

## Critical Pathways in the Emergency Department Improve Treatment Modalities for Patients with ST-Elevation Myocardial Infarction in a European Hospital

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### Summary

**Background:** The use of protocols for patients with ST-elevation myocardial infarction (MI) is growing, but no definite conclusion regarding the value of critical pathways in Europe has been drawn.

**Hypothesis:** The aim of this study was to investigate the impact of critical pathway on processes of care and outcome for patients presenting to the emergency department (ED) of a large urban European hospital because of possible ST-elevation MI.

**Methods:** Critical pathways for management of acute chest pain at our ED were developed in 1998 and have been revised every year. Accordingly, the records of all patients referred in 1997 to the ED because of chest pain (before pathway implementation) and in 2001 (after last pathway revision) were reviewed. An ST-elevation MI was diagnosed at ED in 520 of 5,066 (10.3%) patients with chest pain in 1997, and in 452 of 4,843 (9.3%) patients with chest pain in 2001. Patients were managed according to the ED cardiologists' decisions in 1997, whereas they entered the pathways for ST-elevation MI in 2001, with predefined criteria for diagnosis, thrombolysis, percutaneous coronary intervention, and admission to the coronary care unit.

**Results:** Comparison of treatment modalities disclosed that more patients were given thrombolysis in 1997 (49 vs. 16%,  $p < 0.05$ ), whereas in 2001 more patients were sent to primary angioplasty (63 vs. 11%,  $p < 0.05$ ). Also in 2001, patients more often received aspirin (90 vs. 61%,  $p < 0.05$ ) and intravenous beta blockers (60 vs. 35%,  $p < 0.05$ ) soon after arrival at the ED. Comparison between 1997 and 2001 revealed that admission rates to the coronary care unit (69 vs. 78%, NS) and cardiac wards were similar (19 vs. 10%, NS). Conversely, compared with 1997, patients hospitalized in 2001 had a shorter length of stay ( $12 \pm 5$  vs.  $18 \pm 6$  days,  $p < 0.05$ ), as well as fewer major adverse coronary events (21 vs. 30%,  $p < 0.05$ ) and lower all-cause in-hospital mortality (12 vs. 20%,  $p < 0.05$ ). The quality of care indicators improved with time, as door-to-electrocardiogram interval ( $10 \pm 6$  vs.  $19 \pm 9$  min,  $p < 0.05$ ), door-to-needle time ( $25 \pm 10$  vs.  $35 \pm 10$  min,  $p < 0.05$ ), and door-to-balloon interval ( $70 \pm 15$  vs.  $99 \pm 20$  min,  $p < 0.05$ ) were shorter in 2001 than in 1997.

**Conclusions:** A critical pathway for ST-elevation MI at the ED increases the use of evidence-based treatment strategies and improves outcome and quality of care of patients presenting to a European hospital because of acute chest pain.

**Key words:** chest pain, critical pathways, emergency department, acute myocardial infarction

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