

THE IMPACT OF CKD ON THE OUTCOME OF PRIMARY PCI

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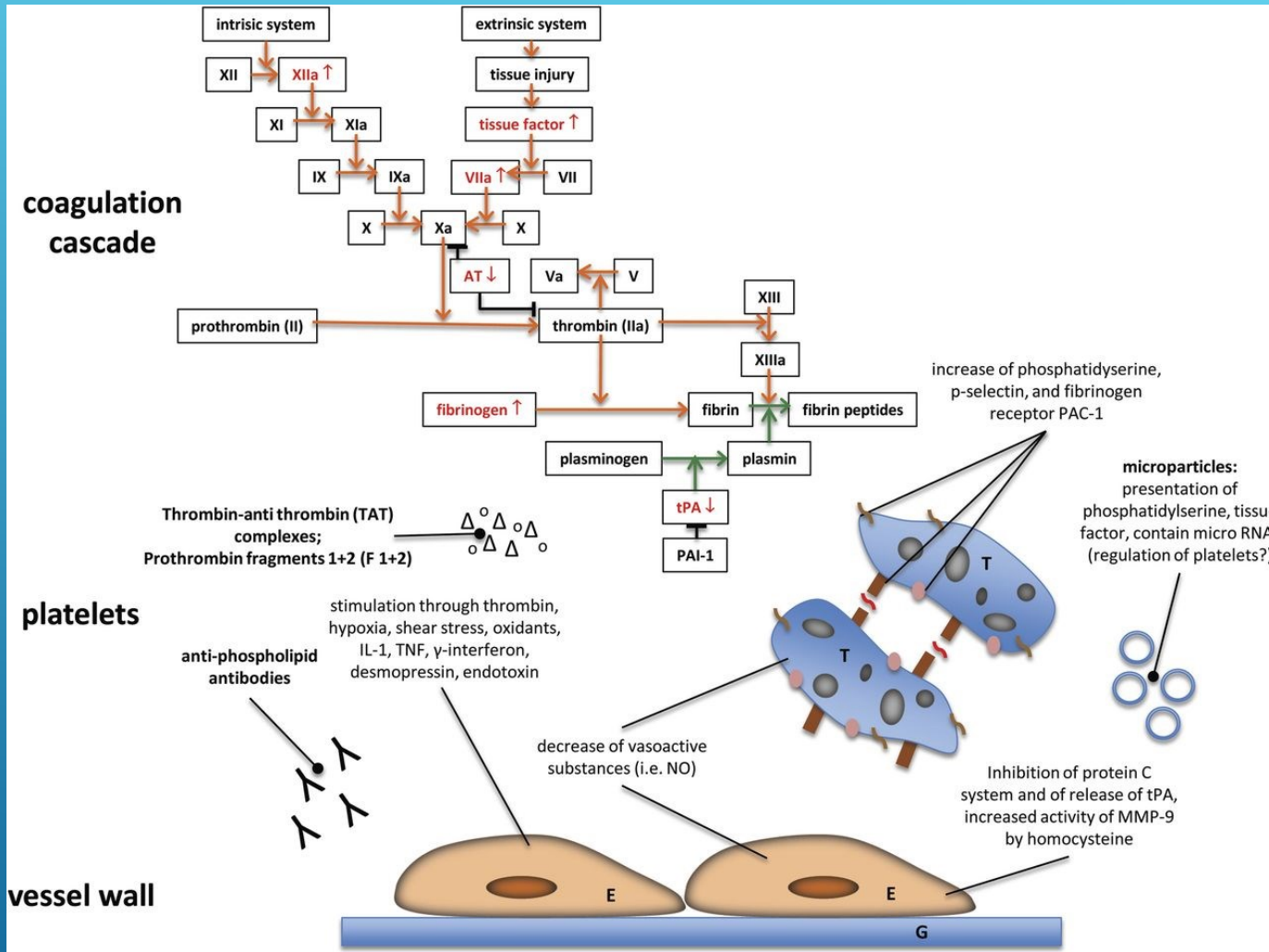
Ain Shams University

- ▶ A thrombotic risk or a bleeding risk ?
- ▶ A short term risk ? An intermediate risk ? or a long term risk ?
- ▶ What grade of ckd is at risk?

