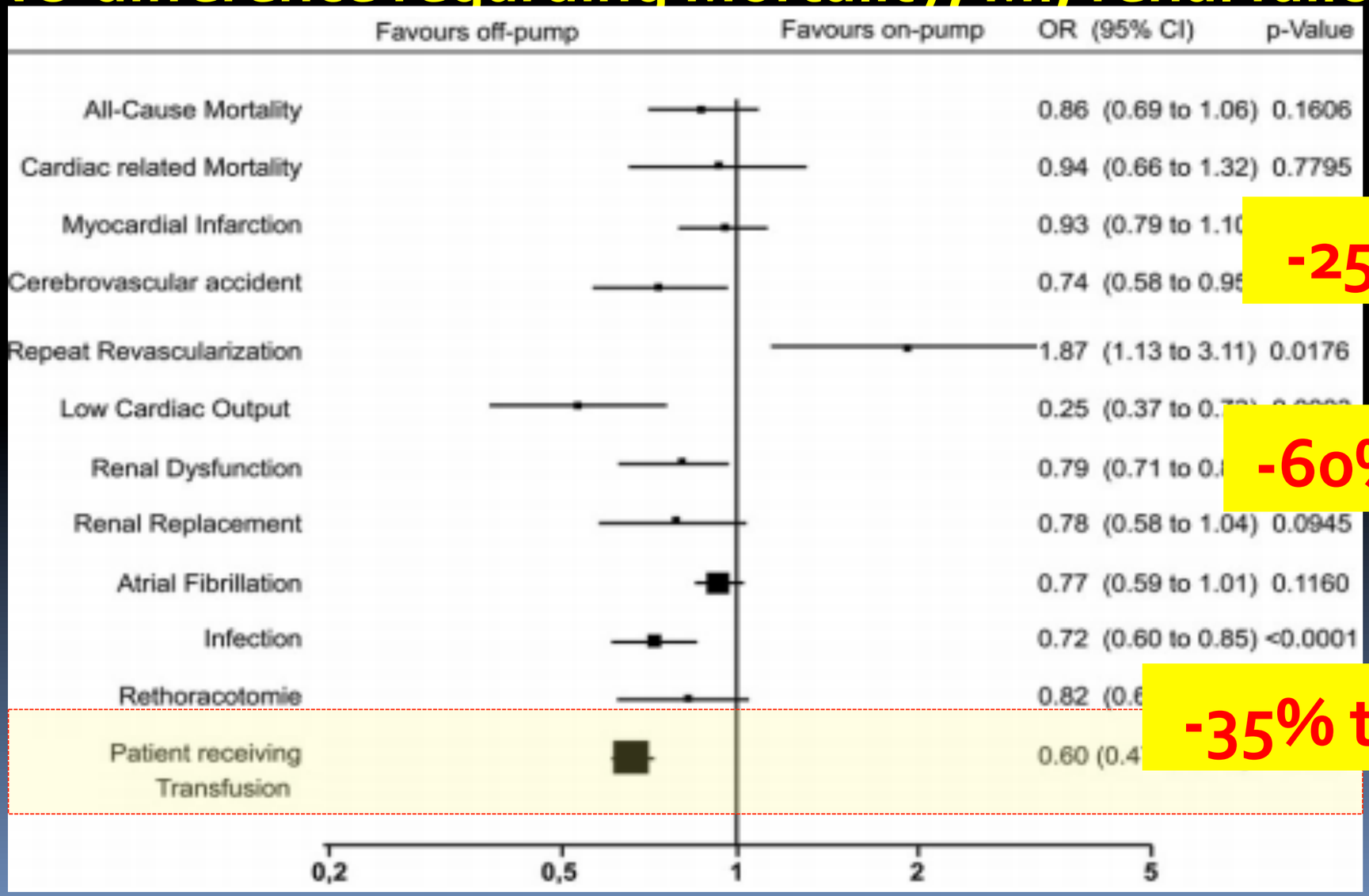
Off-vs On Pump surgery

European Journal of Cardio-Thoracic Surgery 49 (2016) 1031–41

Current evidence of coronary artery bypass grafting off-pump versus on-pump: a systematic review with meta-analysis of over 16 900 patients investigated in randomized controlled trials†

Antje-Christin Deppe[a,*], Wasim Arbash[a], Elmar W. Kuhn[a], Ingo Slottosch[a], Maximilian Scherner[a], Oliver J. Liakopoulos[a], Yeong-Hoon Choi[a,b,†] and Thorsten Wahlers[a,†]

