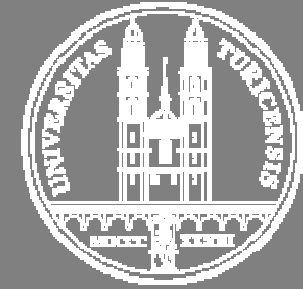


**A** Acute  
**M** Myocardial  
**I** Infarction in  
**S** Switzerland

**University of Zurich**

Institute of Social and  
Preventive Medicine



# AMIS Plus Registry

Acute Myocardial Infarction in Switzerland

Paul Erne

5 March 2009, Berne

# AMIS Plus

## Sponsor's Meeting Programme

9:00 – 10:30

- **Welcome – history of the AMIS Plus Registry**  
*P. Erne*
- **AMIS Plus in perspective with other large registries** *F. Eberli*
- **Status of the AMIS Plus Registry**  
*D. Radovanovic*
- **The need for a national registry – some recent findings**  
*P. Urban*
- **Discussion**



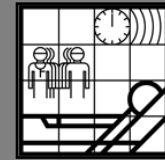
A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus Project

- Sponsoring medical societies:
  - Swiss Society of Cardiology
  - Swiss Society of Internal Medicine
  - Swiss Society of Intensive Medicine
- Prospective, observational study funded by the industry
  - Approval of the project through
    - UREK (supra-regional ethics committee)
    - Swiss Federal Commission for data safety
    - All Cantonal Ethics Commissions (for follow-ups)



