SOLACI
SOCIEDAD LATINOAMERICANA DE CARDIOLOGIA INTERVENCIONISTA

XIV Jornadas SOLACI
5º Región Cono Sur

STEMI y MVD
Nuevos paradigmas

HOSPITAL ITALIANO
de Buenos Aires
Instituto de Medicina Cardiovascular

Daniel Berrocal, MD, FACC
Jefe de Cardiologia Intervencionista
daniel.berrocal@hiba.org.ar

No tengo conflicto de intereses que, declarar respecto a esta presentación

Objetivos en STEMI

Restaurar tempranamente el flujo en la arteria responsable

Disminuir el tamaño del infarto
Preservar la función ventricular

Mejorar la sobrevida

MVD en STEMI

Background

- ✓ **Enfermedad de MV presente en 40-65% de los STEMI**

Los pacientes con STEMI y MVD presentan:

- ✓ **Peor función del VI post STEMI**
- ✓ **Mayor mortalidad post STEMI**

Van der Schaaf et al, Heart, 2006, (12):1760-3

Algunos puntos importantes

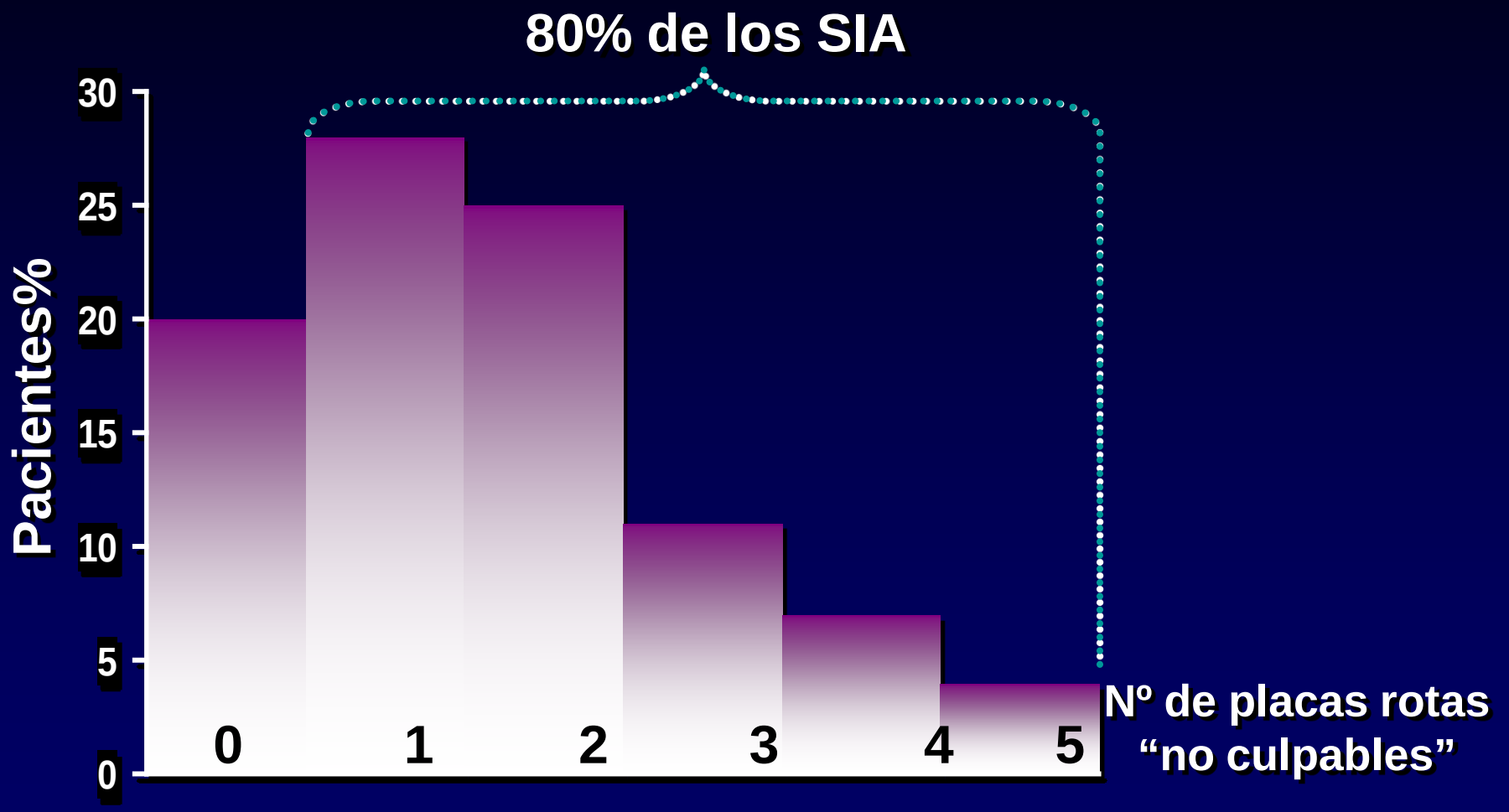
- ✓ Muchos pacientes sometidos a PCI por STEMI, tienen multiples placas complejas que causan angina recurrente y requieren nueva PCI *(Goldstein et al NEJM 2000)*

- ✓ El flujo en las lesiones no culpables, esta enlentecido en el STEMI *(Gibson et al JACC 1999)*, increasing amt of jeopardized Myocardium

- ✓ Mejorar la funcion en los segmento no infartados mejora la sobrevida *(Grines at al Circulation 1989)*

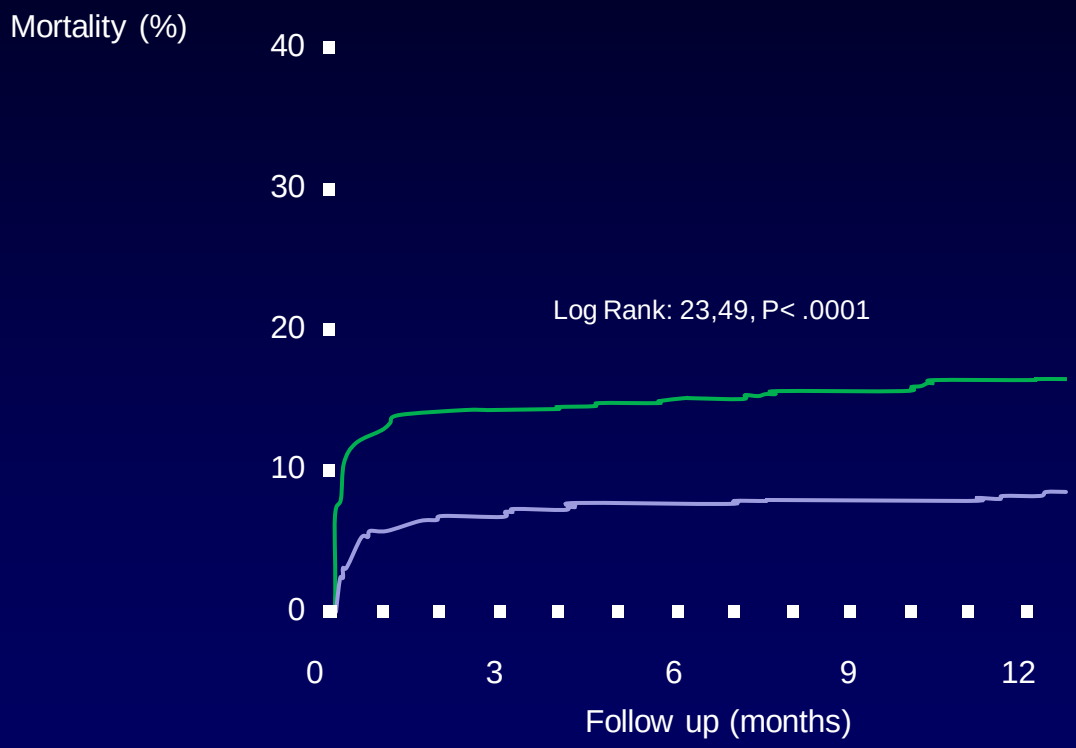
- ✓ La hipercontractilidad compensatoria de los segmento no infartados, puede comprometerse por lesiones significativas de los vasos no culpables del STEMI *(Grines at al Circulation 1989)*

Pacientes vulnerables



Rioufol y cols. Circulation 2002; 106:804-808.

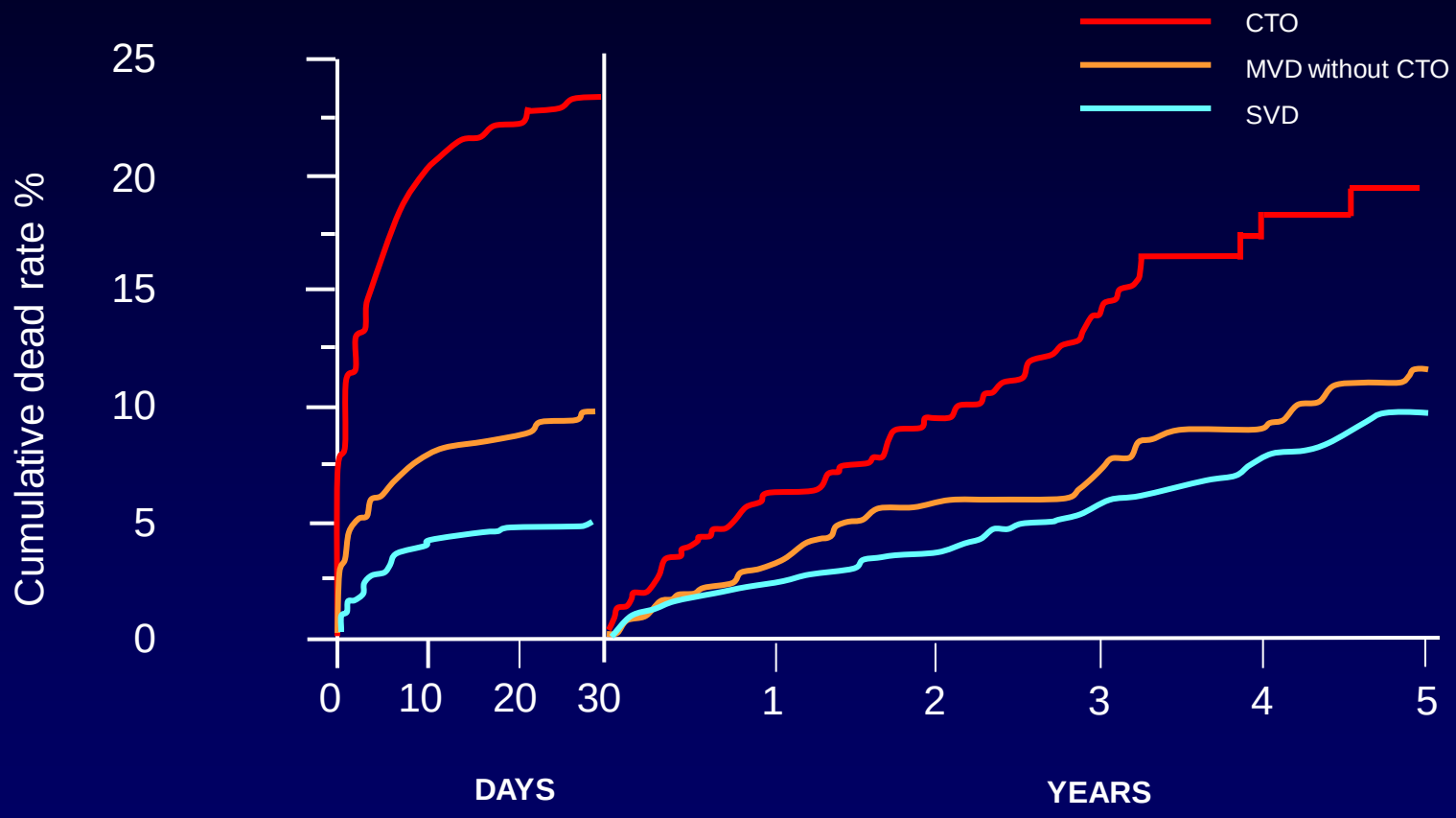
MVD in STEMI



Van der Schaaf et al, Am J Cardiol 2006;98:1165-9

Impact of a CTO in STEMI

(3277 patients)



Claessen BE et al. JACC: Cardiovascular Interventions 2009. Nov;2(11):1128-34

MVD in STEMI

WAIT @ SEE; COOL DOWN
(Ischemia or bad clinical outcome driven revascularization)

COMPLETE REVASCULARIZATION

Stress testing before discharge?

