Antonio Manari
U.O. Cardiologia Interventistica
Arcispedale Santa Maria Nuova
Reggio Emilia

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliera di Reggio Emilia
Arcispedale S. Maria Nuova

Aderence to treatment guidelines for NSTEMI: the role of a network between hospitals

Short term risk of death or non-fatal MI in patients with UA/NSTEMI
2007 ACC/AHA NSTEACS Guidelines

Feature	High Risk *At least 1 of the following features must be present:*	Intermediate Risk *No high-risk feature, but must have 1 of the following:*	Low Risk *No high- or intermediate-risk feature but may have any of the following features:*
History	Accelerating tempo of ischemic symptoms in preceding 48 h	Prior MI, peripheral or cerebrovascular disease, or CABG; prior aspirin use	
Character of pain	Prolonged ongoing (greater than 20 min) rest pain	Prolonged (greater than 20 min) rest angina, now resolved, with moderate or high likelihood of CAD Rest angina (greater than 20 min) or relieved with rest or sublingual NTG Nocturnal angina New-onset or progressive CCS class III or IV angina in the past 2 weeks without prolonged (greater than 20 min) rest pain but with intermediate or high likelihood of CAD (see Table 6)	Increased angina frequency, severity, or duration Angina provoked at a lower threshold New onset angina with onset 2 weeks to 2 months prior to presentation
Clinical findings	Pulmonary edema, most likely due to ischemia New or worsening MR murmur S_3 or new/worsening rales Hypotension, bradycardia, tachycardia Age greater than 75 years	Age greater than 70 years	
ECG	Angina at rest with transient ST-segment changes greater than 0.5 mm Bundle-branch block, new or presumed new Sustained ventricular tachycardia	T-wave changes Pathological Q waves or resting ST-depression less than 1 mm in multiple lead groups (anterior, inferior, lateral)	Normal or unchanged ECG
Cardiac markers	Elevated cardiac TnT, TnI, or CK-MB (e.g., TnT or TnI greater than 0.1 ng per ml)	Slightly elevated cardiac TnT, TnI, or CK-MB (e.g., TnT greater than 0.01 but less than 0.1 ng per ml)	Normal

European Heart Journal
doi:10.1093/eurheartj/ehm161

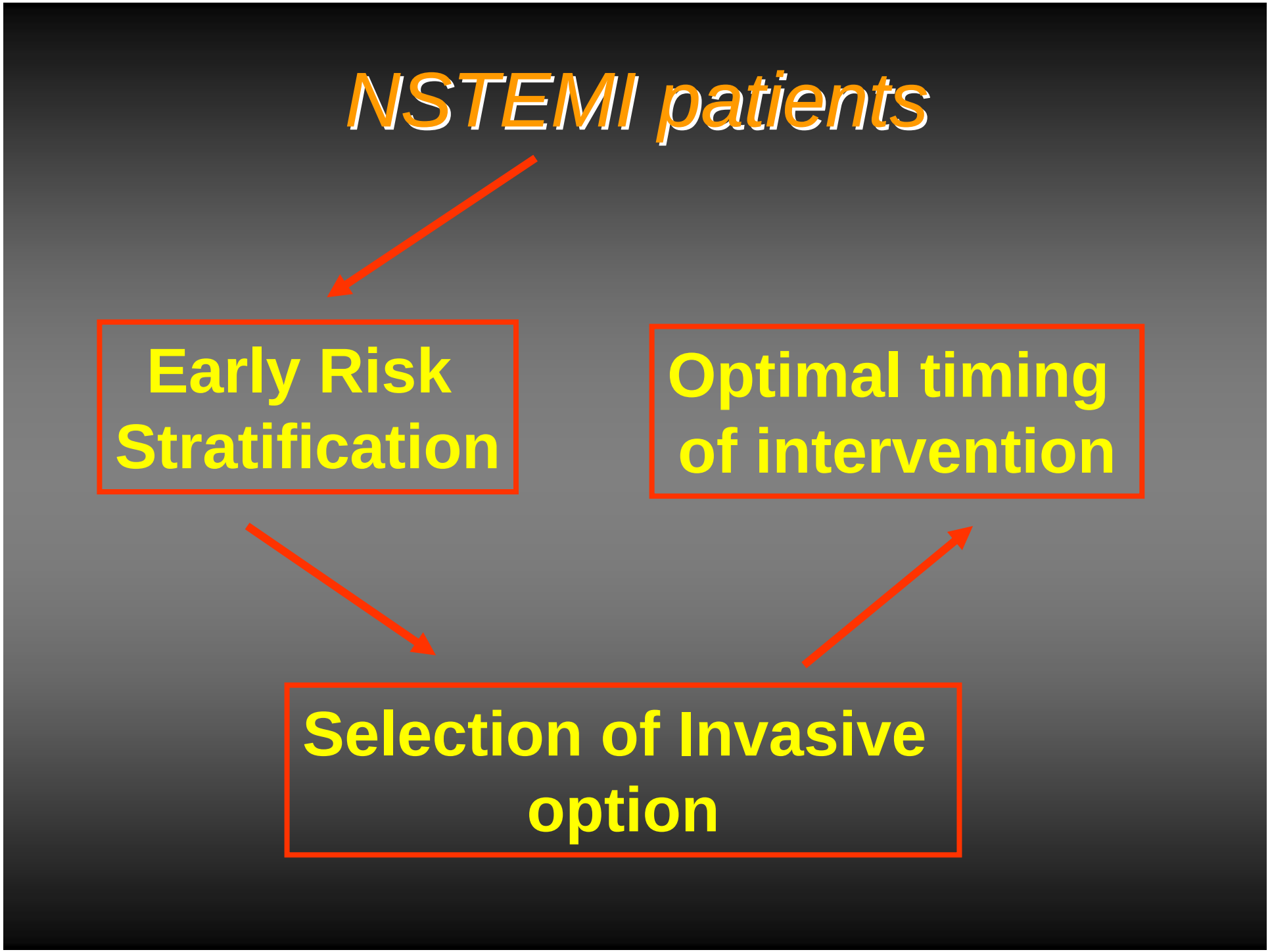
ESC Guidelines

Guidelines for the diagnosis and treatment of non-ST-segment elevation acute coronary syndromes

The Task Force for the Diagnosis and Treatment of Non-ST-Segment Elevation Acute Coronary Syndromes of the European Society of Cardiology

Authors/Task Force Members, Jean-Pierre Bassand* (Chair) (France), Christian W. Hamm* (Co-Chair) (Germany), Diego Ardissino (Italy), Eric Boersma (The Netherlands), Andrzej Budaj (Poland), David Hasdai (Israel), Francisco Fernandez-Aviles (Spain), Keith A.A. Fox (UK), Eric Magnus Ohman (USA), Lars Wallentin (Sweden), William Wijns (Belgium)

European Heart Journal Advance Access published June 14, 2007


NSTEMI patients
Early Risk Stratification
Optimal timing of intervention
Selection of Invasive option

Management Strategy

Validation

- Routine clinical chemistry, particularly troponins (on presentation and after 6 to 12 hours) and other markers according to working diagnoses (e.g. D-dimers, BNP, NT-proBNP)
- Repeat, preferably continuous ST segment monitoring (when available)
- Echocardiogram, MRI, CT or nuclear imaging for differential diagnoses (e.g. aortic dissection, pulmonary embolism),
- Responsiveness to antianginal treatment
- Risk score assessment
- Bleeding risk assessment

Urgent < 120 min

1- Refractory angina
2-Recurrent angina despite intense antianginal treatment associated with ST depression (≥ 2 mm) or deep negative T waves.
3-Clinical symptoms of heart failure or haemodynamic instability
4-Life threatening arrhythmias (ventricular fibrillation or ventricular tachycardia)

Early < 72 hours

Elevated troponin levels
Dynamic ST or T wave changes
Diabetes mellitus
Reduced renal function (GFR < 60 ml/min/1.73m²)
Depressed LVEF < 40%
Early post MI angina
PCI within 6 months
Prior CABG
Intermediate to high risk (GRACE risk score)

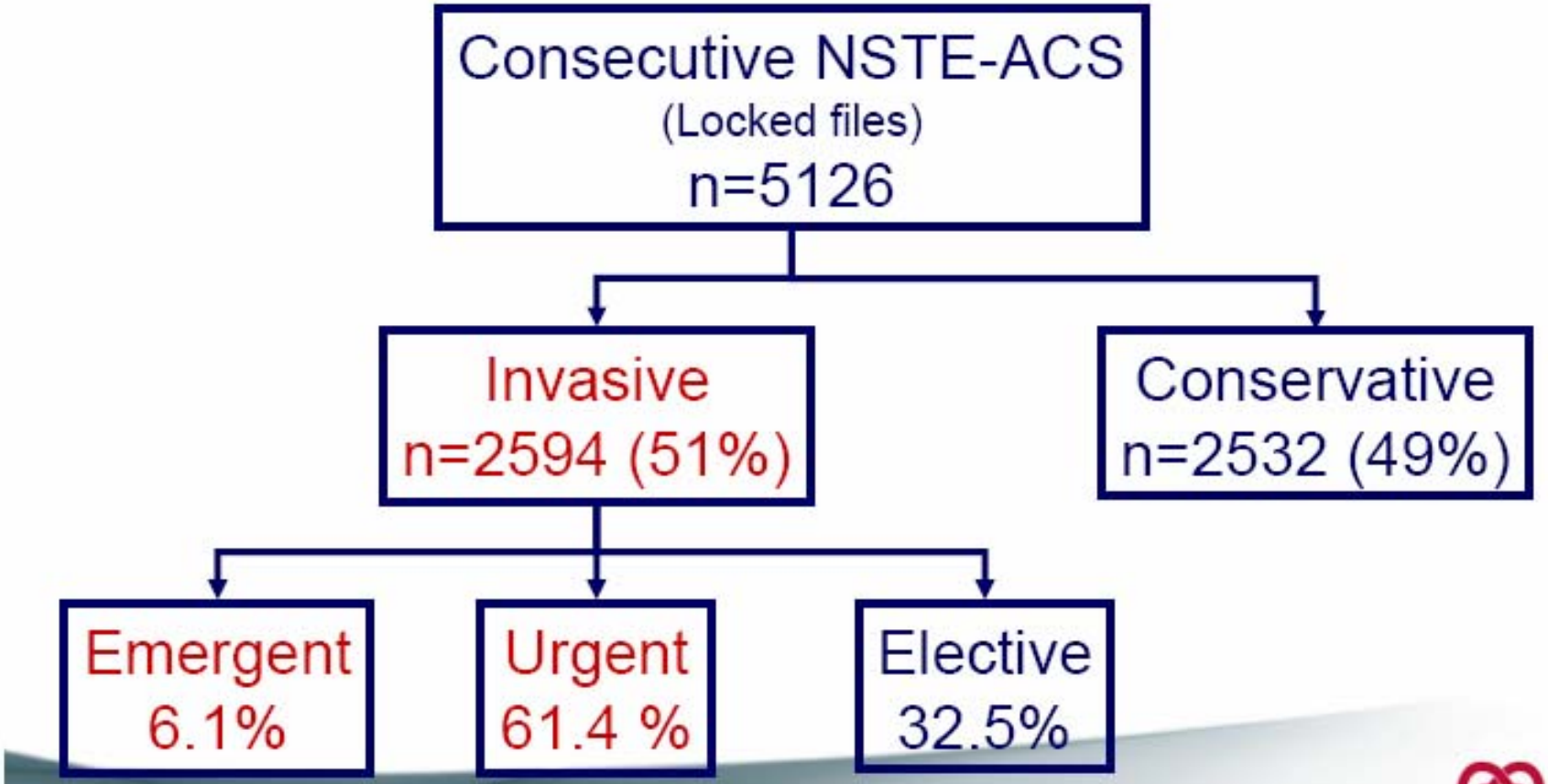
Elective

No recurrence of chest pain
No signs of heart failure
No abnormalities in the initial ECG or a second ECG (6 to 12 hours)
No elevation of troponins (arrival and at 6 – 12 hours)

ESC Guidelines for the Management of NSTE-ACS (131)