CKD AND PPCI

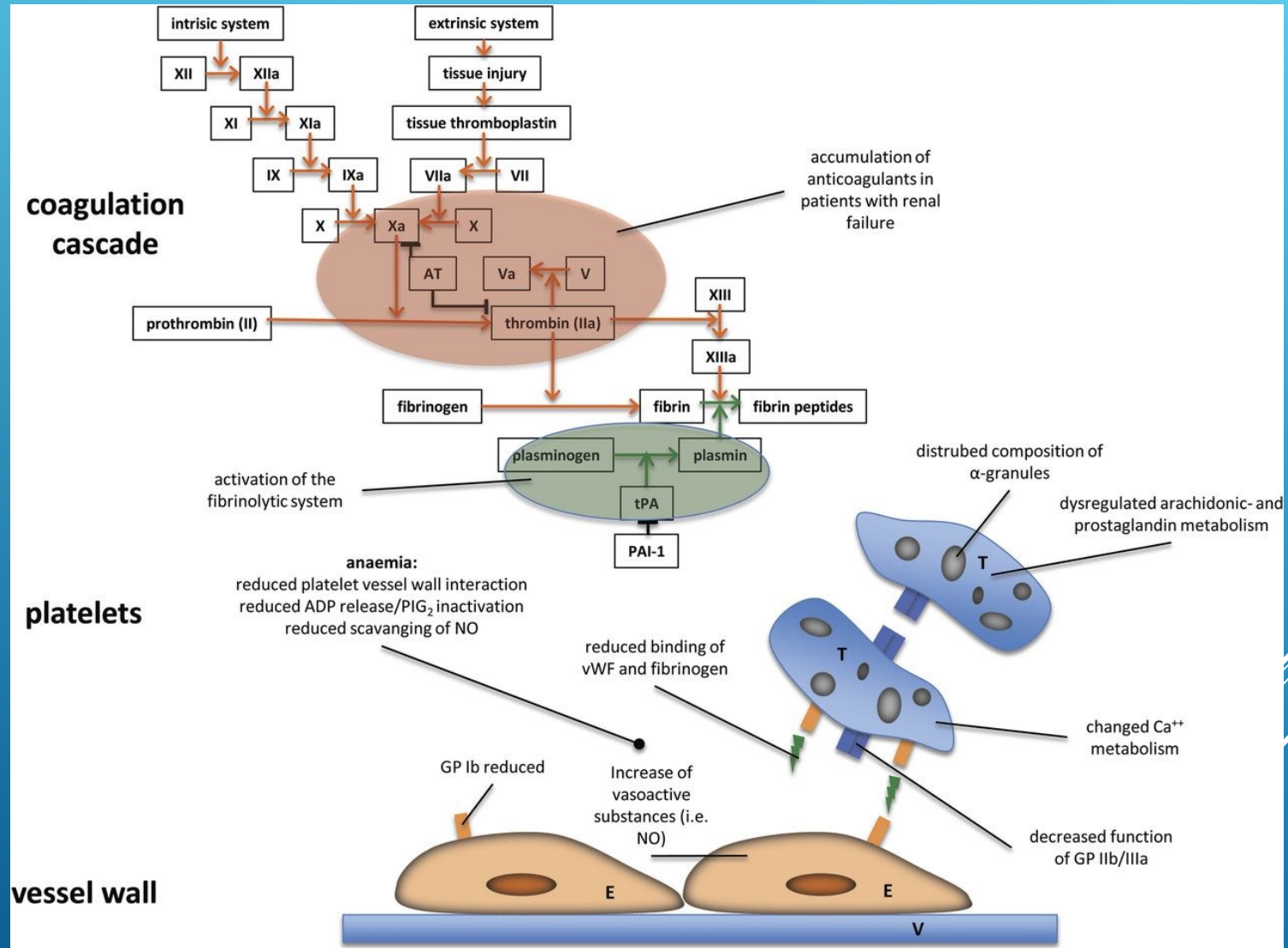


Factors involved in the increased risk of thrombosis in patients with renal failure

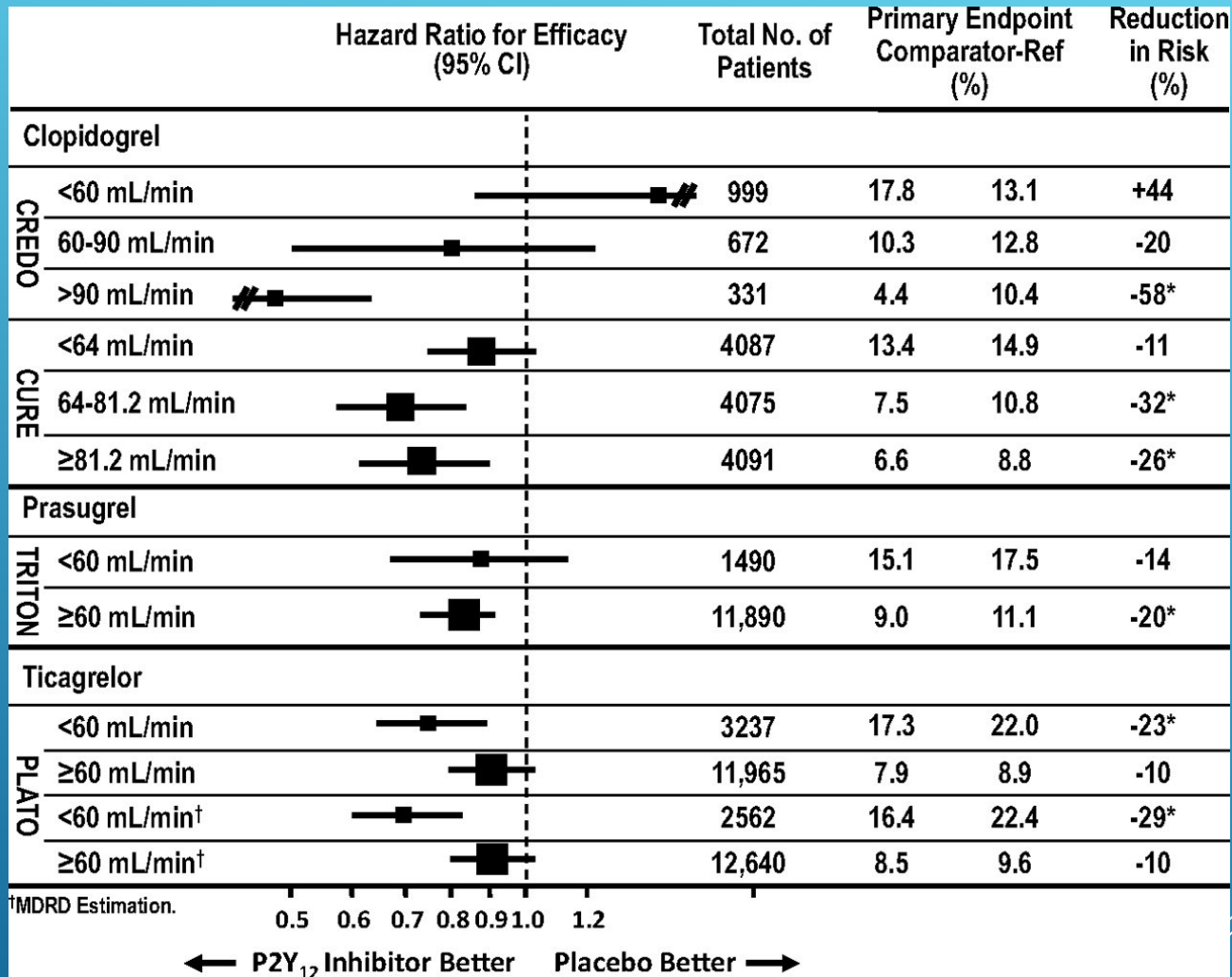


Lutz J et al. Nephrol. Dial. Transplant. 2013;ndt.gft209

FACTORS INVOLVED IN THE INCREASED RISK OF BLEEDING IN PATIENTS WITH RENAL FAILURE



Effect of P2Y12 receptor antagonists stratified by creatinine clearance.



Capodanno D, and Angiolillo DJ. *Circulation*. 2012;125:2649-2661

Fixed (non-modifiable) risk factors	Modifiable risk factors
Older age	Volume of CM
Diabetes mellitus	Hypotension
Pre-existing renal failure	Anemia and blood loss
Advanced CHF	Dehydration
Low LVEF	Low serum albumin level (<35 g/l)
Acute myocardial infarction	ACE inhibitors
Cardiogenic shock	Diuretics
Renal transplant	Non-steroidal anti-inflammatory drugs
	Nephrotoxic antibiotics
	IABP

RISK FACTORS FOR THE DEVELOPMENT OF CIN

	Contrast-Induced Nephropathy (n=86)	No Contrast-Induced Nephropathy (n=1798)	Relative Risk (95% CI)	<i>P</i>
30-Day mortality, %	16.2	1.2	13.8 (7.3,26.2)	<0.0001
1-Year mortality, %	23.3	3.2	7.4 (4.7,11.7)	<0.0001

