STEMI-Leitlinien der European Society of Cardiology und STEMI-Register Leipzig – Was ist neu?

Holger Thiele

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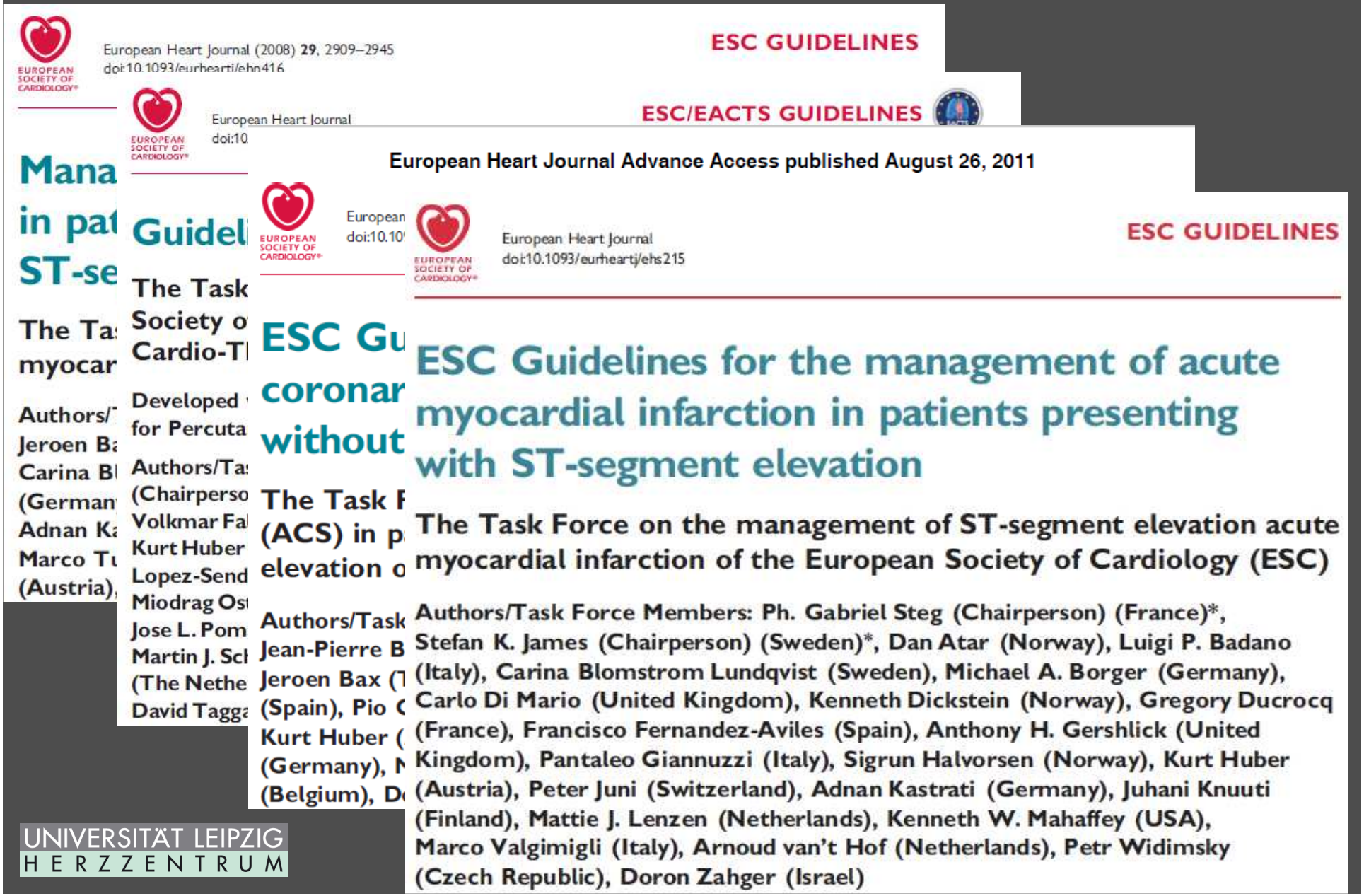
Leitlinien



European Heart Journal (2008) **29**, 2909–2945
doi:10.1093/eurheartj/ehn416

ESC GUIDELINES

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Authors/
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Carina Bl
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Adnan Ka
Marco Tu
(Austria),

European Heart Journal
doi:10

ESC/EACTS GUIDELINES

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Lopez-Send
Miodrag Ost
Jose L. Pom
Martin J. Sch
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David Tagga

European Heart Journal Advance Access published August 26, 2011

European
doi:10.10

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Kurt Huber (
(Germany), N
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European Heart Journal
doi:10.1093/eurheartj/ehs215

ESC GUIDELINES

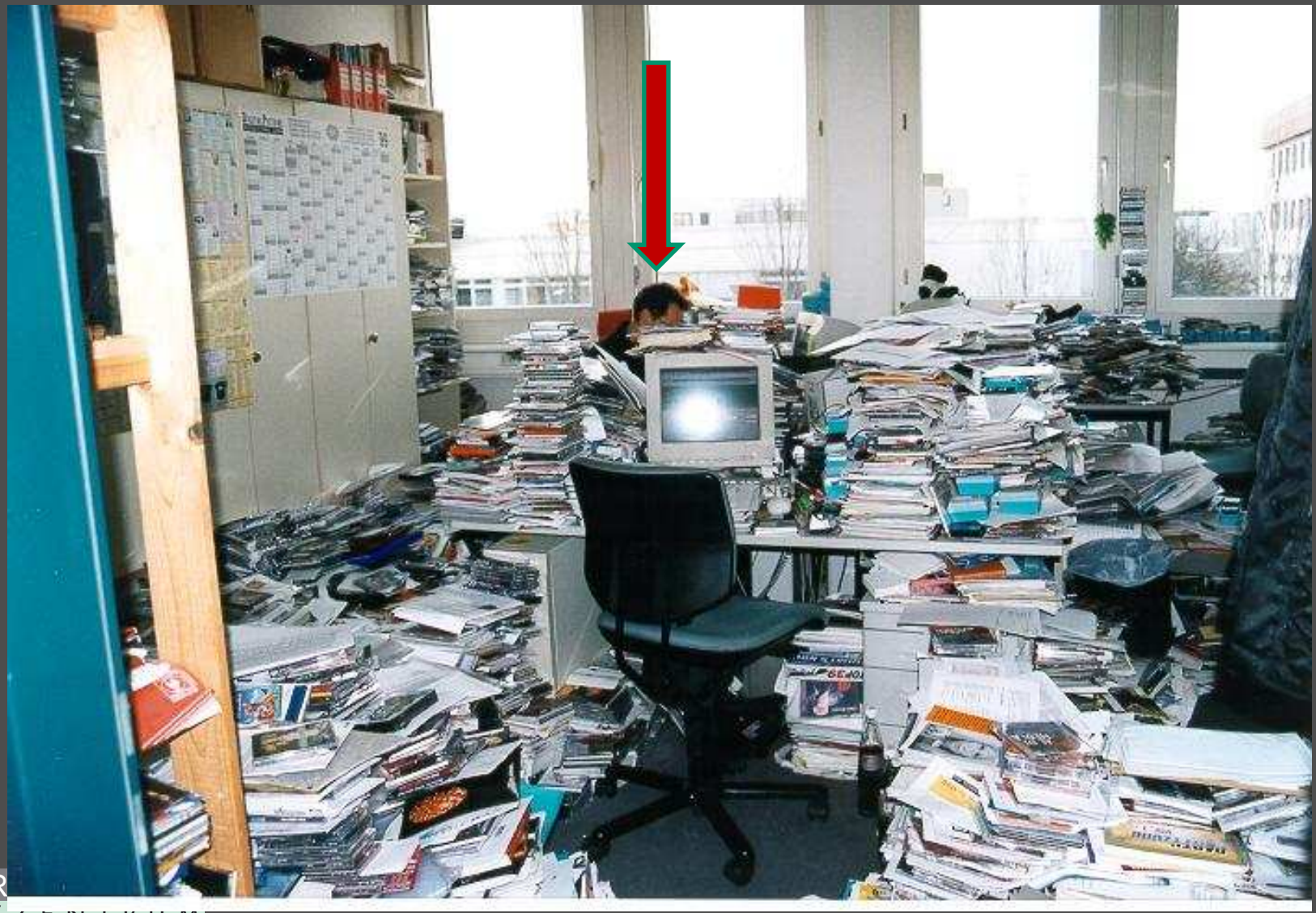
ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

The Task Force on the management of ST-segment elevation acute myocardial infarction of the European Society of Cardiology (ESC)

Authors/Task Force Members: Ph. Gabriel Steg (Chairperson) (France)*, Stefan K. James (Chairperson) (Sweden)*, Dan Atar (Norway), Luigi P. Badano (Italy), Carina Blomstrom Lundqvist (Sweden), Michael A. Borger (Germany), Carlo Di Mario (United Kingdom), Kenneth Dickstein (Norway), Gregory Ducrocq (France), Francisco Fernandez-Aviles (Spain), Anthony H. Gershlick (United Kingdom), Pantaleo Giannuzzi (Italy), Sigrun Halvorsen (Norway), Kurt Huber (Austria), Peter Juni (Switzerland), Adnan Kastrati (Germany), Juhani Knuuti (Finland), Mattie J. Lenzen (Netherlands), Kenneth W. Mahaffey (USA), Marco Valgimigli (Italy), Arnoud van't Hof (Netherlands), Petr Widimsky (Czech Republic), Doron Zahger (Israel)

Leitlinien

“Lokaler SOP-Verantwortlicher“



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Empfehlungs-Klassen

Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommmended/ is indicated.
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*	*Should be considered.*
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*	May be considered.
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended.

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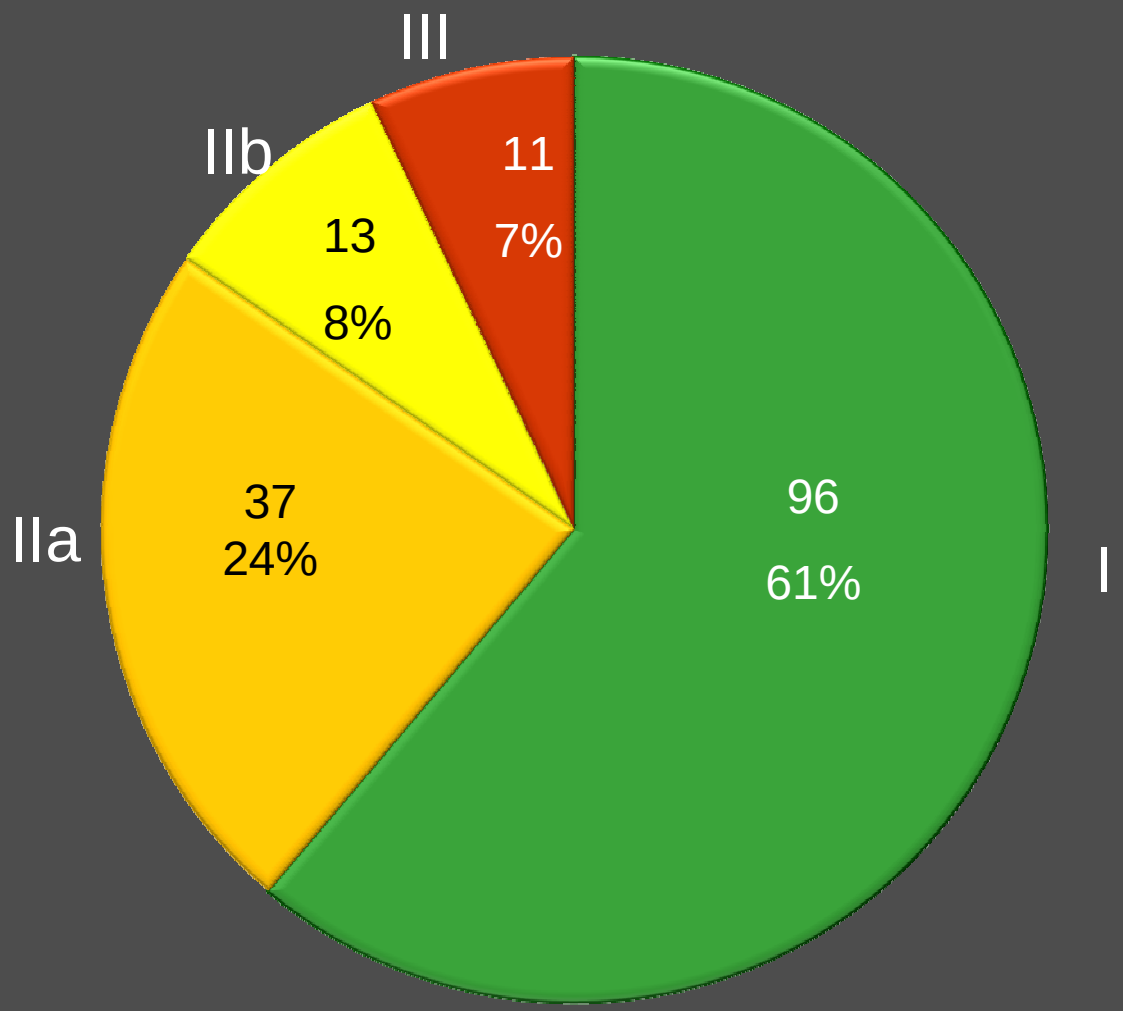
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Empfehlungs-Klassen

