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### **Reports for the California Office of Statewide Health Planning and Development**

#### **Title**

Second Report of the California Hospital Outcomes Project (1996): Acute Myocardial Infarction Volume Two: Technical Appendix-Chapter002

#### **Permalink**

<https://escholarship.org/uc/item/11h9896n>

#### **Authors**

Romano, Patrick S  
Remy, Linda L  
Luft, Harold S

#### **Publication Date**

1996-03-21

## CHAPTER TWO: LITERATURE SUMMARY

An extensive review of the clinical literature in the area of AMI was undertaken. The MEDLINE bibliographic database was searched for English language references since 1970, using relevant keywords. References also were identified through discussions with clinical advisory panel members and review of reference lists in relevant books and meta-analyses.

All studies reporting on risk factors for in-hospital or 30-day mortality after AMI were obtained and reviewed. Studies from developing countries (e.g., Africa, South and Central America) and studies limited to atypical populations (e.g., patients who had specific procedures or risk factors) were set aside. Among the remaining studies, those with at least 250 observations were assigned higher priority than those with fewer observations. Special attention was paid to studies that included multivariate analyses of the independent effects of multiple risk factors in large cohorts. The definitions of risk factors and associated odds ratios or risk ratios were abstracted from these studies.

Table 2.1 lists the major risk factors for in-hospital 30-day mortality after AMI, according to the clinical literature cited at the end of this chapter. These studies include large cohort studies and randomized controlled trials of various therapeutic interventions, such as thrombolysis and angioplasty. Because most of these trials excluded large groups of AMIs (e.g., patients presenting in cardiac arrest or without electrocardiographic changes), their results may not be generalizable to the entire population of AMI patients. Studies based on administrative data, such as hospital discharge abstracts, are not included here. Each reported risk estimate represents the odds ratio or relative risk of death among patients with the characteristic, compared to those without the characteristic. Risk estimates adjusted for other patient characteristics are shown, whenever available. If multiple studies reported different risk estimates for the same factor, the range of these point estimates is shown.

These literature summaries were used in two major ways. First, they were used to identify specific diagnoses generally regarded as risk factors for early death after AMI. These diagnoses were reviewed with all members of the

clinical advisory panel and then adapted to ICD -9-CM, as described in Chapter Seven.

Most importantly, findings from previous studies, shown in Table 2.1, were compared with preliminary findings from the present study. Comorbidities that were far less common than expected, based on literature review (e.g., hyperlipidemia), were deleted from the list of candidate risk factors because it was believed they might be underreported to OSHPD. When the direction of the observed association between a risk factor and the adverse outcome differed from that reported in previous studies, further discussions or analyses were undertaken. If there was no apparent reason for the "counterintuitive" finding, that risk factor was deleted from the list of candidate covariates. Examples of such risk factors include asthma and obesity which were associated with reduced AMI mortality. The most likely causes of such unexpected findings are either unmeasured confounders or selective underreporting of comorbidities among patients who died.

Table 2.1: Literature review of risk factors for in-hospital or 30-day mortality after acute myocardial infarction <sup>1</sup>

<i>RiskFactor</i>	<i>RiskEstimate</i> <sup>1</sup>	<i>Reference</i>
Age	1.97-2.45/10yrs	2,5,10,14,15,19,23,29
	1.98-3.19(>69vs<70)	20,42,27
Females ex	1.51-1.53	15,20,38
Systolichypotension	1.90-3.70	2,6,15,19,27
Meanarterialpressure	0.65/1mmHg	10
Shockonadmission	11.38-13.5(vsnormal)	17,42
Diabetesmellitus	1.23-1.64	2,6,15
Hyperglycemiaonadmission	3.52/40mg/dL	20
Killipclassificat ion	3.50-6.4(>1vs1)	2,17
PreviousAMI	1.23-1.87	2,14,15,27
Antecedentanginapectoris	0.78-2.64	2,6,20
Never smoker	1.37(vseversmoker)	2
Q-waveinfarction	1.24-2.27	3,5,6,9,10,16,27
Historyofpriorcongestiveheartfailure	1.29	5
Bradycardia( first48hrs)	2.70	6
Tachycardia(first48hrs)	1.87	6,13
Heartrate(BPM)	1.14/1unit	10
	<1	19
Hyperkalemia(first48hrs)	1.79	6
Fever(first48hrs)	1.60	6
HighBUN(azotemia)	1.75,1.19/1unit	6,10,19

Historyofhypertension	0.70	6
Abnormalelectrocardiogram	17	8
APACHEIIscore	1.46/1unit	1,10,19
"Donotresuscitate"order	1.16	10
Abnormalchestradiograph:	1.20	10
congestiveheartfailure	2.6(interstitial)	27
	4.0-6.3(parenchymal)	17,27
Inabilitytowalk	1.11 (unablevswith assistance)	10
Diffuse/metastaticcancer	1.09	10
Anteriorwallinfarction	1.68-1.84	13,15,19,33
Atrialfibrillation	2.19	15
Rales(onethirdup)	2.24	13,15
Congestiveheartfailure,withralesor othersigns	10.0	23
ASTscore	>1	19
CKscore	<1	19
PeakCKlevel>8xnormal	2.6(vs<2xnormal)	13
Fieldintubation	>1	19

Table 2.1: Literature review of risk factors for in-hospital or 30-day mortality after acute myocardial infarction<sup>1</sup>, continued

<i>Risk Factor</i>	<i>Risk Estimate</i> <sup>1</sup>	<i>Reference</i>
Number of body systems with acute or chronic disease	>1	19
History of stroke	2.12	20
Peripheral vascular disease	1.99	19
LDH >4 times normal	3.16	19
Thrombolytic therapy	0.29	42
Right ventricular infarction	7.7	42
Ventricular fibrillation	14.9	23
Asystole	30.0	23
History of COPD	>1	14
Complete atrioventricular block	>1	14
Cardiomegaly	3.0 (vs normal)	27

<sup>1</sup> Unless otherwise indicated, these figures represent estimates of the relative risk or odds ratio among those with the risk factor compared to those without the risk factor.

Table 2.2: Selected references for short term outcomes

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