



GUIDELINE 14

ACUTE CORONARY SYNDROMES

OVERVIEW AND SUMMARY

As a part of the International Liaison Committee on Resuscitation (ILCOR) process that led to the International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with treatment recommendations (COSTR) document for 2005 it became clear that there was an increasing need to address questions related to the initial management of acute coronary syndromes (ACS) in the pre hospital and emergency setting^{1,2}.

The management of patients in this setting has been an area of increased research activity over the last 10 years. It is an area that has often been overlooked in guidelines focused on the management of acute coronary syndrome that have tended to focus on immediate and definitive therapeutic interventions once a clear diagnosis has been established. The area of pre hospital and emergency management then was added somewhat belatedly to the 2005 ILCOR and the COSTR 2005 represented the first foray into this area of Resuscitation medicine². The current COSTR process devoted a dedicated Task Force formed from the outset to address 25 topics related to the acute initial management of acute coronary syndromes drawing on expert reviewers from Africa, Asia, Australia, Europe, North America, and South America. The 2010 COSTR has produced an expanded review the available evidence in the area of out of hospital and emergency care of ACS³. A complete systematic review of all literature is contained in this document. For the first time the Australian Resuscitation Council has decided to develop guidelines in this area based on the 2010 COSTR on ACS. Comprehensive guidelines for the diagnosis and treatment of ACS with and without ST elevation have been published by the Cardiac Society of Australia and New Zealand (CSANZ) and the National Heart Foundation (NHF)^{4,5}. This section on ACS has been developed to complement the CSANZ and NHF guidelines.

INTRODUCTION AND DEFINITIONS

The hallmark of acute coronary syndromes (ACS) is a common pathophysiology. The pathophysiology is thought to be related to a ruptured or eroded atherosclerotic plaque that then leads to thrombosis at the site and thromboembolism and ischaemia to the downstream myocardium⁶. This is often associated with the subsequent production of myocardial necrosis. Clinically it is divided into syndromes that are characterised by the presence of ST elevation on the ECG or the absence of ST elevation on the ECG.

In the absence of ST elevation other changes such as ST depression, non-specific ST-T wave abnormalities or even a normal ECG may be noted⁴. These syndromes are related but do have different clinical behaviour, outcomes and therapeutic management.

The term ACS includes ST Elevation Myocardial Infarction (STEMI), non ST elevation myocardial infarction (NSTEMI) and unstable angina pectoris. The term non ST elevation myocardial infarction – acute coronary syndrome or non STEACS has also been introduced to cover both non-STEMI and unstable angina pectoris because the differential diagnosis is dependent on biomarkers that may not be available at the time of initial assessment and treatment⁴. The term covers the suspected diagnosis based on clinical signs and symptoms and electrocardiograph (ECG) on presentation.

One of the best opportunities for improving survival for an acute coronary syndrome is reducing the delay from symptom onset to first medical contact and then initiation of targeted treatment. There are then real potential opportunities for improving survival in the out of hospital phase and emergency phase of care pathway⁷. This is evidenced by the fact that although in hospital from NSTEMI has been reducing significantly by improved reperfusion therapy and optimal medical therapy including risk factor modification, mortality for STEMI is virtually unchanged in the recent decade. This is thought to be because two thirds of patients who die from STEMI do so before they reach hospital for treatment for definitive treatment⁷. Further, ACS are the most common underlying cause leading to sudden cardiac arrest^{3, 8, 9}. These guidelines are designed to address in the first hours after the onset of symptoms, the out of hospital treatment and the initial emergency department management, diagnosis and risk stratification.