Stress testing during F/UP?

No differences

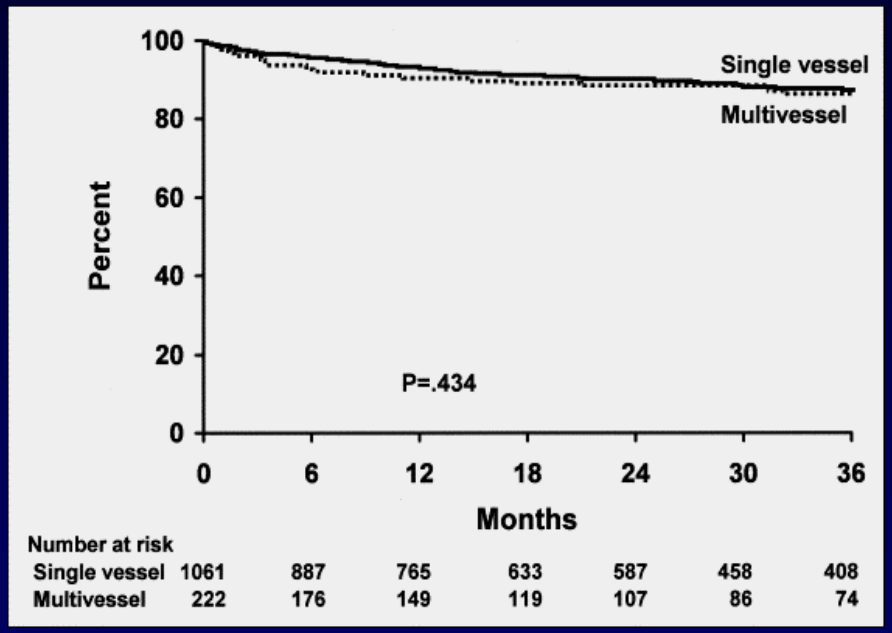
	CR (n=28)	IR (n=25)	P
In-hospital			
Technical success[a], n (%)	27 (96)	24 (96)	NS
Clinical success[b], n (%)	26 (93)	23 (92)	NS
AMI, n (%)	1 (3)	1 (4)	NS
Death, n (%)	1 (3)	1 (4)	NS
FU			
Death for any cause (%)	1 (3)	1 (4)	NS
Noncardiovascular death (%)	1 (3)	0 (0)	NS
AMI (%)	0 (0)	1 (4)	NS
Re-PTCA for restenosis (TLR) (%)	3 (11)	3 (13)	NS
Re-PTCA for the novo lesions (%)	0 (0)	1 (4)	0.09
CABG (%)	1 (3)	0 (0)	NS

[a] Residual lesion <10%.
[b] Technical success without MACE.

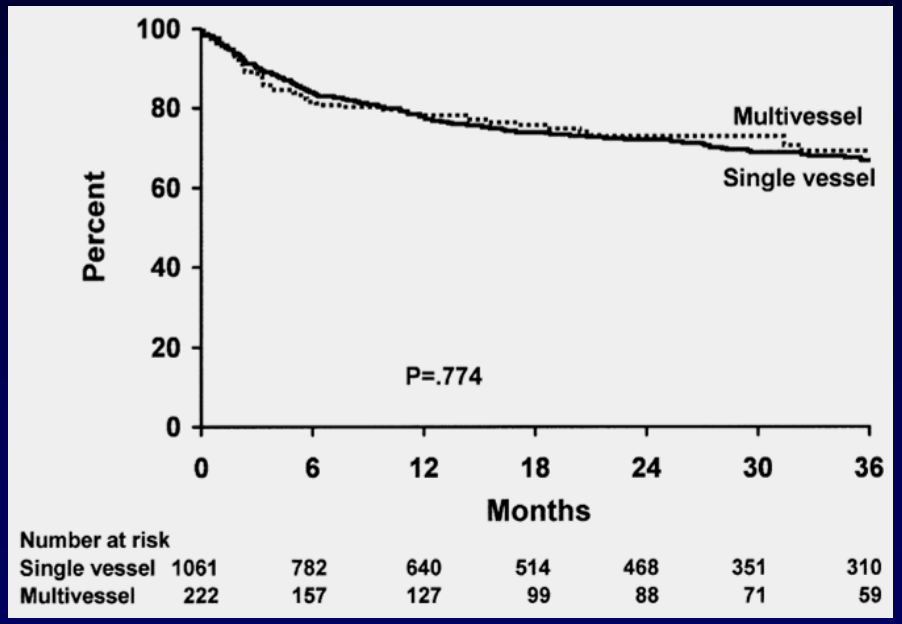
Telayna JM et al. Cardiovascular Revascularization Medicine 8 (2007) 116 – 154

No differences

Survival



Survival free of
MI or new revascularization



Chen et al. Am J Cardiol 2005;95:349–354

CR Worst

	IRA only PCI	Multivessel PCI	*P*
No.	354	152	
Procedural complications			
Acute occlusion	0 (0%)	0 (0%)	1.00
Perforation	0 (0%)	0 (0%)	1.00
Procedure-related CVA	3 (0.8%)	0 (0%)	.26
Major bleed	26 (7.3%)	7 (4.6%)	.25
Vascular complications	21 (5.9%)	6 (3.9%)	.36
Urgent CABG	0 (0%)	1 (0.7%)	.12
Inhospital mortality	20 (5.6%)	8 (5.3%)	.86
30-Day outcomes			
Re-infarction	2 (0.6%)	14 (9.2%)	<.001
Target vessel revascularization	28 (8.0%)	9 (5.9%)	.43
CABG	28 (8.0%)	4 (2.6%)	.02
Mortality	23 (6.5%)	15 (9.9%)	.19
MACE	52 (15%)	33 (22%)	.053
1-Year outcomes			
Re-infarction	10 (2.8%)	20 (13%)	<.001
Target vessel revascularization	53 (15%)	38 (25%)	.007
CABG	41 (12%)	10 (6.6%)	.08
Mortality	42 (12%)	17 (11%)	.82
MACE	98 (28%)	61 (40%)	.006

Corpus et al. Am Heart J 2004;148:493–500

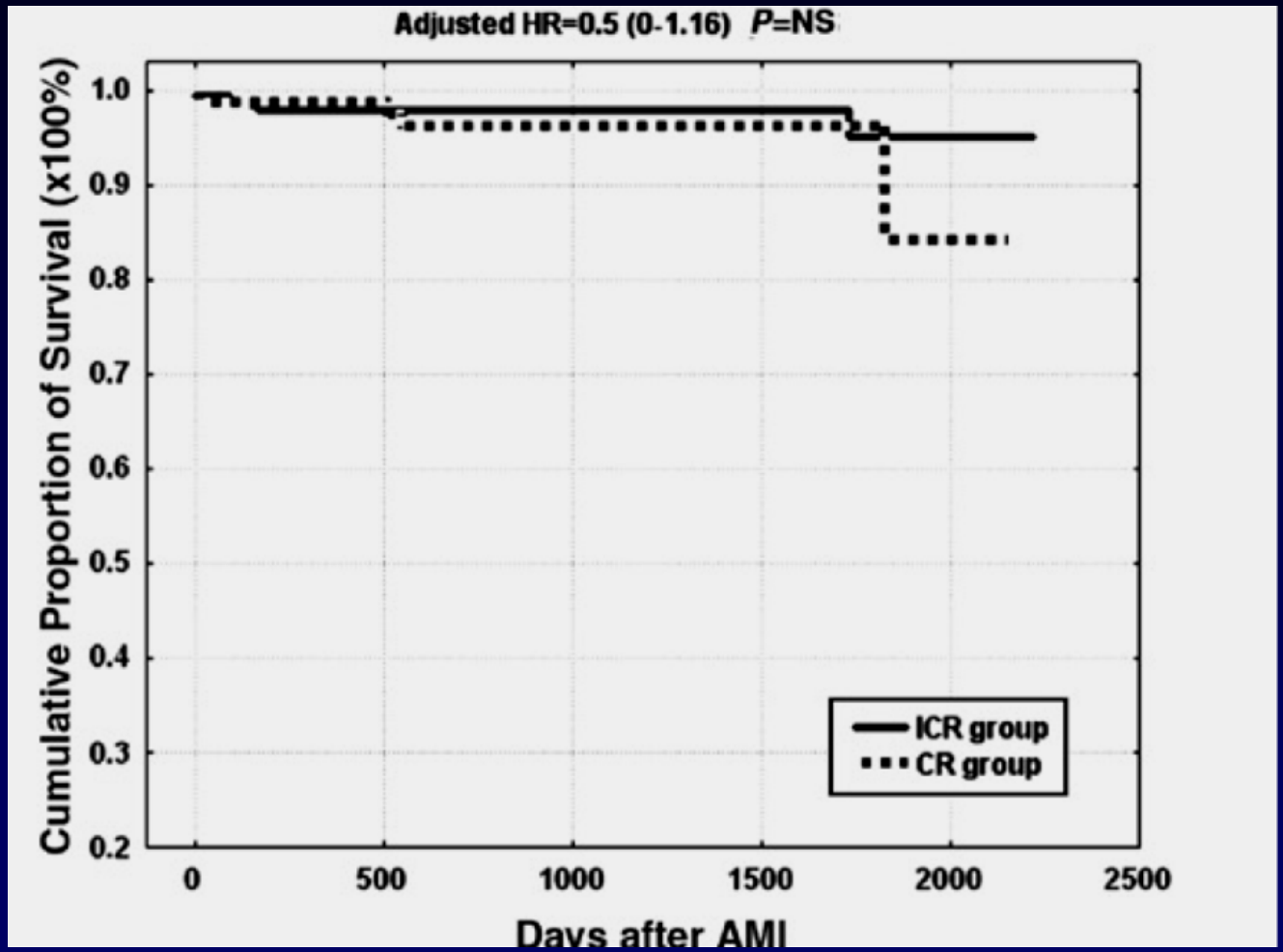
CR Worst

	IRA only	Multivessel PCI: Same procedure	Multivessel PCI: Staged, inhospital	P*
No.	354	26	126	
Procedural complications				
Acute occlusion	0 (0%)	0 (0%)	0 (0%)	1.00
Perforation	0 (0%)	0 (0%)	0 (0%)	1.00
CVA	3 (0.8%)	0 (0%)	0 (0%)	.52
Major bleed	26 (7.3%)	1 (3.8%)	6 (4.7%)	.51
Vascular complications	21 (5.9%)	1 (3.8%)	5 (4.0%)	.66
Urgent CABG	0 (0%)	0 (0%)	1 (0.8%)	.22
Inhospital mortality	20 (5.6%)	5 (19%)	3 (2.4%)	.003
30-Day outcomes				
Re-infarction	2 (0.6%)	0 (0%)	14 (11%)	<.001
Target vessel revascularization	28 (7.9%)	1 (3.8%)	8 (6.3%)	.66
CABG	28 (8.0%)	1 (3.8%)	2 (2.4%)	.07
Mortality	23 (6.5%)	5 (19%)	10 (7.9%)	.06
MACE	52 (14.7%)	6 (23%)	27 (21%)	.15
1-Year outcome				
Re-infarction	10 (2.8%)	1 (3.8%)	19 (15%)	<.001
Target vessel revascularization	53 (15%)	3 (12%)	35 (28%)	.004
CABG	41 (12%)	2 (7.7%)	8 (6.3%)	.21
Mortality	42 (12%)	5 (19%)	12 (9.5%)	.36
MACE	98 (28%)	9 (35%)	53 (41%)	.02

IRA, Infarct related artery; *PCI*, percutaneous coronary intervention; *CVA*, cerebrovascular accident; *CABG*, coronary artery bypass grafting; *MACE*, major adverse cardiac events.
*Comparison among all treatment groups