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus

**Thank you !**

- **Sponsors and Donators**
- **Participants**
- **Members March 2009**

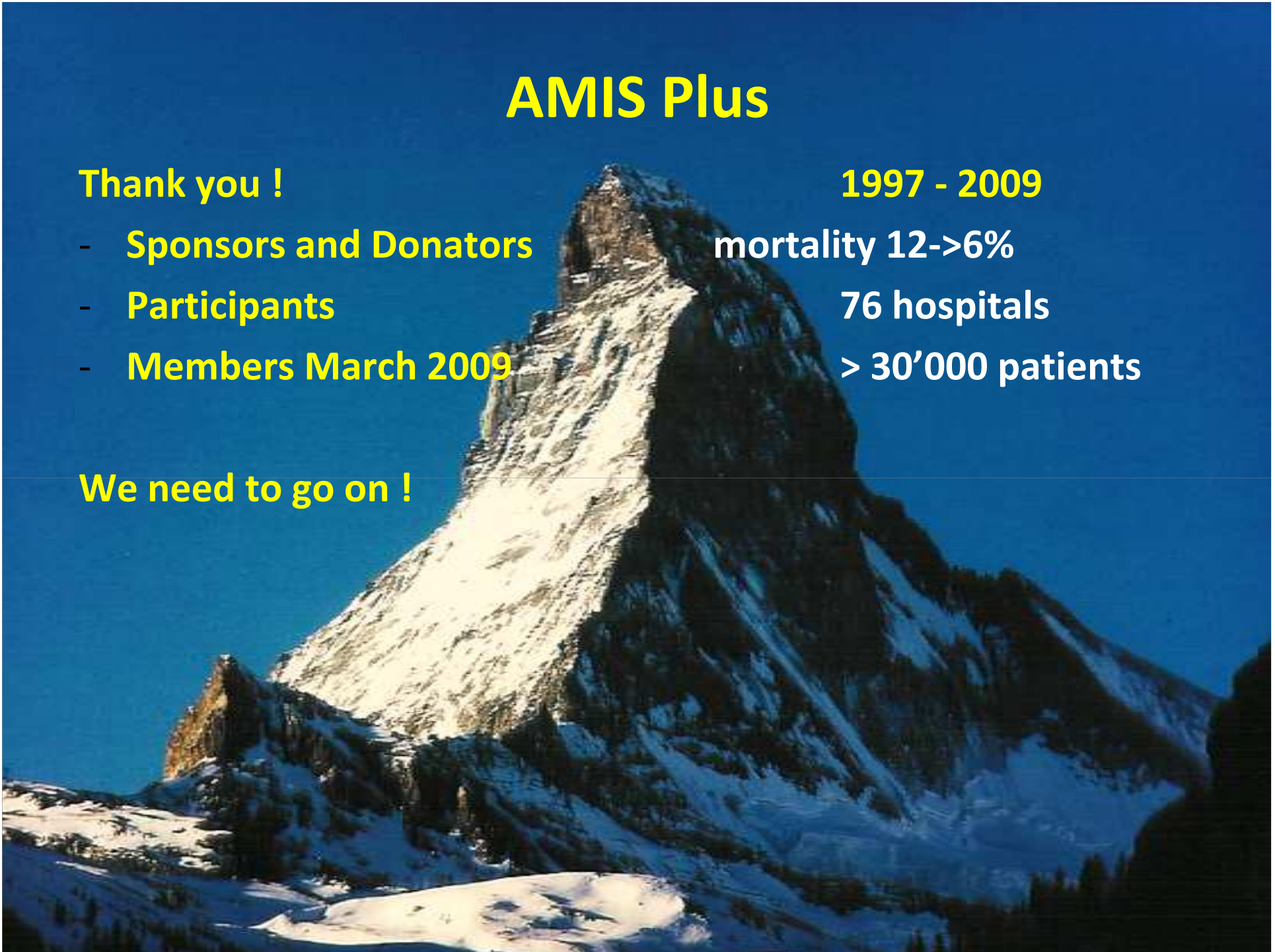
**1997 - 2009**

**mortality 12->6%**

**76 hospitals**

**> 30'000 patients**

**We need to go on !**



# AMIS Plus History

- PIMICS: 1995/96, AMI in 73 hospitals
- AMIS: 1997, AMI in 50 hospitals
  - electronic data transfer, diskettes or Internet
  - Data Center at the Department of Clinical Epidemiology, Geneva University Hospital
- AMIS Plus: 2000, AMI and UA, 20 hospitals
- Transfer of Data Center from Geneva to Zurich
  - at the Institute of Social and Preventive Medicine, University of Zurich



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# Quality of Patient Care through a reliable Data Base



**A** Acute  
**M** Myocardial  
**I** Infarction in  
**S** Switzerland

Paul Erne, Berne 5 March 2009



# The AMIS concept

**Randomized controlled  
trials  
=EBM**



**Guidelines**



**Practical work  
= AMIS**



**A** Acute  
**M** Myocardial  
**I** Infarction in  
**S** Switzerland

Paul Erne, Berne 5 March 2009



# Role of Observational Studies

- Collect data demographics, practice patterns and outcomes
- Comparison of the «real world » to randomized trials and define topics to be improved
- Examine subgroups
- Access and analyze clinical issues at less cost than in clinical trials



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009





# Registries versus Prospective Studies

## Registries

- „Real world“ conditions (females, elderly patients, polymorbidity)
- Representative of various strategies and differing treatment logistics
- Results reliable only if data acquisition is complete and data quality checked

## Prospective Studies

- Selected well-defined study populations: Selection bias by exclusion of the majority of patients
- Strictly standardized treatment conditions
- High data quality



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# Why are ACS registries necessary?

- ACS is the most important single cause of death – outcome
- ACS patients are high-cost users of medical care
- ACS care is complex although the patient population is homogenous
- ACS is a suitable index tracer for testing overall performance of cardiovascular care addressing all important dimensions of quality



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# Why do we need a national ACS registry?

- Teaching
  - Adherence to guidelines ?
  - Application to current knowledge ?
  - Assessment of quality ?
- Research
  - Are results from RCT identical in the real world and in subgroups ?
  - Are guidelines applicable and cost effective ?
  - Trends – do they have an impact ? Do we need to adapt ?



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# A National AMIS Plus Registry of ACS Patients...

- Provides reliable data on epidemiology
- Is a valuable instrument of quality improvement by assessment and benchmarking
- Gives possibilities for intervention
- Allows improvement of logistics and algorithms
- AMIS-Plus is a comprehensive and ongoing registry
- Focuses on data controlling and data quality
- Enables online analyses
- Is powered by the positive motivation of participating physicians and nurses



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# Networks / other registries

	Strengths	Weaknesses
<b>Verein Outcome/ QuaZentral</b>	<ul style="list-style-type: none"><li>–Implementation through cantonal authorities</li><li>–Compulsory</li></ul>	<ul style="list-style-type: none"><li>–No national registry</li><li>–Limited duration (only a few years)</li></ul>
<b>European Society of cardiology Registry/ GRACE</b>	<ul style="list-style-type: none"><li>–International comparison</li><li>–Intensive controlling of data collection</li></ul>	<ul style="list-style-type: none"><li>–Not a representative inclusion of centers and limited time periods</li></ul>



**A** Acute  
**M** Myocardial  
**I** Infarction in  
**S** Switzerland

Paul Erne, Berne 5 March 2009



# Players

- Sponsors and Donators
- Hospitals:
  - >500 beds: 9
  - 250-499 beds: 10
  - 125-245 beds: 30
  - 75-124 beds: 14
  - - 74 beds: 13
- AMIS Plus Data Center
- Steering Committee:
  - 14 members