**MORTALITY RATES STRATIFIED BY THE
DEVELOPMENT OF
CONTRAST-INDUCED NEPHROPATHY**

THE SHORT AND INTERMEDIATE TERM IMPACT OF RENAL DYSFUNCTION IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION TREATED WITH PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Omar Salah Awad, MD, M.Ayman A. Saleh, MD, Ghada Selim, MD, Haitham Galal Mohamed, MD, Tarek Rashid Mohamed, MD, Khaled Aly, MD

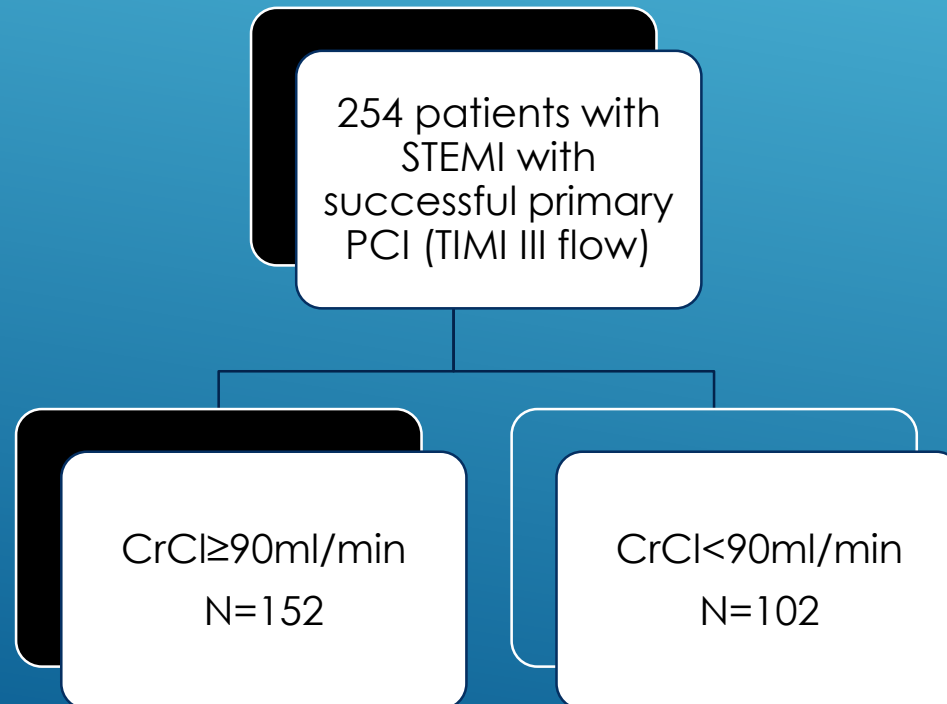


Table (1): Baseline characteristics and risk factors

	Crcl≥90ml/min	Crcl<90ml/min	P-value
Age	53.22±10	58.95±11.2	<0.0001
Male	80.3%	67.6%	<0.022
Hypertension	34.9%	43.1%	<0.184
Diabetes	29.6%	43.1%	<0.026
Dyslipidemia	25.5%	17.1%	<0.104
Current smoking	60.5%	56.9%	<0.793
Family history	4.9%	13.2%	<0.03
PVD	15.8%	22.5%	<0.174
Previous CVS	5.3%	16.7%	<0.003
Previous ACS	3.9%	2.9%	<0.671

Table (2): Clinical status at presentation and serum creatinine

Systolic BP	120.98±21.7	116.56±29.73	<0.173
Diastolic BP	74.73±12.7	70.63±16.52	<0.027
Heart rate	83.82±15.22	87.96±19.66	<0.6
Killip class			
Class 1	92.1%	80.4%	
Class 2	2.6%	7.8%	
Class 3	1.3%	2%	
Class 4	3.9%	9.8%	0.047
Heart block	3.9%	7.8%	<0.182
serum Cr	0.924±0.178	1.53±0.66	<0.0001
eCrCl	114.53±26.57	58.15±17.51	<0.0001

	CrcI≥90ml/min	CrcI<90ml/min	P-value
Pain to door	7.13±5.8	8.52±6.90	<0.171
Door to balloon	36.54±5.8	38.43±12.78	<0.275
Contrast volume used in ml	172.36±50.81	168.23±50.78	<0.525
Culprit vessel(LAD)	71.7%	63.7%	<0.596
Thrombus grade			
Grade 5:	36.2%	50%	
Grade 4:	44.7%	36.3%	
Grade 3:	15.8%	8.8%	<0.126
Grade 2:	2.6%	3.9%	
Grade 1:	none	1%	
Grade 0:	0.7%	none	
TIMI flow pre-procedural			
TIMI 0	89.5%	88.2%	
TIMI I	8.6%	6.9%	<0.388
TIMI II	2%	4.9%	
MBG post-procedural			
MBG 0			
MBG 1	2.6%	8.8%	<0.012
MBG2	20.4%	32.4%	
MBG3	60.5%	47.1%	
	16.4%	11.8%	
Multi-vessel affection	32.2%	59.8%	<0.0001
Thrombus aspiration	25%	37.3%	<0.36
Clearway balloon	0.7%	1%	<0.64
Balloon pre-dilation	52.6%	63.7%	<0.8
IC drugs			
GPI	19.7%	27.5%	
Adrenaline	0.7%	0%	<0.265
None	79.6%	72.5%	
Stent type			
BMS	97.2%	100%	
DES	2.8%	0%	<0.151
Stent length	22.69±7.12	24±6.15	<0.163
Stent diameter	3.29±0.35	3.26±0.33	<0.463
Multi-vessel intervention VS culprit only	1.3%	6.9%	<0.24
Thrombotic complications	12.9%	31.4%	<0.0001
CIN	2.0%	7.8%	<0.027
Hospital stay duration	3.065±0.7	3.81±1.216	<0.0001
Heart failure	5.3%	13.7%	<0.019
Ejection fraction	46.16±11.48%	39.71±10.29%	<0.0001

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**Table (4): Event rates in both groups
(Primary endpoints)**

	Crcl≥90ml/min	Crcl<90ml/min	P-value
<u>Primary end points:</u>			
<u>Death</u>			
a) In hospital			
b) at 30 days	3.3%	10.8%	<0.017
c) at 6 months	0%	1.1%	<0.382
	1.4%	2.2%	<0.49
<u>Non fatal MI</u>			
a) In hospital	1.3%	1.1%†	<0.675
b) at 30 days	None	None	
c) at 6 months	1.4%	5.7%	<0.073

<u>TVR</u>			
a)In hospital	0.7%	5.4%	<0.033
b) at 30 days	None	None	
c) at 6 months	2.1%	1.1%	<0.514
<u>CVS</u>			
a)In hospital	None	None	
b)at 30 days	0.7%	1.1%	<0.616
c)at 6 months	none	5.7%	<0.007
<u>Major bleeding</u>			
a)In hospital	0.7%	3.2%	<0.164
b)at 30 days	None	None	
c) at 6 months	1.4%	3.4%	<0.278
<u>Composite endpoints</u>			
a)In hospital			
b)at 30 days	5.9%	19.6%	<0.0007
c)at 6 months	0.7%	2.2%	<0.55
	6.1%	17.8%	<0.0045