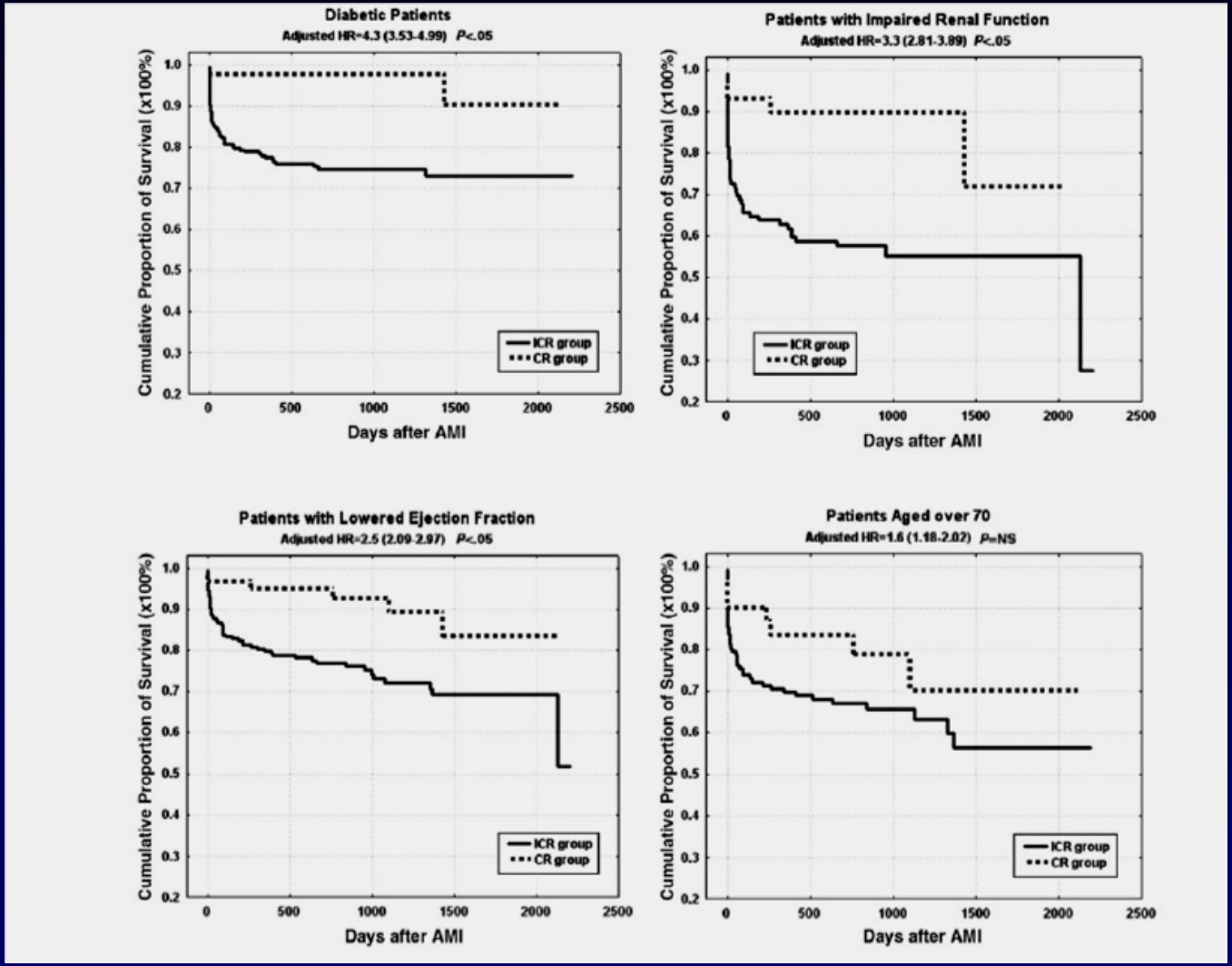
Corpus et al. Am Heart J 2004;148:493–500

CR Better



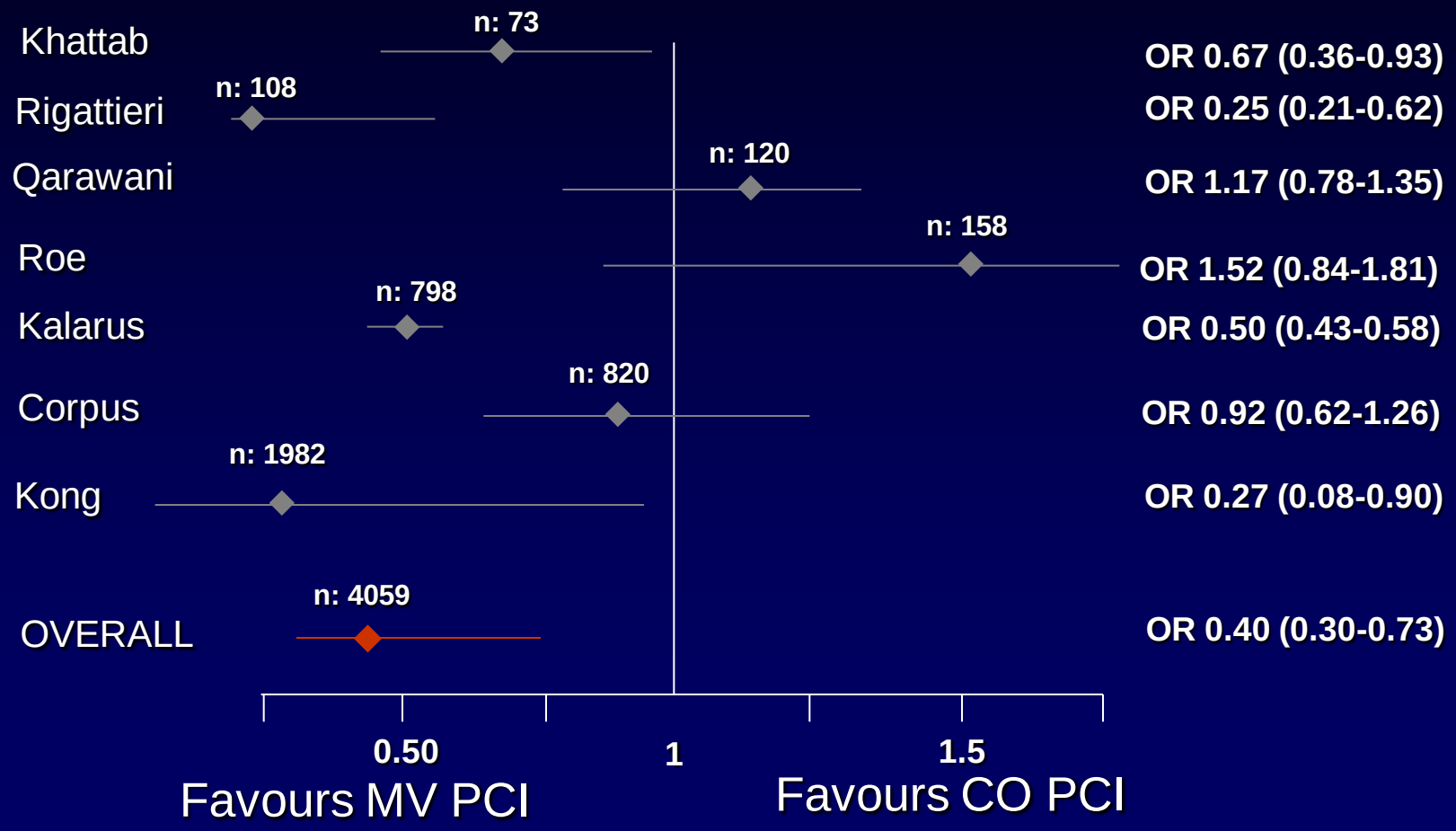
Kalarus et al Am Heart J Volume 153, Number 2 February 2007

CR Better



Kalarus et al Am Heart J Volume 153, Number 2 February 2007

STEMI
DEATH in Registries
n: 2077 patients



AHG DK Meta-analysis of publshed data
T Gershlick. TCT 2008

STEMI
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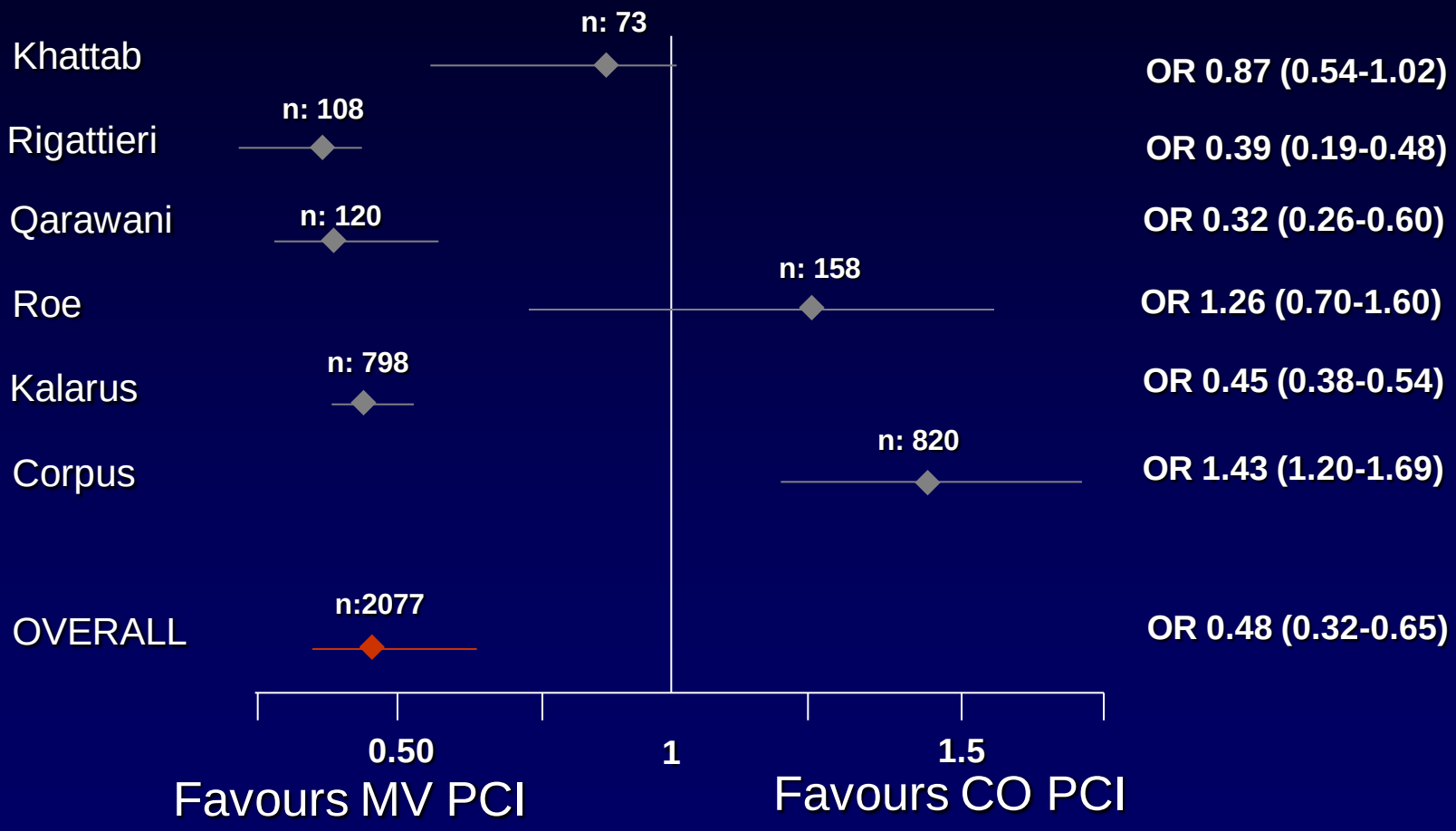