ACS in Europe 2006-2008

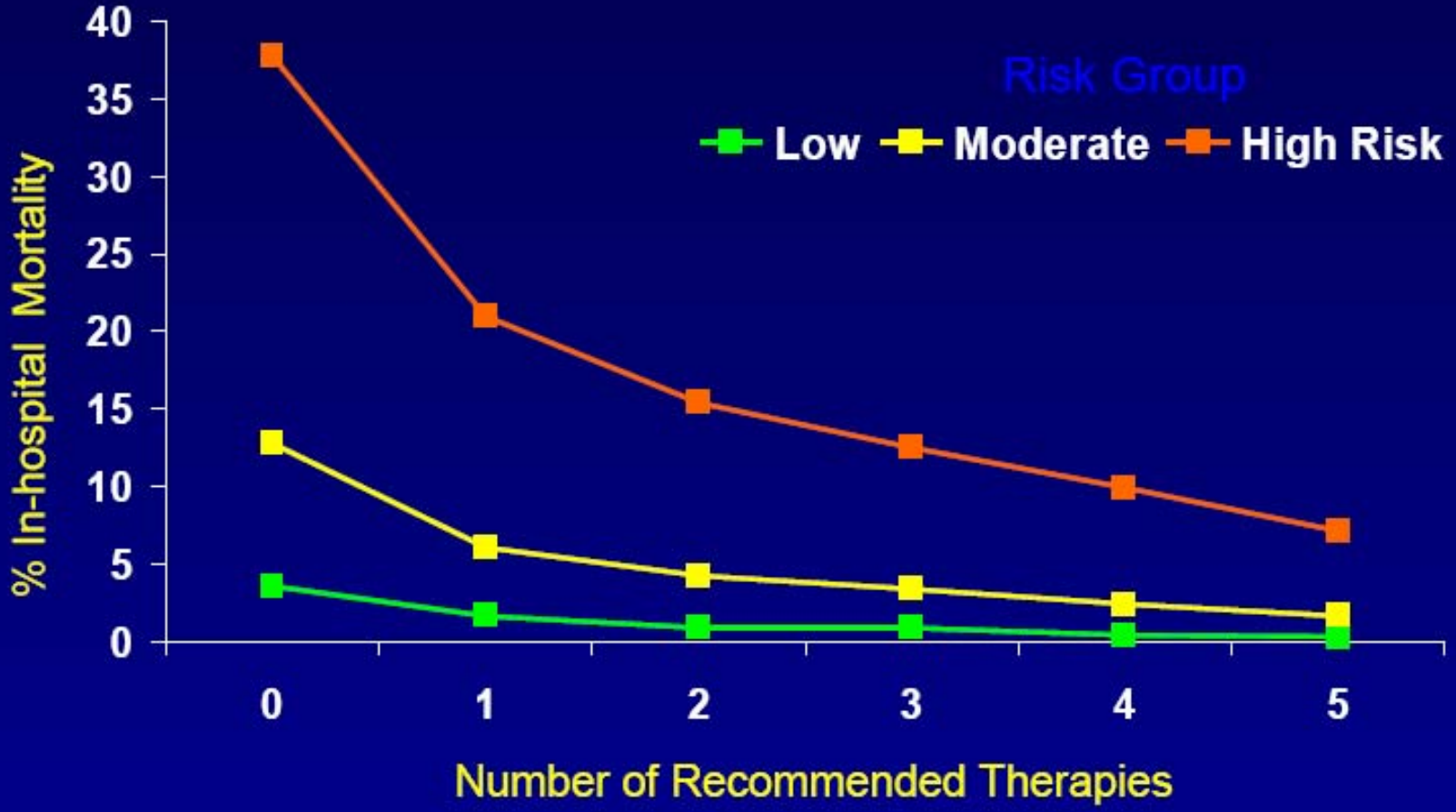
NSTE-ACS



www.escardio.org

EUROPEAN SOCIETY OF CARDIOLOGY®

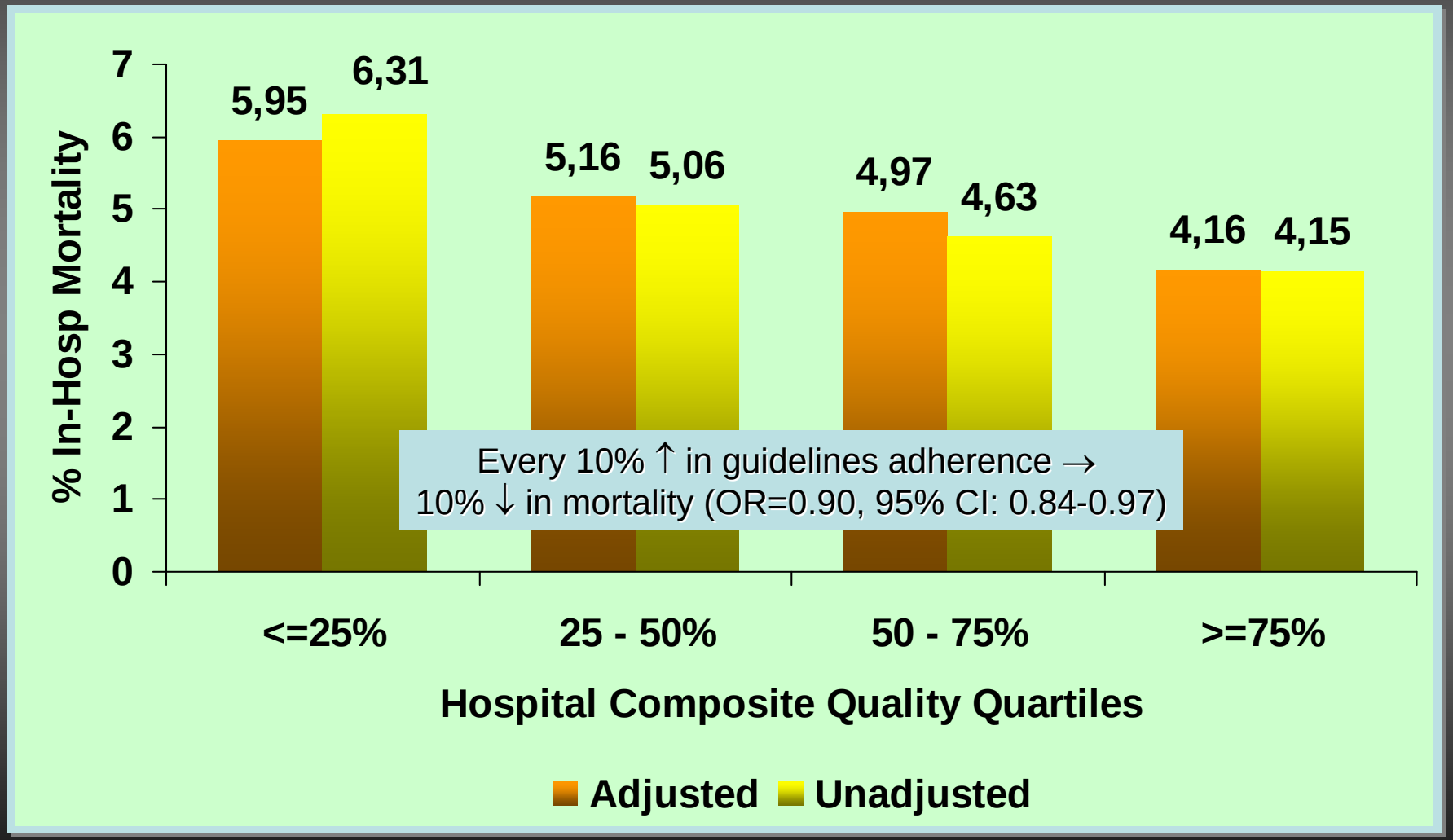
CRUSADE: Mortality Rates by Acute Guideline Recommended Therapies



Therapies = Acute Aspirin, Acute Beta-blockers, Acute Heparin, GP IIb/IIIa inhibitors, Cardiac Catheterization <48 hours; Based on CRUSADE Risk Score

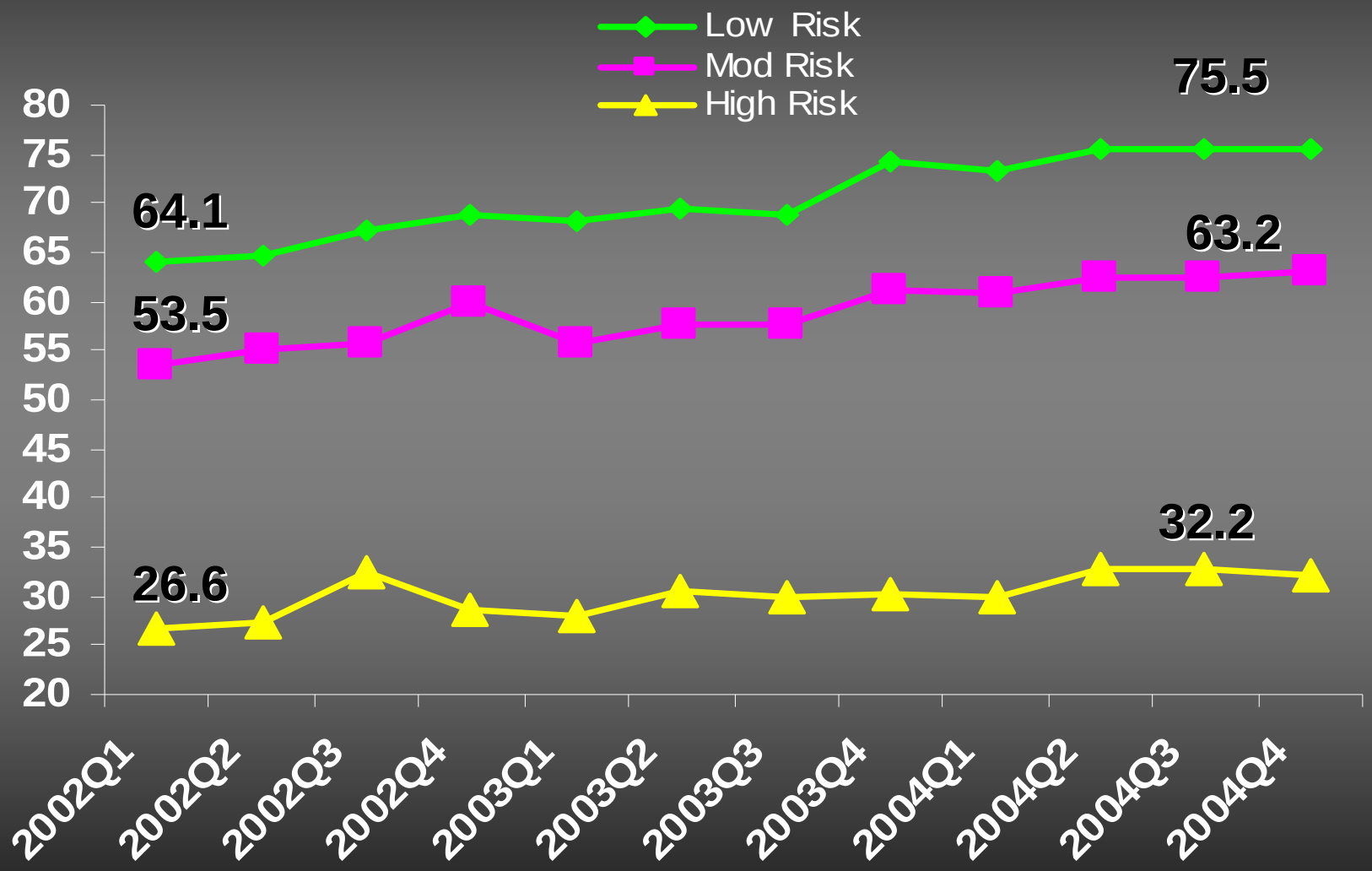
Peterson et al JAMA

Hospital Link Between Overall Guidelines Adherence and Mortality



Peterson et al, JAMA 2006;295:1863-1912

Are We Performing Interventional Procedures in the Right Patients



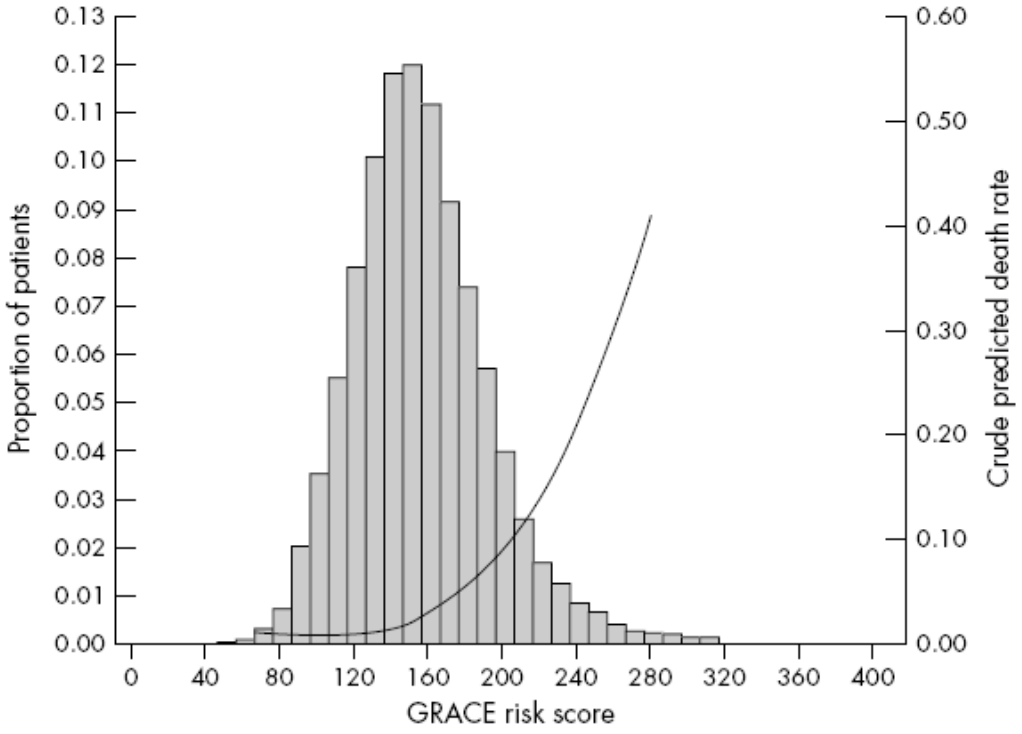
Tricoci et al, AHA 2005 Abstract

Intervention in acute coronary syndromes: do patients undergo intervention on the basis of their risk characteristics? The Global Registry of Acute Coronary Events (GRACE)