NO difference regarding Mortality, MI, renal failure



-25% Stroke

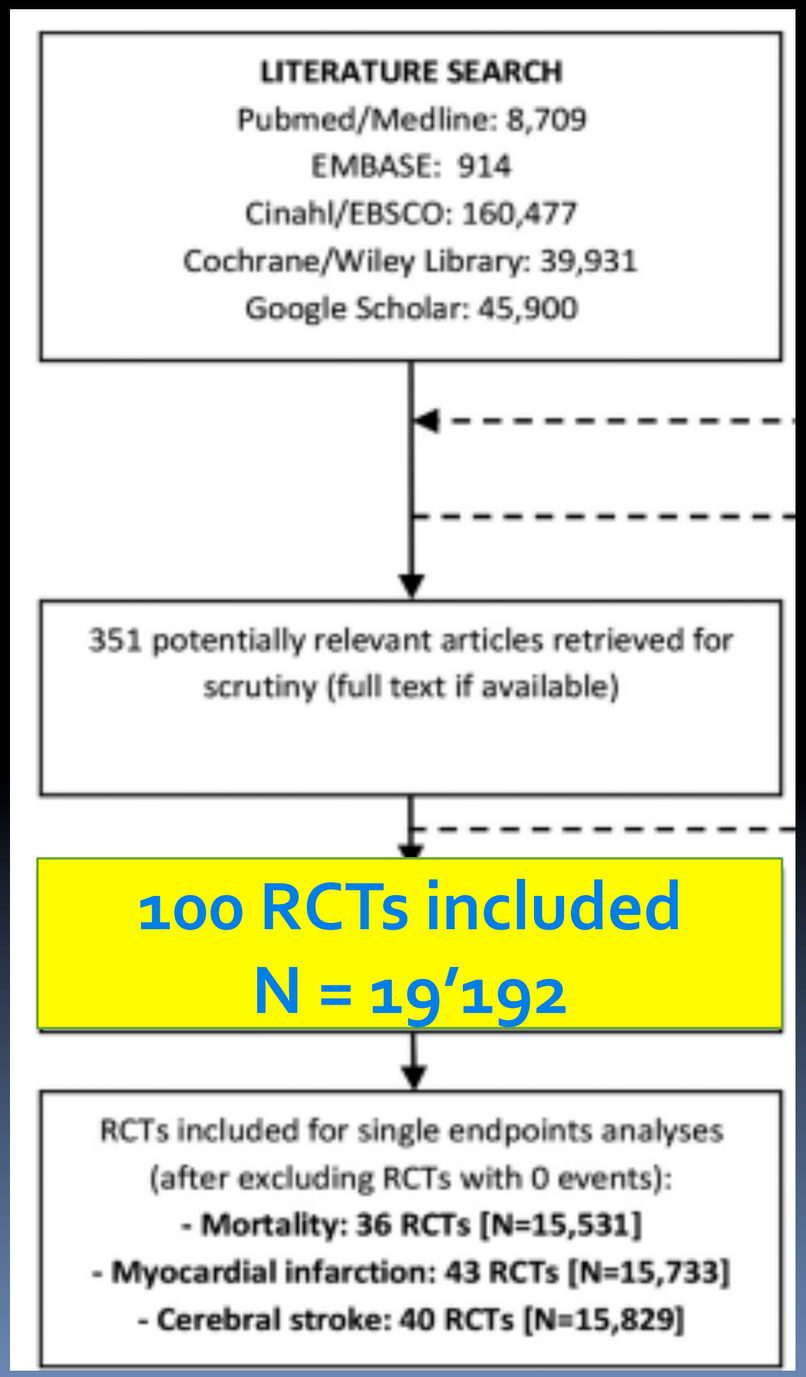
-60% Low CO

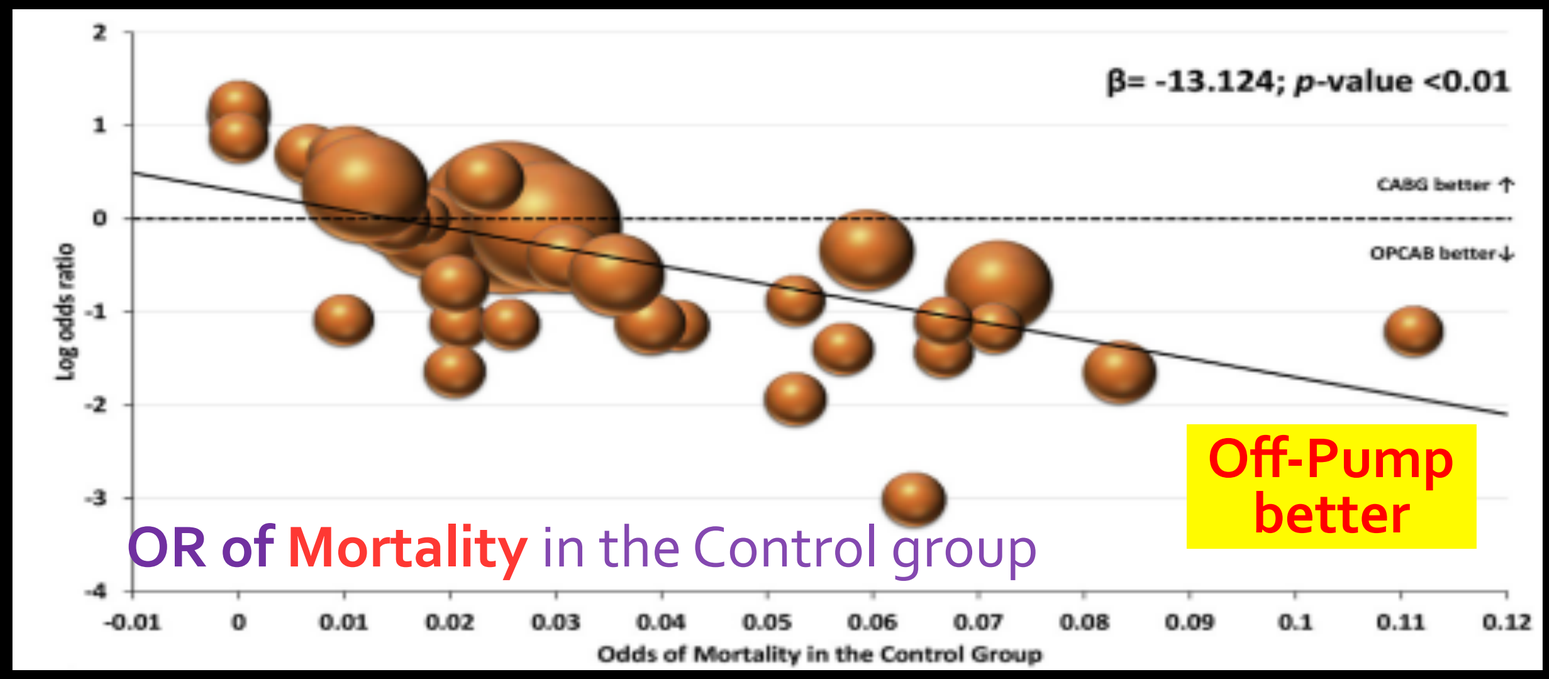
-35% tranfusion

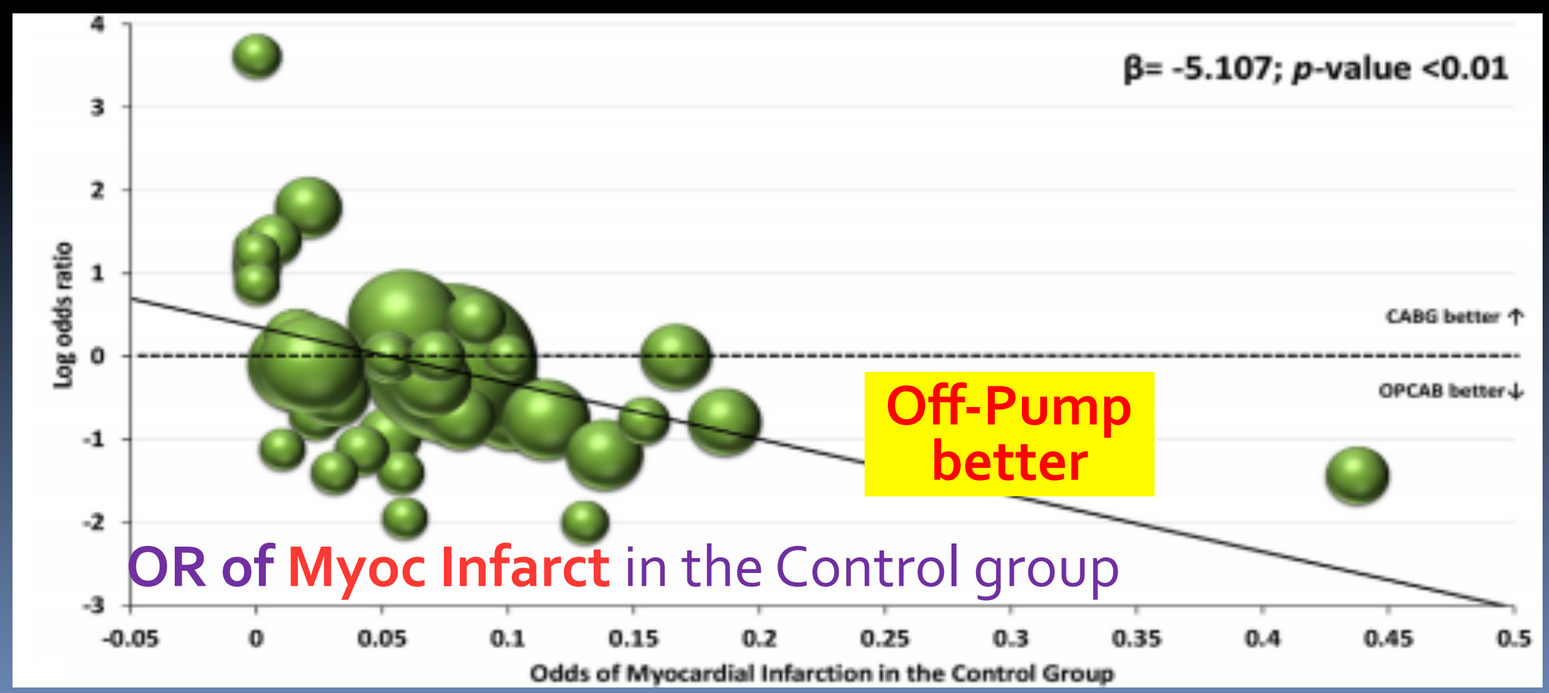
Off-pump coronary artery bypass grafting improves short-term outcomes in high-risk patients compared with on-pump coronary artery bypass grafting: Meta-analysis

J Thorac Cardiovasc Surg 2016;151:60-77

Mariusz Kowalewski, MD,[a,b,c] Wojciech Pawliszak, MD,[a] Pietro Giorgio Malvindi, MD,[d]







Patients with ACS receiving APT & ACT

Take Home Messages

1. **CABGS**
   - Delay > 5 d (if possible)
   - If urgent, consider OPCAB (?)