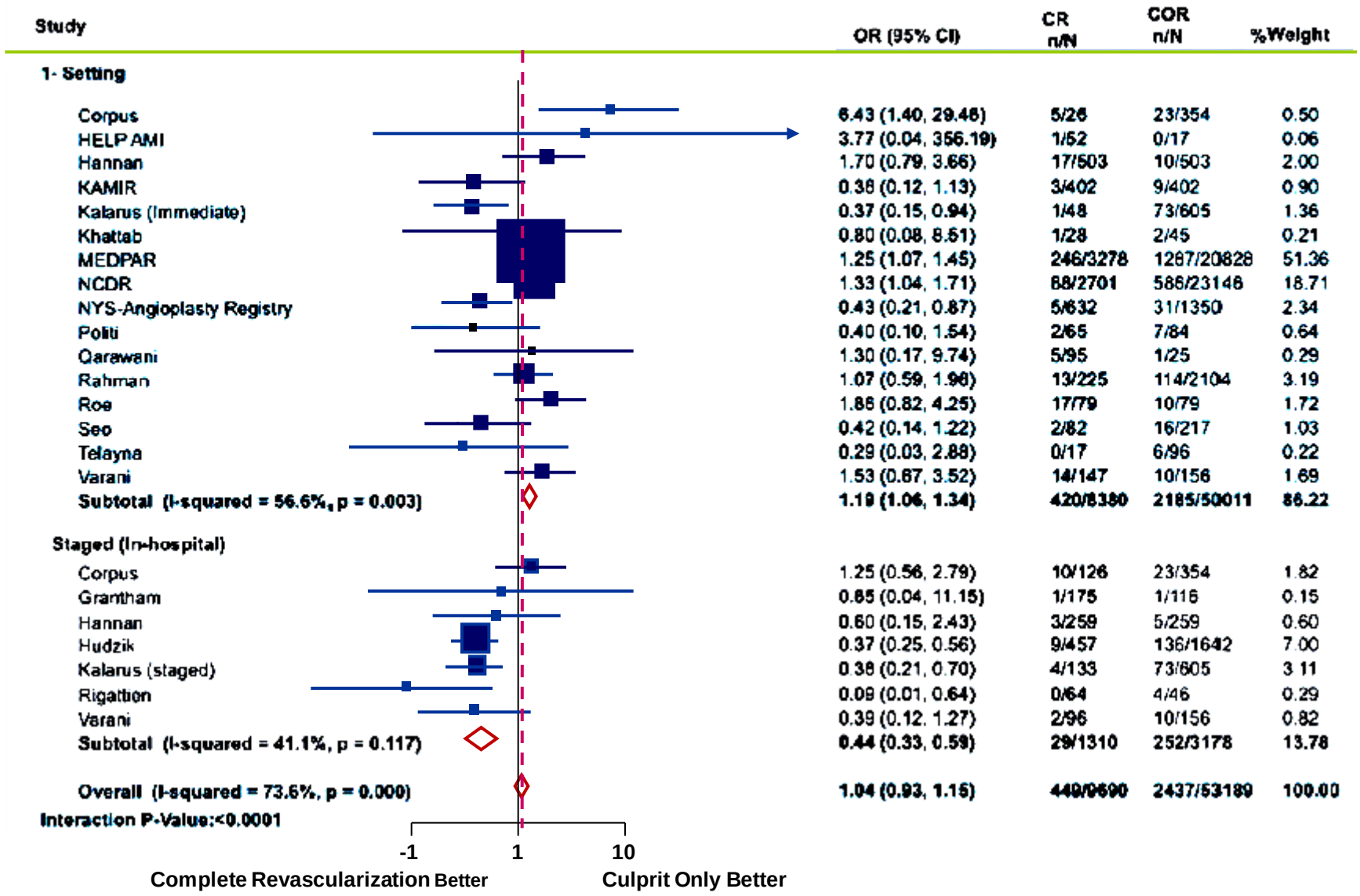
AHG DK Meta-analysis of publshed data
T Gershlick. TCT 2008

Study	Year	Subjects	Age (years)	Men	Cardiogenic Shock	Killip Class 3/4	Diabetes	Follow-up (months)	Multivessel Revascularization Setting	
									1 Setting	Staged
Corpus et al[11]	2004	506	63	69%	3.4%	—	17%	12	+	+
Grantham[12]	2006	291	61	73%	0%	4.8%	22%	6	0	+
Hannan et al[13]	2010	1524	—	80%	0%	—	22%	42	+	+
HELP-AMI[7]	2004	69	64	87%	0%	18.8%	19%	12	+	0
Hudzik[14]	2009	2099	64	57%	12%	11.8%	26%	36	0	+
Kalarus et al[15]	2007	786	61	71%	10%	10.0%	33%	30	+	+
KAMIR[19]	2009	804	63	75%	0%	6.0%	28%	8	+	0
Khattab et al[16]	2008	73	66	77%	4%	—	12%	12	+	0
MEDPAR[27]	2010	24,106	—	60%	—	—	—	0	+	0
NCDR[25]*	2009	25,847	61	72%	0%	—	24%	0	+	0
NYS Angioplasty Registry[26†]	2006	1982	61	74%	0%	7.5%	19%	0	+	0
Politi et al[8‡]	2010	149	65	77%	0%	—	19%	30	+	0
Qarawani et al[17]	2007	120	66	65%	0%	22.5%	13%	12	+	0
Rahman et al[18]	2010	2077	—	—	—	—	—	12	+	0
Rigattieri et al[20]	2008	110	66	75%	0	—	23%	13	0	+
Roe et al[21]	2001	158	63	71%	28%	33.2%	33%	6	+	0
Seo et al[22]	2009	299	—	—	—	—	—	48	+	0
Telayna[23]	2002	113	60	85%	0	8.8%	19%	6	+	0
Varani et al[24]	2008	399	69	71%	—	10.6%	16%	21	+	+

* Cohort without cardiogenic shock.

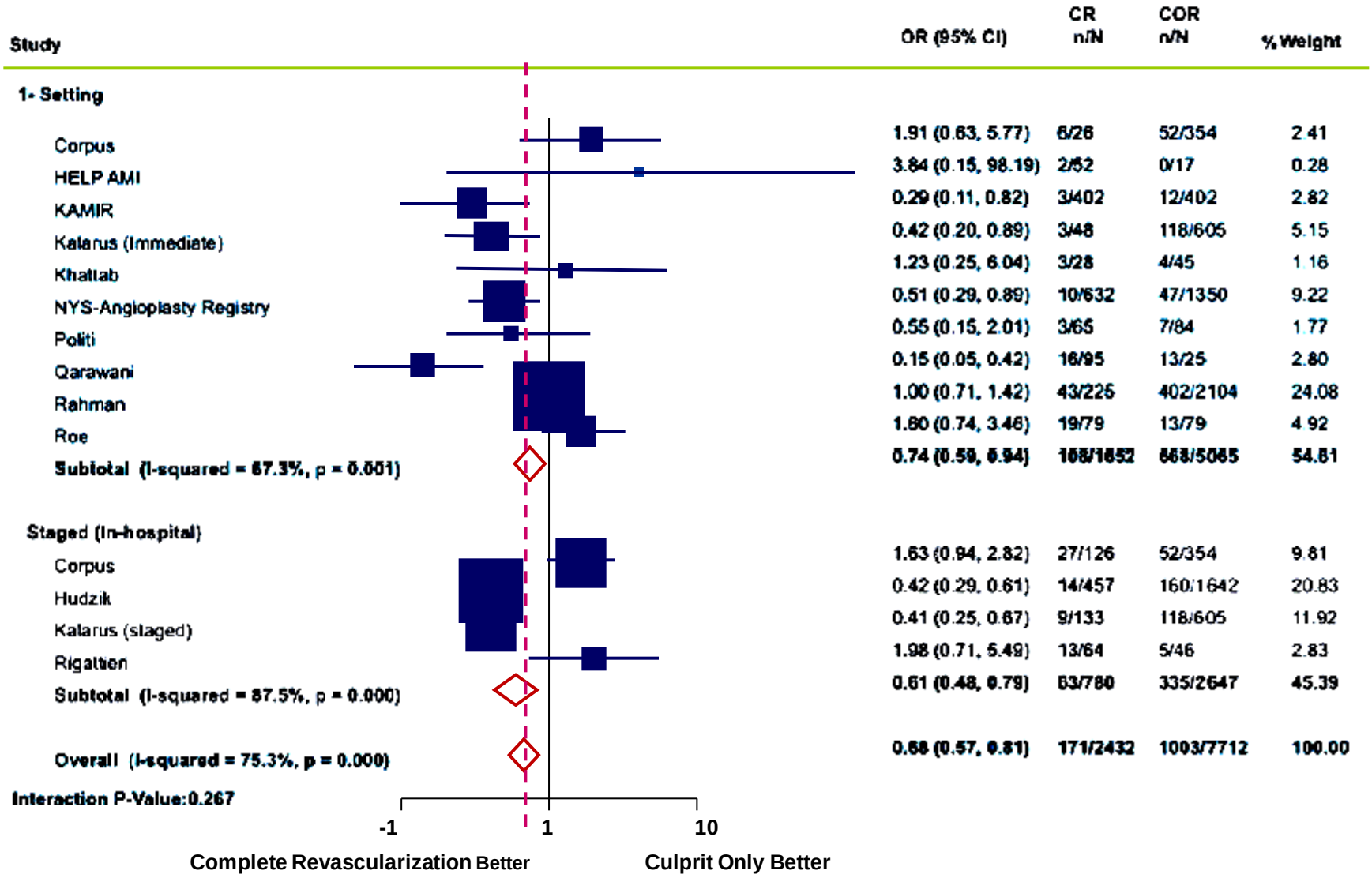
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

30 Days Mortality



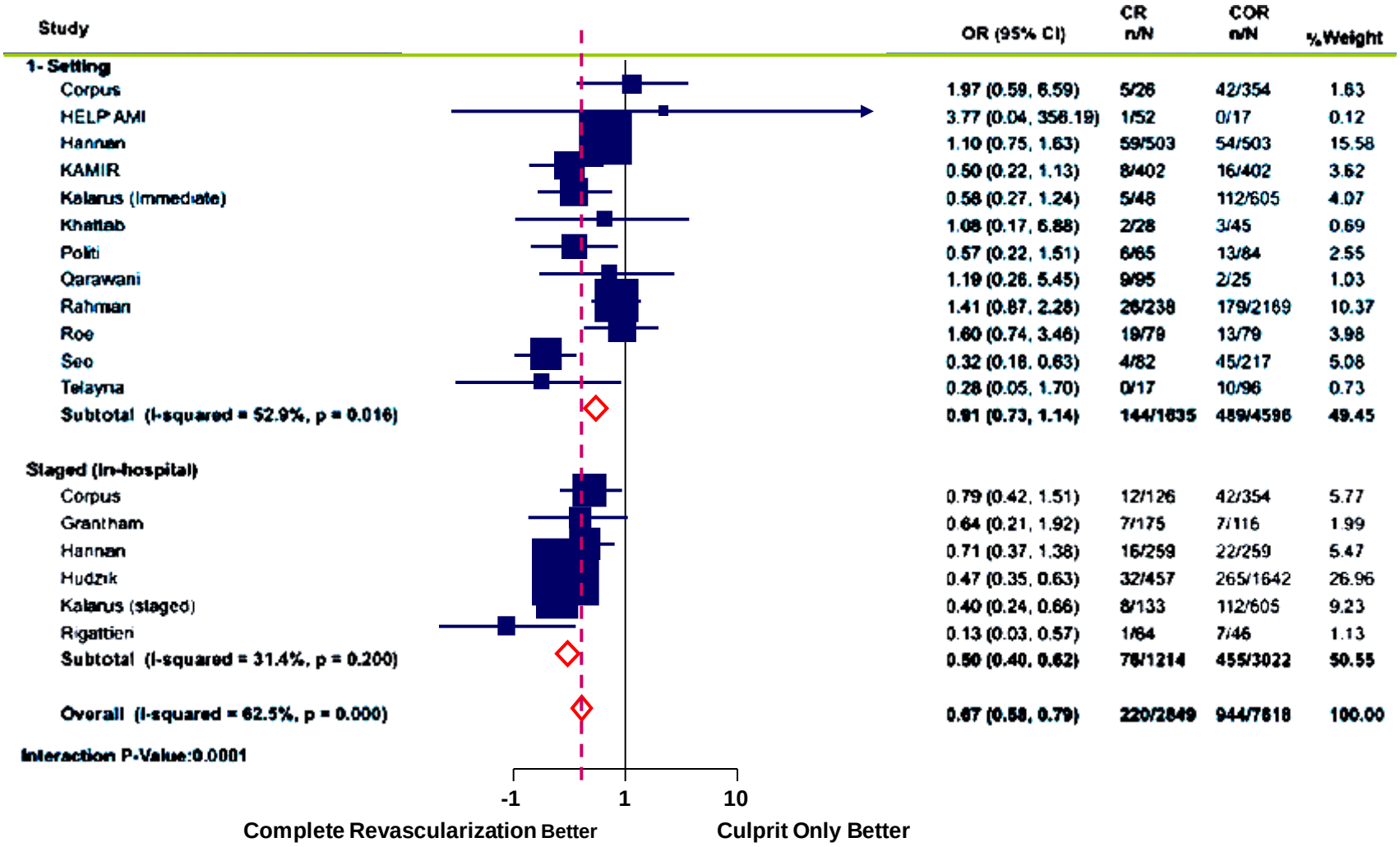
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