157 Empfehlungen



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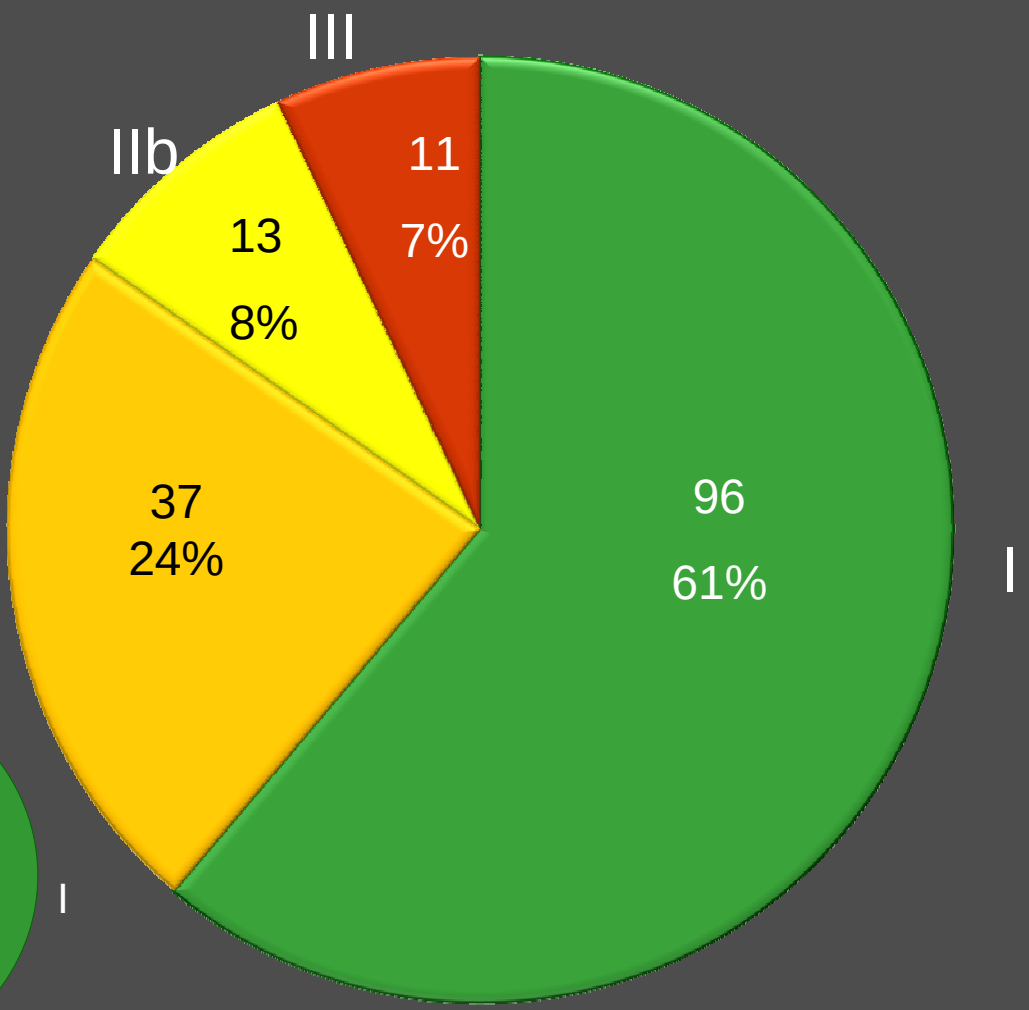
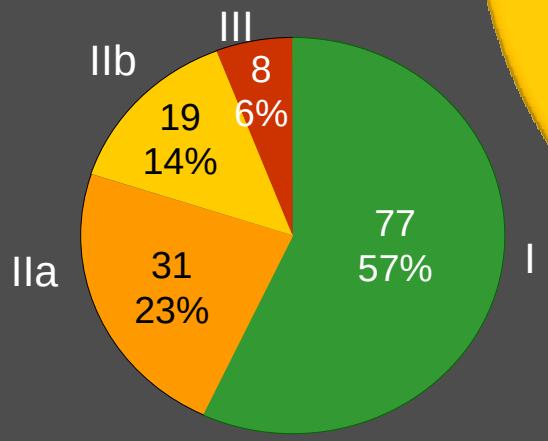
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Empfehlungs-Klassen

157 Empfehlungen



135 Empfehlungen in ESC 2008



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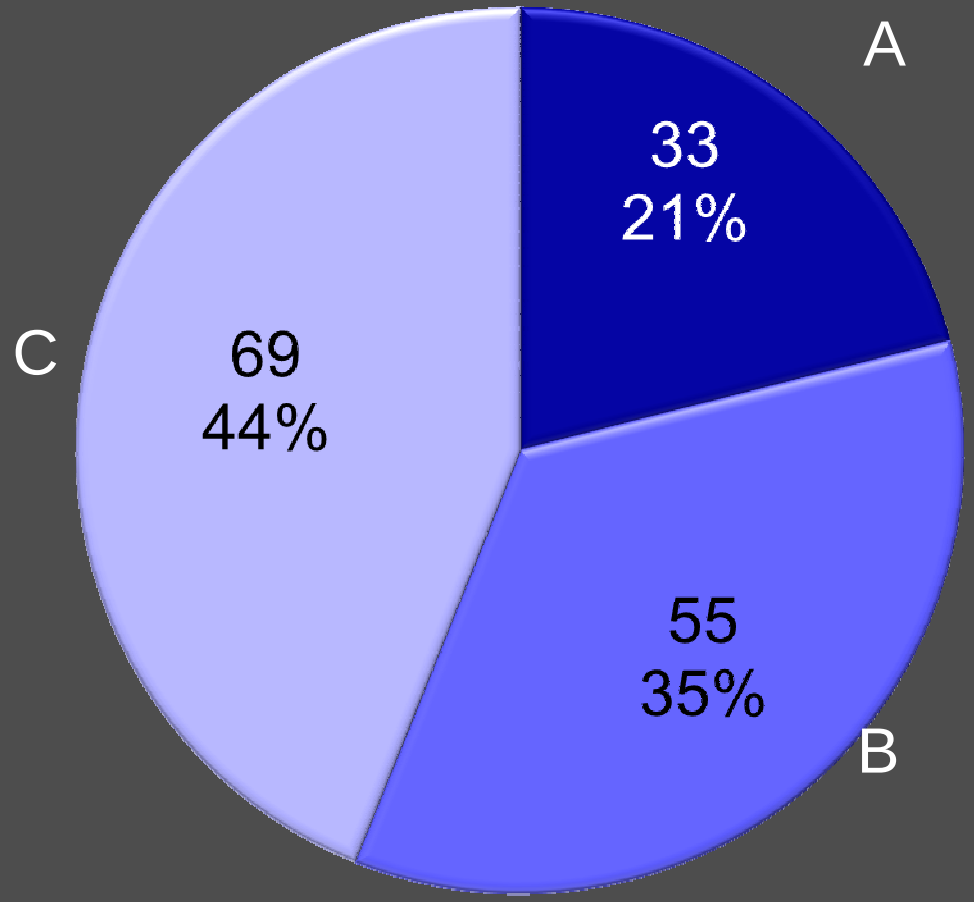
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Evidenz-Level

Level of Evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of Evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of Evidence C	Consensus of opinion of the experts and/ or small studies, retrospective studies, registries.

Evidenz-Level

157 Empfehlungen basierend auf 346 Referenzen



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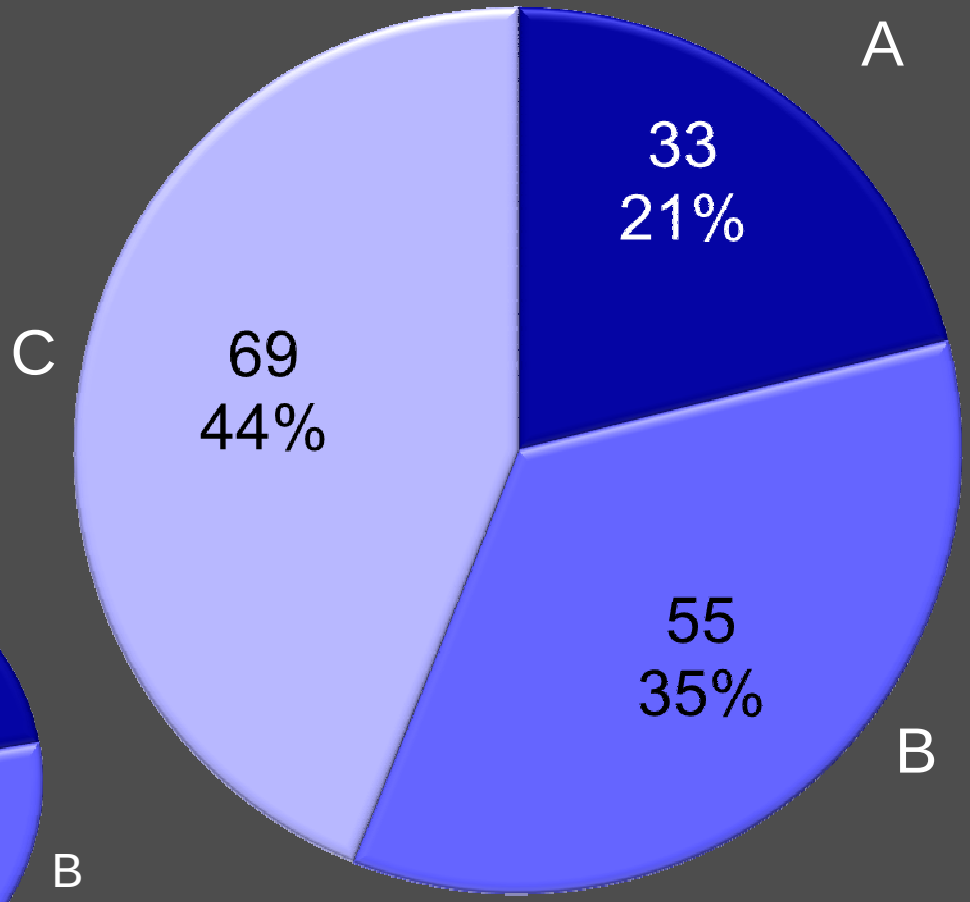
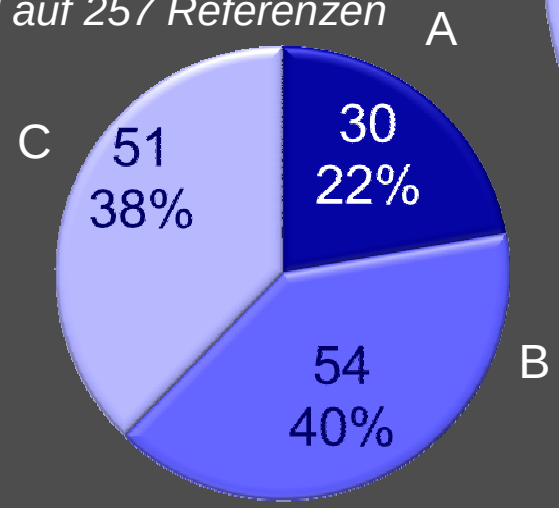
Evidenz-Level

157 Empfehlungen
basierend auf 346
Referenzen



ESC 2008
135 Empfehlungen
basierend auf 257 Referenzen



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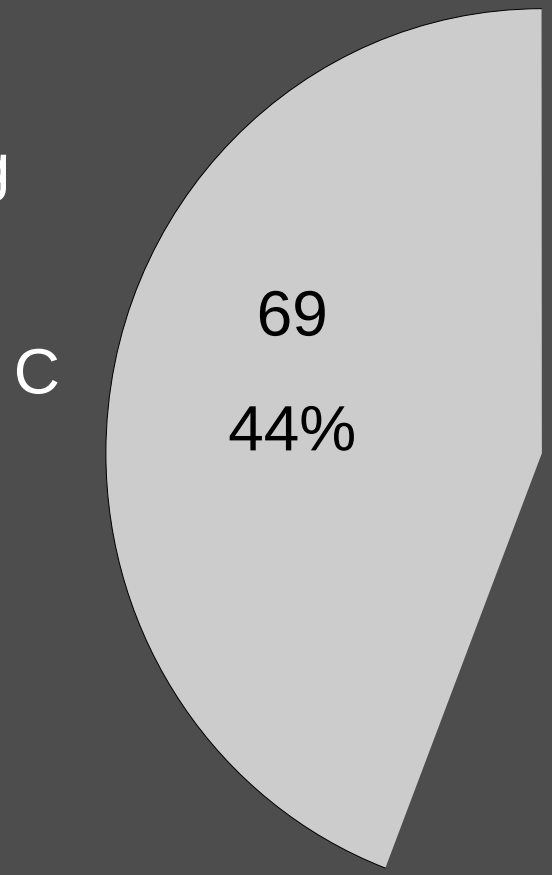
Evidenz-Level