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus Founding Sponsors 1997

- Swiss Heart Foundation
- Astra
- Bristol-Myers Squibb
- Merck Sharp & Dohme-Chibret
- Pfizer



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus Sponsors and Donators (time frame)

- Aventis Pharma, 2004
- Boston Scientific, 2004-2006
- Bayer, 2004-2005
- Boehring Ingelheim, 2003-2006
- Boston Scientific, 2004-2006
- Guidant, 2002-2006
- Jomed, 2002
- MCMmedsys, 2006
- Mepha Pharma, 2004-2005
- Merck, 2003-2005
- Roche Pharma, 2002
- Sanofi-Aventis, 2002-2004
- Santésuisse, 2004
- SPSS Schweiz, 2003
- St. Jude Medical, 2003, 2005
- Takeda Pharma, 2004
- Vision Stiftung, 2003



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009





# Sponsors of the AMIS Plus Project 2009

- **AstraZeneca**
- **Biotronik**, *since 2003*
- **Bayer/Schering**, *since 2005*
- **Daiichi/Sankyo/Lilly**  
*since 2008*
- **Invatec**, *since 2004*
- **Medtronic**, *since 2003*
- **A. Menarini**, *since 2002*
- **Pfizer**
- **St. Jude Medical**, *since 2006*



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# Donators of the AMIS Plus project 2009

- Abbott, *since 2006*
- Aotec, *since 2007*
- Bristol-Myers Squibb,  
*since 2005*
- GlaxoSmithKline AG,  
*since 2004*
- Guidant, *since 2008*
- Johnson & Johnson –  
*since 2002*
- Merck Sharp & Dohme-  
Chibret/Essex, *since 2005*
- Novartis, *since 2006*
- Servier, *since 2003*
- Sanofi-Aventis, *since 2005*
- Takeda Pharma, *since  
2005*