30 Days MACE



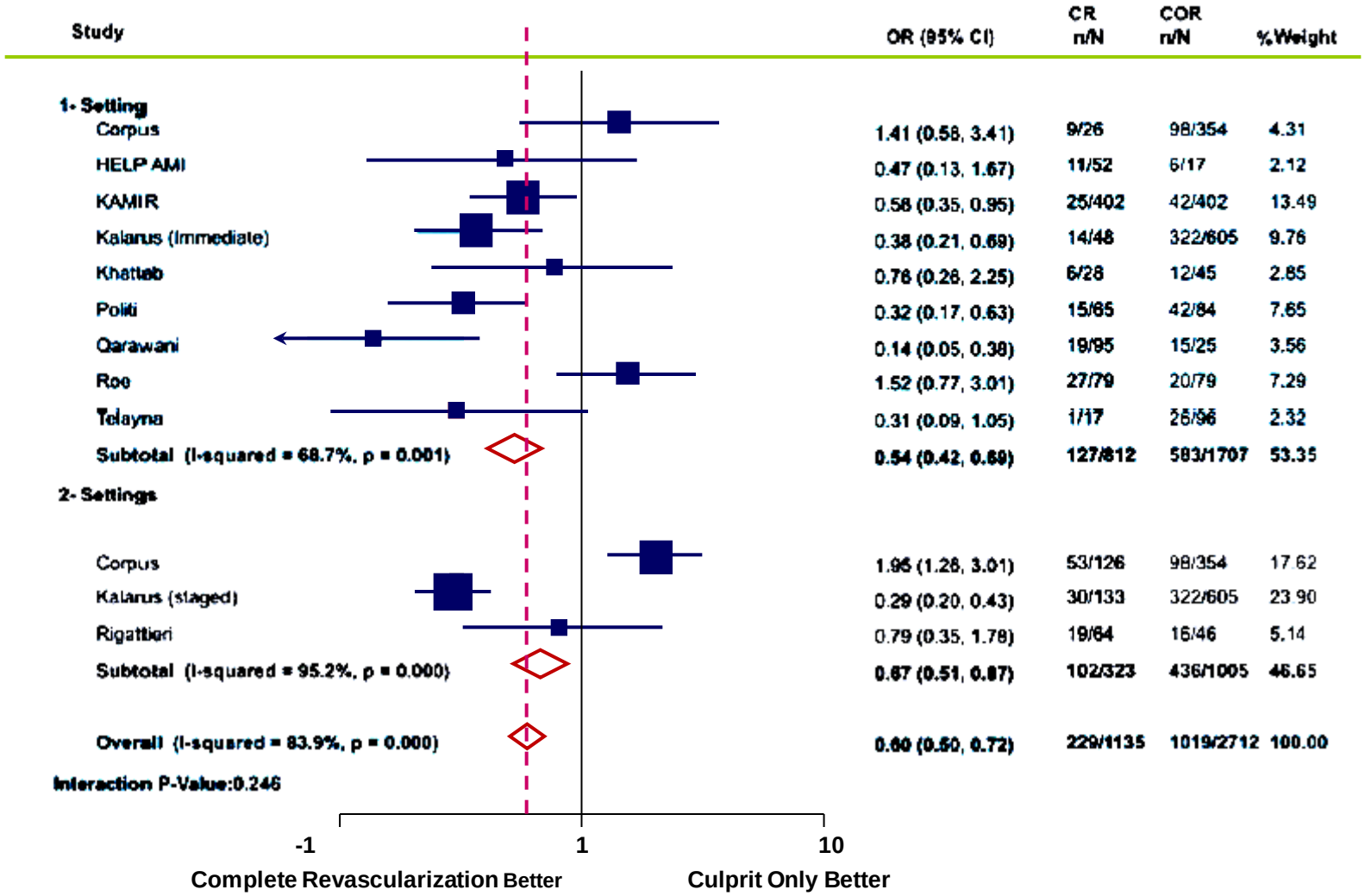
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

Long term Mortality



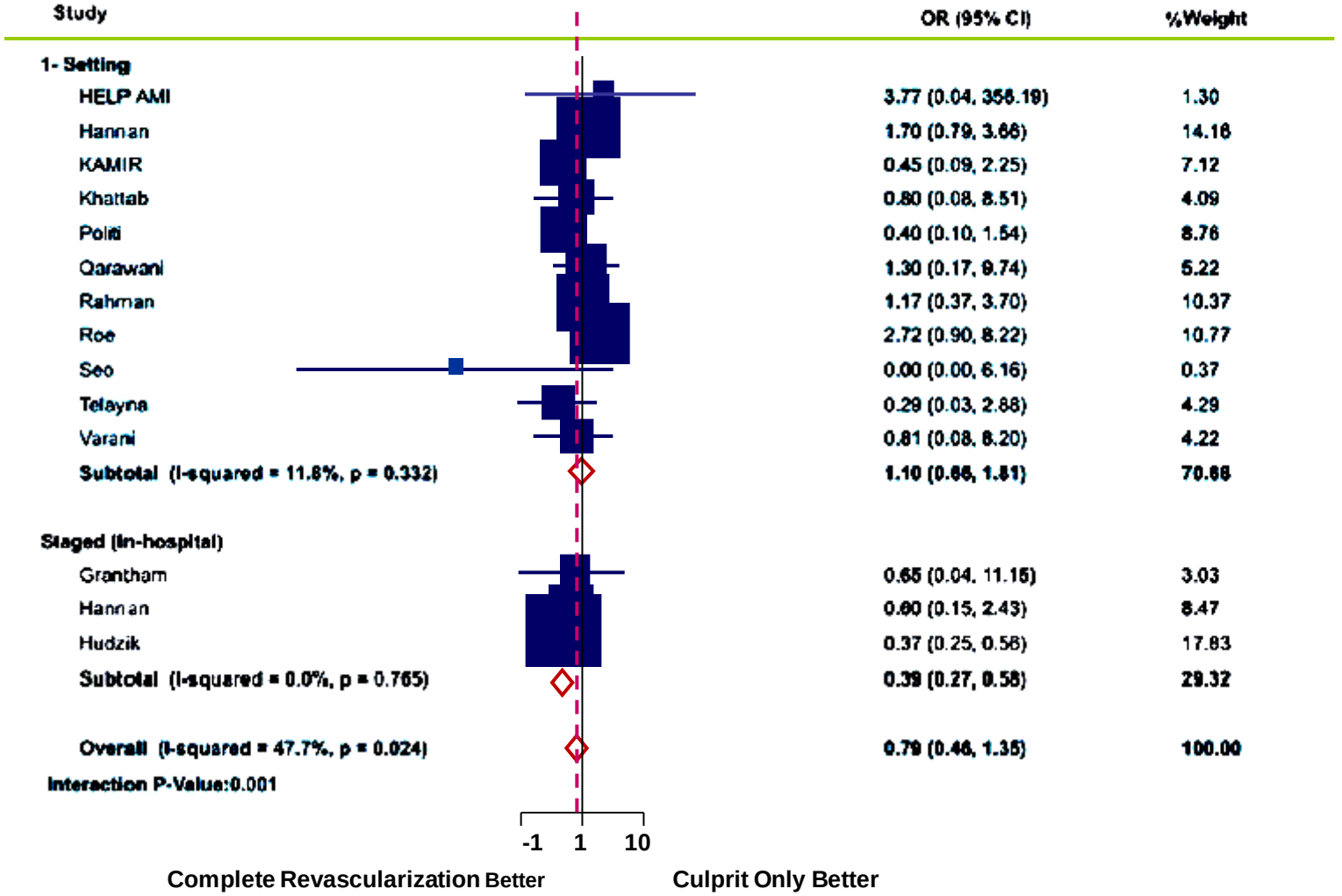
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

Long term MACE



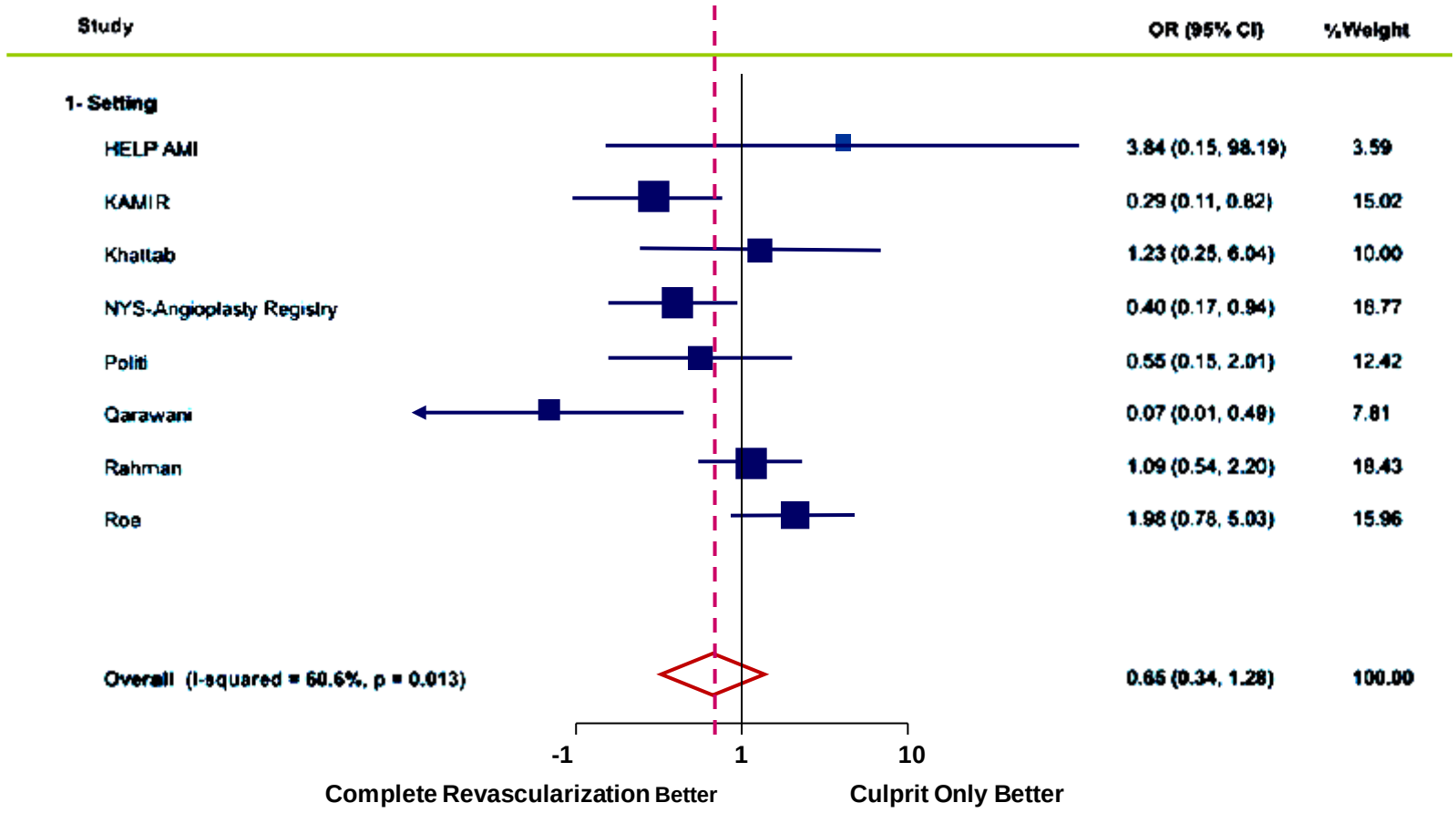
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