Notwendigkeit der weiteren Forschung

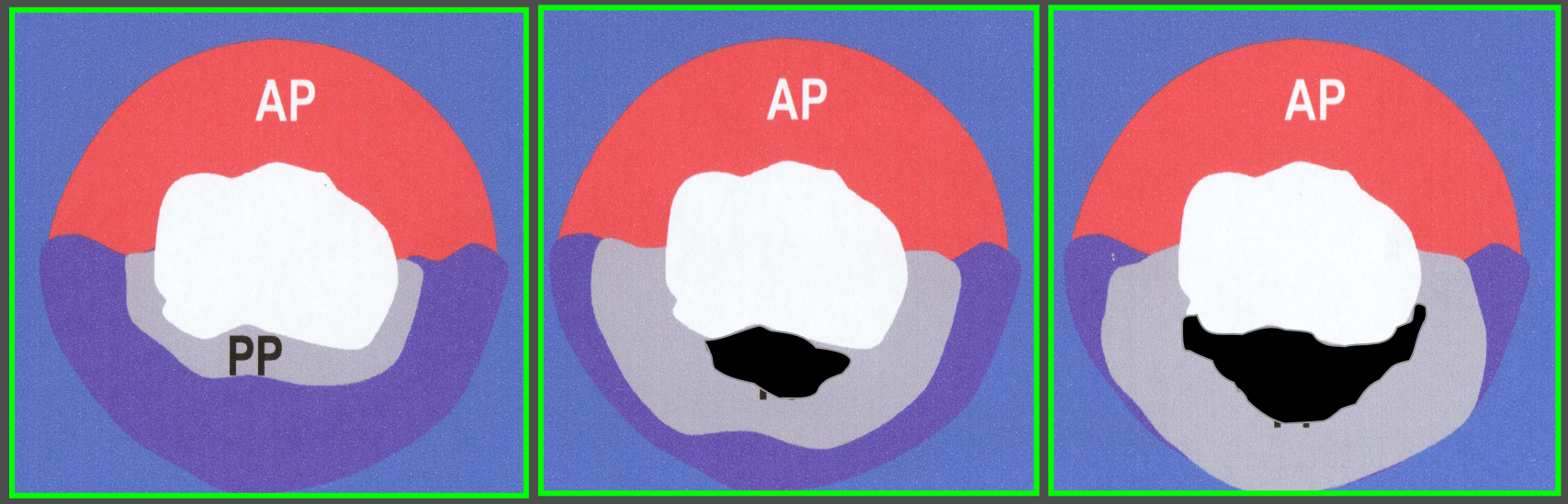


Was ist neu?

- Frühe Diagnose
  - Erweiterte Sektion, atypische Präsentation
- Herzstillstand
  - Erweiterte Sektion. Rolle der therapeutischen Hypothermie und Angiographie.
- Prähospitale Logistik
  - Erweiterte Sektion, Rolle der prähospitalen Diagnose, Triage und Netzwerke betont
- Reperfusionsstrategien
  - Modifizierte Empfehlungen zu maximalen Zeitverzögerungen
- PCI Strategien
  - Stentempfehlungen, antithrombotische Therapie
- Routinetherapie und Strategien
  - Dauer der KH-Behandlung, Sekundärprävention, Dauer der antithrombotischen Therapie, Evaluation der LV-Funktion und Vitalität

Wellenfrontphänomen - Tierversuch

Auftreten von No-reflow (Mikrovaskuläre Obstruktion)



40 Min.
ca. 25% Nekrose

3 h
ca. 60% Nekrose

24 h
>90% Nekrose

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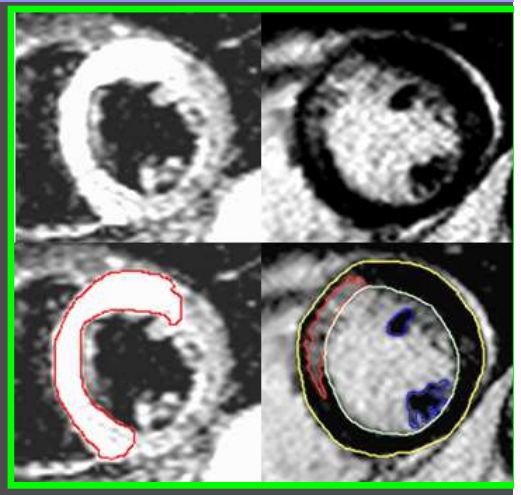
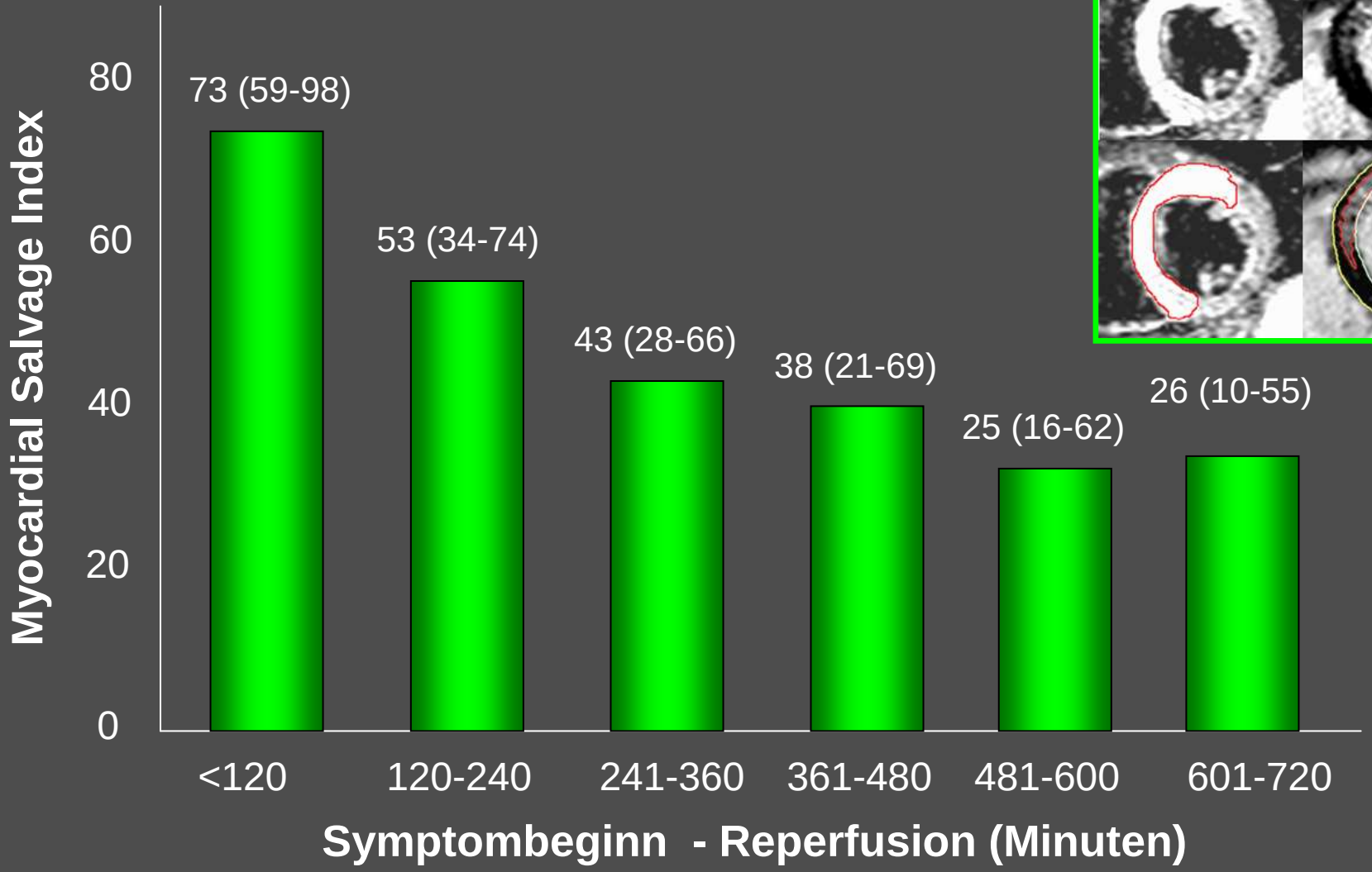
Jennings et al. Circulation 1983;68:25-36

Ischämiezeit und Myocardial Salvage





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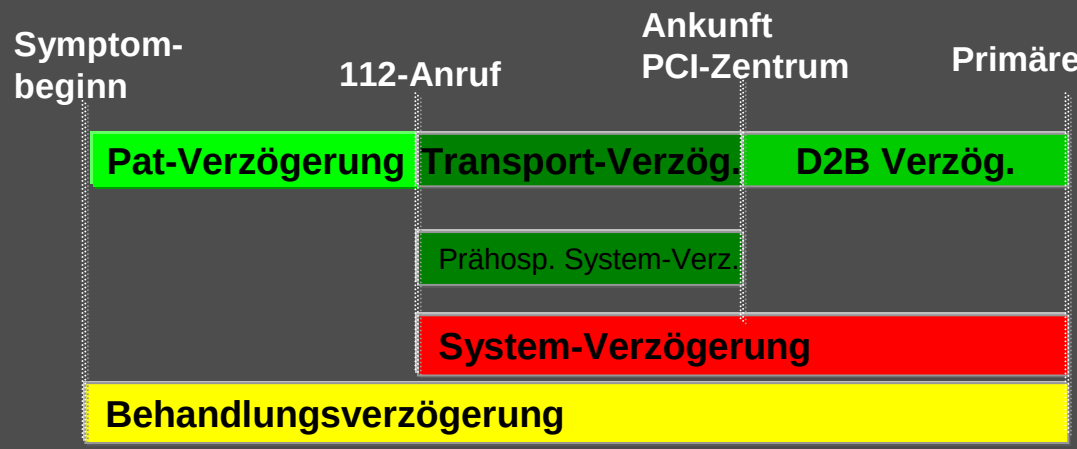
Eitel et al. JACC 2010; 55:2470-2479