K A A Fox, F A Anderson Jr, O H Dabbous, P G Steg, J López-Sendón, F Van de Werf, A Budaj, E P Gurfinkel, S G Goodman, D Brieger, on behalf of the GRACE investigators

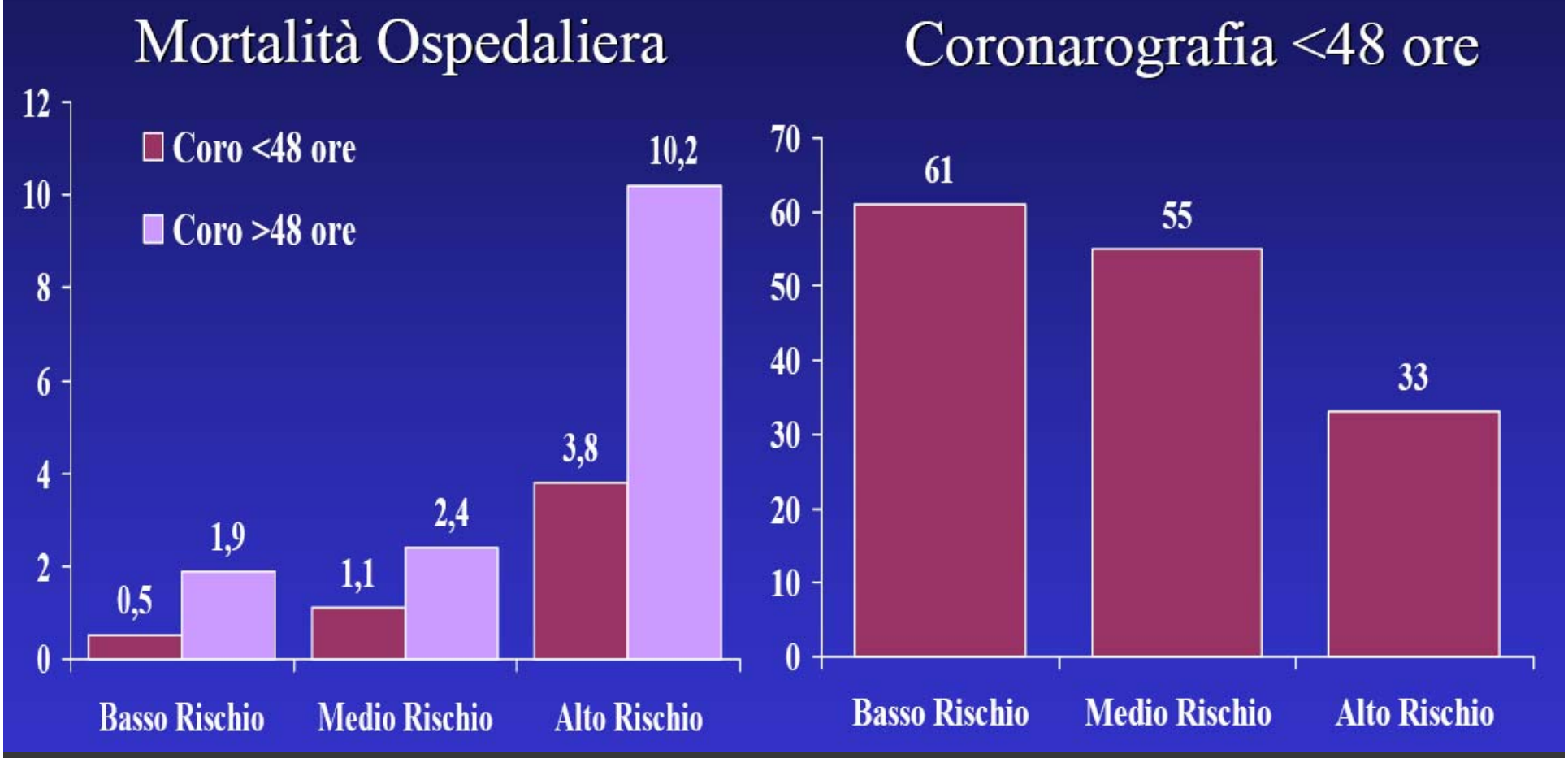
Heart 2007;**93**:177–182. doi: 10.1136/hrt.2005.084830

Use of intervention according to risk in ACS



NSTE-MI ACS

Coronarografia <48 ore e Rischio



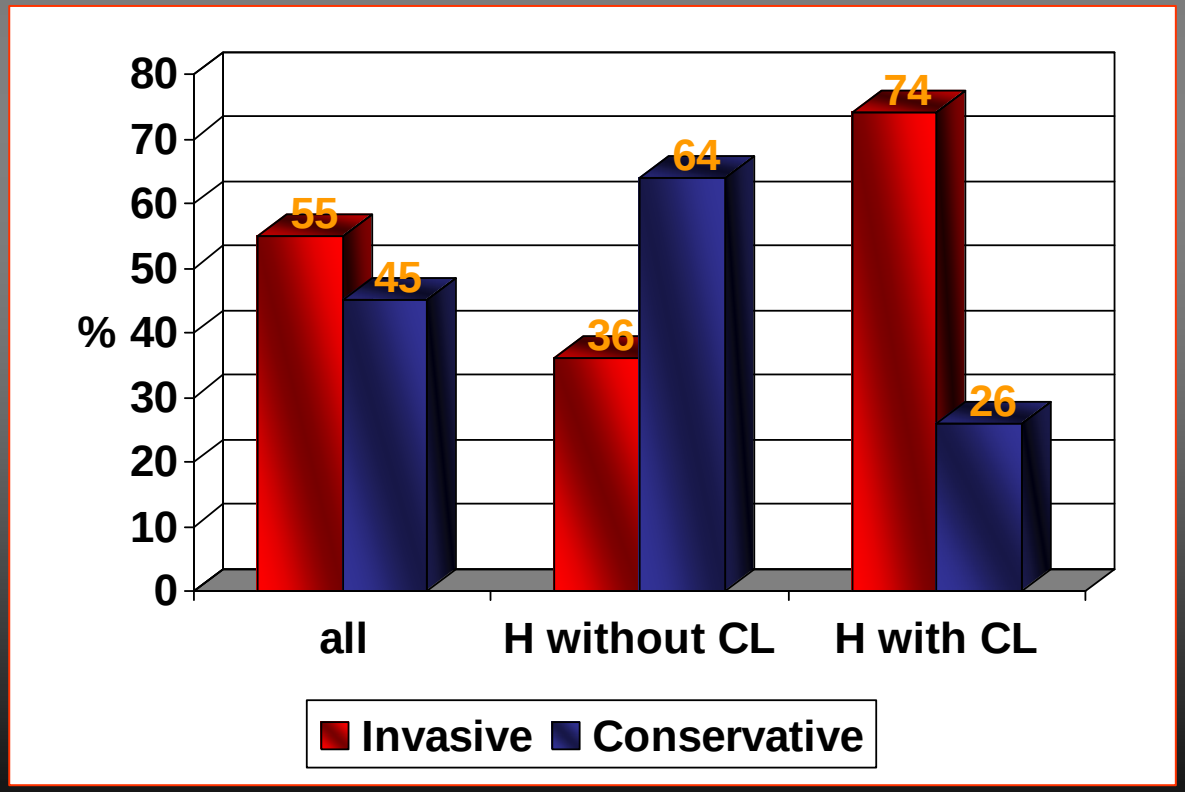
Il Rischio non guida la procedura

European Heart Journal (2006) 27, 393–405
doi:10.1093/eurheartj/ehi557

Clinical research

Epidemiology of non-ST elevation acute coronary syndromes in the Italian cardiology network: the BLITZ-2 study

Antonio Di Chiara[1,2*], Claudio Fresco[1], Stefano Savonitto[3], Cesare Greco[4], Donata Lucci[2], Lucio Gonzini[2], Antonio Mafrici[3], Filippo Ottani[5], Leonardo Bolognese[6], Stefano De Servi[7], Alessandro Boccanelli[4], Aldo P. Maggioni[2], and Francesco Chiarella[8] on behalf of the BLITZ-2 Investigators[†]



Patterns of transfer for patients with non–ST-segment elevation acute coronary syndrome from community to tertiary care hospitals

Matthew T. Roe, MD, MHS,[a] Anita Y. Chen, MS,[a] Elizabeth R. Delong, PhD,[a] William E. Boden, MD,[b] James E. Calvin, Jr, MD,[c] Charles B. Cairns, MD,[d] Sidney C. Smith, Jr, MD,[e] Charles V. Pollack, Jr, MD, MA,[f] Ralph G. Brindis, MD, MPH,[g] Robert M. Califf, MD,[a] W. Brian Gibler, MD,[h] E. Magnus Ohman, MD,[a] and Eric D. Peterson, MD, MPH[a] *Durham and Chapel Hill, NC; Buffalo, NY; Chicago, IL; Philadelphia, PA; San Francisco, CA; and Cincinnati, OH*

Transfer patterns

Among all 124 hospitals in this analysis, 3,839 of 19,238 patients (20.0%) were transferred within 48 hours of presentation, whereas 8,889 patients (46.2%) were transferred at any time during the hospitalization.