30 Days Mortality (Sensitivity Analysis)



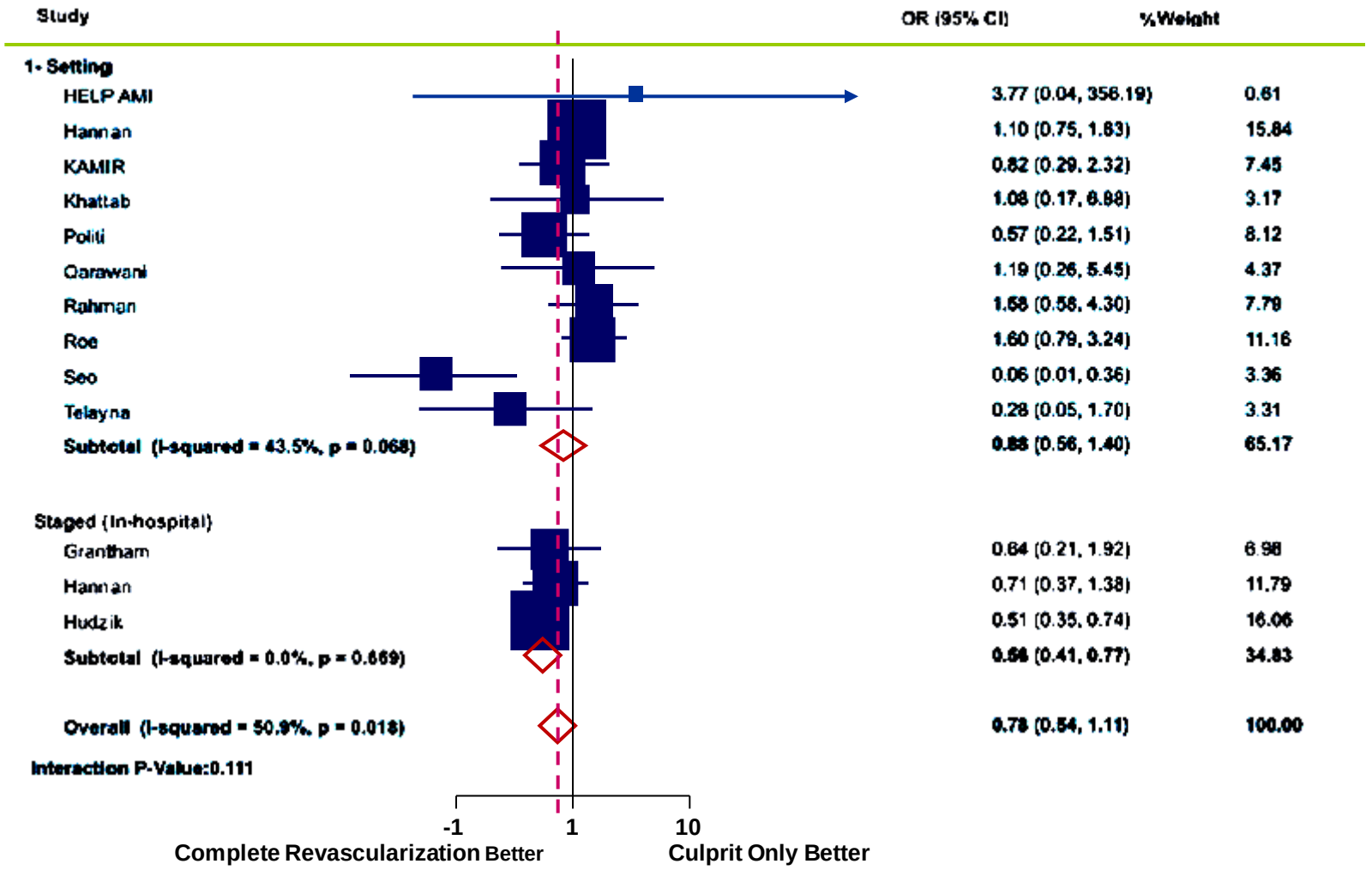
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

30 Days MACE (Sensitivity Analysis)



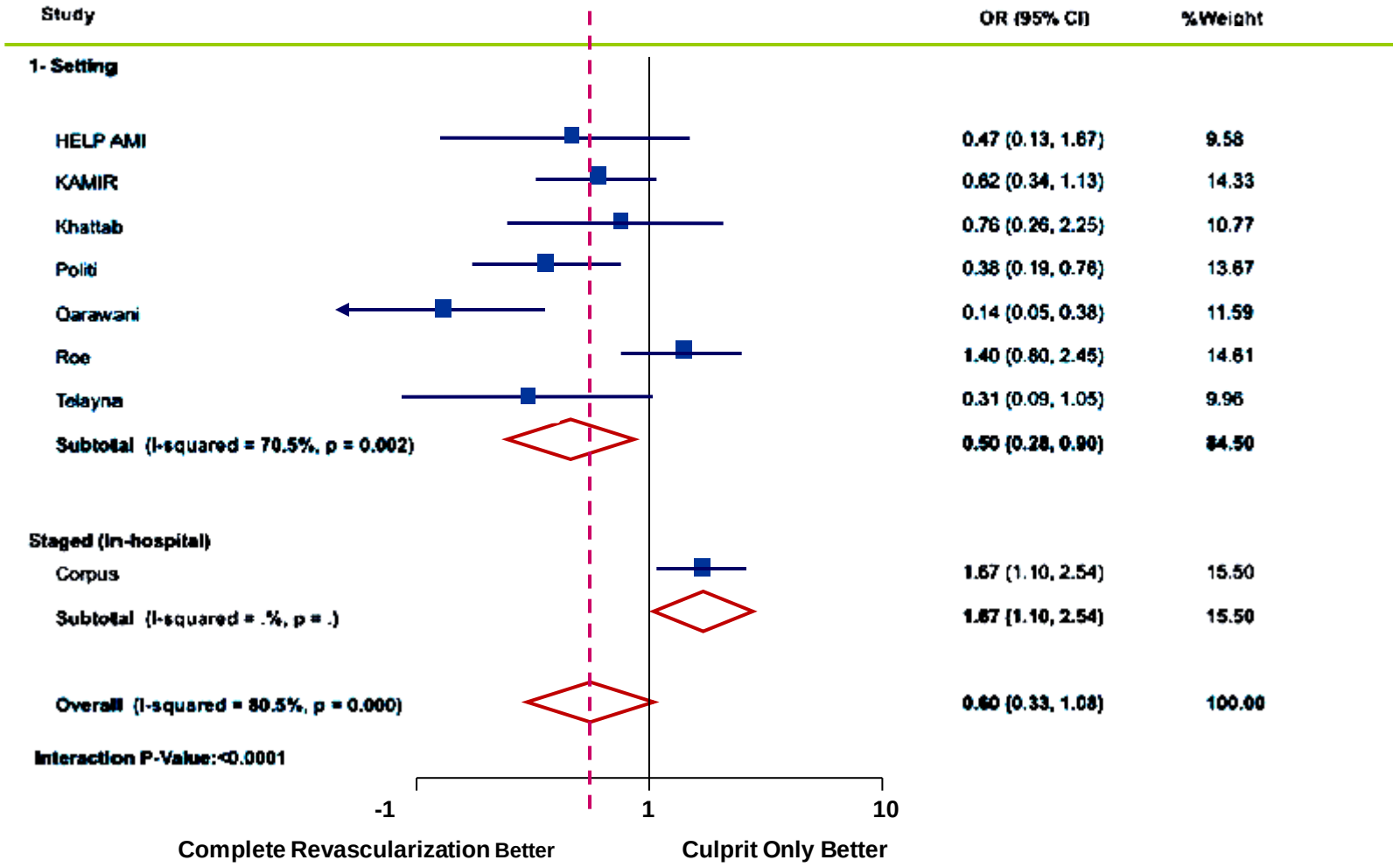
Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

Long Term Mortality (Sensitivity Analysis)



Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

Long Term MACE (Sensitivity Analysis)



Bangalore S, et al. Am J Cardiol 2011;107:1300 –1310

Puntos a tener en cuenta cuando consideramos PCI de MV en STEMI

- ✓ Priorizar un buen resultado en el vaso responsable con un stent «limpio», flujo TIMI3 y buen «blush» miocardico

- ✓ Las ventajas versus el riesgo agregado de tratar MV esta influenciada por la dificultad anatomica, los recursos disponibles y la experiencia del operador, entre otras cosas

- ✓ La PCI en el medio de la noche o intercalada en el trabajo del día, por una u otra razón, necesitan terminarse

Conclusiones

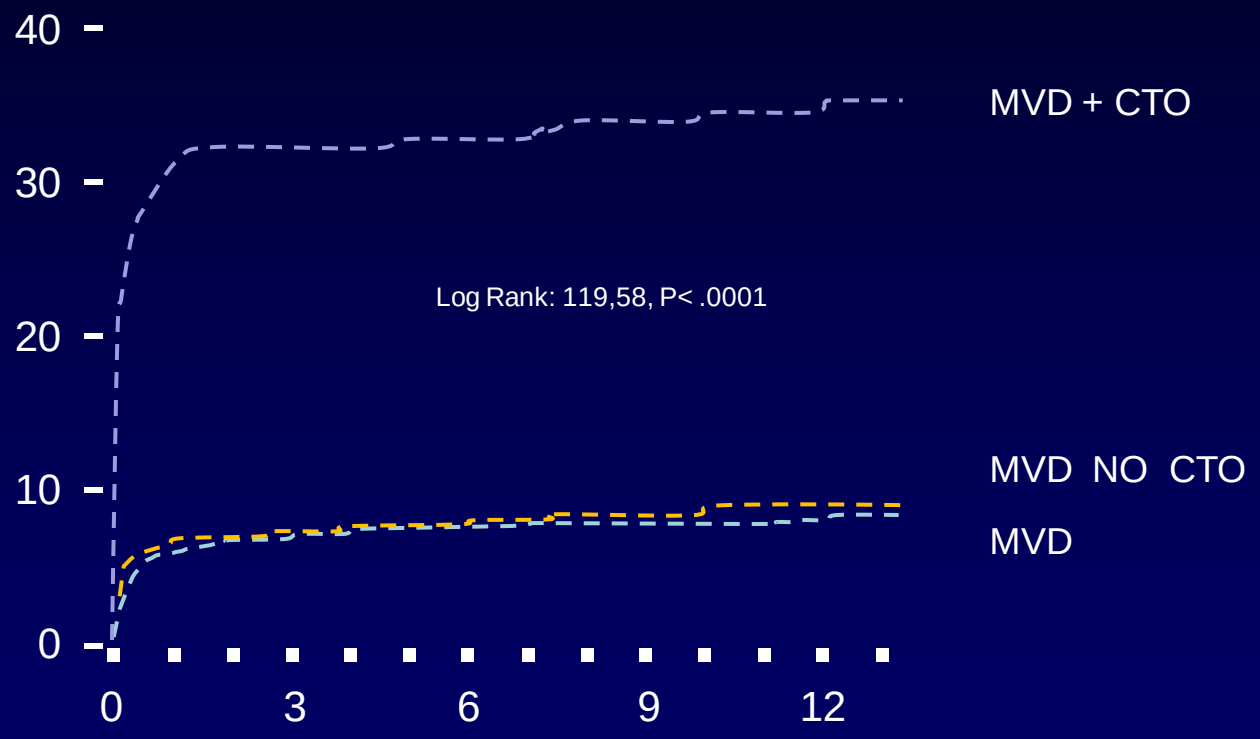
- ✓ Hay una base racional para recomendar una revascularización lo mas completa posible, en los pacientes con IAM
- ✓ Las guías actuales estratifican la intervención sobre lesiones “no culpables ” durante la angioplastía primaria, como Clase III (potencialmente perjudicial)
- ✓ Hay incipiente evidencia que favorece la revascularización completa pero, NO es concluyente
- ✓ El mejor momento para lograr la revascularización completa, también tiene que ser evaluado

HOSPITAL ITALIANO
de Buenos Aires
Instituto de Medicina Cardiovascular

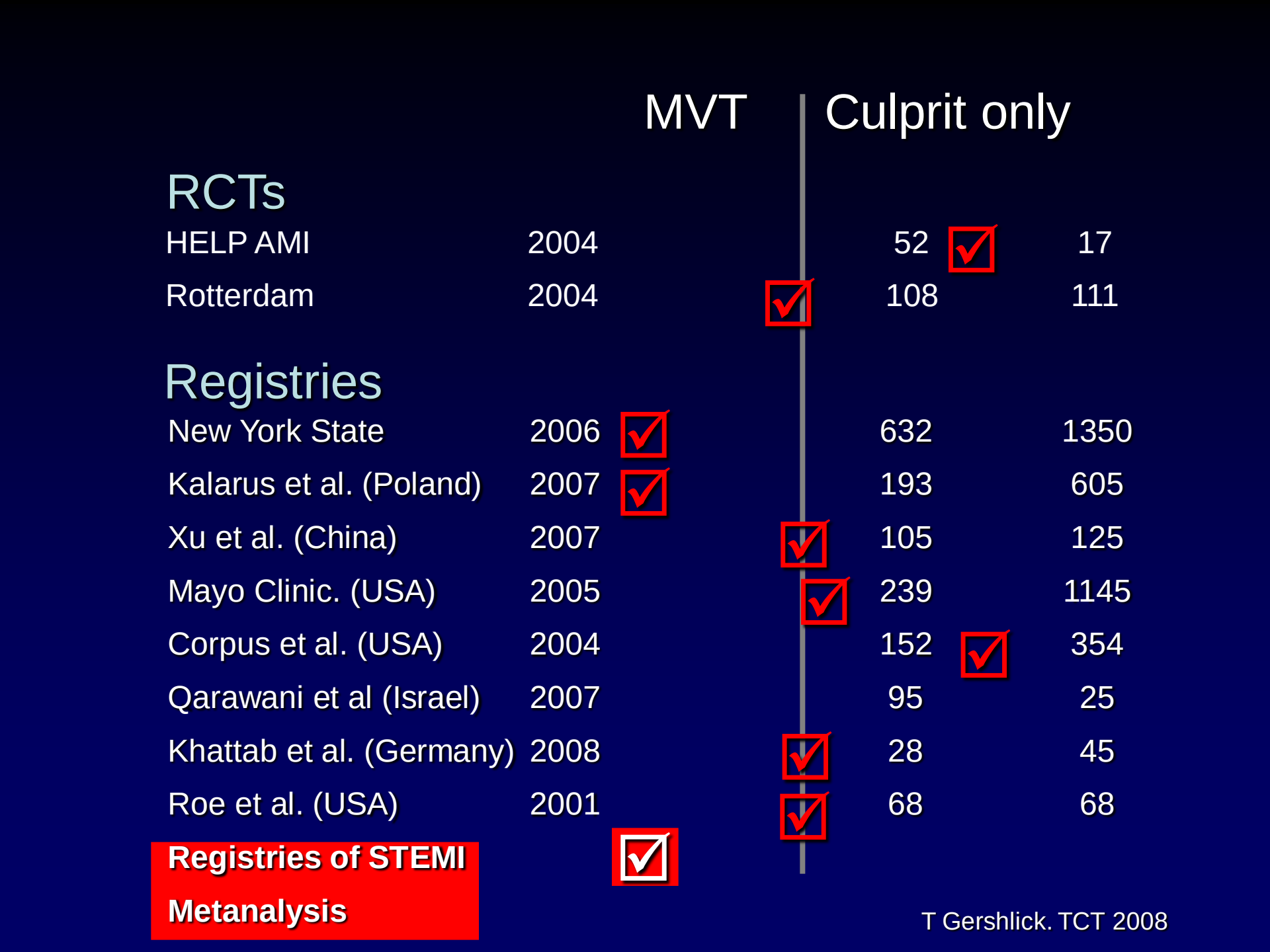
Daniel Berrocal, MD, MTSAC, FACC
Jefe de Cardiologia Intervencionista
daniel.berrocal@hospitalitaliano.org.ar