Composite In-hospital MACE including mortality

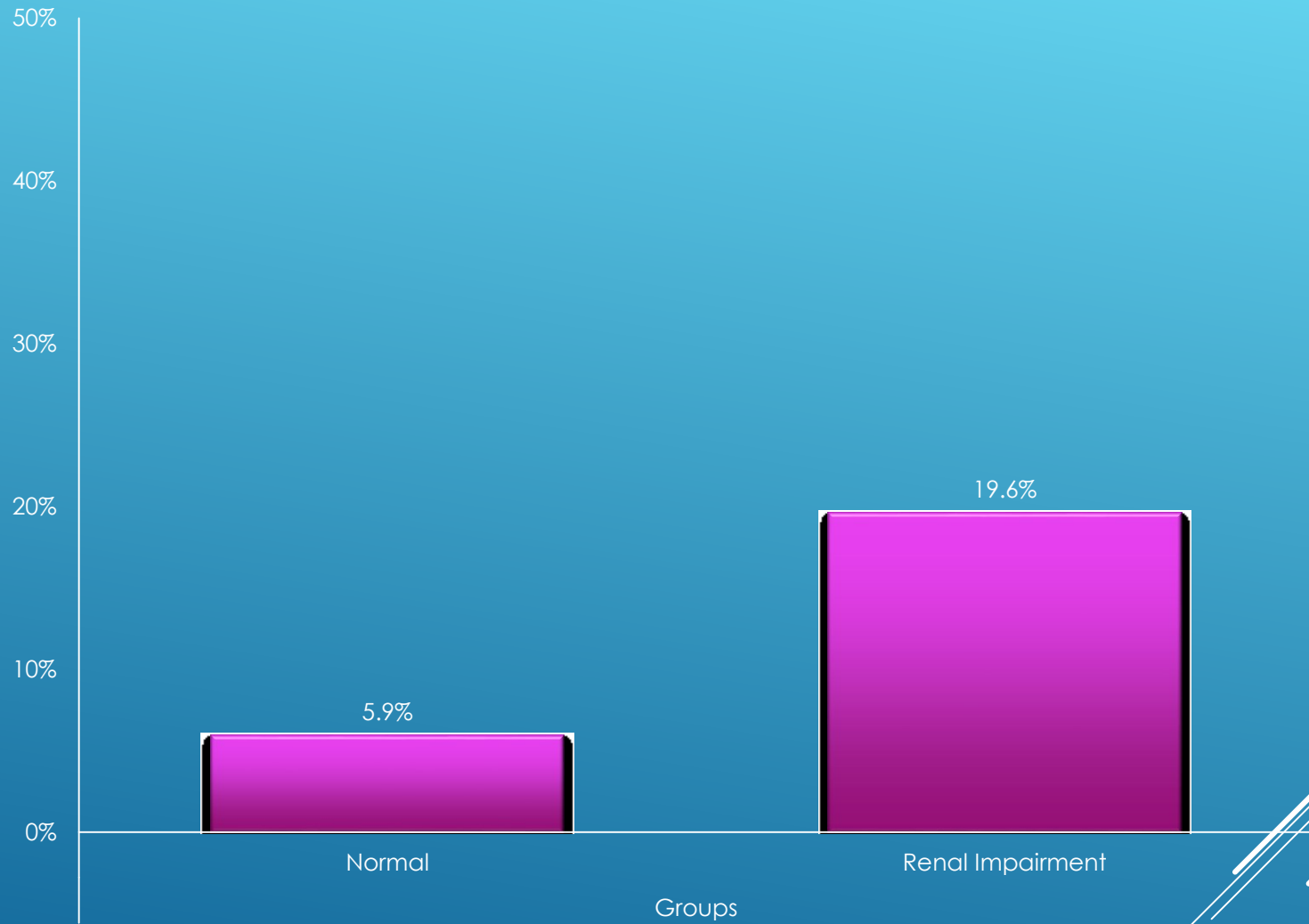


Figure: Column chart comparing composite in-hospital primary end points

Composite at 6 months MACE including mortality

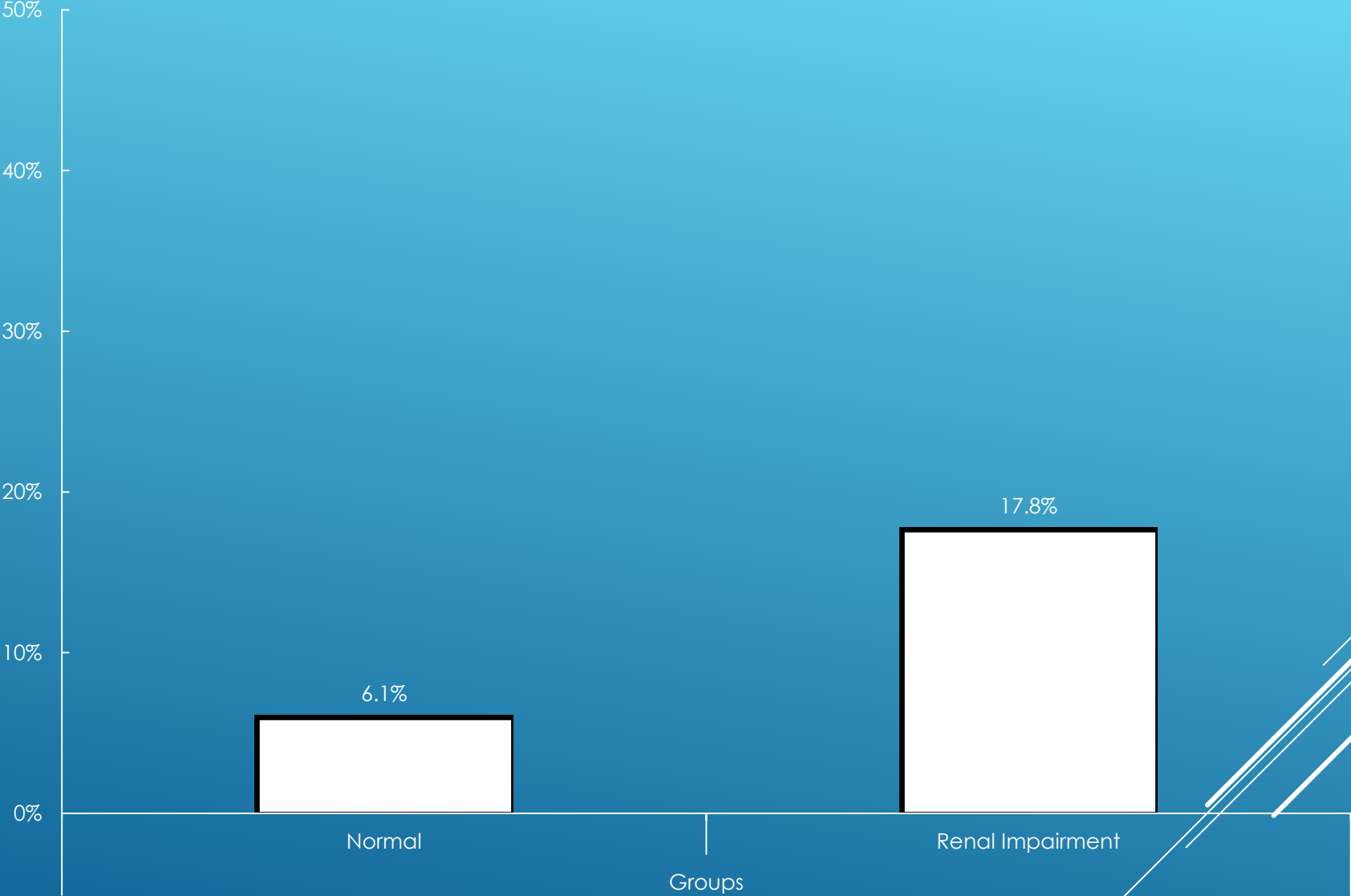


Figure: Column chart comparing composite six-month primary end points

In hospital Death Percentage Within Each Class

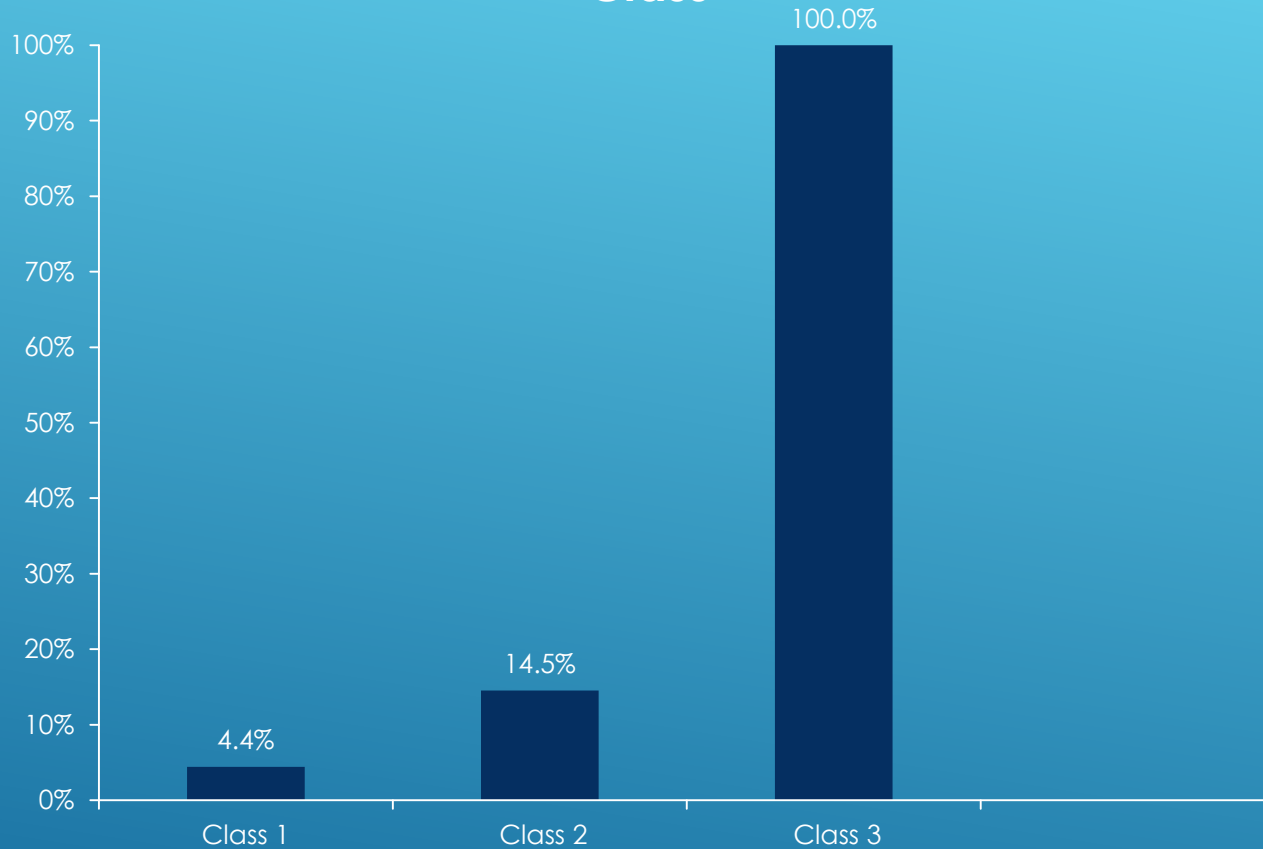


Figure 4: In-hospital death percentage within each class

Determinants of admission renal dysfunction and Odds Ratios after multivariable adjustment

Variable	OR	95%CI	p-value
Female gender	1.65	1.20-2.25	0.002
Age (/year)	1.07	1.05-1.08	<0.001
Weight < 67 kg	0.87	0.61-1.23	0.87
CAD ^(a)	1.35	1.00-1.82	0.05
PAD ^(b)	1.89	1.26-2.84	0.002
AHT ^(c)	1.10	0.84-1.43	0.49
DM ^(dcp)	0.97	0.69-1.36	0.87