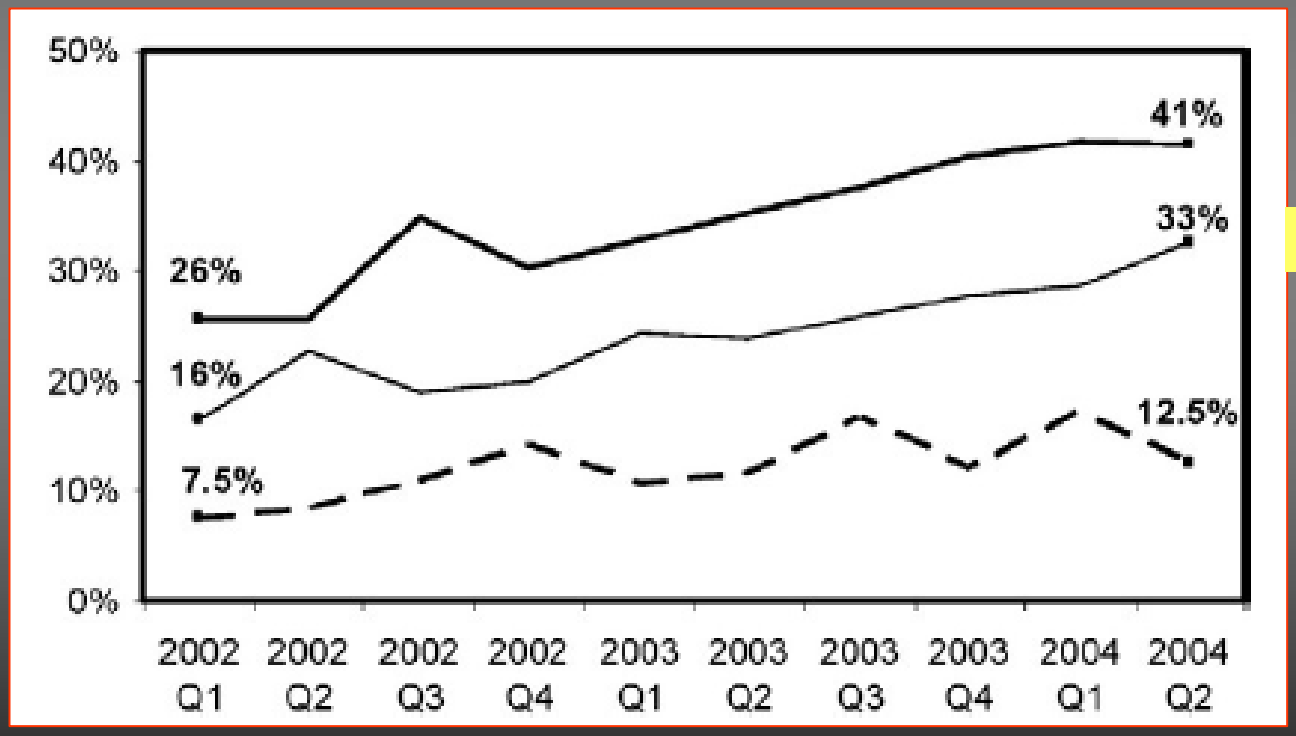
19.238 pts admitted to Spoke Centers

20,0% < 48 ore
46,2% > 48 ore

Am Heart J 2008;156:185

	Hospitals without diagnostic catheterization (n = 6967)		
	No Transfer (n = 3347)	Transfers <48 h (n = 1656)	Transfers >48 h (n = 1964)
% of total population	17.4	8.6	10.2
Demographics			
Age (y) *	77 (65,85)	64 (54,75)	69 (58,78)
Female sex	51.0	36.7	42.2
White race	78.0	83.4	79.8
Insurance status			
HMO/private	28.4	50.1	42.8
Medicare	59.8	35.5	45.2
Medicaid	5.8	5.8	5.1
Self/none	4.2	6.6	5.4
Medical history			
Hypertension	68.5	57.7	65.7
Diabetes mellitus	35.4	28.0	34.6
Current smoking	16.0	26.8	23.1
Hyperlipidemia	33.1	43.2	40.1
Renal insufficiency †	16.0	4.5	11.3
Prior stroke	15.0	5.9	8.5
Prior MI	33.6	25.2	26.8
Prior CHF	27.9	8.1	15.0
Prior PCI	14.8	16.6	17.4
Prior CABG	17.7	12.9	16.0
Presenting characteristics			
ST depression	34.5	41.1	41.0
Transient ST elevation	5.9	11.5	7.6
Positive cardiac markers	84.3	77.2	83.3
Signs of CHF	32.1	14.1	22.4
Heart rate (beats/min) *	89 (74, 105)	81 (69, 96)	85 (72, 101)
Systolic BP (mm Hg) *	141 (119, 163)	149 (130, 168)	148 (129, 170)
Other features			
Cardiology care ‡	24.3	36.5	30.2

Transfer patterns based upon CRUSADE inhospital mortality model



Low-risk (+ 15%)

Moderate-risk (+17%)

High-risk (+5%)

Am Heart J 2008;156:185

European Heart Journal (2005) 26, 2733–2741
doi:10.1093/eurheartj/ehi673

ESC Report

Implementation of reperfusion therapy in acute myocardial infarction. A policy statement from the European Society of Cardiology

Jean-Pierre Bassand[1*], Nicolas Danchin[2], Gerasimos Filippatos[2], Anselm Gitt[1], Christian Hamm[1], Sigmund Silber[3], Marco Tubaro[2], and Franz Weidinger[3]

[1]*Members of the Board of the European Society of Cardiology;* [2]*Representatives of ESC Working Group 27 Acute Cardiac Care; and* [3]*Representatives of ESC Working Group 10 Interventional Cardiology*

"…Establishing networks of reperfusion at regional and national level…is a key issue."

NSTEMI

Inter-hospital networks?

NSTEMI

Inter-hospital network?

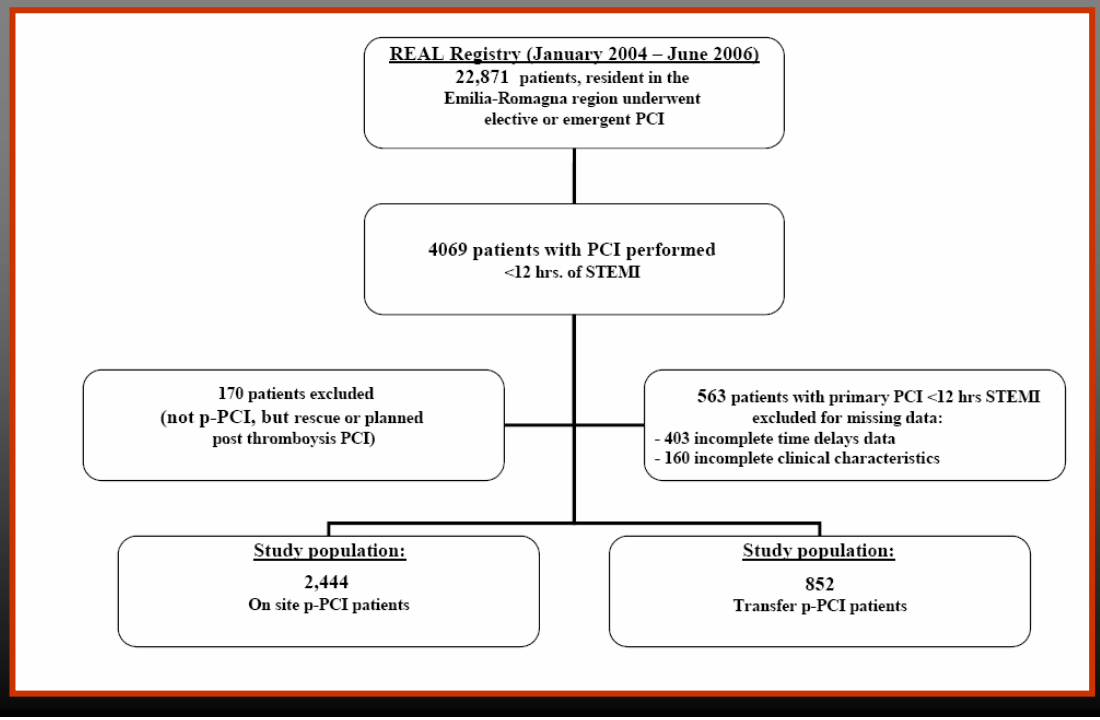
- Is the STEMI inter-hospital network able to guarantee the right treatment of patients with NSTEMI ?

European Heart Journal (2008) **29**, 1834–1842
doi:10.1093/eurheartj/ehn323

CLINICAL RESEARCH
Coronary heart disease

Clinical impact of an inter-hospital transfer strategy in patients with ST-elevation myocardial infarction undergoing primary angioplasty: the Emilia-Romagna ST-segment elevation acute myocardial infarction network

Antonio Manari[1]*, Paolo Ortolani[2], Paolo Guastaroba[3], Gianni Casella[4], Luigi Vignali[5], Elisabetta Varani[6], Giancarlo Piovaccari[7], Vincenzo Guiducci[1], Gianfranco Percoco[8], Stefano Tondi[9], Francesco Passerini[10], Andrea Santarelli[7], and Antonio Marzocchi[2]



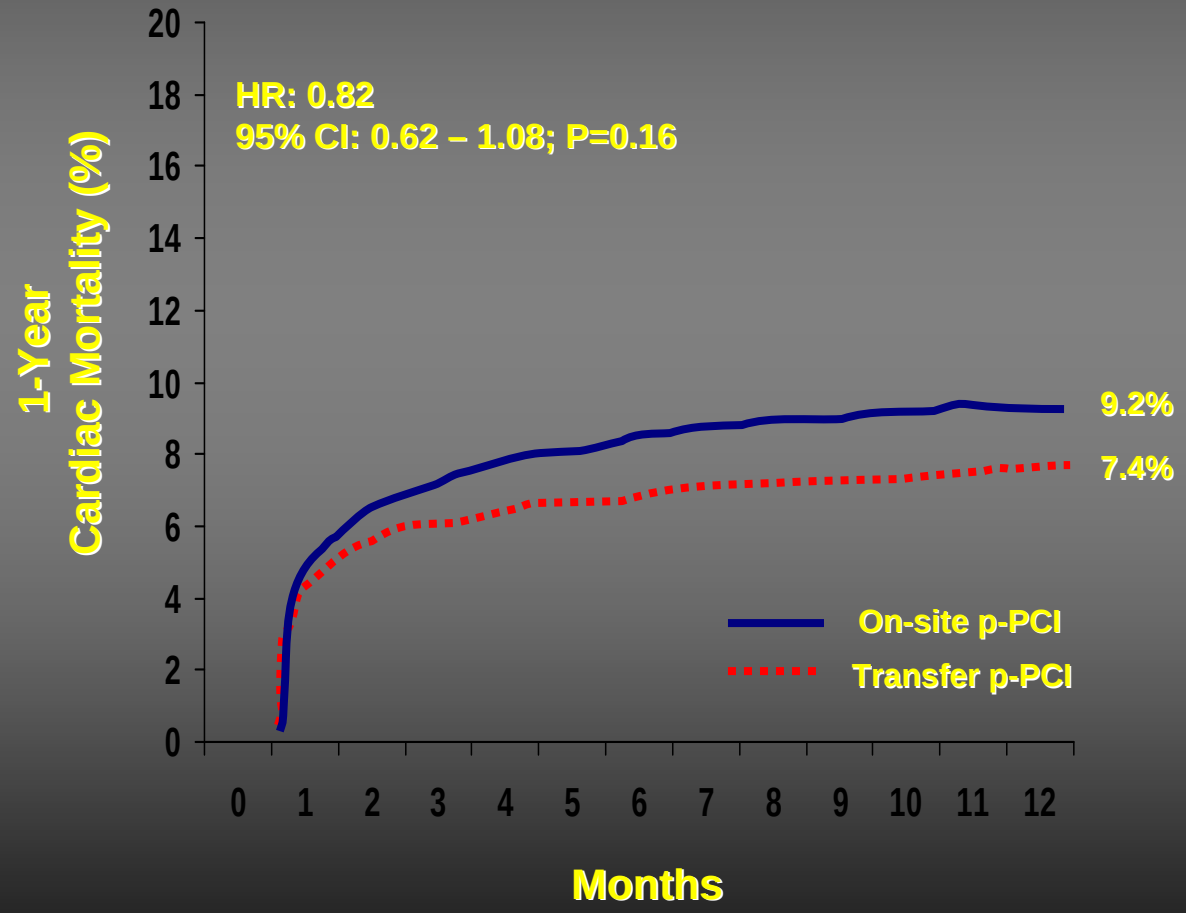
Variables	2004 (year)	2005 (year)	2006 (first semester)
Emilia-Romagna Region p-PCI:			
On-site p-PCI, (n)	**879**	**985**	**580**
Transfer p-PCI, (n)	**281**	**359**	**212**
Network door-to-balloon time:			
On-site p-PCI, (min), (median 25th-75th)	**73 (50-102)**	**69 (43-100)**	**74 (47-115)**
Transfer p-PCI, (min), (median 25th-75th)	**114 (90-146)**	**111 (90-150)**	**107 (81-140)**

Variables	2004 (year)	2005 (year)	2006 (first semester)
Emilia-Romagna Region p-PCI:			
On-site p-PCI, (n)	**879**	**985**	**580**
Transfer p-PCI, (n)	**281**	**359**	**212**
Non-transferred STEMI patients admitted to non-PCI centres (%)	**26.0**	**19.5**	**15.5**
Age, (yrs), mean SD	**77 13**	**78 13**	**81 12**
Charlson index, mean SD	**1.4 1.7**	**1.6 1.7**	**1.7 1.8**
Mortality, (%)	**25.5**	**32.2**	**31.2**