   - Point-Of-Care Monitoring of Hemostasis
     - Guide procoagulant therapy
     - Combine with « coagulation in the field »

2. **Bleeding complications**
   - ↑ Need for transfusion associated with higher M & M
   - **Spinal/epidural hematoma**

     rare but life threatening life & **impaired QoL**

     → early invasive approach

     → chance of neurological recovery

Thank you

Effects of Continuous Administration of Clopidogrel Before Off-Pump Coronary Artery Bypass Grafting in Patients With Acute Coronary Syndrome

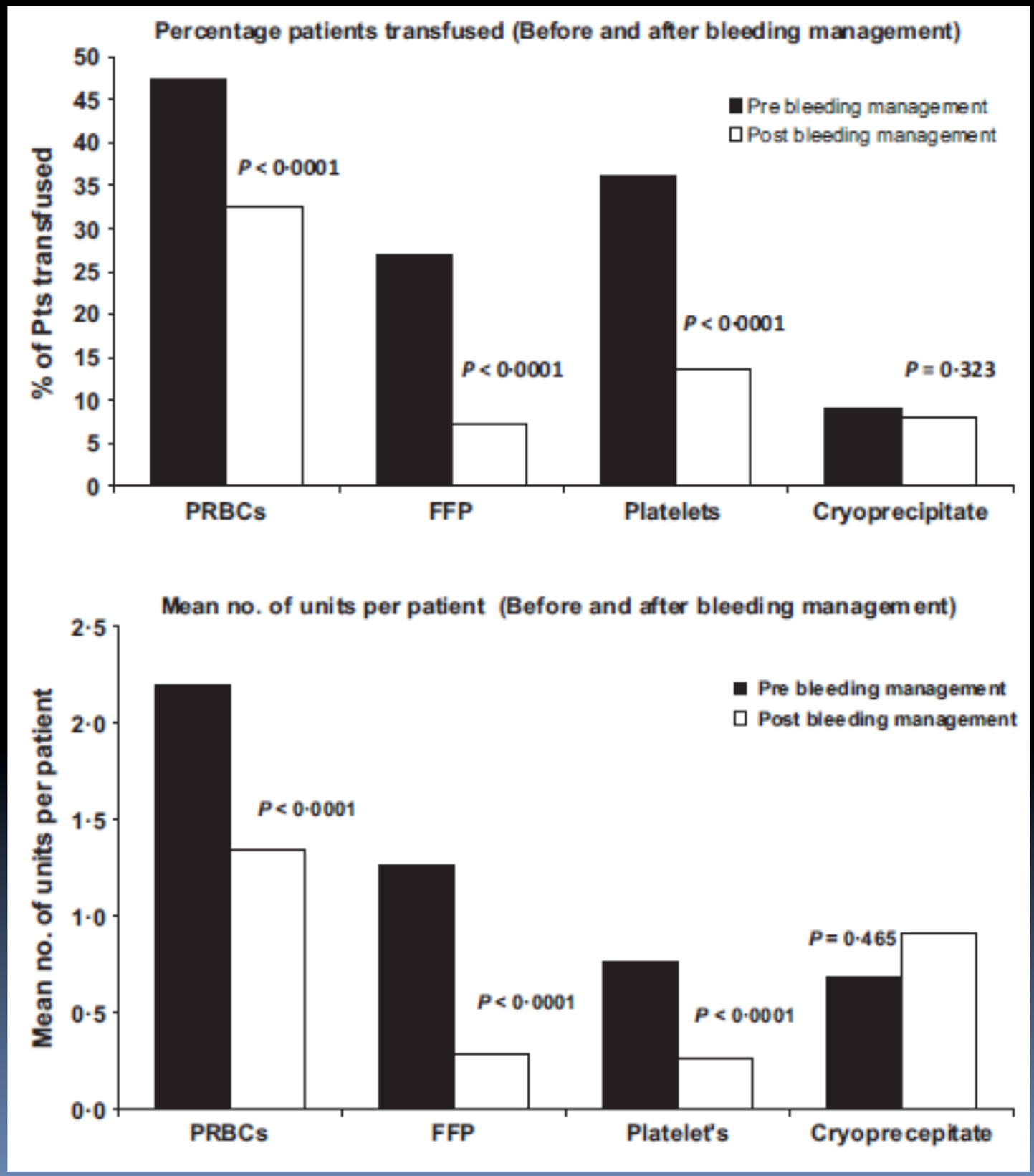
Circ J 2008; **72:** 626–632 **A Propensity Score Analysis** ——