Gevaert et al. *BMC Nephrology* 2013 **14**:62 doi:10.1186/1471-2369-14-62

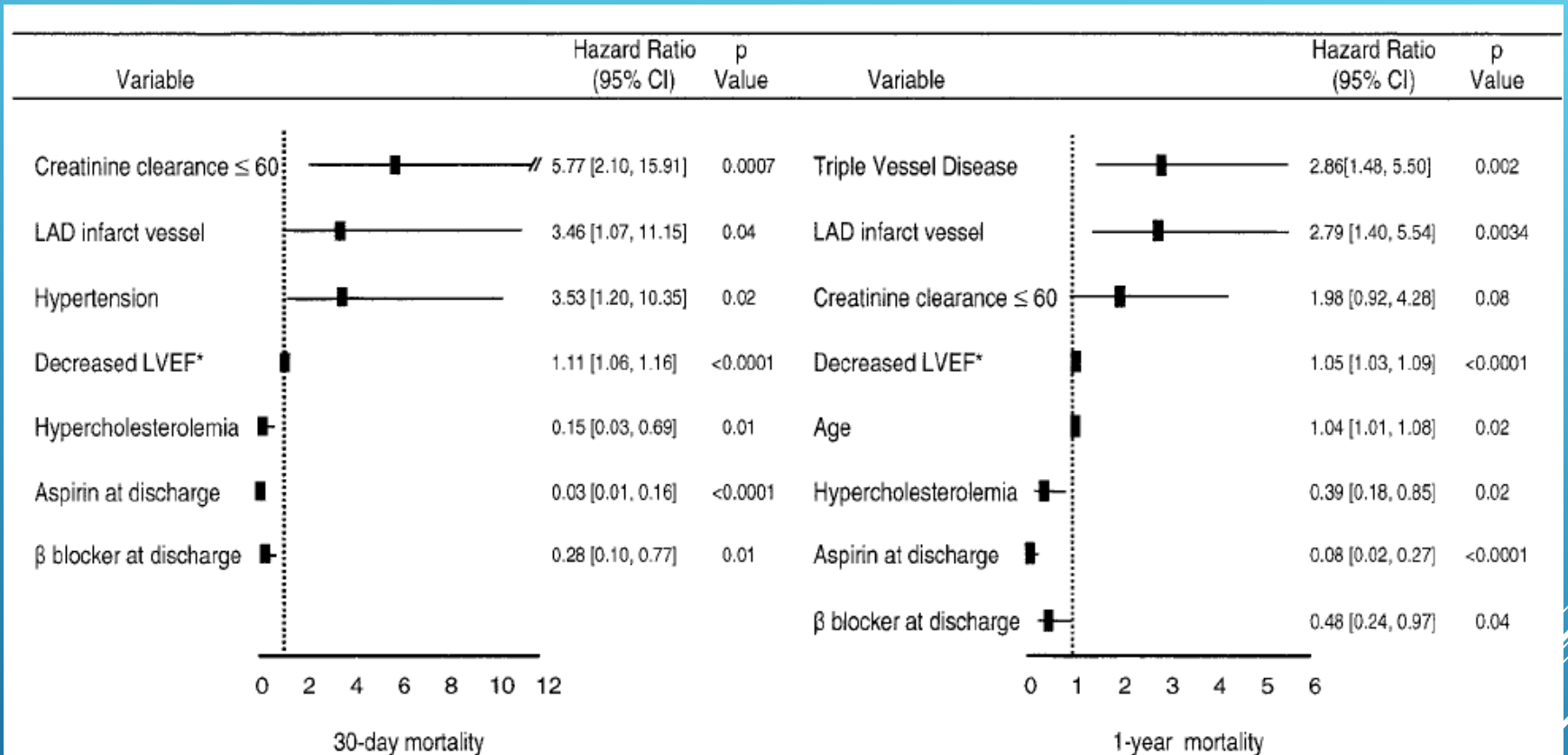
IMPACT OF RENAL INSUFFICIENCY IN PATIENTS UNDERGOING PRIMARY ANGIOPLASTY FOR ACUTE MYOCARDIAL INFARCTION

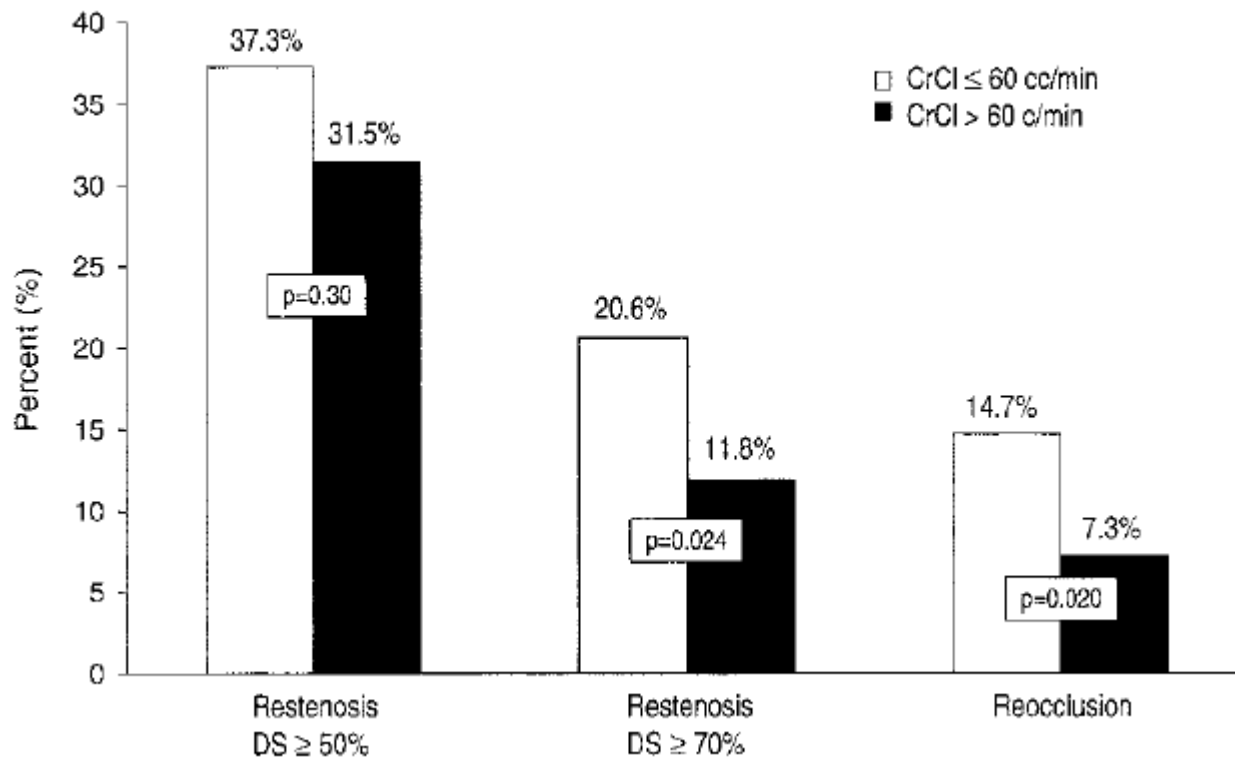
- ▶ H. Mehrdad Sadeghi, MD; Gregg W. Stone, MD; Cindy L. Grines, MD; Roxana Mehran, MD;
- ▶ Simon R. Dixon, MBChB; Alexandra J. Lansky, MD; Martin Fahy, MSc; David A. Cox, MD;
- ▶ Eulogio Garcia, MD; James E. Tchong, MD; John J. Griffin, MD; Thomas D. Stuckey, MD;
- ▶ Mark Turco, MD; John D. Carroll, MD