Manari A et al . *Eur Heart J*, 2008

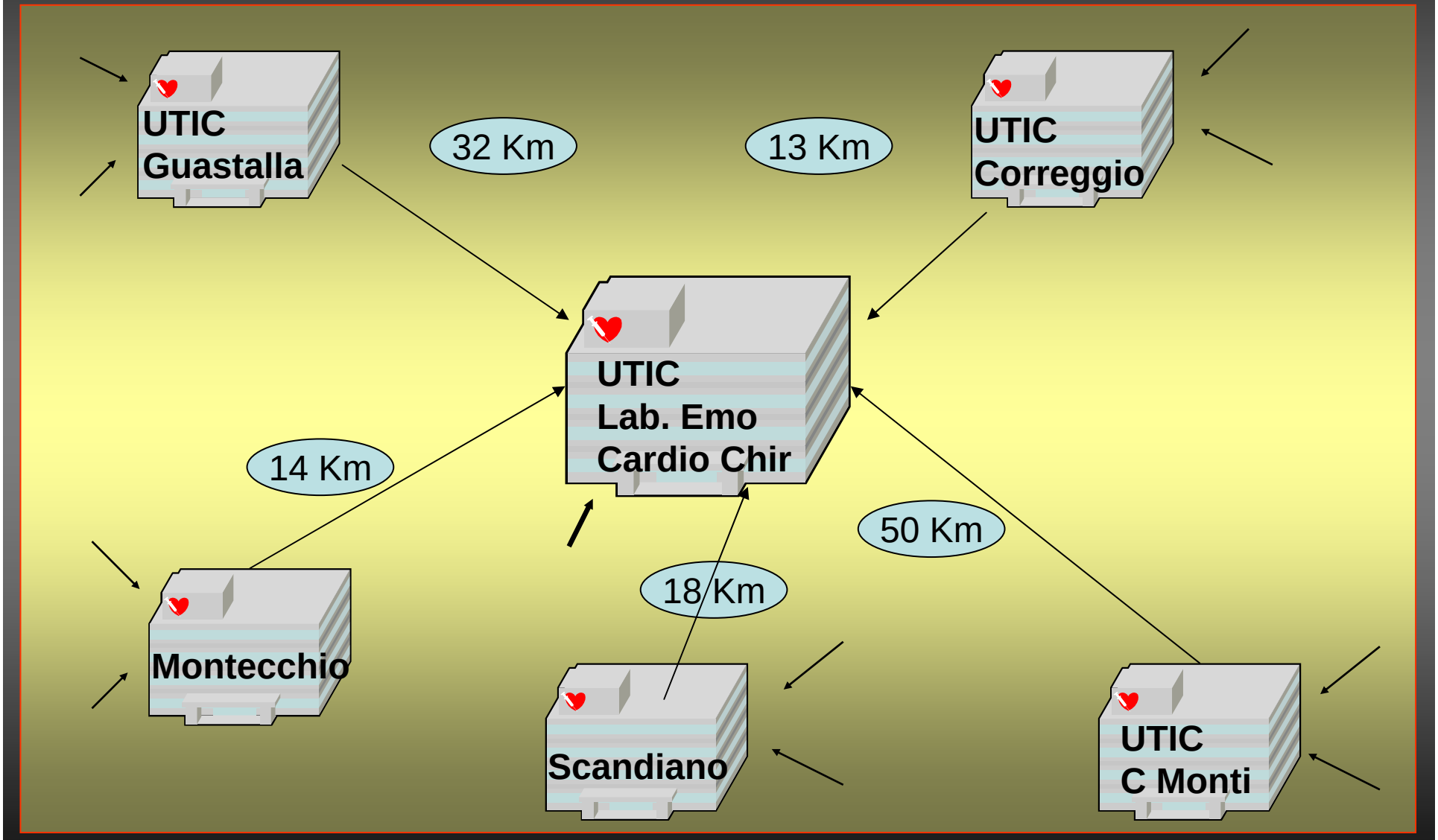
Clinical Impact of an Inter-hospital Transfer Strategy in pts. with STE-MI treated with Primary PCI

The Emilia-Romagna STEMI network

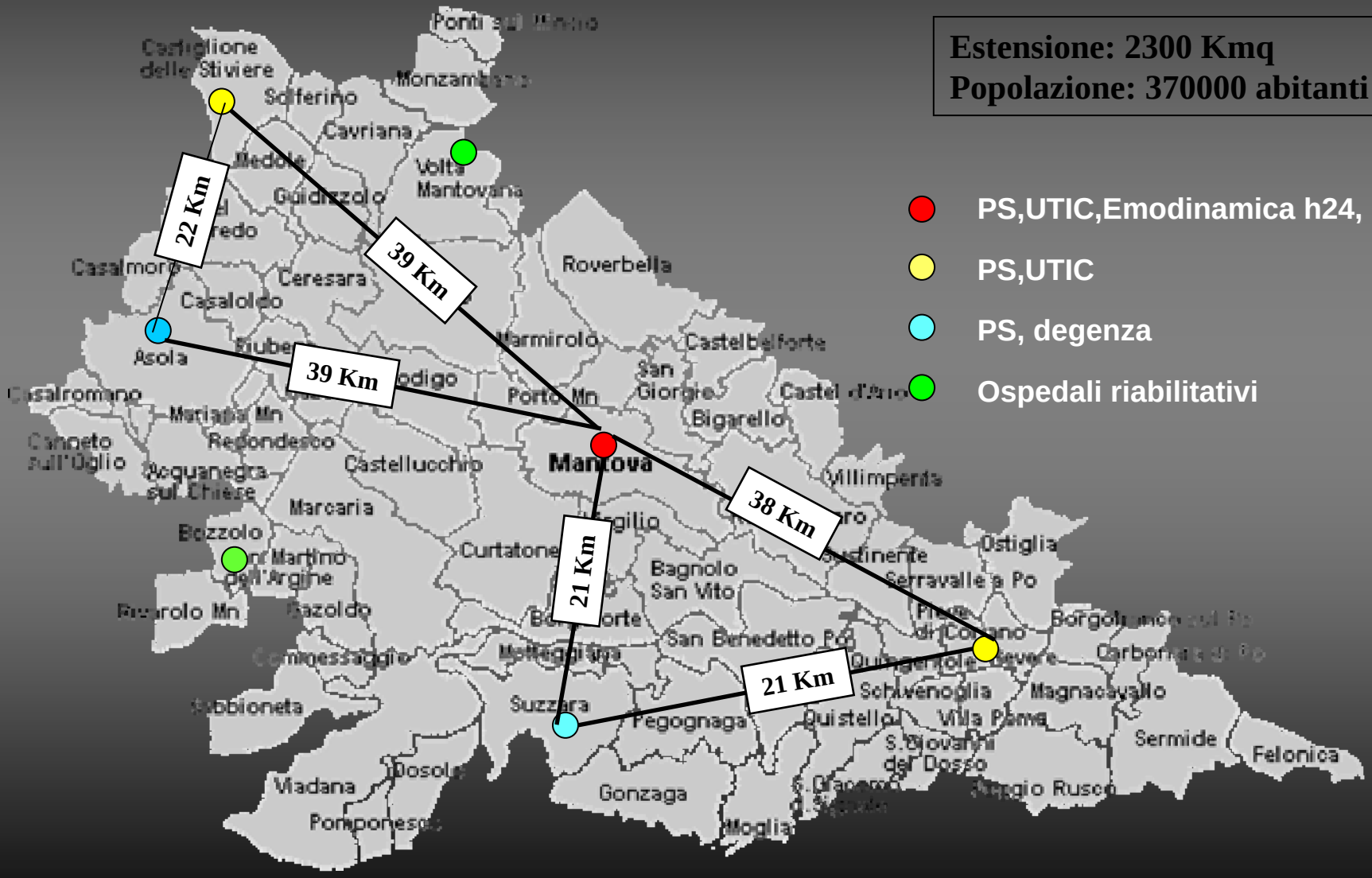


Manari A et al. Eur Heart J 2008;29:1834

Provincia di Reggio Emilia (512.000 abitanti)