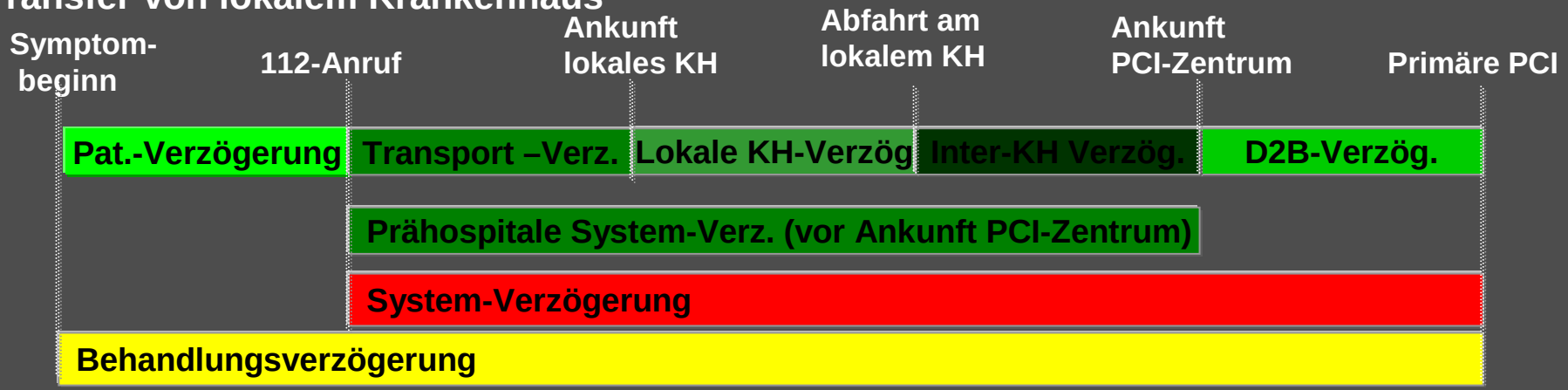
System-Verzögerungen und Outcome

Dänemark, 3 high-volume PCI Zentren 2002-2008, 6209 primäre PCI Patienten

Prähospitale Triage zum PCI Zentrum



Transfer von lokalem Krankenhaus



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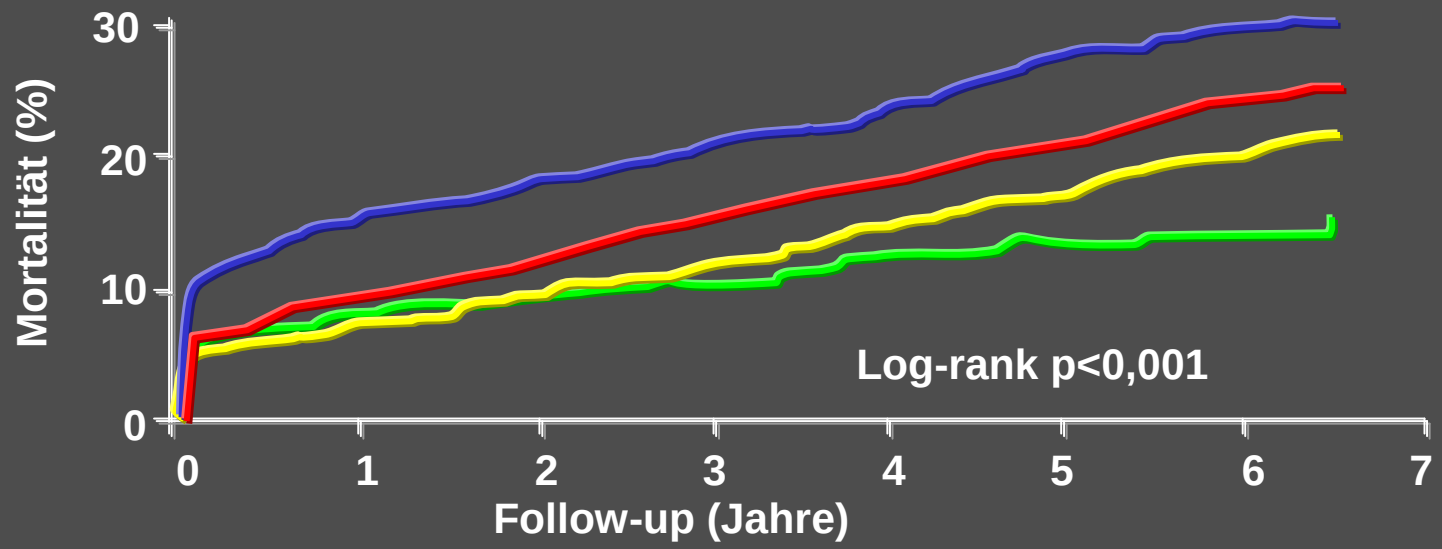
Terkelsen et al. JAMA 2010;304:763-771

System-Verzögerung und Outcome

Dänemark, 3 high-volume PCI Zentren 2002-2008, 6209 primäre PCI Patienten



No. at risk System-Verzögerung (min)							
0-60	347	311	278	230	192	138	87
61-120	2643	2339	1906	1420	1006	667	375
121-180	2092	1836	1503	1183	842	533	278
181-360	1127	923	765	647	491	332	172

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Terkelsen et al. JAMA 2010;304:763-771

Wichtige Behandlungsziele

Delay	Target
Preferred for FMC to ECG and diagnosis	**≤10 min**
Preferred for FMC to fibrinolysis ('FMC to needle')	**≤30 min**
Preferred for FMC to primary PCI ('door to balloon') in primary PCI hospitals	**≤60 min**
Preferred for FMC to primary PCI	**≤90 min** (≤60 min if early presenter with large area at risk)
Acceptable for primary PCI rather than fibrinolysis	**≤120 min** (≤90 min if early presenter with large area at risk) if this target cannot be met, consider fibrinolysis.
Preferred for successful fibrinolysis to angiography	**3–24 h**

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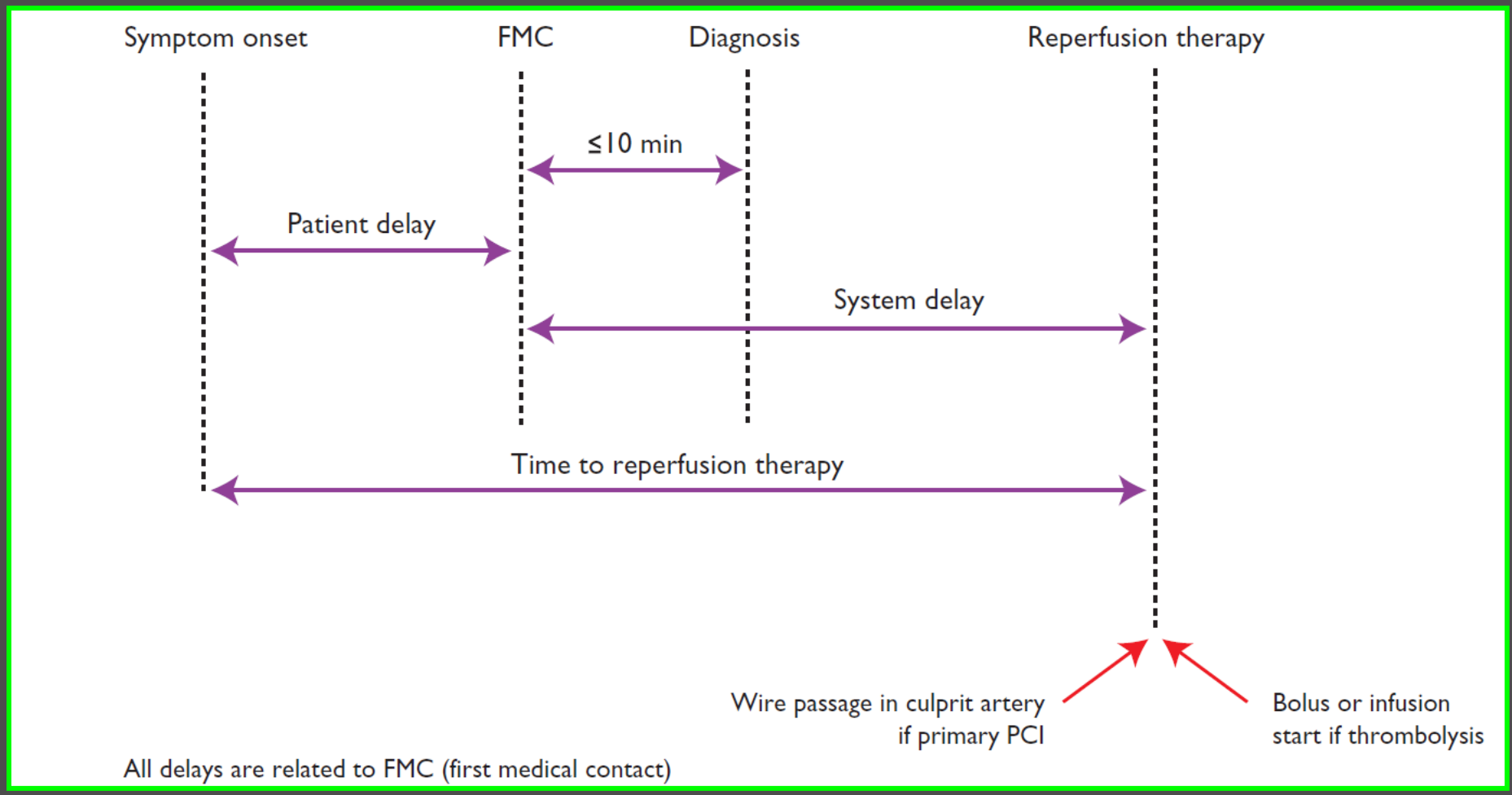
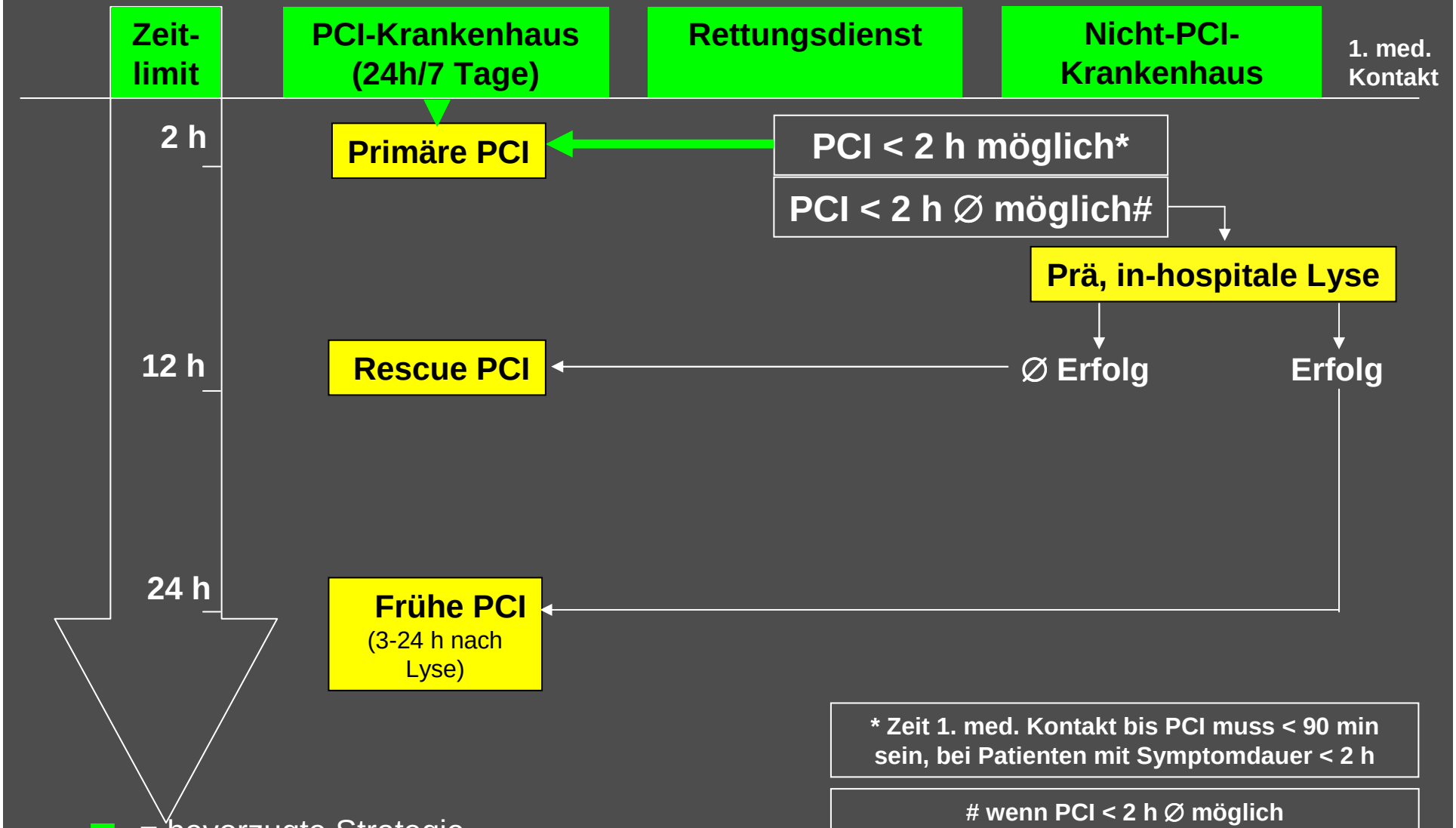
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Definition: Komponenten des Zeitverlustes