Suk-Won Song, MD; Young-Nam Youn, MD; Gijong Yi, MD; Sak Lee, MD; Kyung-Jong Yoo,

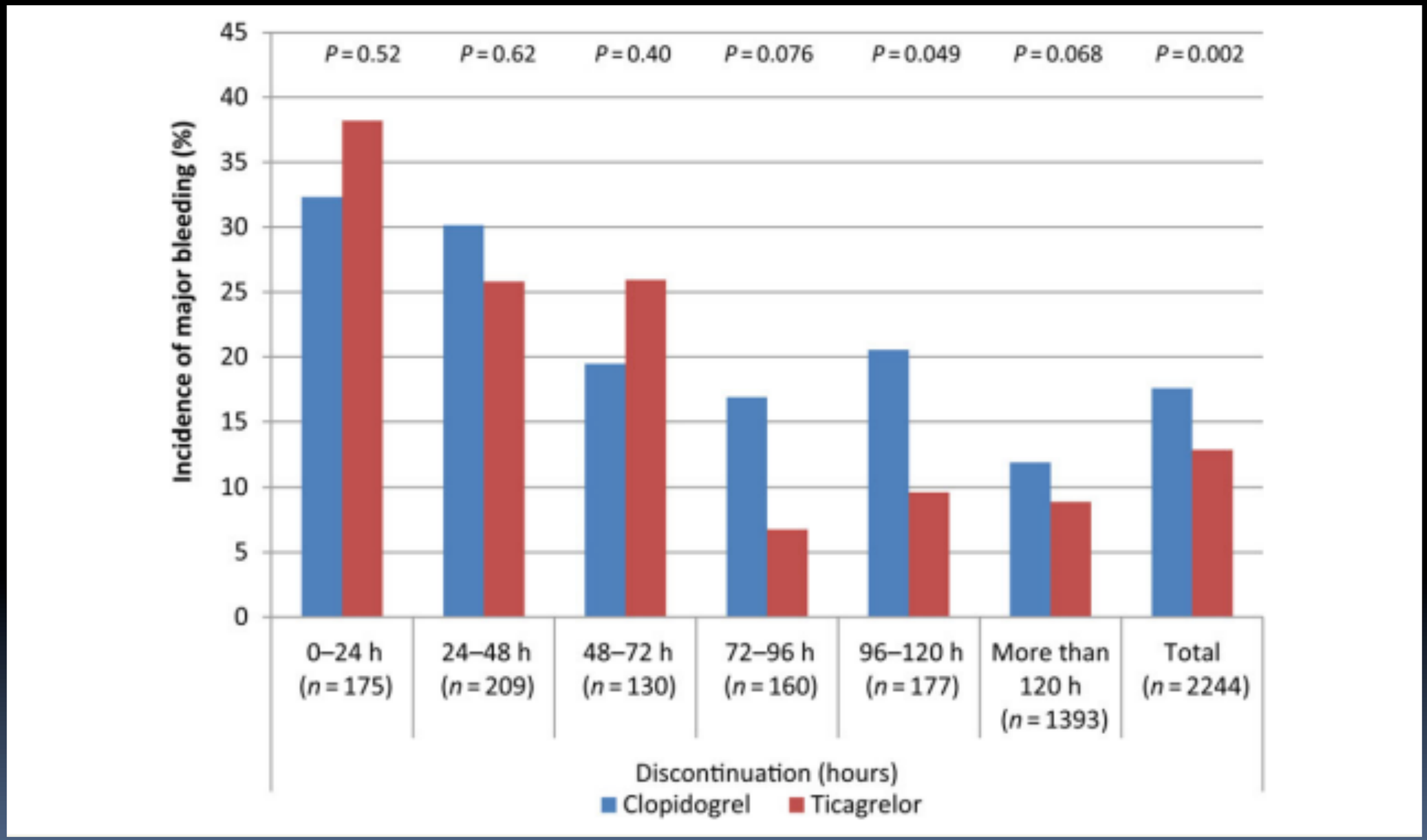
- 172 patients with ACS + off-pump CABGS (2004-6)
  - 70 with clopidrogel, 102 with no clopidr. before s