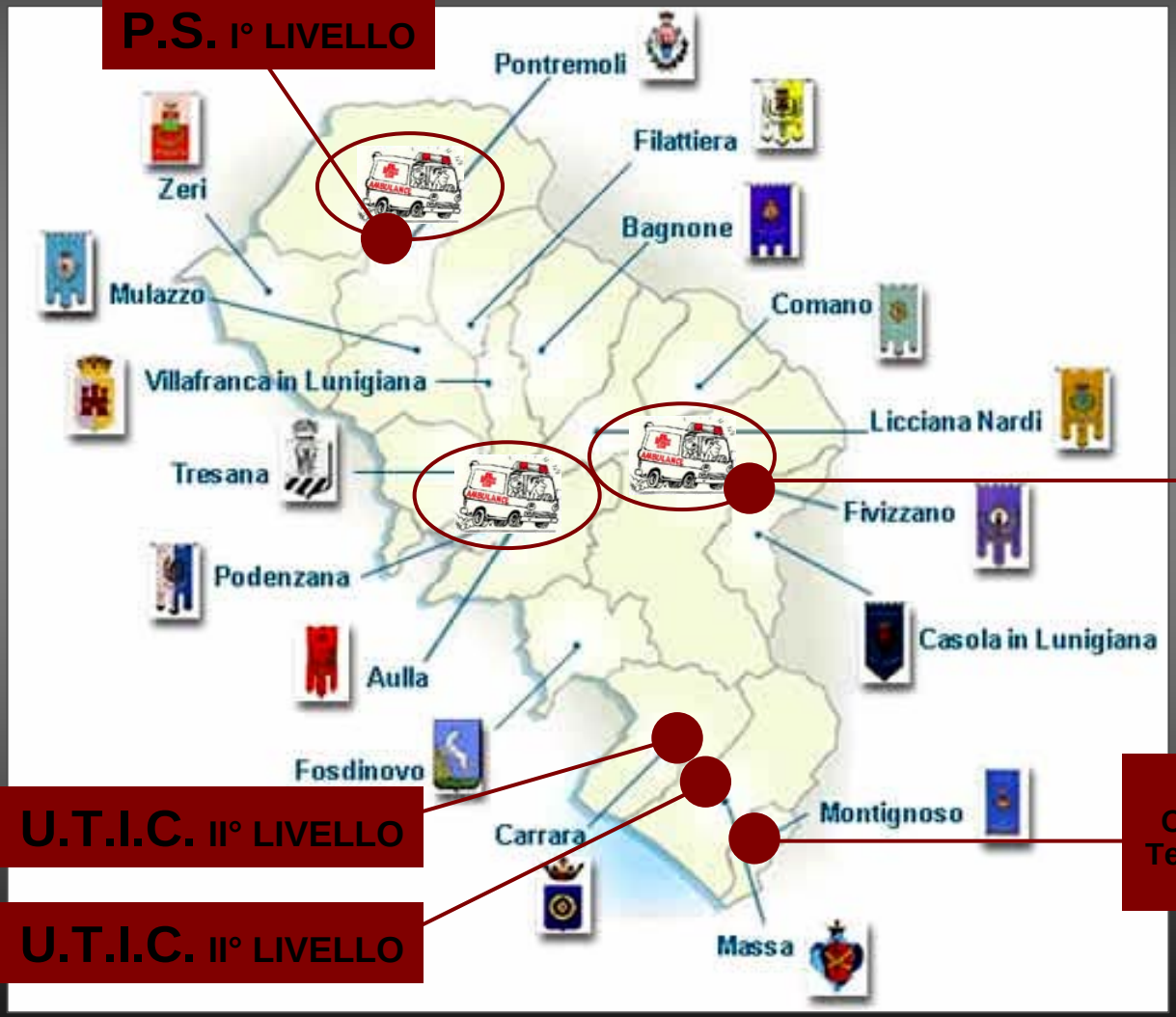
DISTRIBUZIONE DEI PRESIDI OSPEDALIERI NELLA PROVINCIA DI MANTOVA

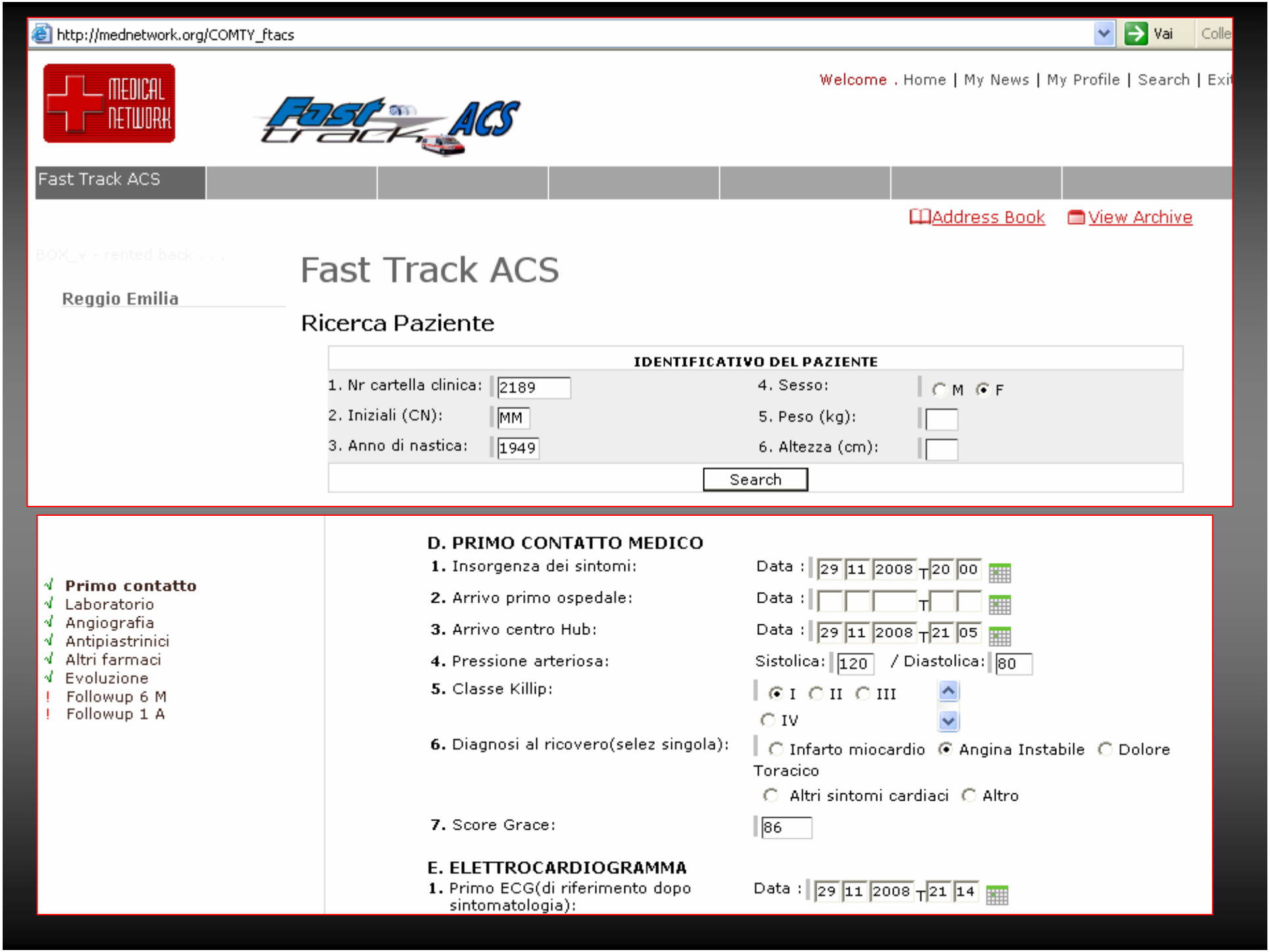


Estensione: 2300 Kmq
Popolazione: 370000 abitanti

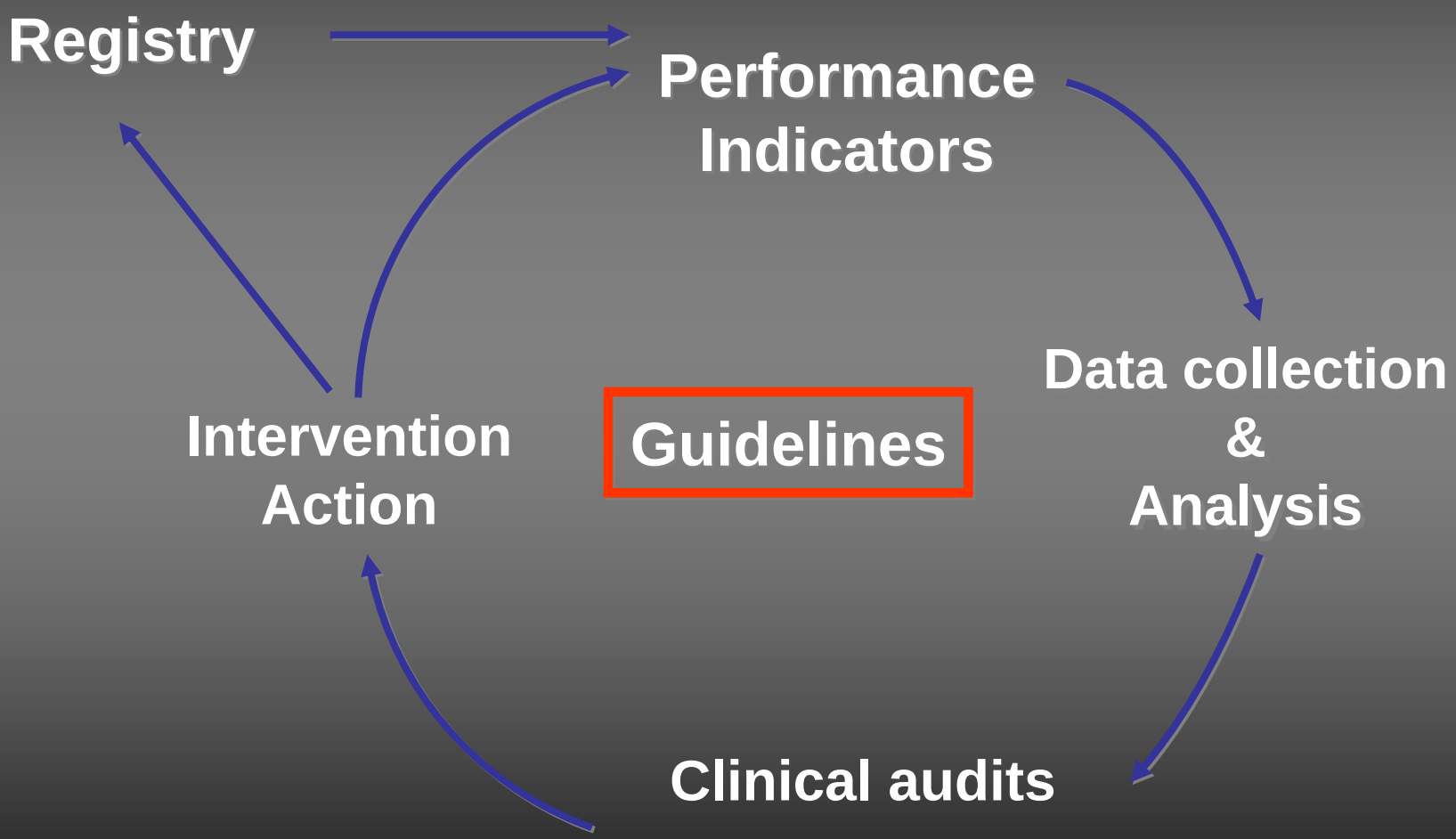
- PS,UTIC,Emodinamica h24, CaCh
- PS,UTIC
- PS, degenza
- Ospedali riabilitativi

La rete di Massa-Carrara

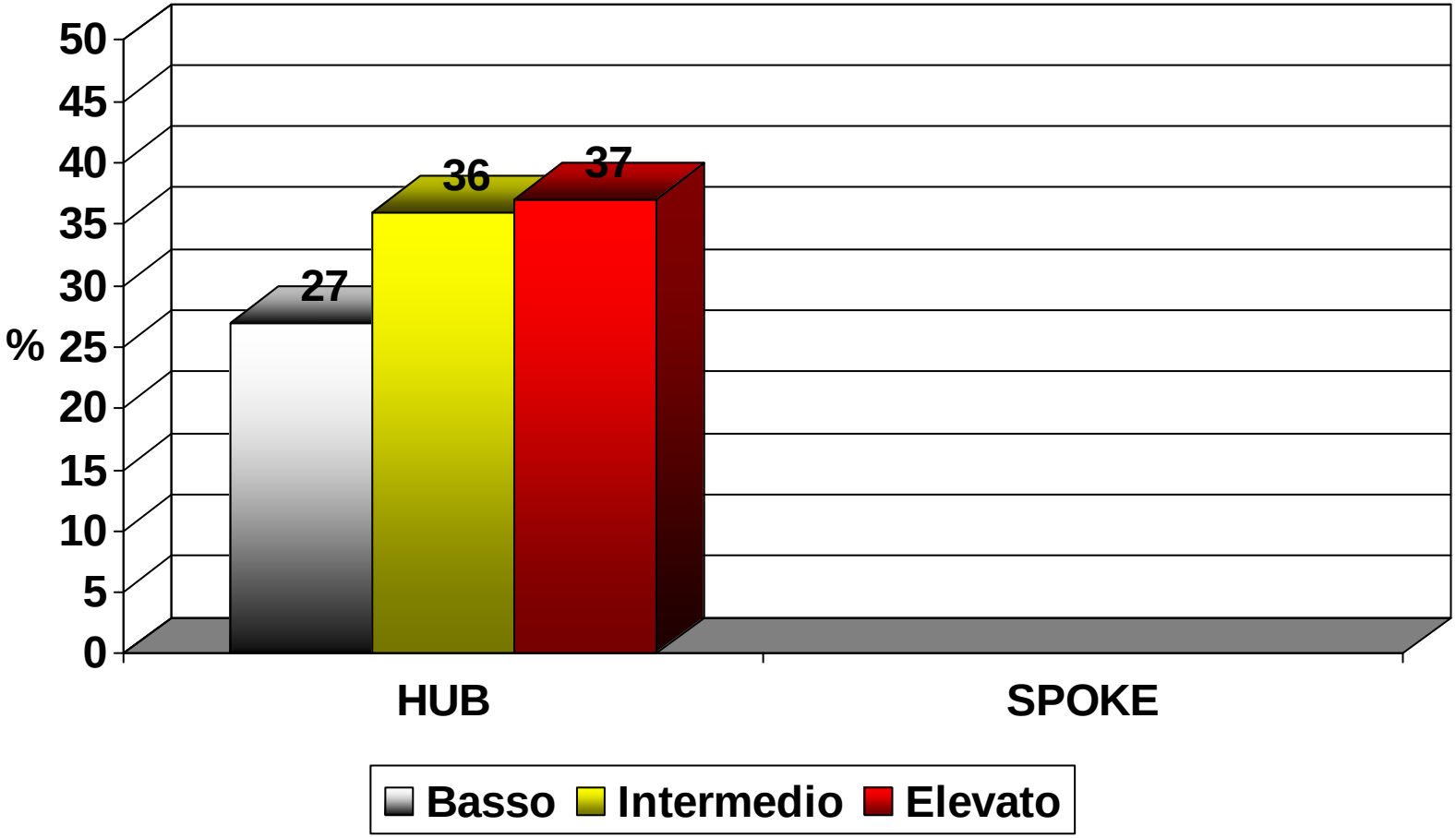



http://mednetwork.org/COMTY_ftacs
Vai
Welcome . Home | My News | My Profile | Search | Exit
MEDICAL NETWORK
Fast Track ACS
Fast Track ACS
Address Book
View Archive
Reggio Emilia
Fast Track ACS
Ricerca Paziente
IDENTIFICATIVO DEL PAZIENTE
1. Nr cartella clinica: 2189
2. Iniziali (CN): MM
3. Anno di nastica: 1949
4. Sesso: M F
5. Peso (kg):
6. Altezza (cm):
Search
√ Primo contatto
√ Laboratorio
√ Angiografia
√ Antipiastrinici
√ Altri farmaci
√ Evoluzione
! Followup 6 M
! Followup 1 A
D. PRIMO CONTATTO MEDICO
1. Insorgenza dei sintomi: Data : 29 11 2008 T 20 00
2. Arrivo primo ospedale: Data : T
3. Arrivo centro Hub: Data : 29 11 2008 T 21 05
4. Pressione arteriosa: Sistolica: 120 / Diastolica: 80
5. Classe Killip: I II III IV
6. Diagnosi al ricovero(selez singola): Infarto miocardio Angina Instabile Dolore Toracico Altri sintomi cardiaci Altro
7. Score Grace: 86
E. ELETTROCARDIOGRAMMA
1. Primo ECG(di riferimento dopo sintomatologia): Data : 29 11 2008 T 21 14