MVD in STEMI

Independent prognostic importance of MVD determined by presence of a CTO in a non-IRA* (n=1417)



Van der Schaaf et al, Am J Cardiol 2006;98:1165-9


MVT
Culprit only
RCTs
HELP AMI 2004 52 17
Rotterdam 2004 108 111
Registries
New York State 2006 632 1350
Kalarus et al. (Poland) 2007 193 605
Xu et al. (China) 2007 105 125
Mayo Clinic. (USA) 2005 239 1145
Corpus et al. (USA) 2004 152 354
Qarawani et al (Israel) 2007 95 25
Khattab et al. (Germany) 2008 28 45
Roe et al. (USA) 2001 68 68
Registries of STEMI Metanalysis
T Gershlick. TCT 2008

Metanalisis DA IGUAL

Bangalore S, Kumar S, Poddar KL, et al. Meta-analysis of multivessel coronary artery revascularization versus culprit-only revascularization in patients with ST-segment elevation myocardial infarction and multivessel disease. *Am J Cardiol*. 2011 Volume 107, Issue 9,*1300-1310*

- ✓Hay una base racional para recomendar una revascularización lo mas completa posible, en los pacientes con IAM

- ✓Las guías actuales estratifican la intervención sobre lesiones “no culpables ” durante la angioplastía primaria, como Clase III (potencialmente perjudicial)

- ✓Hay incipiente evidencia que favorece la revascularización completa pero, NO es concluyente

- ✓El mejor momento para lograr la revascularización completa, también tiene que ser evaluado

Conclusions

✓There is a rational basis for recommending a revascularization as complete as possible in primary PCI

✓Current guidelines stratify intervention on “no culprit” lesions during primary PCI as Class III (potentially harmful)

✓No conclusive evidence favors the additional PCI after successful culprit lesion stenting

✓The right moment for performing PCI in other than culprit vessel, must also be addressed

MVD in STEMI

possible strategies

Immediate additional revascularization of all MVD lesions
(reducing ischemia and improving recovery and outcome)

Wait and see; Cool down
Only ischemia driven revascularization

Routine revascularization in selected MVD patients
(reducing ischemia and improving recovery and outcome)

Impact of a CTO in STEMI

Independent predictors for mortality

Multivariate Cox regression analysis	HR	95% CI	P
Shock	**4.4**	3.6-5.4	<0.01
CTO	**2.8**	2.3-3.5	<0.01
Age >60 years	**1.9**	1.5-2.3	<0.01
LAD related infarction	**1.7**	1.4-2.1	<0.01
MVD without CTO	**1.3**	1.1-1.7	0.01
Postprocedural TIMI 3 flow	**0.5**	0.4-0.6	<0.01

Claessen BE, van der Schaaf RJ, Henriques JPS. JACC: Cardiovascular Interventions In Press

Impact of a CTO in STEMI

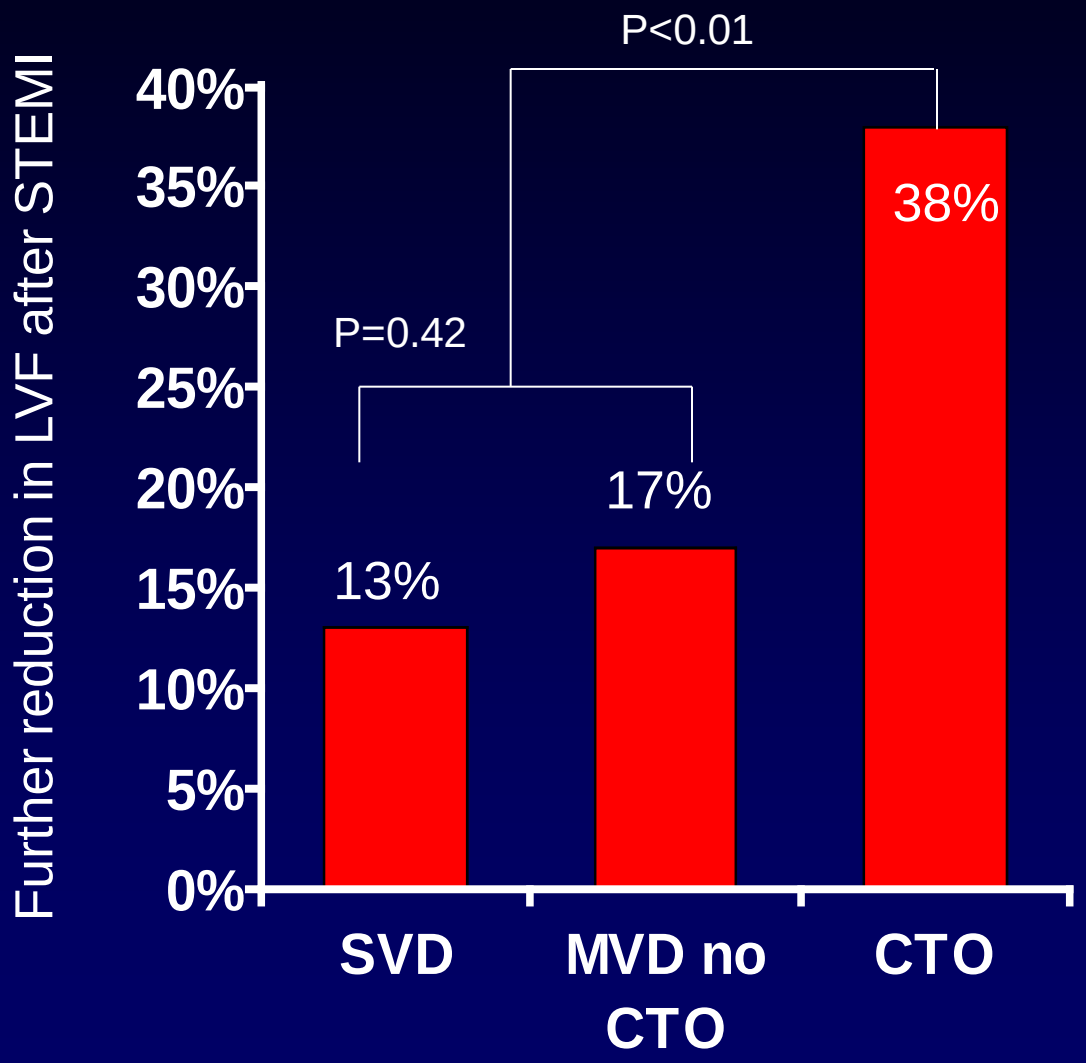
Independent predictors for mortality in hospital survivors

Multivariate Cox regression analysis	HR	95% CI	P
Age >60 years	**3.3**	2.4-4.5	<0.01
CTO	**1.9**	1.3-2.6	<0.01
LAD related infarction	**1.7**	1.3-2.2	<0.01
Shock	**1.6**	1.0-2.4	0.04
MVD without CTO	**1.1**	0.8-1.5	0.51
Postprocedural TIMI 3 flow	**0.6**	0.5-0.9	<0.01

Claessen BE, van der Schaaf RJ, Henriques JPS. JACC: Cardiovascular Interventions In Press

Impact of a CTO in STEMI

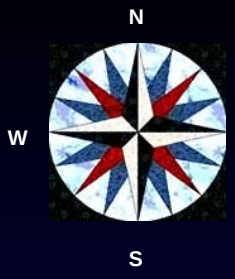
Further reduction in LVEF



LVEF stratified
>50%
41-50%
30-40%
<30%

Claessen BE, van der Schaaf RJ, Henriques JPS. JACC: Cardiovascular Interventions In Press

EXPLORE trial



EXPLORE

300 patients after STEMI
CTO in non-IRA

Randomization

PCI of CTO < 7 days

No PCI of CTO

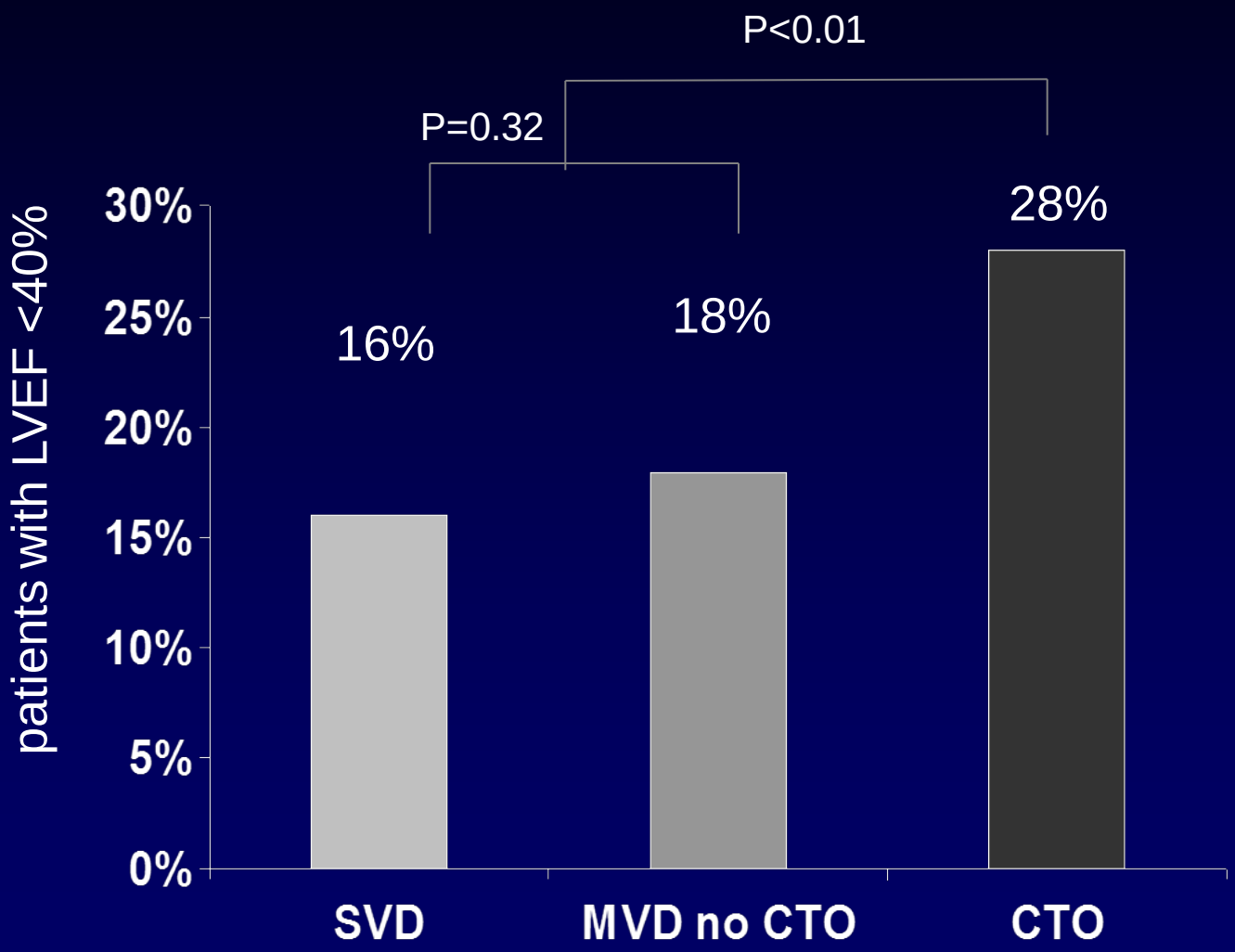
Primary endpoint @ 4 months MRI

LVEF and LV diameters

Principal investigators: René van der Schaaf / José PS Henriques
Study coordinator: Bimmer Claessen / Loes Hoebers
E-mail: explore@amc.nl