Steg et al. Eur Heart J 2012;epub ahead of print 26.08.2012

Reperfusionsstrategien bei STEMI



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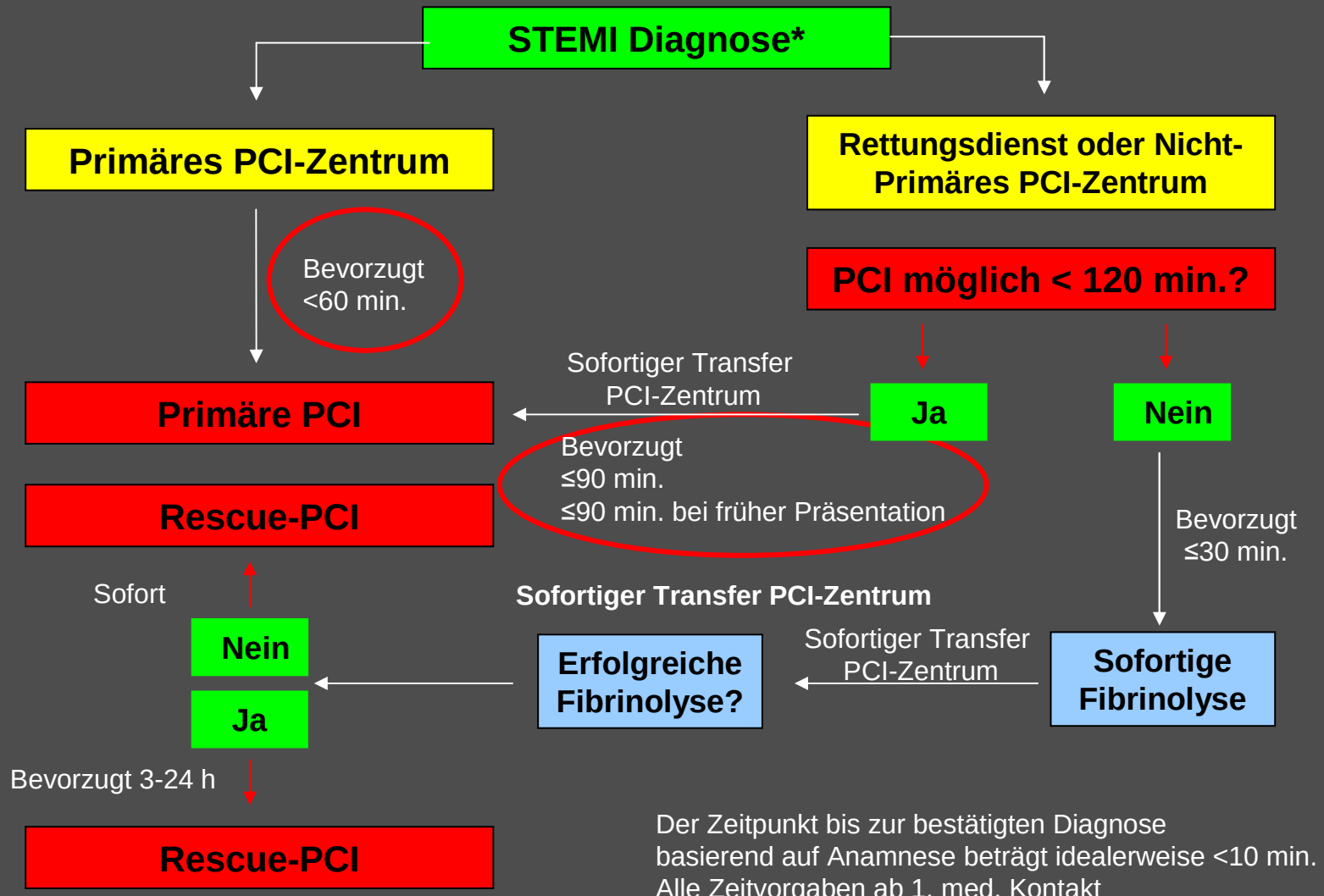
ESC STEMI Guidelines. Eur Heart J.2008;29:2909-2945

Reperfusionsstrategien bei STEMI



Der Zeitpunkt bis zur bestätigten Diagnose basierend auf Anamnese beträgt idealerweise <10 min.
Alle Zeitvorgaben ab 1. med. Kontakt

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Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Prähospitale Logistik

Recommendations	Class[a]	Level[b]
Ambulance teams must be trained and equipped to identify STEMI (with use of ECG recorders and telemetry as necessary) and administer initial therapy, including thrombolysis where applicable.	I	B
The prehospital management of STEMI patients must be based on regional networks designed to deliver reperfusion therapy expeditiously and effectively, with efforts made to make primary PCI available to as many patients as possible.	I	B
Primary PCI-capable centres must deliver a 24/7 service and be able to start primary PCI as soon as possible but always within 60 min from the initial call.	I	B

Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

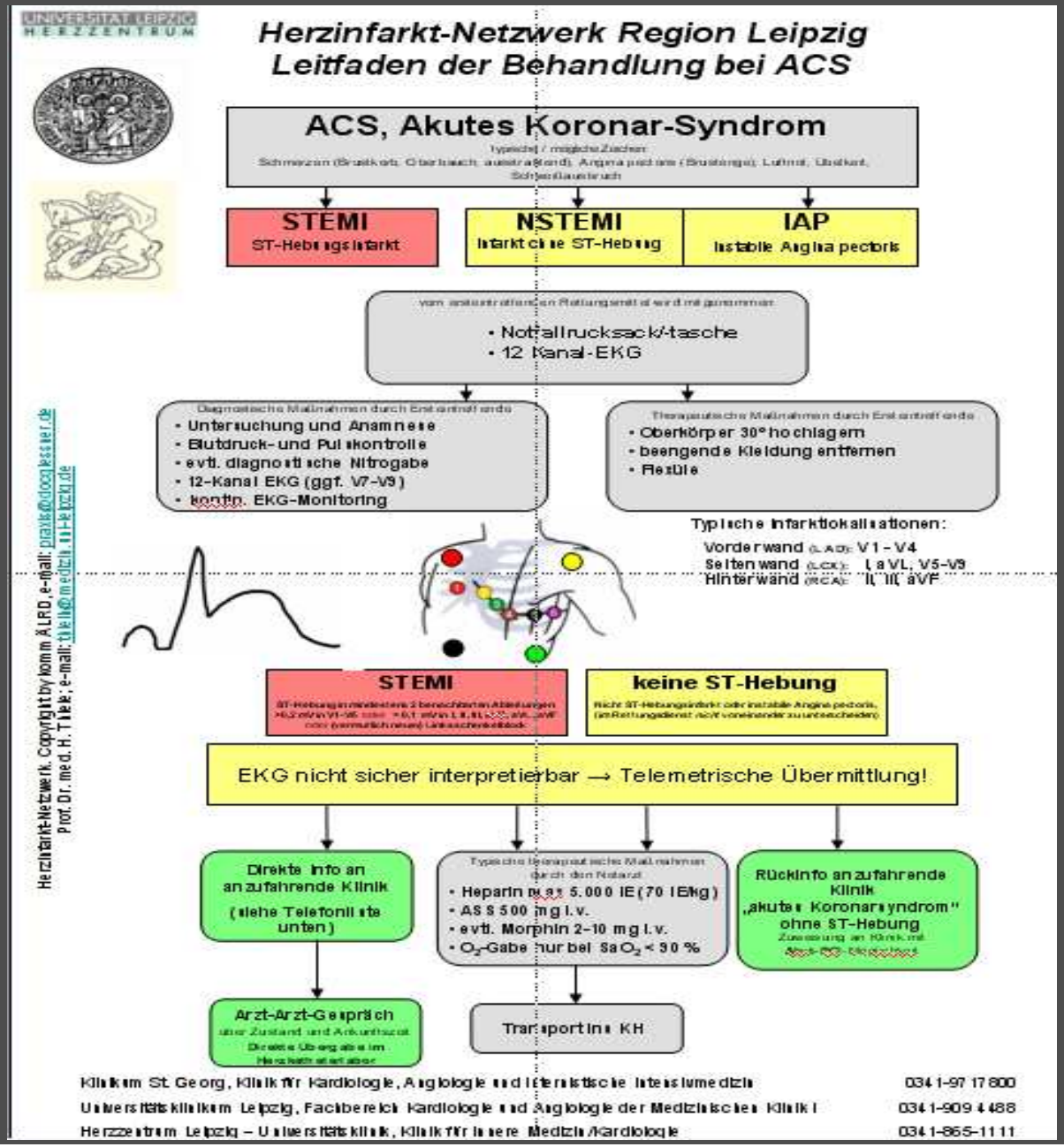
Prähospitale Logistik

All hospitals and EMSs participating in the care of patients with STEMI must record and monitor delay times and work to achieve and maintain the following quality targets:
• first medical contact to first ECG ≤10 min;
• first medical contact to reperfusion therapy:
  • for fibrinolysis ≤30 min;
  • for primary PCI ≤90 min (≤60 min if the patient presents within 120 min of symptom onset or directly to a PCI-capable hospital).
	I	B

All EMSs, emergency departments, and coronary care units must have a written updated STEMI management protocol, preferably shared within geographic networks.	I	C
Patients presenting to a non-PCI-capable hospital and awaiting transportation for primary or rescue PCI must be attended in an appropriately monitored area.	I	C
Patients transferred to a PCI-capable centre for primary PCI should bypass the emergency department and be transferred directly to the catheterization laboratory.	IIa	B

Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

Prähospitale Algorithmen



Prähospitale Daten

Herzinfarkt-Netzwerk Region Leipzig
Handlungsablauf/Dokumentation ACS

Name ....

Vorname .... geb. ....

Strasse ....

Wohnort ....

R ☐ ☐ ☐ ☐ ☐

☐ 5/82 ☐ 6/82 ☐ 7/82 ☐ LNA

☐ Med1 ☐ Med2 ☐ Q8 ☐ RTH

Einsatzdatum: T T . M M . J J

Patientenphase	Uhrzeit	
Beginn der akuten Beschwerden	__ __ . __ __	Angina pectoris > 20 Minuten
Alarmierungszeit Rettungsdienst	__ __ . __ __	

Notarztphase	Uhrzeit	Bemerkungen
Ankunft	__ __ . __ __	Untersuchung und Anamnese, Blutdruck- und Pulskontrolle, Evtl. diagnostische Nitrogabe, 12-Kanal-EKG; Oberkörper 30° Hochlagerung
12–Kanal–EKG abgeleitet	__ __ . __ __	STEMI / kein STEMI
Bei „STEMI" Anruf Leitstelle 112	__ __ . __ __	Leitstelle verbindet beim Stichwort „STEMI" direkt in PCI-Klinik
Typische Maßnahmen: Heparin ggf. 5.000 IE (70 IE/kgKG), Aspisol 500 mg i.v., Clopidogrel 600 mg p.o., Metoprolol bis 3 x 5 mg i.v., Morphium 2–10 mg i.v.		
Abfahrt zum Zielkrankenhaus	__ __ . __ __	Bei STEMI Arzt-Arzt-Gespräch bei Abfahrt: *„Patient mit STEMI in … Minuten in Ihrer Klinik"*
Ankunft Zielkrankenhaus	__ __ . __ __	St. Georg / Uni / HZL

Bemerkungen: ☐ Alles prima geklappt?

Bitte ein EKG zusätzlich ausdrucken und dem Cardiodienst beifügen. Danke!

Klinikum St. Georg, Klinik für Klinik für Kardiologie, Angiologie und Internistische Intensivmedizin XXXXXX

Universitätsklinikum Leipzig, Fachbereich Kardiologie und Angiologie der Medizinischen Klinik I XXXXXXX

Herzzentrum Leipzig – Universitätsklinik, Klinik für Innere Medizin/Kardiologie 0341-865-1111

Herzinfarkt-Netzwerk Leipzig
Handlungsablauf/Dokumentation ACS

Name ....

Vorname .... geb. ....

Strasse ....

Wohnort ....

T T . M M . J J

Arzt ....

Pflege ....

Krankenhausphase	Uhrzeit	
Eintreffen im Krankenhaus	__ __ . __ __	Die „door-to-balloon"-Zeit beginnt, wenn der Patient die Tür des Krankenhaus passiert
12–Kanal-EKG in Aufnahme	__ __ . __ __	Nur wenn kein suffizientes 12 – Kanal – EKG vom Notarzt vorhanden ist
HKL-Alarm bei Bestätigung „STEMI"?	__ __ . __ __	Bereits alarmiert durch den Rettungsdienst / Erst nach der Aufnahme in der Klinik alarmiert
Anmeldung Patientenaufnahme		Nur Name, Vorname, Geburtsdatum, Kostenträger (Chipkarte)
Aufklärung /Einwilligung zur HKU / PCI		Durch den Aufnahmearzt während der Fahrt ins HKL
Ankunft HKL	__ __ . __ __	
Punktion der Arterie	__ __ . __ __	
Erste Ballonaufdehnung bzw. Thrombektomie im Infarktarterie	__ __ . __ __	
„door–to–balloon"-Zeit	☐ ☐ ☐	**Minuten**
TIMI III – Fluss	__ __ . __ __	Kein TIMI III – Fluss zu erreichen