	With Clopidrogel N= 70	No Clopidrogel N=70	*p value*
Bleeding complications	*1 (1.4)*	*2 (2.9)*	*1.00*
Reexploration	*1 (1.4)*	*1 (1.4)*	*1.00*
UGI bleeding	*0 (0)*	*1 (1.4)*	*0.65*
Prolonged drainage	*1 (1.4)*	*1 (1.4)*	*1.00*
Hemothorax	*0 (0)*	*1 (1.4)*	*0.65*
Blood transfusion	*23 (33.3)*	*24 (34.3)*	*1.00*
pRBC transfusion (U)	*0.4±0.3*	*0.5±0.4*	*0.624*
Platelet transfusion	*2 (2.9)*	*5 (7.1)*	*0.44*
Graft Patency by Multi-Slice CT	*Continuous (n=70)*	*Non-continuous (n=102)*	*p value*
Multi-slice CT evaluation[a]	*54 (77.1)*	*88 (86.3)*	*0.88*
Patent graft (%)[b]	*167/168 (99.4)*	*287/290 (99.0)*	*0.92*

Vox Sang 2015; 109, 267–279



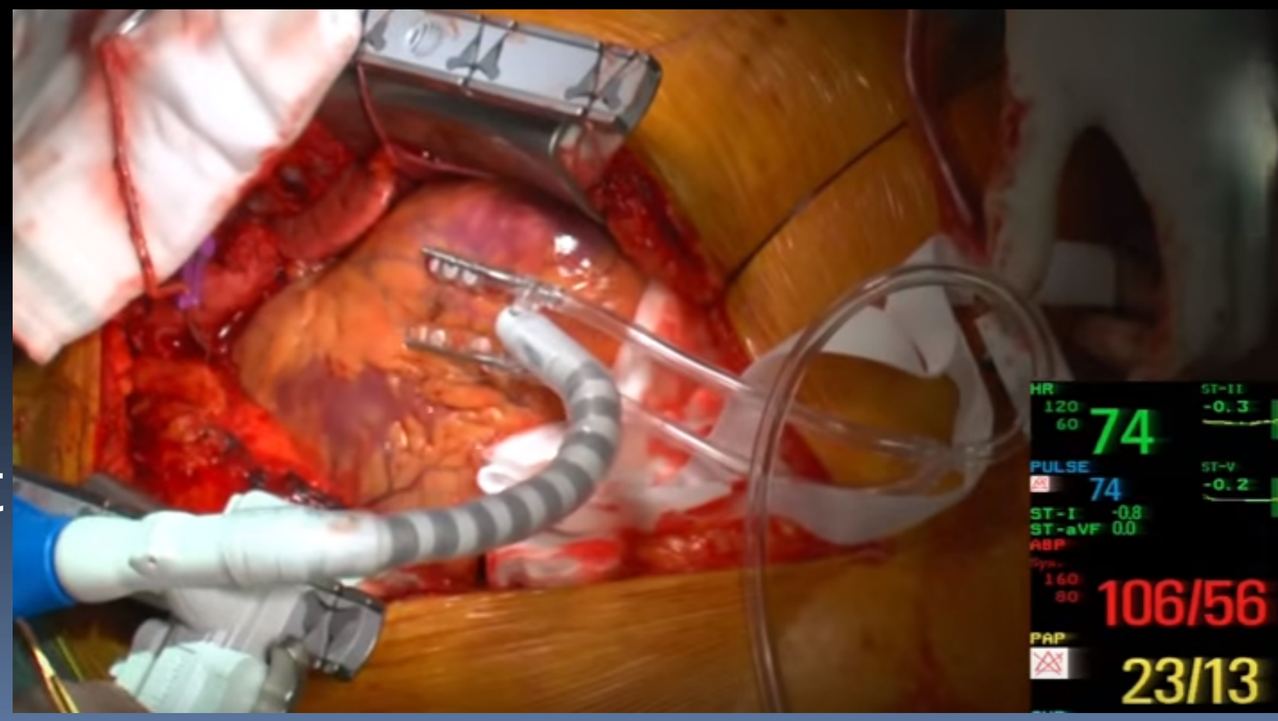
Risks related to Dual AntiPlatelet Therapy



Eur Heart J 2016;37:189-197

Intra-operative management

- **Anesthesia** :
  - Ket/propofol – Sufentanyl – Desflurane (preconditioning)
- **Blood** & **hemostasis**
  - Anti-fibrinolytics IV (Tranexamic acid 15 mg/kg)
  - Availability of PRBC (3u), Thrombapheresis (1)
- **Surgery** :
  - Sternotomy
  - Heparin 150 U/kg
  - OPCAB, intra-coronary shunt
    - LIMA →LAD
    - SVG → Mg1
    - VG → Cx



Int Jnl Lab Hem 2015;37:143–7

Consensus Recommandations on Multiplate

- Perform Multiplate testing if pts have taken P2Y12 (clopidrogel, Ticagrelor, Prasugrel) within 5-7 days prior to surgery
- Decision to reserve/order platelets, will depend on distance to the blood bank, length of time upon delivery
- « significant bleeding » vary between institutions
- If there is no bleeding, don't transfuse platelets (regardless of tests results)

Do not treat patient unless there is clinically significant bleeding

Pre Op Management for High Risk Patient's:

Age > 75yrs, BMI < 20, Re- do surgery, Complex surgery, Anaemia, Haemostatic abnormalities, Anti-coagulant / platelet therapy within the previous 7 days (Warfarin, Heparin etc, Clopidogrel, Prasugrel, Ticlopidine, Ticagrelor etc, Aspirin, NSAID's, Fish Oil, Turmeric, Garlic, Ginger)

Multiplate ADP AUC < 30 ASPI AUC < 20 TRAP AUC < 50	Poor Platelet Function	Consider Platelet Availability	Tranexamic Acid	Consider Cell Salvage

On Bypass Testing *(minimum 36°)*

FIBTEM MCF < 5 mm	Low Fibrinogen	Consider Cryoprecipitate Availability
EXTEM A10 < 30 mm & FIBTEM A10 > 10 mm	Poor Platelet Contribution	Consider Platelet Availability