Impact of a CTO in STEMI

Residual LVEF <40%



Claessen BE, van der Schaaf RJ, Henriques JPS. JACC: Cardiovascular Interventions In Press

Conclusions

CTO drives mortality in STEMI patients with MVD

An independent predictor for mortality
Associated with reduced LVEF
Associated with a further reduction of LVEF

Strategies for MVD in primary PCI

Culprit only or culprit plus

MVD is present in 40-65% of STEMI patients

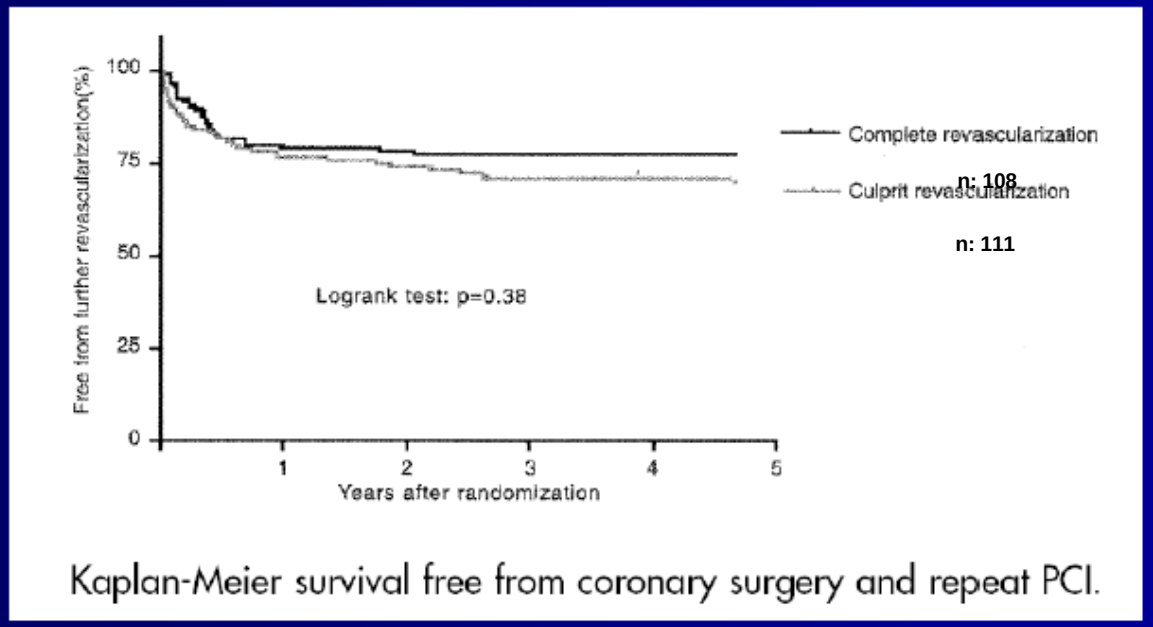
CTO drives mortality in STEMI patients with MVD

Immediate Multivessel PCI has no benefit …..(SHOCK?)

For non-CTO: Wait and see; Cool down
Only ischemia driven revascularization

For CTO

Rotterdam study – not AMI



Kaplan-Meier survival free from coronary surgery and repeat PCI.

No significant difference in revascularization rates at long-term F/U

Ijsselmuiden MD, et al. Am Heart J. 2004;148(3):467-74

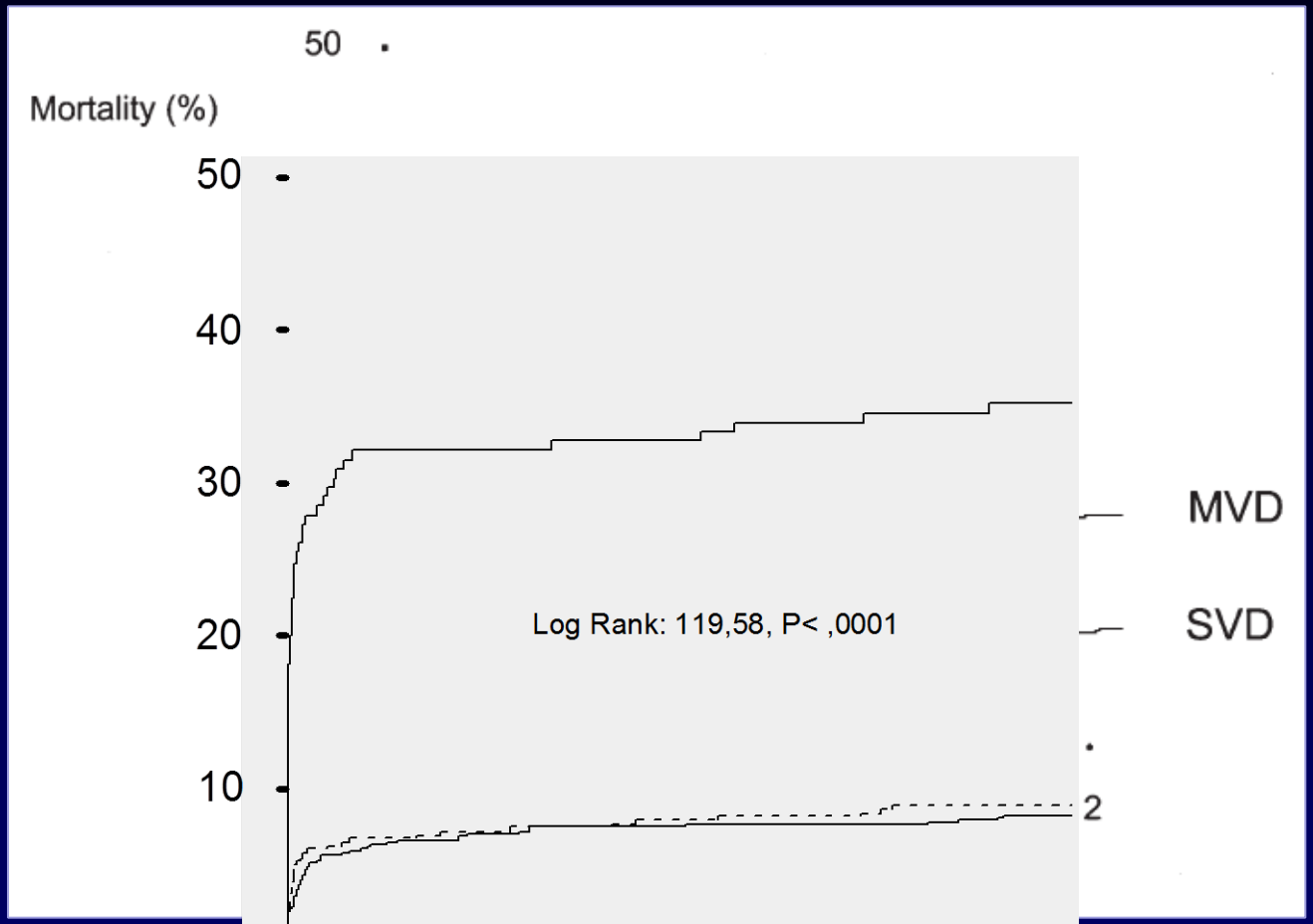
Advice, Recommendations ?

•Evidence is scarce and inconclusive

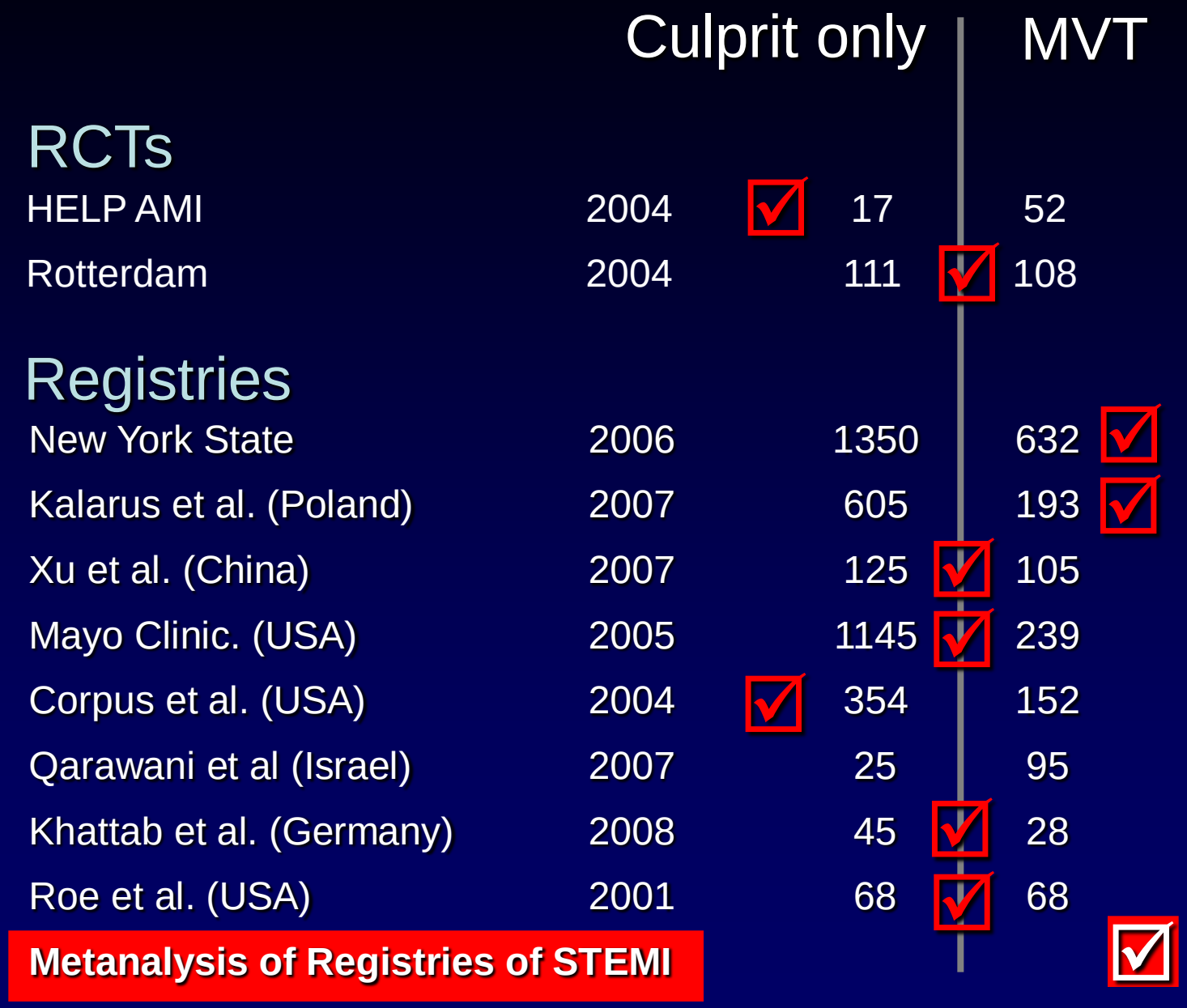
•Need to individualize therapeutic decisions – we know STEMI is a heterogenous substrate !!

• MVS definitely justifiable where multiple “culprits” and where pt still unstable or in shock after obvious culprit well treated

• MVS may be safe and defendable in hands of experienced operators with availability of adjunctive devices eg. thrombectomy, protection devices (prox or distal) and using pretreatment
with abciximab,
clopidogrel and knowledge of pharmacotherapy for noreflow etc.



Van der Schaaf et al, Am J Cardiol 2006;98:1165-9



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