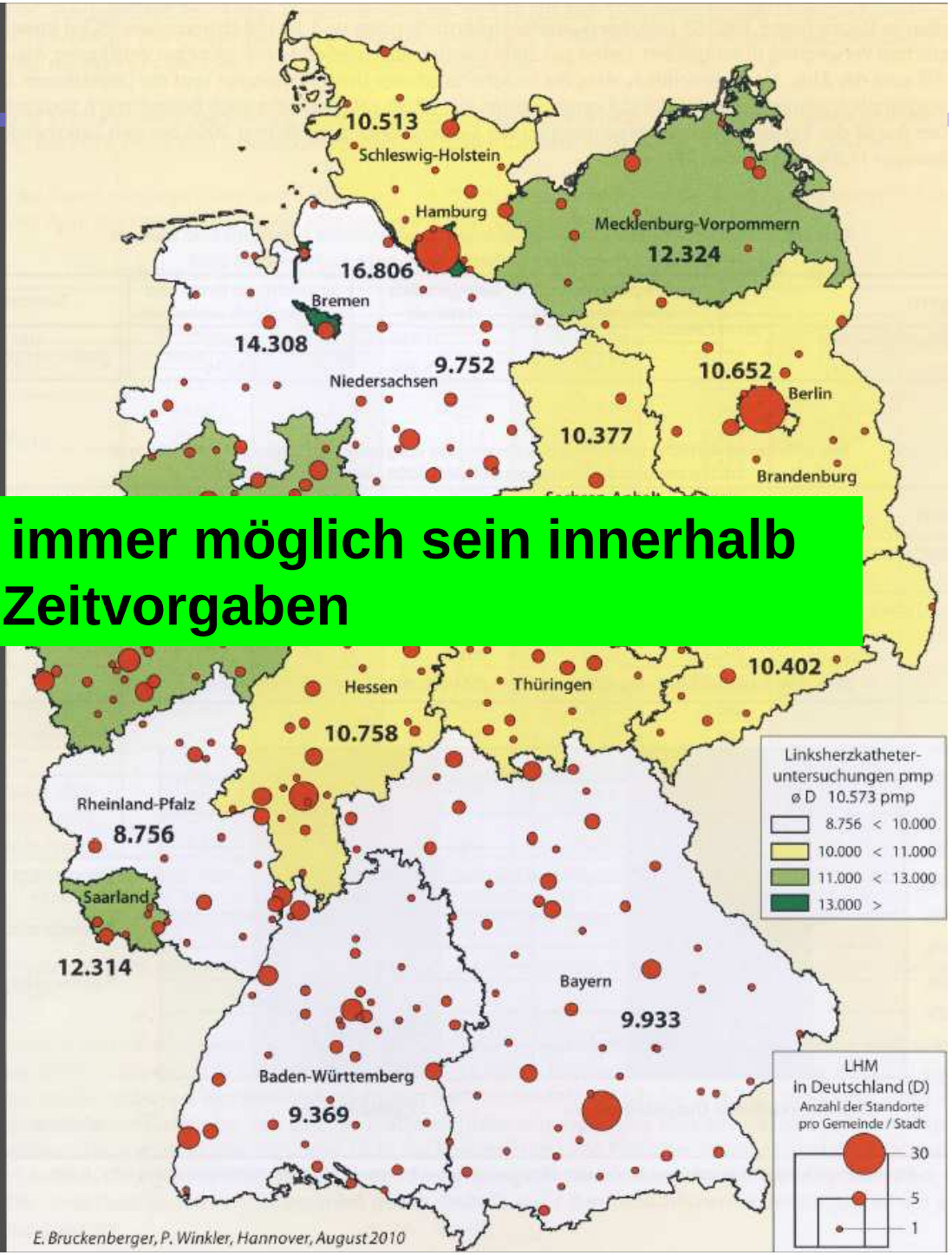
Bemerkungen: ☐ Alles prima geklappt?

Leitstelle Leipzig ????? — Leitstelle ????? ?????

HKT Mitte 582 0172-362 1232 — HKT Süd 782 0171-174 4311

HKT West 682 0176-660 97783

Katheterlabordichte in Deutschland



-> Primäre PCI sollte immer möglich sein innerhalb der Zeitvorgaben

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Netzwerke

KH Bitterfeld

KH Schkeuditz

KH Delitzsch

KH Torgau

KH Eilenburg

KH Riesa

KH Merseburg

KH Leisnig

KH Weißenfels

KH Döbeln

KH Wurzen

KH Grimma

KH Naumburg

KH Zeitz

KH Zwenkau

KH Altenburg

NEF Bad Lausick

NEF Schmölln

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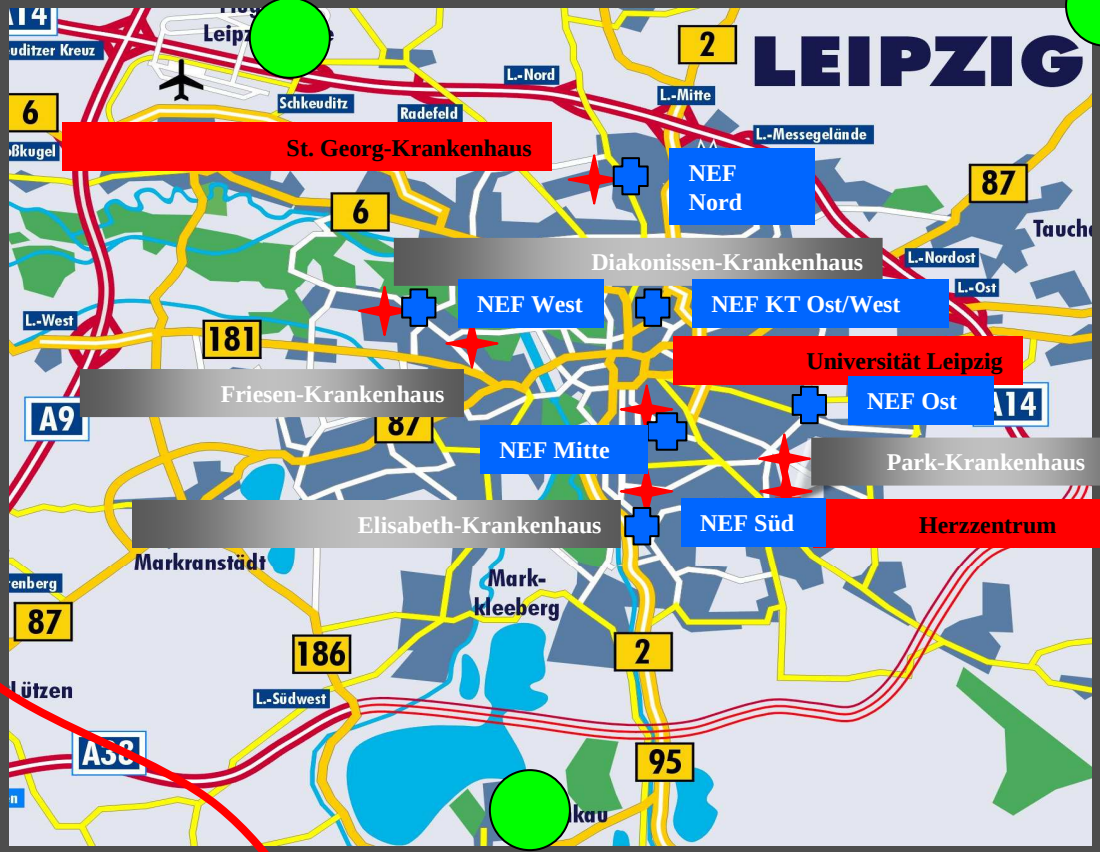
STEMI Netzwerke



KH Bitterfeld 01-2006

KH Schkeuditz

KH Delitzsch

KH Torgau

KH Eilenburg

KH Riesa 01.04.09

KH Leisnig

KH Merseburg

KH Weißenfels 10-2012

KH Döbeln 10-2010

KH Wurzen

KH Grimma

KH Naumburg

KH Zeitz

KH Zwenkau 01-2008

11-2008 KH Altenburg

KH Borna

NEF Schmölln

NEF Bad Lausick

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Prähospitale Logistik

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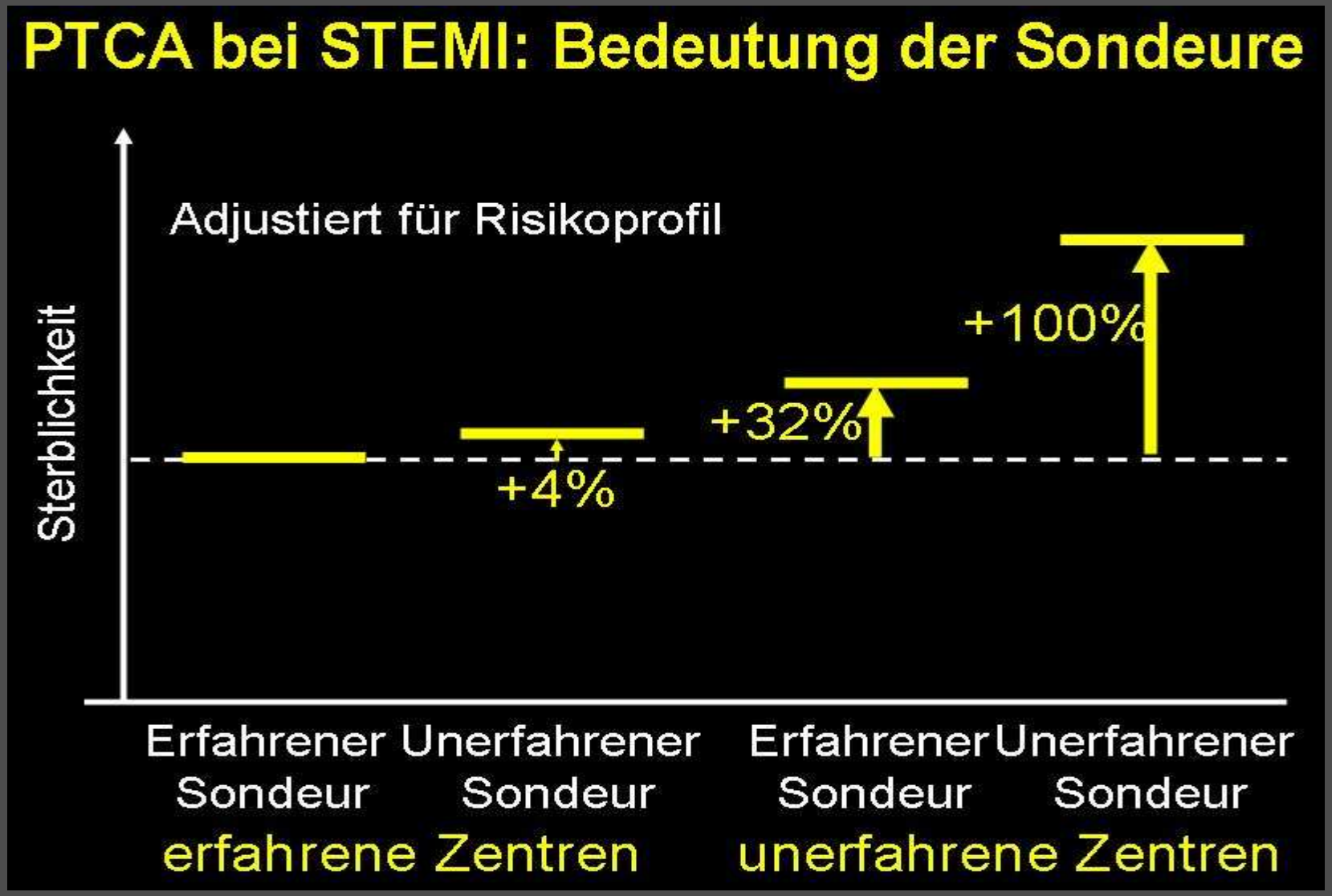
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

PCI-Erfahrung und Mortalität



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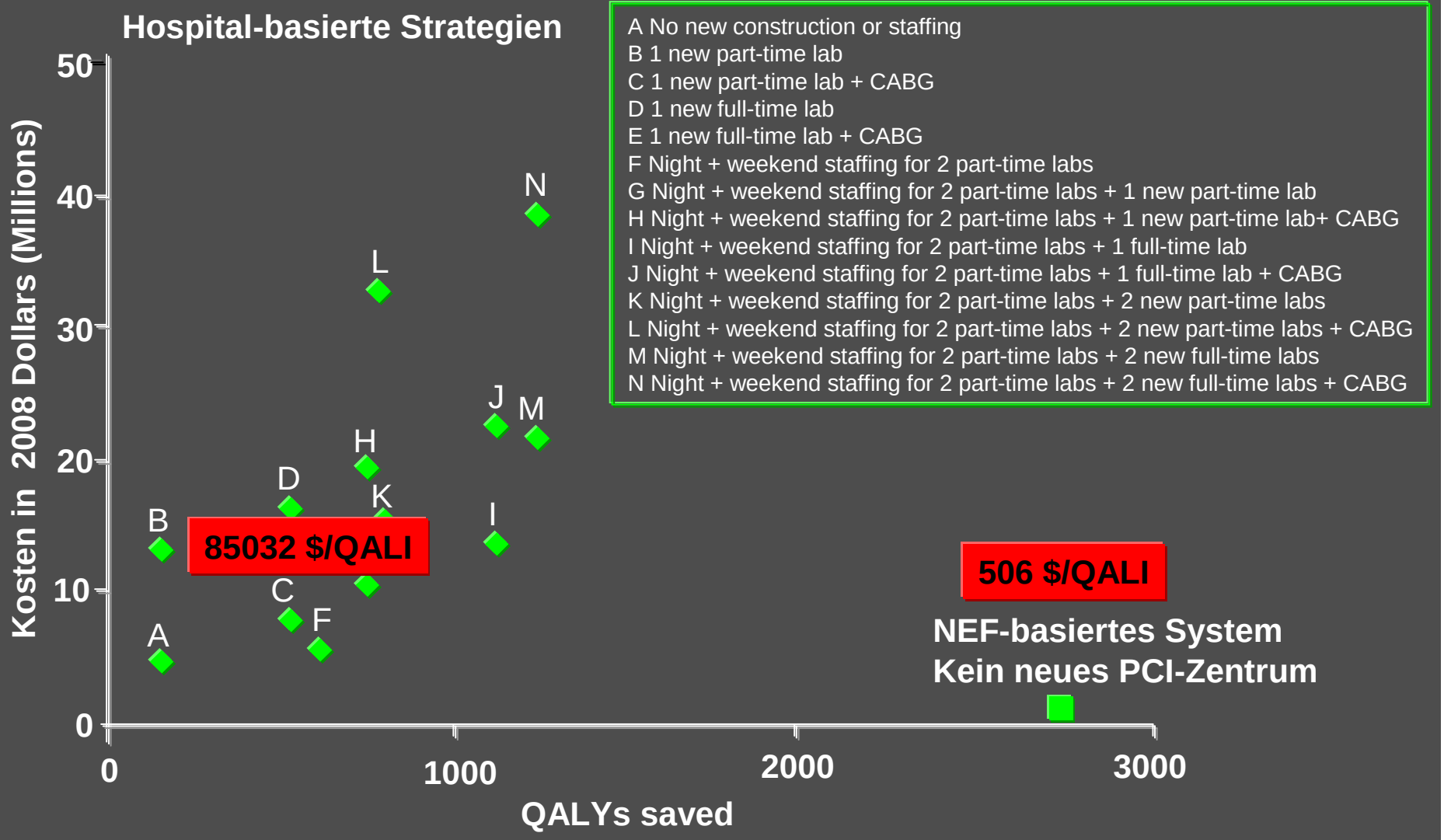
HERZZENTRUM