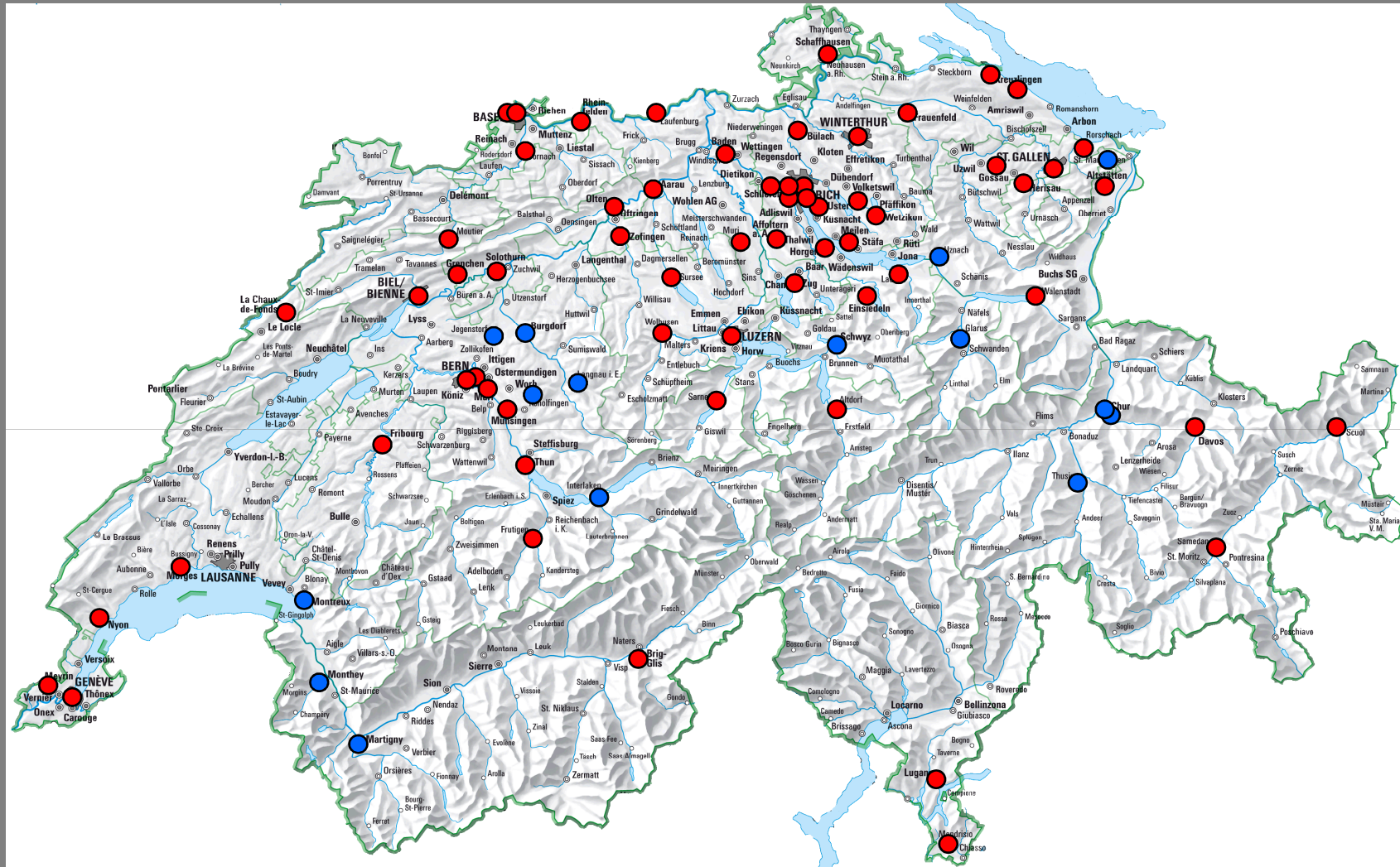


A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus Participants



- A Acute
- M Myocardial
- I Infarction in
- S Switzerland

Paul Erne, Berne 5 March 2009



# Steering Committee

- Erne Paul, Lucerne, President
- Bertel O, Zurich
- Eberli F, Zurich
- Essig M, Zweisimmen
- Gutzwiller F, Zurich
- Hunziker P, Basel
- Keller P-F, Genève
- Maggiorini M, Zurich
- Pedrazzini G, Lugano
- Radovanovic D, Zurich
- Rickli H, St. Gallen
- Stauffer J-C, Lausanne
- Urban P, Genève
- Windecker S, Berne



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



# AMIS Plus Data Center Team



Dragana Radovanovic, *head of Data Center*  
(60%)



- Nicole Duvoisin, *data management*  
(60%)



- Caroline Bähler, *data management*  
(40%)



- Eveline Doukas, *office management*  
(40%)



- Jenny Picket, *publications assistant*  
(50%)



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009



**ACUTE CORONARY SYNDROMES**

Gender differences in management and outcomes in patients with acute coronary syndromes: results on 20 290 patients from the AMIS Plus Registry

Dragana Radovanovic, Paul Erne, Philip Urban, Osmund Bertel, Hans Rickli, Jean-Michel Gaspoz, on behalf of the AMIS Plus Investigators

Heart 2007;93:1369-1375. doi: 10.1136/hrt.2006.106781

ORIGINAL ARTICLE

**Admission glycaemia and outcome in patients with acute coronary syndrome**

DAMARIS MÜDESPACHER, DRAGANA RADOVANOVIC, EDOARDO CAMENZIND, MANFRED ESSIG, OSMUND BERTEL, PAUL ERNE, FRANZ ROBERT EBERLI, FELIX GUTZWILLER ON BEHALF OF THE AMIS PLUS INVESTIGATORS

**Abstract**

Some studies of patients with acute myocardial infarction have reported that hyperglycaemia at admission may be associated with a worse outcome. This study sought to evaluate the association of blood glucose at admission with the outcome of unselected patients with acute coronary syndrome (ACS).

Intervals [CI] 1.05-1.14, p<0.001) per mmol/L. The OR for in-hospital mortality was 1.04 (95% CI 0.99-1.1; p=0.140) per mmol/L for patients with diabetes but 1.21 (95% CI 1.12-1.30; p<0.001) per mmol/L for non-diabetic patients.

In conclusion, elevated glucose level in ACS patients on admission is a significant independent predictor of in-hospital mortality and is even more important for

**Annals of Internal Medicine**

**Diagnosis and Treatment of**



**Simple point of care risk stratification in acute coronary syndromes: The AMIS model**

David J. Kurz, Abraham Bernstein, Katrin Hunt, Dragana Radovanovic, Paul Erne, Zbigniew Siudak and Osmund Bertel

Heart published online 9 Dec 2008;

Downloaded from heart.bmjournals.com on 17 June 2005

882

**CARDIOVASCULAR MEDICINE**

**Trends in reperfusion therapy of ST segment myocardial infarction in Switzerland: nationwide registry**

A-A Fassa, P Urban, D Radovanovic, N Duvoisin, J-M Gaspoz Plus Investigators

**Objective:** To document the trends in reperfusion therapy (STEMI) in Switzerland.  
**Design:** National prospective multicentre registry, AMIS (Switzerland), of patients admitted with acute myocardial infarction (MI) in Switzerland.  
**Setting:** 54 hospitals of varying size and capability in Switzerland.  
**Patients:** 7098 of 11 845 AMIS Plus patients who presented with ST segment MI and ST segment elevation on the ECG at admission.  
**Main outcome measures:** In-hospital mortality and its predictors.  
**Results:** The proportion of patients treated by primary percutaneous coronary intervention (PPCI) increased from 10.7% in 1997 to 20.0% in 2004.