Post Bypass Testing *(10 post protamine)*

EXTEM A10 ≤ 40 mm & FIBTEM A10 ≤ 10 mm	Low Fibrinogen	Cyroprecipitate	Re-examination of ROTEM Plus or Minus Multiplate Analysis 10 mins after treatment
EXTEM CT > 90 secs OR HEPTEM CT > 280 secs	Low Coagulation Factors	PCC / FFP	
EXTEM A10 ≤ 40 mm & FIBTEM A10 > 10 mm	Poor Platelet Contribution	Platelets / DDAVP	
ADP AUC < 30 ASPI AUC < 20 TRAP AUC < 50	Platelet Dysfunction		
Lysis Index LI 30 > 15 %	Hyperfibrinolysis	TXA	

Aim for :

- Temp > 36
- pH > 7·3
- Ca > 1 mmol/l
- Hb > 7g/dl

Vox Sang 2015, 109, 267–279

ACS – DAPT– spinal/epidural hematoma

Risk of spontaneous spinal hematoma

Bakheet MF et al. 2015 Jun;10(4):501-5 International Journal of Stroke

11 RCTs from 1990 to 2014, comparing ASA vs ASA + Clopidrogel

- 8 RCTs did not identify any subdural hematoma
- 3 RCTS identify subdural hematoma
  - 23,136 pts (mean age 66 years)
  - AP to treat stroke, acute coronary syndromes or atrial fibrillation
  - 39 subdural hematomas during a mean follow-up 2.1 years/pt
- Clop + ASA
  - Incidence: 1.1 (95% CI 0.7,1.6) per 1000 pt – years
  - vs ASA alone RR 2.0, 95% CI 1.0, 3.8

SANG		normes	23/09/2015 16:20:00	24/09/2015 22:00:00
VS		-		
Globules rouges	T/l	4.40-6.0	4.24	4.00
Hémoglobine	g/l	140-180	129	123
Hématocrite	%	40.0-52.	38.1	36.4
MCV/MCH	fl	82.0-98.	89.9/30.4	91.0/30.8
MCHC	g/l	320-360	339	338
Globules blancs	G/l	4.0-11.0	5.3	6.9
Neutrophiles segm./Nb.A	/	- / -	/	59.0/3.78
Neutrophiles non segm.		-		8.0
Eosinophiles		-		4.0
Basophiles		-		0.0
Monocytes		-		7.0
Lymphocytes/Nb.Abs	/	- / -	/	22.0/1.41
Cellules réparties		-		100
Plaquettes	G/l	150-350	183	178
INR		-	1.00	1.00
Quick	%	> 70-	>100	>100
PTT	sec	26.0-37.	40.3	31.7
Fibrinogène	g/l	1.5-3.5	3.1	3.0

CHIMIE SANGUINE				
p-glucose		-		8.2
p-sodium	mmol/l	136-144	140	141
p-potassium	mmol/l	3.6-4.6	4.3	4.8
p-chlorure		-		110
p-CO2 total		-		23.4
p-osmolalité calculée		-		297
p-trou anionique		-		12
p-magnésium total		-		0.90
p-calcium total/corrigé	/	- / -	/	1.85/2.09
p-phosphates		-		1.04
p-urée	mmol/l	3.2-7.5	6.7	7.3
p-créatinine	µmol/l	62-106	91	78
p-protéines		-		45
p-CK totale/p-CK MB	U/l /	47-222 /	107/	564/

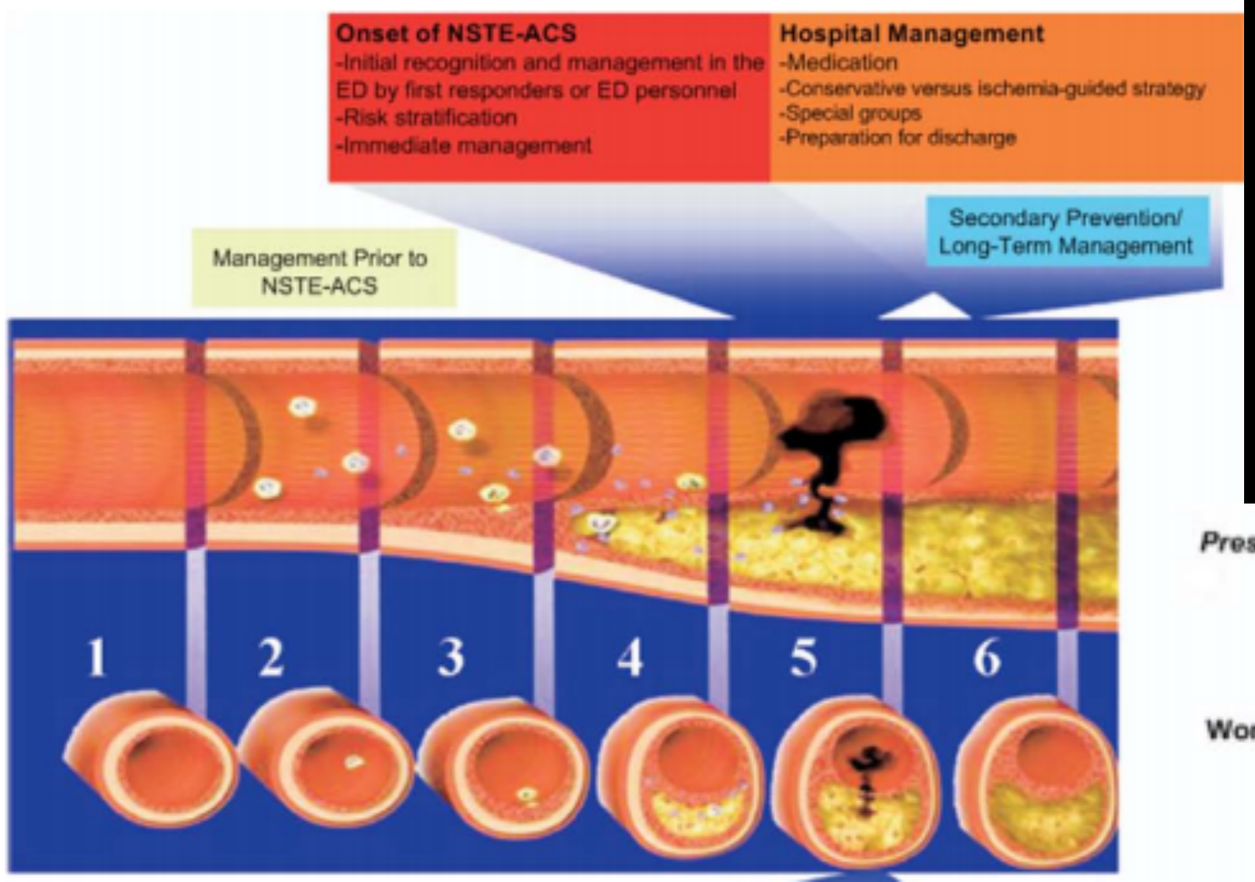
Risks related to Dual AntiPlatelet Therapy