Brown et al Circulation 2001

Komplette PCI-Abdeckung und Kosten



A No new construction or staffing
B 1 new part-time lab
C 1 new part-time lab + CABG
D 1 new full-time lab
E 1 new full-time lab + CABG
F Night + weekend staffing for 2 part-time labs
G Night + weekend staffing for 2 part-time labs + 1 new part-time lab
H Night + weekend staffing for 2 part-time labs + 1 new part-time lab+ CABG
I Night + weekend staffing for 2 part-time labs + 1 full-time lab
J Night + weekend staffing for 2 part-time labs + 1 full-time lab + CABG
K Night + weekend staffing for 2 part-time labs + 2 new part-time labs
L Night + weekend staffing for 2 part-time labs + 2 new part-time labs + CABG
M Night + weekend staffing for 2 part-time labs + 2 new full-time labs
N Night + weekend staffing for 2 part-time labs + 2 new full-time labs + CABG

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Concannan et al. Circ Cardiovasc Qual Outcomes 2010;3:506-513

Prozedurale Aspekte primäre PCI

Procedural aspects of primary PCI		
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B
If performed by an experienced radial operator, radial access should be preferred over femoral access.	IIa	B
If the patient has no contraindications to prolonged DAPT (indication for oral anticoagulation, or estimated high long-term bleeding risk) and is likely to be compliant, DES should be preferred over BMS.	IIa	A
Routine thrombus aspiration should be considered.	IIa	B
Routine use of distal protection devices is not recommended.	III	C
Routine use of IABP (in patients without shock) is not recommended.	III	A

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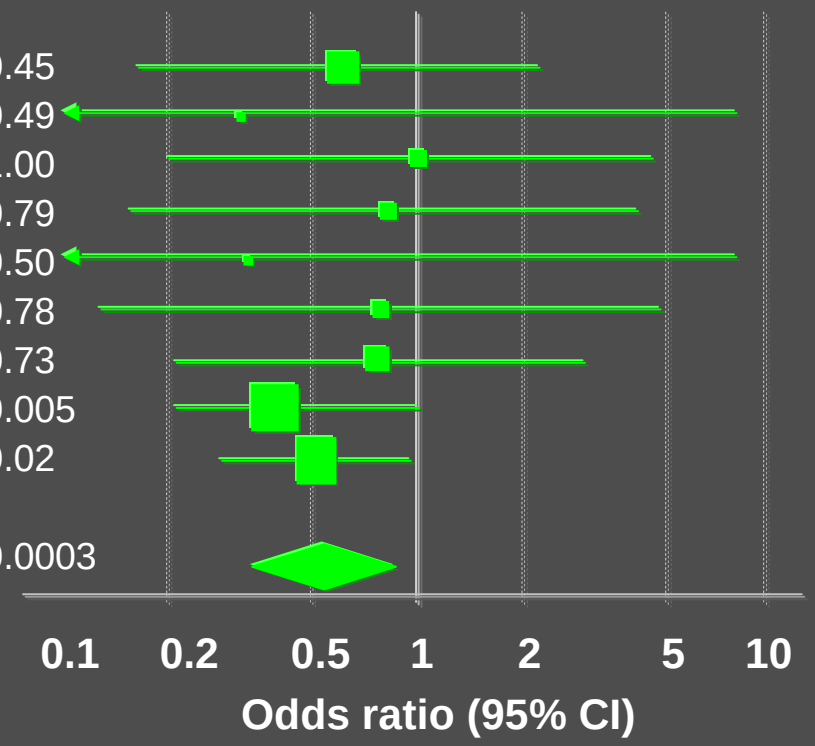
Einfluss Zugangsweg auf Mortalität

Studienname	n/total Radialis	n/total Femoralis	OR (95% CI)	P-Wert
TEMPURA	4/77	6/72	0.60 (0.16 – 2.34)	0.45
RADIAL-AMI	0/25	1/25	0.32 (0.01 – 8.25)	0.49
FARMI	3/57	3/57	1.00 (0.19 – 5.18)	1.00
Yan	3/57	3/46	0.80 (0.15 – 4.15)	0.79
RADIAMI	0/50	1/50	0.33 (0.01 – 8.22)	0.50
Gan	2/90	3/105	0.77 (0.13 – 4.73)	0.78
Hou	4/100	5/100	0.79 (0.21 – 3.04)	0.73
RIVAL	12/955	32/1003	0.39 (0.20 – 0.75)	0.005
RIFLE-STEACS	26/500	46/501	0.66 (0.33 – 0.99)	0.02
GEPOOLED	54/1911	100/1959	0.54 (0.38 – 0.77)	0.0003



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Thiele et al. Kardiologe 2012;6:423-426

Prozedurale Aspekte primäre PCI

Procedural aspects of primary PCI		
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B
If performed by an experienced radial operator, radial access should be preferred over femoral access.	IIa	B
If the patient has no contraindications to prolonged DAPT (indication for oral anticoagulation, or estimated high long-term bleeding risk) and is likely to be compliant, DES should be preferred over BMS.	IIa	A
Routine thrombus aspiration should be considered.	IIa	B
Routine use of distal protection devices is not recommended.	III	C
Routine use of IABP (in patients without shock) is not recommended.	III	A

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Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

STEMI vom 10.02.2012

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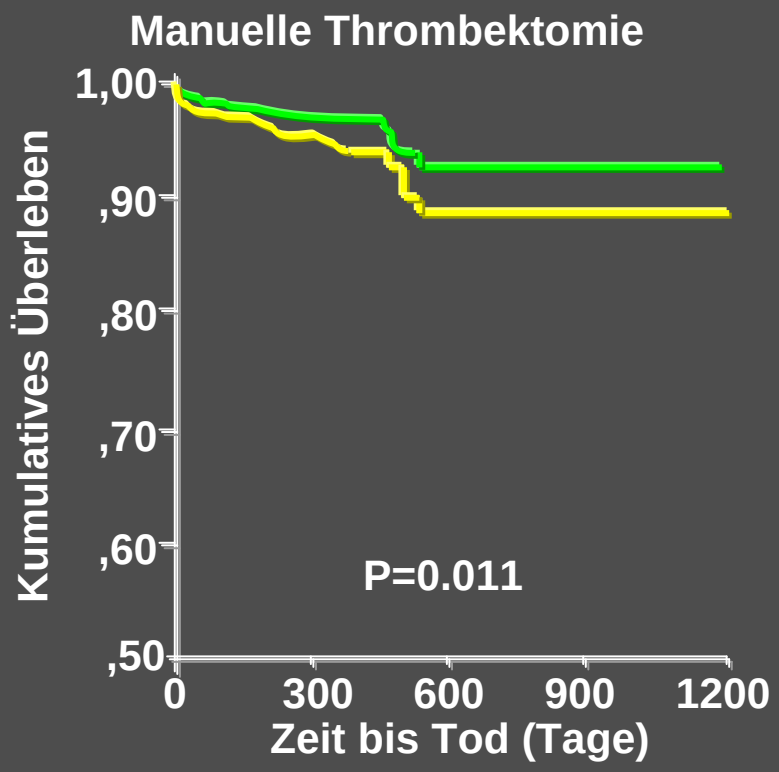
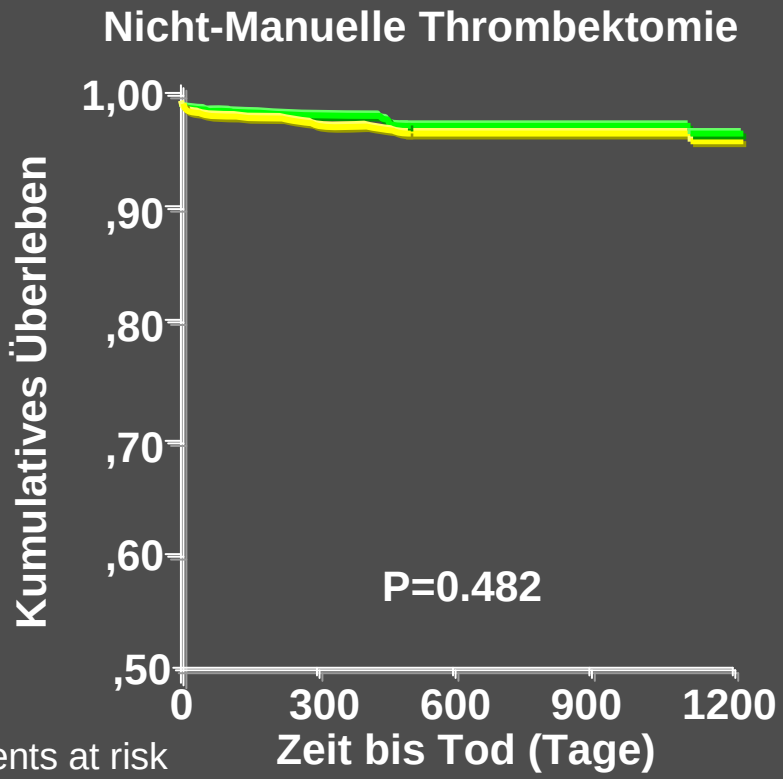
Thrombektomie – 11 Studien

Individuelle Patienten-basierte Meta-Analyse



Patients at risk				
Standard PCI	904	642	61	16
Manuelle Thrombekt.	906	642	53	11



Patients at risk				
Standard PCI	428	214	106	80
Nicht-manuelle Thrombektomie	432	221	110	89