Quality Improvement Processes

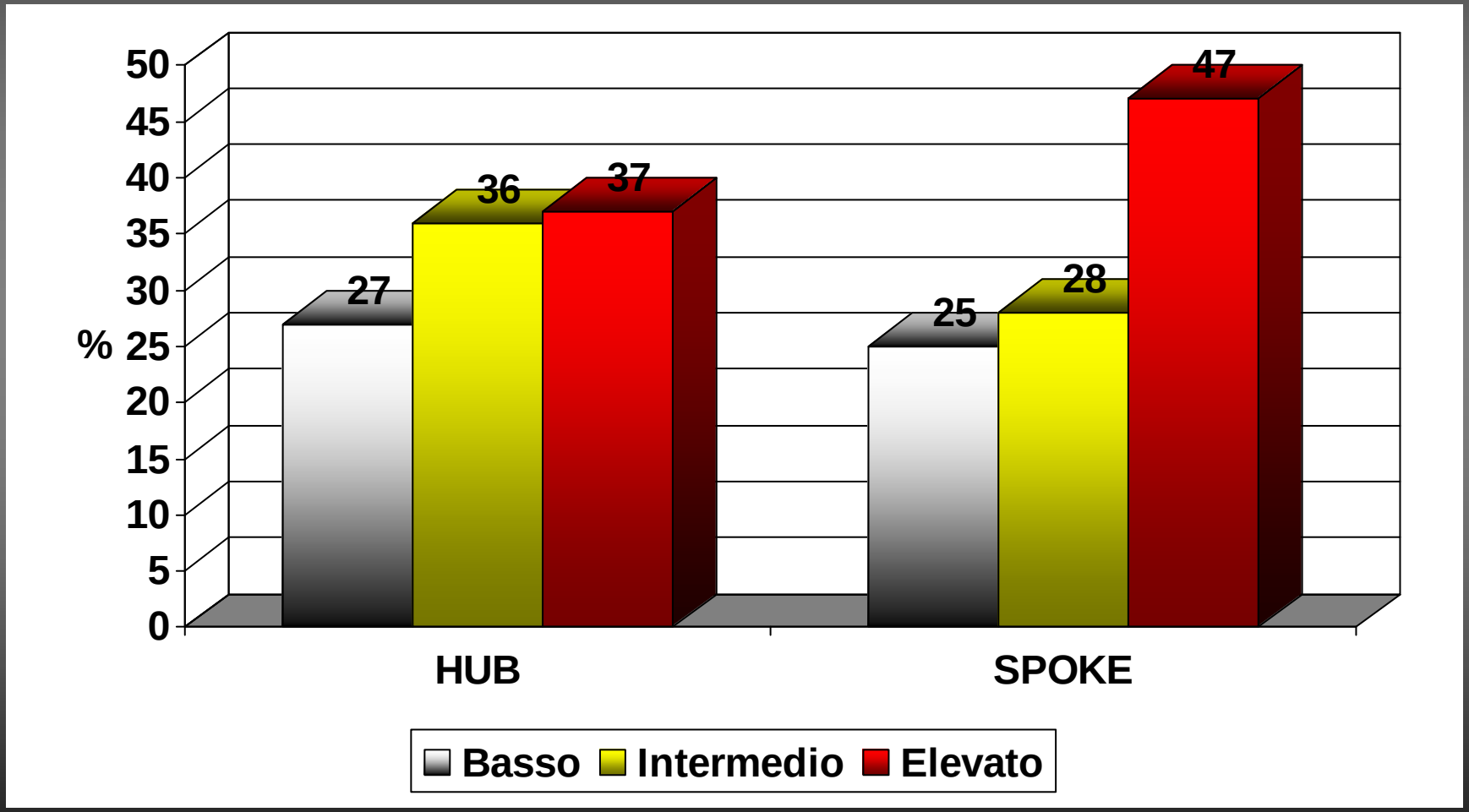


Risk profile in patients undergoing Angiography



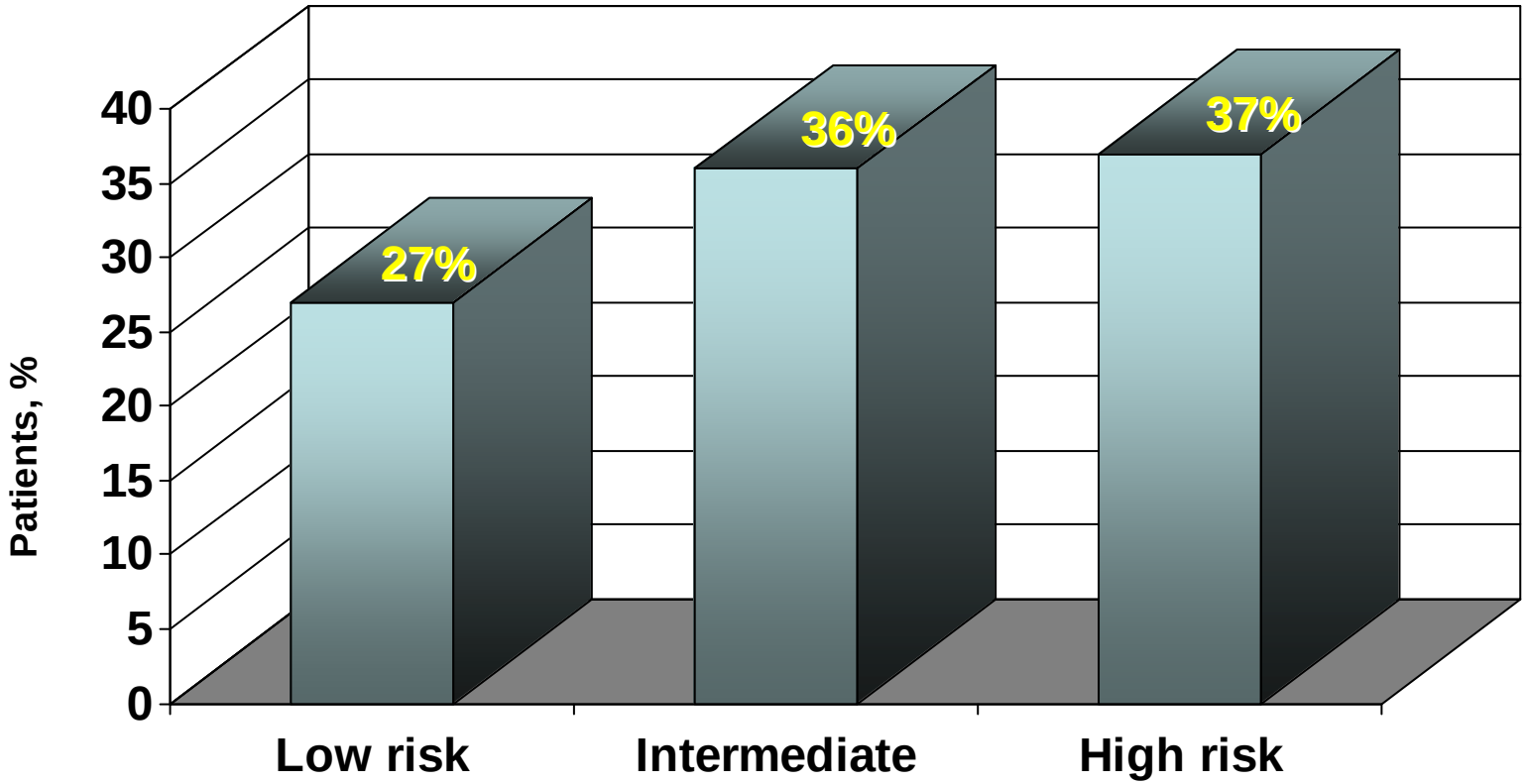
(Grace Score)

Risk profile in patients undergoing Angiography



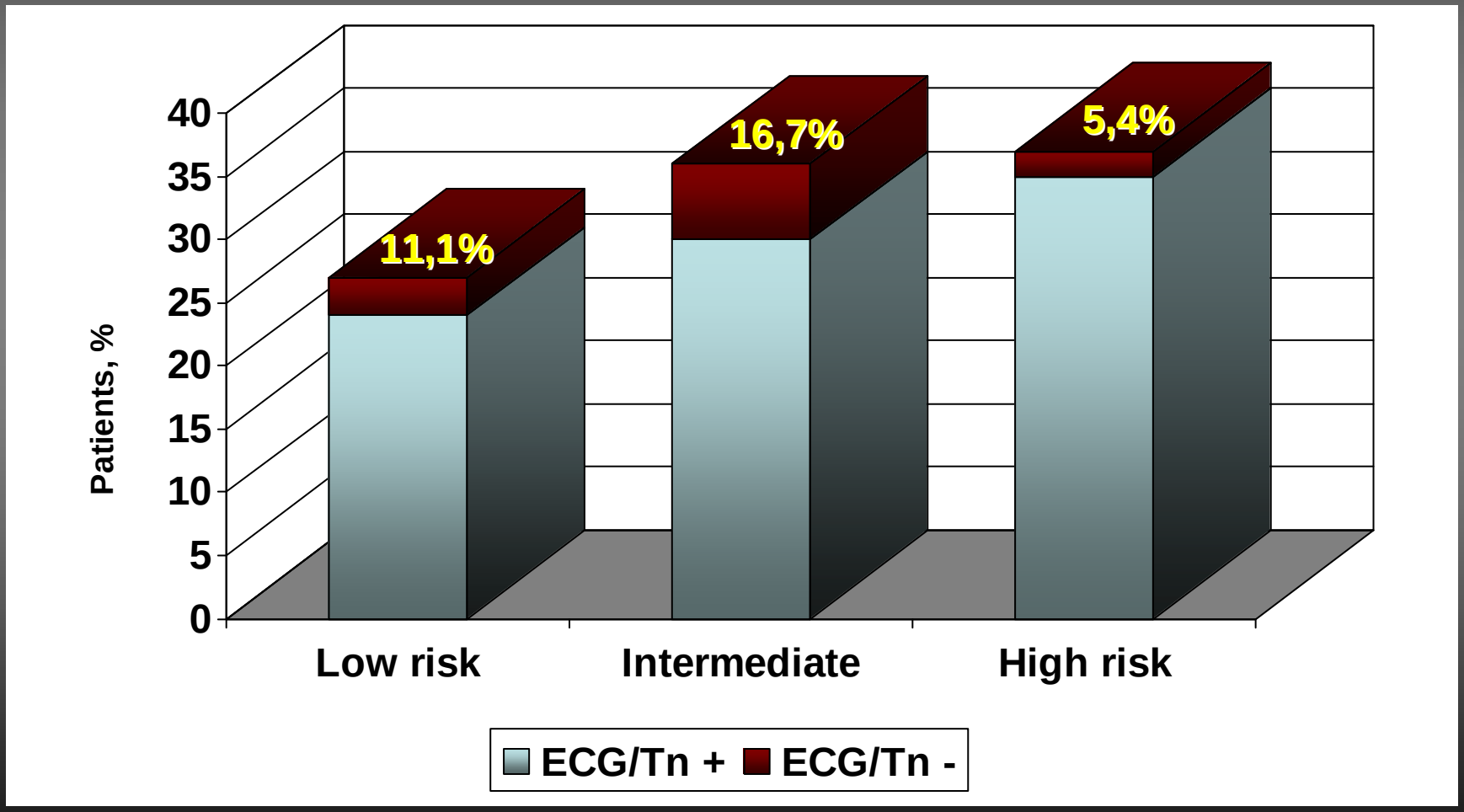
(Grace Score)

Risk profile in patients undergoing Angiography in Hub Centers



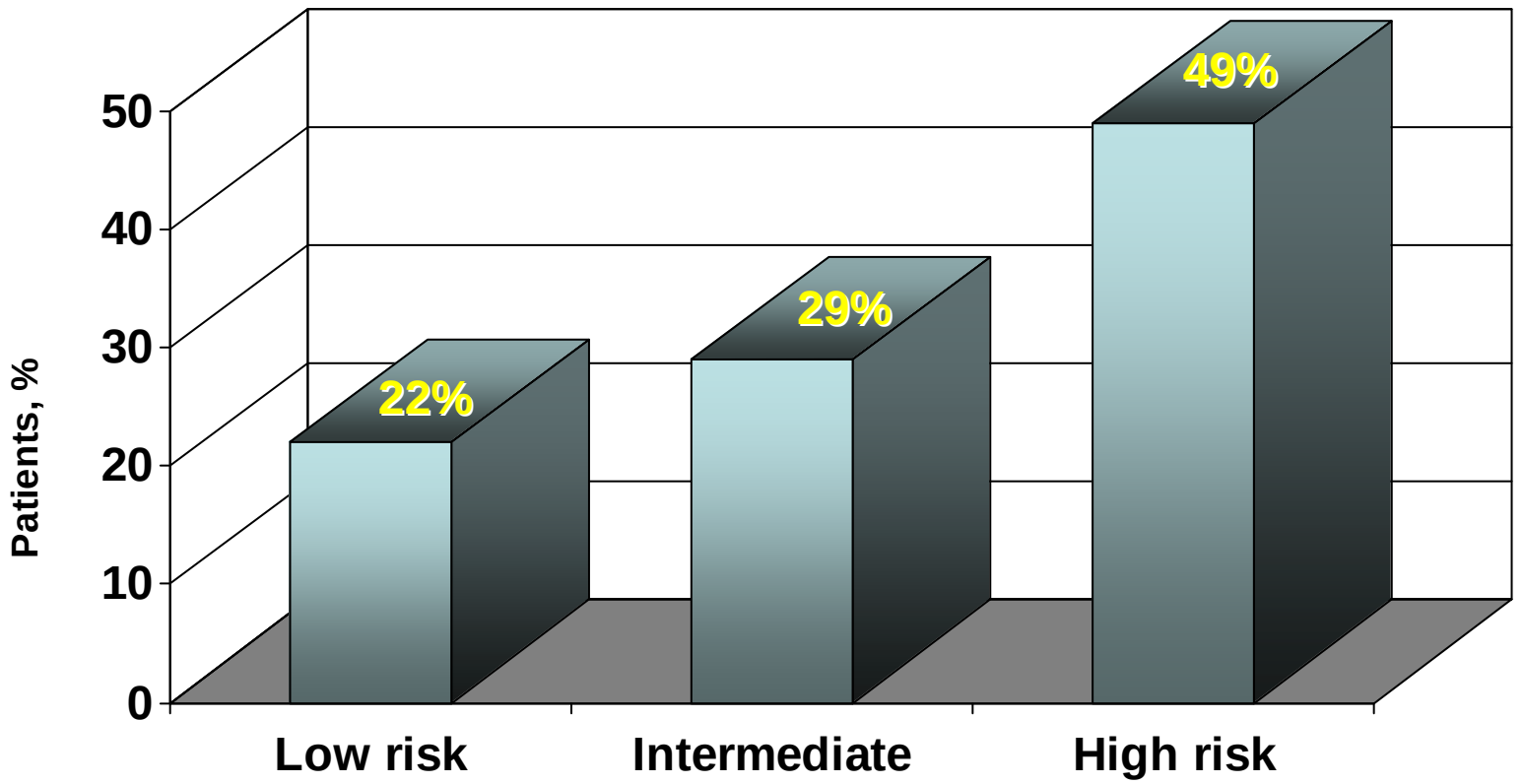
(Grace Score)