**Clinical Trial**

Heart Drug 2003;3:134-140  
DOI: 10.1159/00073838

**Early Drug Therapy and In-Hospital Mortality following Acute Myocardial Infarction**

Paul Erne<sup>a</sup> Dragana Radovanovic<sup>b</sup> Philip Urban<sup>d</sup> Jean-Christophe Stauffer<sup>e</sup> Osmund Bertel<sup>c</sup> Felix Gutzwiller<sup>b</sup> for the AMIS Plus Investigators<sup>1</sup>

<sup>a</sup>Division of Cardiology, Kantonsspital, Luzern, <sup>b</sup>AMIS Plus Data Center, Institute for Social and Preventive Medicine, University Zürich, Zürich, Switzerland, <sup>c</sup>Division of Cardiology, Stadtspital Triemli, Zürich, <sup>d</sup>Division of Cardiology, Hôpital La Tour, Genève, <sup>e</sup>Division of Cardiology, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

**Key Words**

Drug therapy · Acute myocardial infarction · In-hospital mortality

participating hospitals between 1997 and 2004. The effect of factors and drug therapy on in-hospital mortality was assessed by logistic regression. Results: Age and diabetes were independent predictors of in-hospital mortality. Early drug therapy was associated with a lower in-hospital mortality.

**CLINICAL RESEARCH STUDY**



**Impact of Changing Definitions for Myocardial Infarction: A Report from the AMIS Registry**

Philip Urban, MD,<sup>a</sup> Dragana Radovanovic, MD,<sup>b</sup> Paul Erne, MD,<sup>c</sup> Jean-Christophe Stauffer, MD,<sup>d</sup> Giovanni Pedrazzini, MD,<sup>e</sup> Stephan Windecker, MD,<sup>f</sup> Osmund Bertel, MD,<sup>g</sup>; For the AMIS Plus investigators

<sup>a</sup>Cardiovascular Department, La Tour Hospital, Geneva, Switzerland; <sup>b</sup>AMIS Plus Data Center, Institute of Social and Preventive Medicine, University of Zurich, Zurich, Switzerland; <sup>c</sup>Cardiology Department, Cantonal Hospital, Luzern, Switzerland; <sup>d</sup>Cardiology Department, Cantonal Hospital, Fribourg, Switzerland; <sup>e</sup>Cardiocentro, Lugano, Switzerland; <sup>f</sup>Cardiology Department, Inselspital, Bern, Switzerland; <sup>g</sup>Cardio-Vascular Center Zurich, Klinik im Park, Zurich, Switzerland.

Cardiovasc Drugs Ther (2007) 21:389-398  
DOI 10.1007/s10557-007-6044-0

**Determinants of Costs of Coronary Syndromes: A Study of More Than 10 000 Patients**

Matthias Bramkamp · Dragana Radovanovic · Paul Erne · Thomas D. Szucs

**Original Research**  
Cardiology 2008;109:156-162  
DOI: 10.1159/000106676

**The Impact of Statin Treatment on Presentation Mode and Early Outcomes in Acute Coronary Syndromes**

F. Eberli · J.C. Stauffer · O. Bertel · P. Erne

**Age-Related Differences in the Use of Guideline-Recommended Medical and Interventional Therapies for Acute Coronary Syndromes: A Cohort Study**

Andreas W. Schoenenberger, MD,<sup>a</sup>† Stephan Windecker, MD,<sup>b</sup>† Dragana Radovanovic, MD,<sup>c</sup>† Philip Urban, MD,<sup>d</sup>† Franz R. Eberli, MD,<sup>e</sup>† Felix Gutzwiller, MD, DrPH,<sup>f</sup>† and Paul Erne, MD,<sup>g</sup>† for the AMIS Plus Investigators

# AMIS Plus - Future

- Modifications needed to focus on current challenges
  - Assess novel diagnostic & therapeutic options
  - Assess drug interactions
  - Optimal care despite constraints
  - Assess shortcomings
  - Challenge of congestive heart failure
  - Strategies to prevent sudden death
  - Outcome



A Acute  
M Myocardial  
I Infarction in  
S Switzerland

Paul Erne, Berne 5 March 2009