	CrCl ≤60 mL/min (n=350)	CrCl >60 mL/min (n=1583)	Relative Risk (95% CI)	P
30-Day adverse events				
Death, %	7.5	0.8	9.0 (4.7, 17.4)	<0.0001
Cardiovascular	4.9	0.6	7.7 (3.6, 16.7)	<0.0001
Sudden or arrhythmic	1.1	0.2	...	...
Myocardial infarction	0.6	0.1	...	...
Heart failure	0.9	0.1	...	...
Stroke	0.3	0	...	...
Unclassified/unknown	2.0	0.2	...	...
Noncardiovascular	2.7	0.1	20.9 (4.6, 95.1)	<0.0001
Reinfarction, %	0.9	0.8	1.1 (0.3, 3.7)	NS
Target vessel revascularization, %	3.0	3.8	0.8 (0.4, 1.5)	NS
Disabling stroke, %	0.3	0.1	2.4 (0.2, 24.8)	NS
Composite events, %	10.9	4.8	2.3 (1.6, 3.3)	<0.0001
Moderate/severe bleeding, %	6.7	2.8	2.4 (1.5, 3.9)	0.0003
Transfusion, %	8.9	3.6	2.5 (1.6, 3.8)	<0.0001
Thrombocytopenia, %	3.7	3.2	1.2 (0.6, 2.1)	NS
Subacute thrombosis, %	0.9	1.0	0.9 (0.3, 2.9)	NS
Contrast-induced nephropathy, %	9.7	3.4	2.8 (1.8, 4.3)	<0.0001
1-Year adverse events				
Death, %	12.7	2.4	5.3 (3.5, 8.1)	<0.0001
Cardiovascular	7.3	1.2	6.0 (3.4, 10.7)	<0.0001
Sudden or arrhythmic	2.7	0.7	...	...
Myocardial infarction	1.2	0.1	...	...
Heart failure	0.9	0.1	...	...
Stroke	0.3	0	...	...
Unclassified/unknown	2.2	0.3	...	...
Noncardiovascular	3.9	0.9	4.3 (2.1, 8.8)	<0.0001
Reinfarction, %	2.8	2.2	1.3 (0.6, 2.6)	NS
Target vessel revascularization, %	12.7	13.8	0.9 (0.7, 1.2)	NS
Disabling stroke, %	0.9	0.4	2.4 (0.6, 9.1)	NS
Composite events, %	24.5	16.3	1.5 (1.2, 1.9)	0.0001

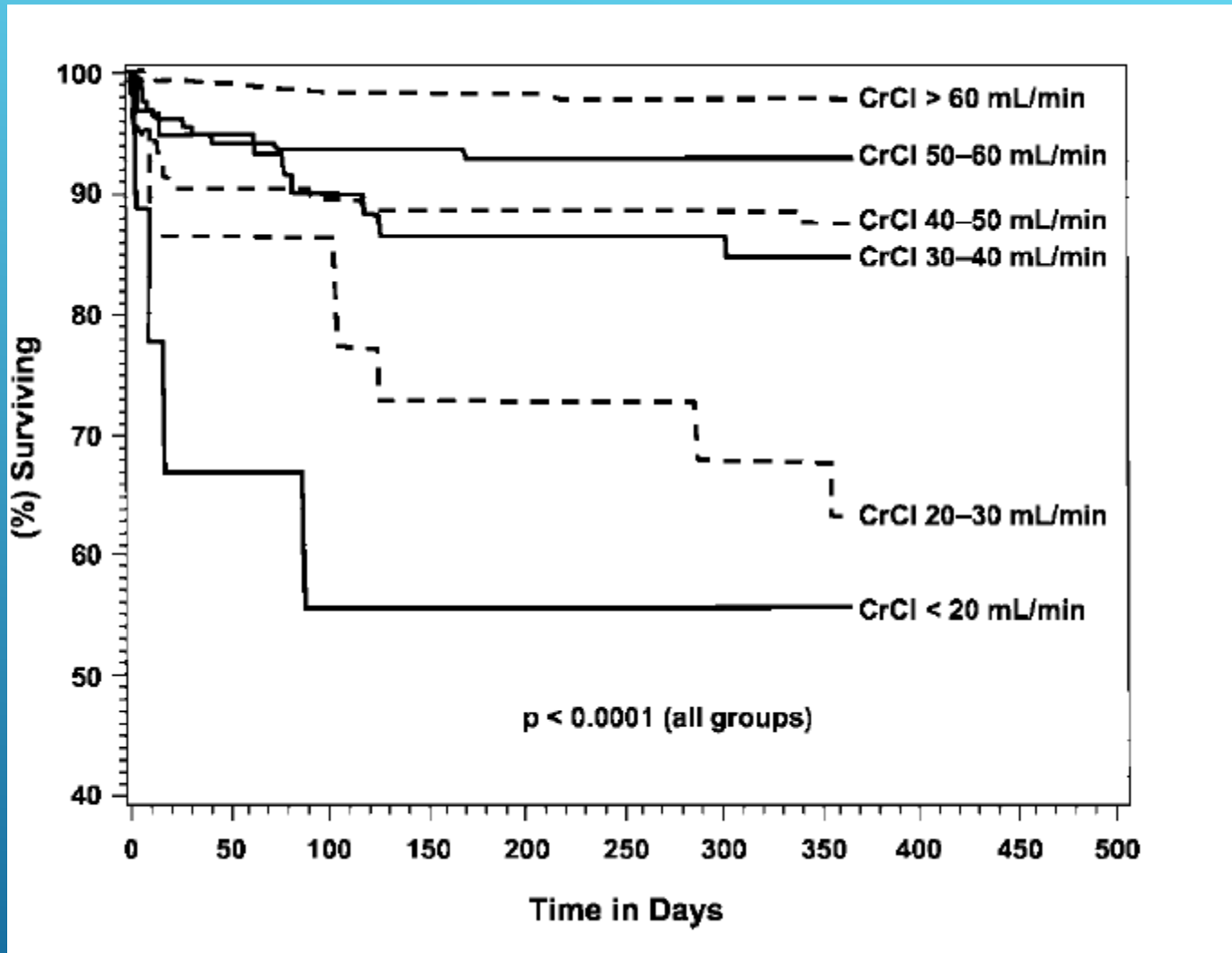
CLINICAL OUTCOMES STRATIFIED BY BASELINE CRCL

Multivariate predictors of mortality at 30 days (left) and 1 year (right) after primary PCI for AMI. F





Incidence of restenosis and infarct artery reocclusion after primary PCI for AMI in 584 patients undergoing routine angiographic follow-up at 7 months, stratified by presence or absence of baseline RI. RI defined by CrCl 60 mL/min.