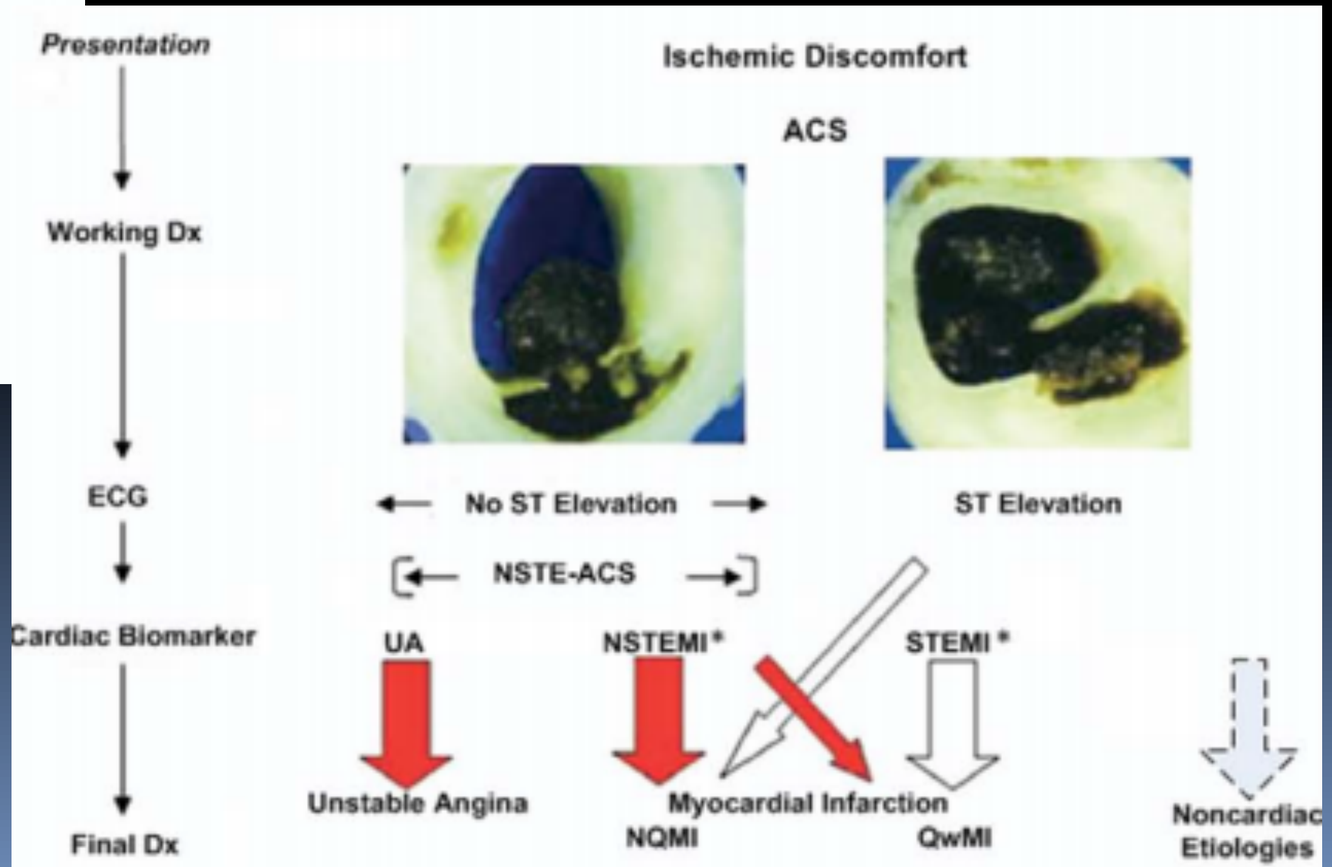
Elective surgery

- Current guidelines recommend withdrawal of clopidogrel and ticagrelor 5 days (120 h) before elective surgery.
- Shorter discontinuation would reduce the risk of thrombotic events and save hospital resources, but may increase the risk of bleeding

2014 AHA/ACC Guideline for the Management of Patients With Non–ST-Elevation Acute Coronary Syndromes: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines





Guideline for Reversal of Antithrombotics in Intracranial Hemorrhage

NEUROCRITICAL CARE
A Journal of Acute and Emergency Care

2016: 24:6-46

A Statement for Healthcare Professionals from the Neurocritical Care Society and Society of Critical Care Medicine

Surgery – Anesthesia (con't)