Risk profile in patients undergoing Angiography in Hub Centers



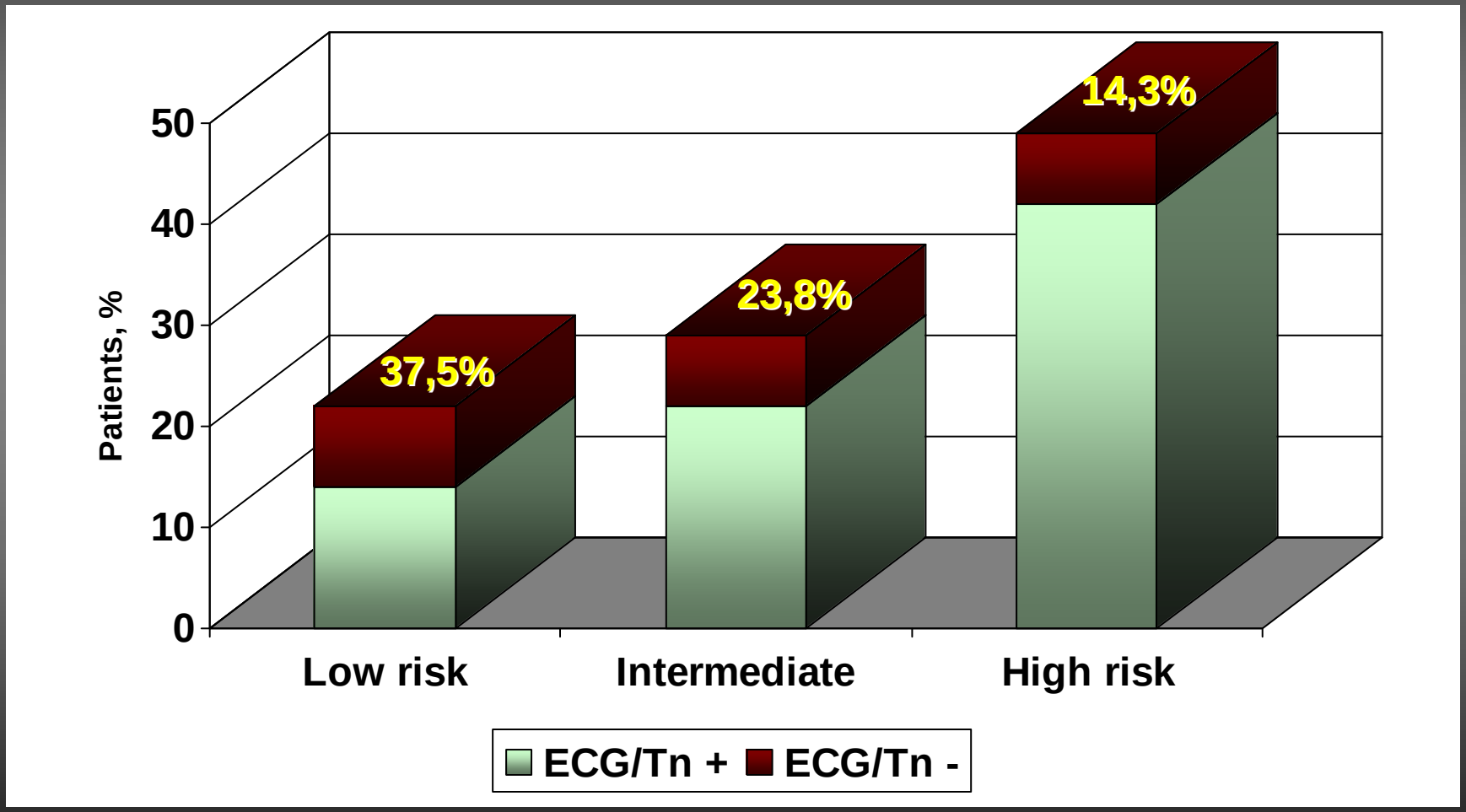
(Grace Score)

Risk profile in patients undergoing Angiography in Spokes Centers

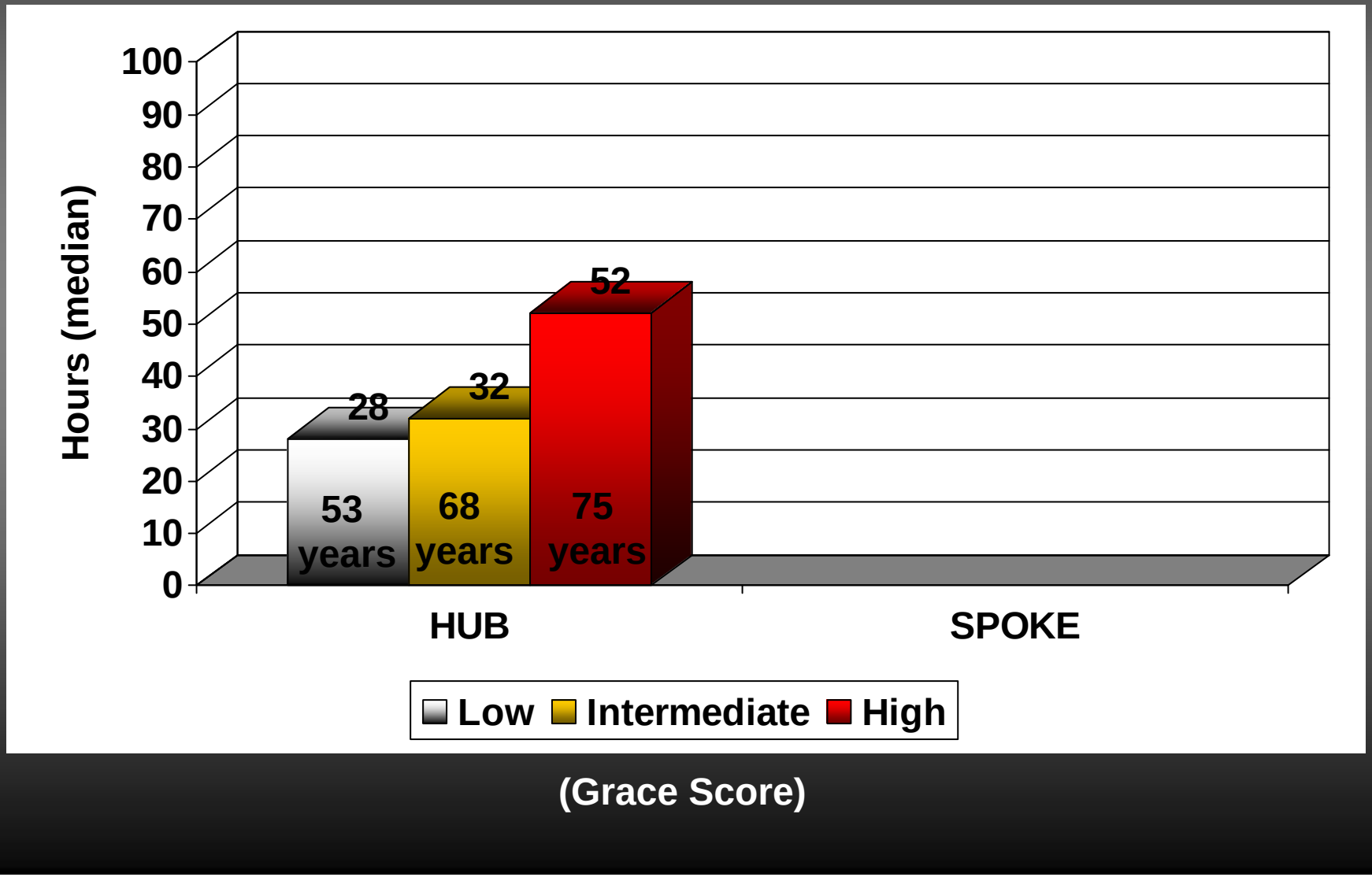


(Grace Score)

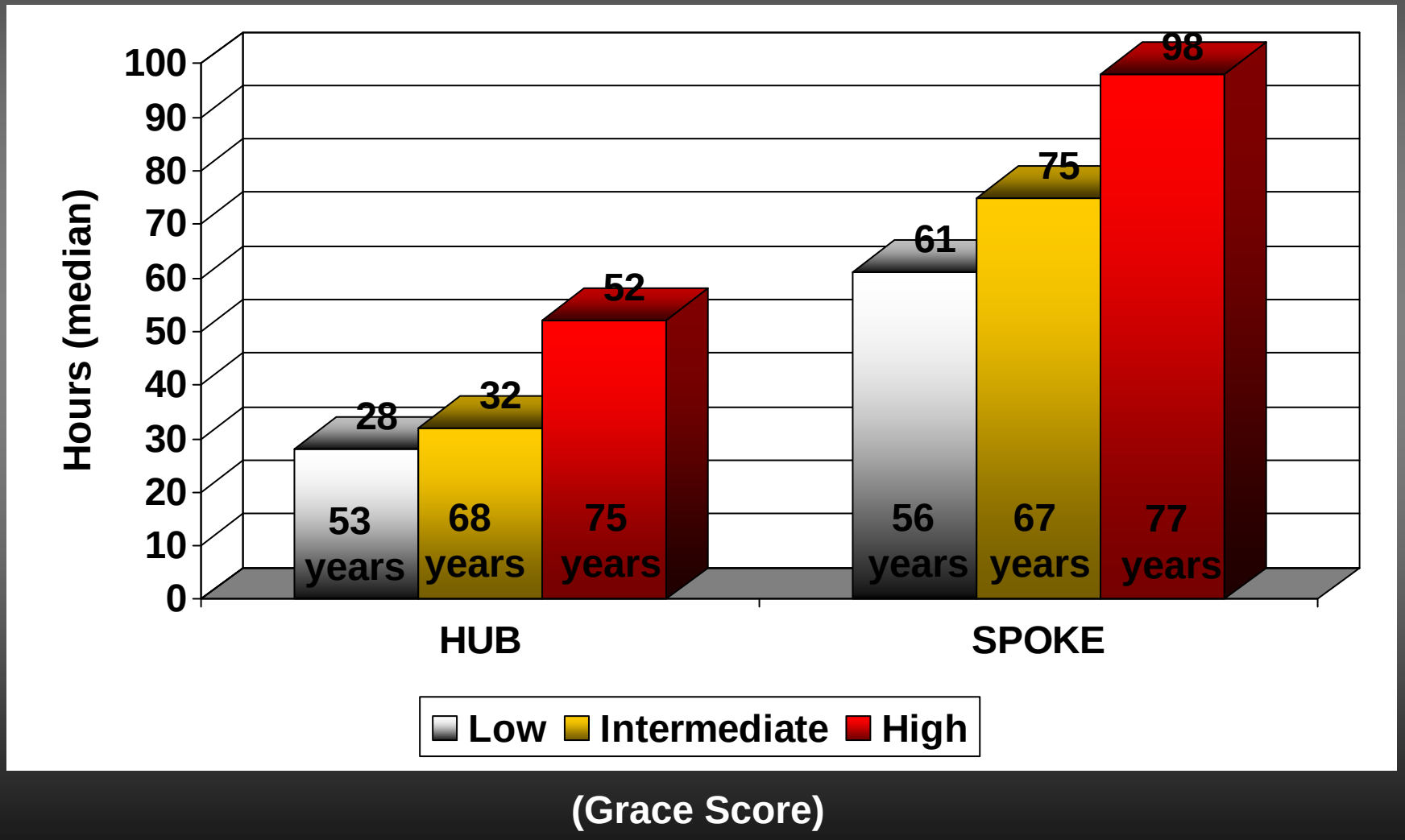
Risk profile in patients undergoing Angiography in Spokes Centers



Admission – Angio delay



Admission – Angio delay



Conclusions

- In the real world setting, patients with the highest predicted risk mortality are least likely to be transferred early and do not undergo risk stratification with guideline-recomended diagnostic procedures.
- A running STEMI inter-hospital network is not enough to improve a right application of guidelines for NSTEMI (in particular for patients first admitted to the community Hospital centers).

Relazione Angiografia-Score di rischio