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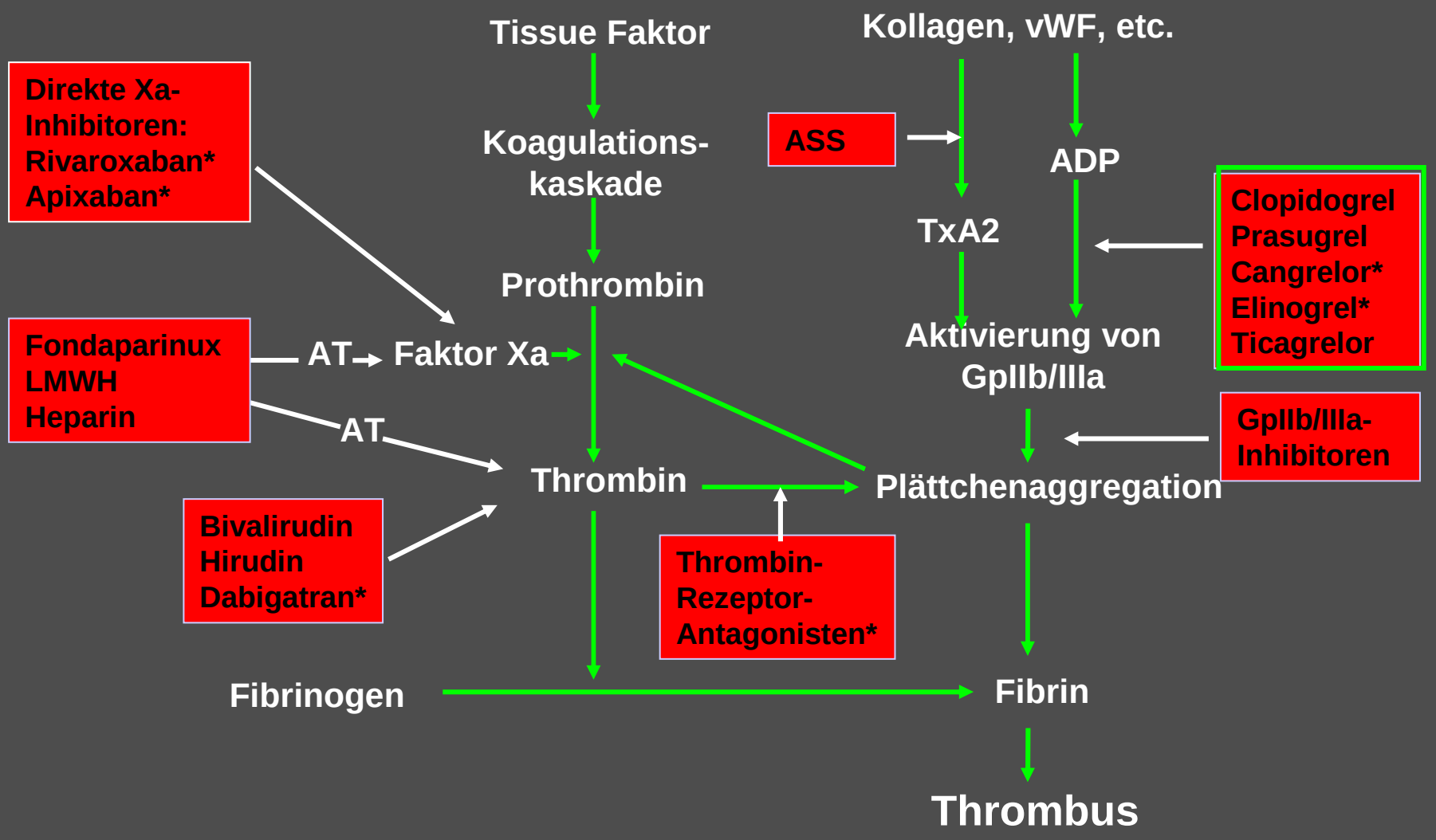
Burzotta et al Eur Heart J 2009;30,2193-2203

Antiplättchen-Therapie + Antikoagulation



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Periprozedurale antithrombotische Medikation – primäre PCI

Recommendations	Class[a]	Level[b]
Antiplatelet therapy		
Aspirin oral or i.v. (if unable to swallow) is recommended	I	B
An ADP-receptor blocker is recommended in addition to aspirin. Options are:	I	A
• Prasugrel in clopidogrel-naive patients, if no history of prior stroke/TIA, age <75 years.	I	B
• Ticagrelor.	I	B
• Clopidogrel, preferably when prasugrel or ticagrelor are either not available or contraindicated.	I	C

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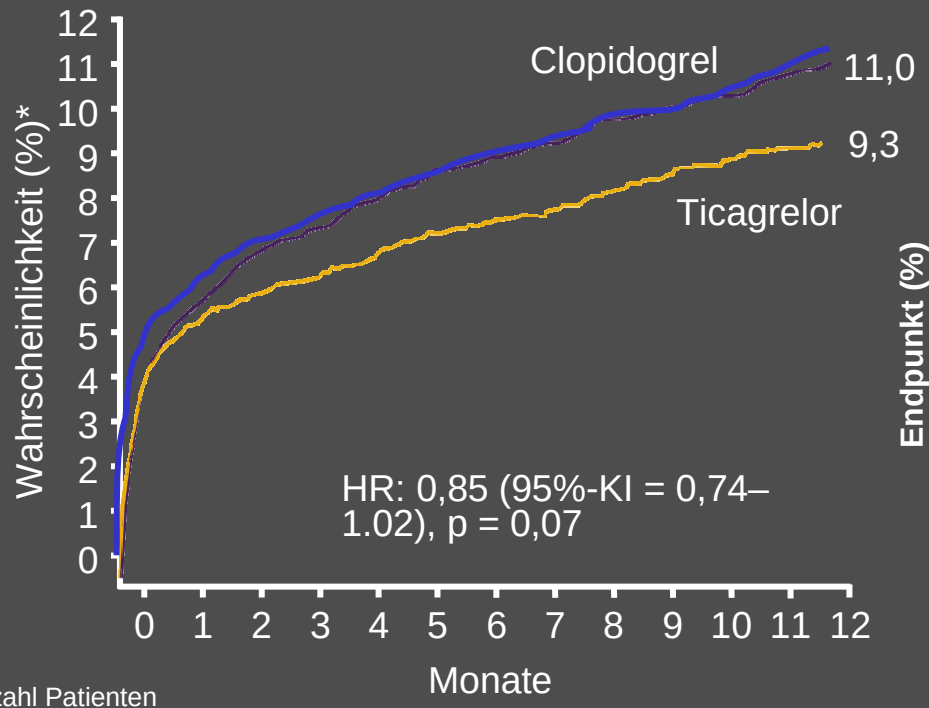
Steg et al. ESC STEMI Guidelines. Eur Heart J.2012;33:2569-2619

STEMI-Patienten

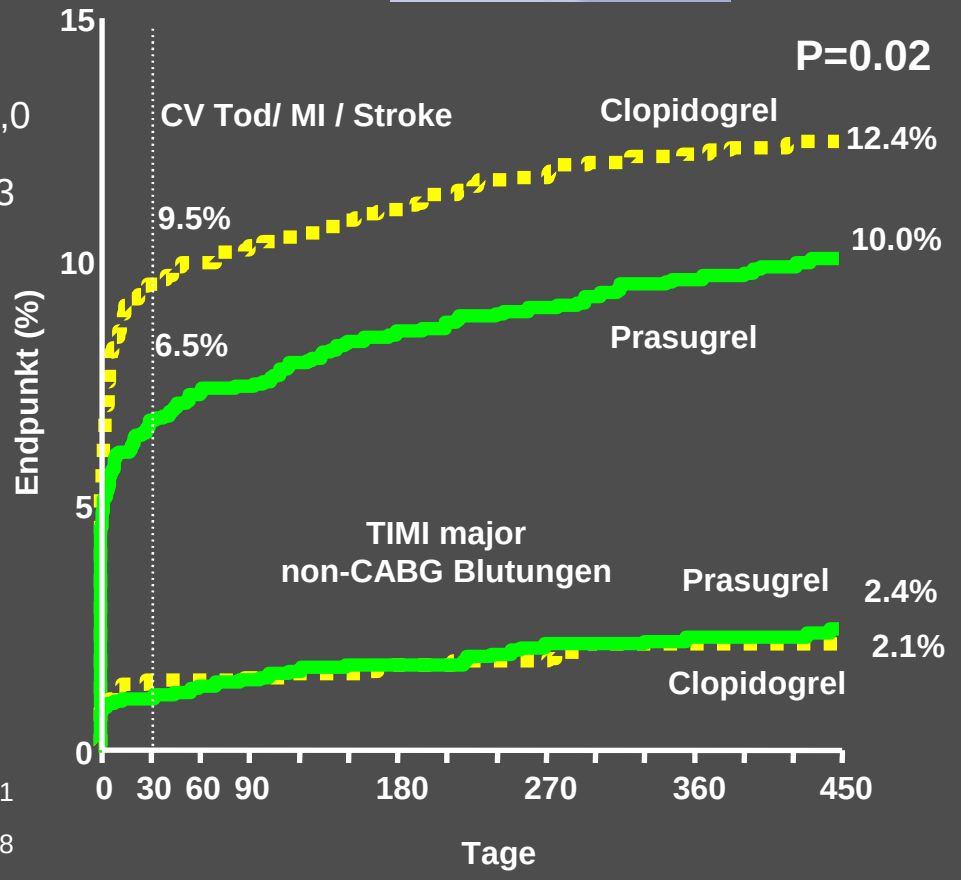
PLATO STEMI



Anzahl Patienten							
Ticagrelor	4.201	3.887	3.834	3.732	3.011	2.297	1.891
Clopidogrel	4.229	3.892	3.823	3.730	3.022	2.333	1.868

Steg et al. Circulation 2010;122:2131-2141

TRITON TIMI-38



Montalescot et al. Lancet 2009;373:723–731

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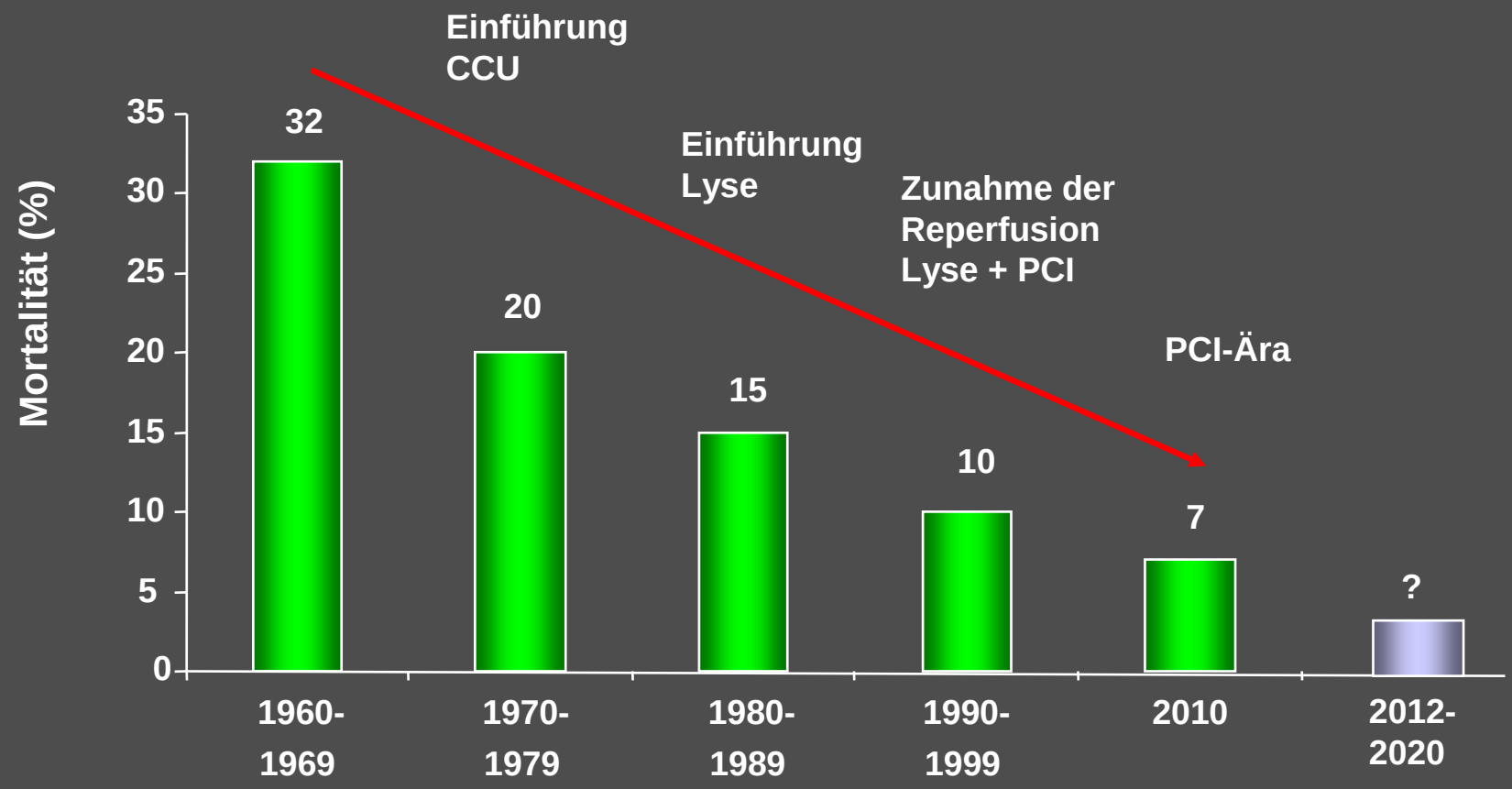
Logistische Vorgehensweise KH-Behandlung

Recommendations	Class [a]	Level [b]
All hospitals participating in the care of STEMI patients should have a coronary care unit equipped to provide all aspects of care for STEMI patients, including treatment of ischaemia, severe heart failure, arrhythmias and common comorbidities.	I	C
Length of stay in the coronary care unit		
Patients undergoing uncomplicated successful reperfusion therapy should be kept in the coronary care unit for a minimum of 24 h, after which they may be moved to a step-down monitored bed for another 24–48 h.	I	C
Transfer back to a referring non-PCI hospital		
Early transfer (same day) may be considered in selected, low-risk patients after successful primary PCI without observed arrhythmia.	IIb	C
Hospital discharge		
Early discharge (after approximately 72 h) is reasonable in selected low-risk patients, if early rehabilitation and adequate follow-up are arranged.	IIb	B

In-hospitale Sterblichkeit STEMI - Historie



According to
De Vreede et al, JACC 1991;18:698-706
+ Zahn et al, JACC 2001;37:1827-1835

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Danke für die Aufmerksamkeit

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