		24.9.2015 15:50	16:20	16:50	17:20	17:50	18:20	18:50	19:20	19:50	20:20	
Perf.	NaCl 0.9%	250			500			500				2'000 m
	NaCl 0.9%	250										
	NaCl 0.9%	250										
	Sang cell saver										479	479 mL
	CE											280 mL
	Thromba											150 mL
Balance		2'103	2'390	2'618	2'881	3'459	4'199	4'809	5'366	5'924	6'683	mL
Total In		3'028	3'315	3'568	3'831	4'409	5'149	5'819	6'376	6'934	7'693	mL
Total Out		925	925	950	950	950	950	1'010	1'010	1'010	1'010	mL
IN	Cristal.	3'028	3'315	3'568	3'831	4'409	5'149	5'819	6'376	6'934	7'537	mL
	PSL										155	mL
Out	Tot. Sang.	300	300	300	300	300	300	300	300	300	300	mL
	Urine[vidé]	**40**		**25**				**60**				mL
	Tot. Urines	625	625	650	650	650	650	710	710	710	710	mL
Equip.	VVP [16G]	Pied Droit										0 d/10 h
	VVP [16G]	Pied Gauche										
	VVP [autre]ep	...Votre Choix										0 d/10 h
	VVP [autre]ep	...Votre Choix										
	KT Artériel [3F 6x1.0	Radial Droit										0 d/10 h
	VVC 3 lumières	...Votre Choix										0 d/9 h/5
	TOT [7.5+b]	Oral										0 d/10 h
	S. Vésicale [Autre]	Vésicale										0 d/10 h
	S. Gastrique [CH16]	Bouche										0 d/9 h/4
BIS												**Units**
Valeur (Bis)		**30**						**37**	**43**			None
Labos spec												
ACT					**214**		**144**		**119**	**126**		sec
Gazométrie	Libellé matériel	*sga*		sga		sga			sga		sga	None
	T	**37.0**		**37.0**		**37.0**			37.0		37.0	°C
	FO2(I)	***80***		**21**		**50**			80		60	%
	PH(mesuré)	**7.46**		**7.42**		**7.40**			7.35		7.34	None
	PH(T)	***7.46***		**7.42**		**7.40**			7.35		7.34	None
	PCO2(mesuré)	**4.44**		**4.96**		**5.04**			5.42		5.93	kPa
	PCO2(T)	***4.44***		**4.96**		**5.04**			5.42		5.93	kPa
	PO2(mesuré)	**33.1**		**22.2**		**22.8**			22.5		14.4	kPa
	PO2(T)	***33.10***		**22.20**		**22.80**			22.50		14.40	kPa
	Hb/Ht	***104/32.1***		**107/32.9**		**102/31.6**			86/26.9		92/28.4	None
	CtHb	**104**		**107**		**102**			86		92	g/L
	Hct	***32.1***		**32.9**		**31.6**			26.9		28.4	%
	SO2	***100.0***		**100.0**		**99.6**			99.5		98.0	%
	Na+/K+	**139/3.8**		**140/4.4**		**140/4.3**			140/4.0		138/4.4	None
	CCl-	**111**		**110**		**112**			114		112	mmol/L
	CCa2+	**1.13**		**1.17**		**1.15**			1.10		1.15	mmol/L
	CLac	**1.2**		**1.2**		**1.0**			1.1		1.3	mmol/L

TIMI score → sum of the presence of 7 variables

At admission; 1 point is given for each of the following variables:

- ≥65 y of age
- ≥3 risk factors for CAD
- prior coronary stenosis ≥50%
- ST deviation on ECG
- ≥2 anginal events in prior 24 h
- use of aspirin in prior 7 d
- elevated cardiac biomarkers

Table 3. TIMI Risk Score* for NSTE-ACS

TIMI Risk Score	All-Cause Mortality, New or Recurrent MI, or Severe Recurrent Ischemia Requiring Urgent Revascularization Through 14 d After Randomization, %
0–1	4.7
2	8.3
3	13.2
4	19.9
5	25.2
6–7	40.9

- **Prasugrel** approved in the UK by NICE for use in :
  - STEMI undergoing PCI
  - diabetic pts with NSTE ACS undergoing PCI
  - Pts with stent thrombosis
- **Ticagrelor** approved in October 2011 by NICE for :
  - pts with moderate-to-high risk NSTE ACS and STEMI undergoing primary PCI (in preference to clopidogrel in European guidelines)

5.1.1. PCI–Oral and Intravenous Antiplatelet Agents

Class I

1. **Patients already taking daily aspirin before PCI should take 81 mg to 325 mg non–enteric-coated aspirin before PCI.[27,190–192] *(Level of Evidence: B)***
2. **Patients not on aspirin therapy should be given non–entericcoated aspirin 325 mg as soon as possible before PCI.[27,190–192] *(Level of Evidence: B)***
3. **After PCI, aspirin should be continued indefinitely at a dose of 81 mg to 325 mg daily.[28,142,193] *(Level of Evidence: B)***
4. **A loading dose of a $P2Y_{12}$ receptor inhibitor should be given before the procedure in patients undergoing PCI with stenting.[27,147,170,172,194–197] *(Level of Evidence: A)* Options include:**
   a. **Clopidogrel: 600 mg[170,194–196,198–200] *(Level of Evidence: B)* or**
   b. **Prasugrel#: 60 mg[172] *(Level of Evidence: B)* or**
   c. **Ticagrelor‖: 180 mg[147] *(Level of Evidence: B)***
5. **In patients with NSTE-ACS and high-risk features (eg, elevated troponin) who are not adequately pre-treated with clopidogrel or ticagrelor, it is useful to administer a GP IIb/IIIa inhibitor (abciximab, double-bolus eptifibatide, or high-dose bolus tirofiban) at the time of PCI.[201–204] *(Level of Evidence: A)***
6. **In patients receiving a stent (bare-metal stent or drug-eluting stent [DES]) during PCI for NSTE-ACS, $P2Y_{12}$ inhibitor therapy should be given for at least 12 months.[169] Options include:**
   a. **Clopidogrel: 75 mg daily[170,171] *(Level of Evidence: B)* or**
   b. **Prasugrel#: 10 mg daily[172] *(Level of Evidence: B)* or**
   c. **Ticagrelor‖: 90 mg twice daily[147] *(Level of Evidence: B)***

PCI–Oral and Intravenous Antiplatelet Agents

Class I

4. A loading dose of a $P2Y_{12}$ receptor inhibitor should be given before the procedure in patients undergoing PCI with stenting.[27,147,170,172,194–197] *(Level of Evidence: A)* Options include:
   a. Clopidogrel: 600 mg[170,194–196,198–200] *(Level of Evidence: B)* or
   b. Prasugrel#: 60 mg[172] *(Level of Evidence: B)* or
   c. Ticagrelor‖: 180 mg[147] *(Level of Evidence: B)*

ACS – antiplatelet therapy and bleeding

Learning Objectives

- Adhesion to guidelines for management of ACS
- Treatment of bleeding in pts with ACS receiving DPT