ONE YEAR KAPLAN MEIER SURVIVAL CURVE STRATIFIED BY CRCL LEVELS.

From: Long-Term Impact of Chronic Kidney Disease in Patients With ST-Segment Elevation Myocardial Infarction Treated With Primary Percutaneous Coronary Intervention: The HORIZONS-AMI (Harmonizing Outcomes With Revascularization and Stents in Acute Myocardial Infarction) Trial

J Am Coll Cardiol Intv. 2011;4(9):1011-1019. doi:10.1016/j.jcin.2011.06.012

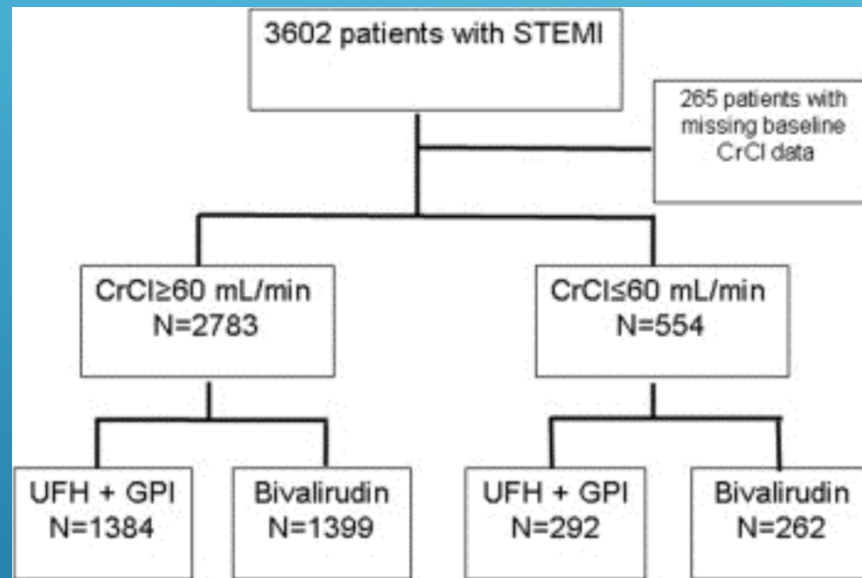


Figure Legend:

Patient Distribution in the HORIZONS-AMI Trial

Patient distribution in the HORIZONS-AMI trial according to the availability of baseline creatinine clearance data and randomization. CrCl = creatinine clearance; STEMI = ST-segment elevation myocardial infarction.

From: Long-Term Impact of Chronic Kidney Disease in Patients With ST-Segment Elevation Myocardial Infarction Treated With Primary Percutaneous Coronary Intervention: The HORIZONS-AMI (Harmonizing Outcomes With Revascularization and Stents in Acute Myocardial Infarction) Trial

J Am Coll Cardiol Intv. 2011;4(9):1011-1019. doi:10.1016/j.jcin.2011.06.012

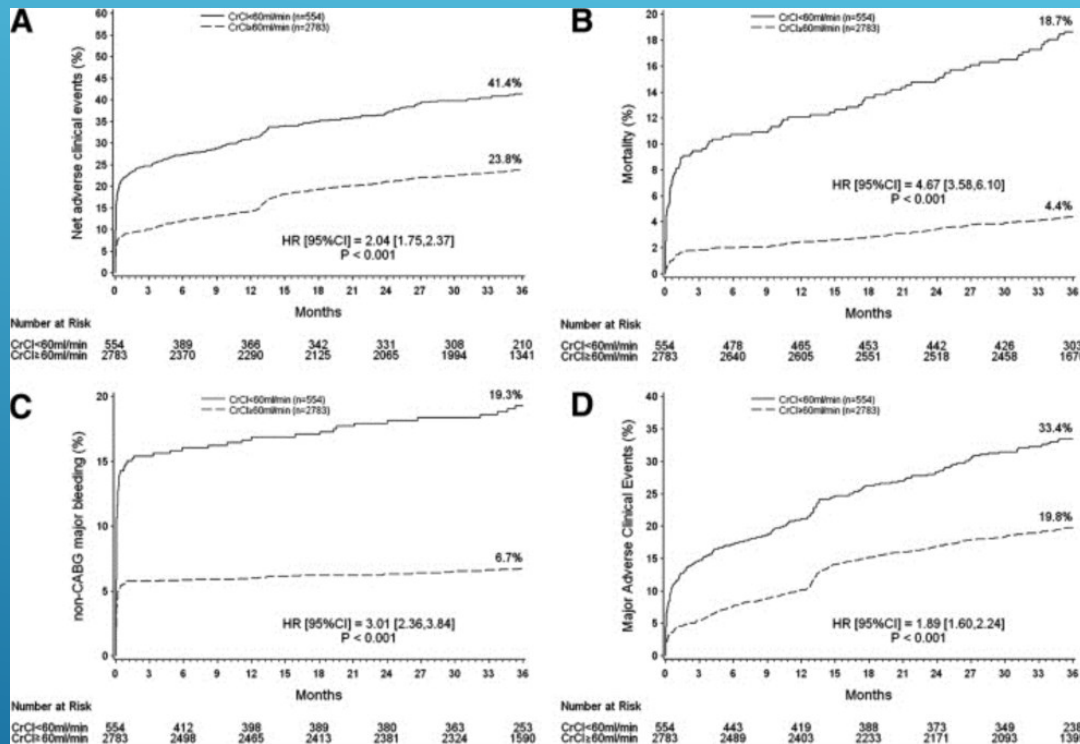



Figure Legend:


Time-to-Event Curves Stratified by the Presence or Absence of CKD

Time-to-event curves stratified by the presence or absence of chronic kidney disease (CKD) for (A) net adverse cardiac events; (B) all-cause mortality; (C) non-coronary artery bypass grafting (CABG) major bleeding; and (D) major adverse cardiovascular events. CI = confidence interval; CrCl = creatinine clearance; HR = hazard ratio.

TAKE HOME MESSAGE

- ▶ 1. CKD is a major predictor of mortality after PPCI for STEMI .
 - ▶ 2. This mortality risk continues in hospital , at 30 days , 6 months , one year and thereafter .
 - ▶ 3. CKD is associated with worse MB , more in hospital both thrombotic and bleeding complications .
 - ▶ 4. CKD is also associated with TVR , TLR .
 - ▶ 5. Moreover , CKD is associated with increased incidence of CVS in the 6 months following PPCI .
- 

TAKE HOME MESSAGE

- ▶ 6. The risk posed by CKD on PPCI outcome demonstrates a gradient starting with the minimal degree of renal impairment .
 - ▶ 7. PPCI remains the revascularization of choice for CKD patients with STEMI . But more care is needed for every detail of such patients .
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THANK YOU