SUMMARY OF THE GUIDELINES

Guideline 14

Introduction to Acute Coronary Syndromes (ACS)

Guideline 14.1

Presentation with ACS

- Symptoms and Signs
- The 12 lead ECG
- Cardiac Biomarkers
- Decision Rules
- Chest Pain Observation Units (CPUs)
- Imaging

Guideline 14.2

Initial Medical Therapy

- Oxygen and analgesia
- Anti platelet agents and Anticoagulants
- Optimal Medical Therapy for Primary and Secondary Prevention

Guideline 14.3

Reperfusion Strategy

- Introduction
- Primary Percutaneous Coronary Intervention (PCI)
- Fibrinolytic therapy
- Triage and inter facility transfer for Primary PCI
- Facilitated PCI
- Rescue PCI
- Pharmaco-invasive Strategy

There are a number of new evaluations that should be highlighted since initial 2005 COSTR that have been outlined in the 2010 document³. These include:

Guideline 14.1 Presentation with ACS

- In isolation the clinical history, clinical examinations, biomarkers, ECG criteria and risk scores are unreliable for the identification of patients who may be safely discharged early in the emergency setting.
- Chest Pain Observations Units (CPUs) have an important role in the safe and effective evaluation of patients presenting with possible ACS. The use of a protocol that includes serial evaluation of physical findings, symptoms, ECG, biomarker testing coupled with further provocative testing or imaging procedures are recommended to identify patients who required admission for further testing and treatment.
- The use of pre-hospital ECG for the diagnosis of ST elevation myocardial infarction is recommended and can be interpreted by a variety of methods including by trained non medical staff in the field, remote transmission or with computer assistance.

Guideline 14.2 Initial Medical Therapy

- Supplemental oxygen should be initiated for breathlessness, hypoxaemia or signs of heart failure or shock however hyperoxaemia may be harmful in uncomplicated myocardial infarction.
- Response of chest pain to nitrate therapy is not reliable for diagnostic purposes.
- Non-steroidal anti inflammatory other than aspirin should not be administered as they may be harmful in patients with suspected ACS.
- Aspirin may be given by dispatchers or bystanders provided true allergy or a bleeding disorder can be excluded.
- Newer anti-platelet agents have an important role in the early management of ACS.

Guideline 14.3 Reperfusion Strategy

- Clinical reperfusion networks that include emergency medical services and hospitals with an agreed approach to ST Elevation Myocardial Infarction (STEMI) management can be beneficial in achieving best outcomes for patients with ACS.
- Primary Percutaneous Coronary Intervention (PPCI) is the preferred reperfusion strategy for STEMI when it is performed in a timely manner by an experienced team.
- Fibrinolysis continues to be an important treatment modality for many patients when PPCI is not available.
- Acceptable first medical contact to PPCI delays varies depending on the infarct territory, age of the patient, and duration of symptoms.
- Rescue Percutaneous Coronary Intervention (PCI) should be performed if fibrinolysis fails.
- Patients may be directed to PPCI capable facilities in the pre hospital setting bypassing closer Emergency Departments if PPCI can be delivered in a timely manner.
- Patients with successful fibrinolysis but not in a PCI-capable facility should be transferred for angiography and possible PCI at ideally 6–24 h after fibrinolysis.

- However immediate routine PCI after fibrinolysis or combination fibrinolysis ('facilitated') is not recommended.
- Immediate angiography and PCI is a reasonable approach to patients with return of spontaneous circulation (ROSC), even in patients without ST elevation on the electrocardiograph, and may be a part of a standardised protocol for the post arrest care of patients.

REFERENCES:

1. Gazmuri RJ, Nadkarni VM, Nolan JP, et al. Scientific knowledge gaps and clinical research priorities for cardiopulmonary resuscitation and emergency cardiovascular care identified during the 2005 International Consensus Conference on ECC [corrected] and CPR science with treatment recommendations: a consensus statement from the International Liaison Committee on Resuscitation (American Heart Association, Australian Resuscitation Council, European Resuscitation Council, Heart and Stroke Foundation of Canada, InterAmerican Heart Foundation, Resuscitation Council of Southern Africa, and the New Zealand Resuscitation Council); the American Heart Association Emergency Cardiovascular Care Committee; the Stroke Council; and the Cardiovascular Nursing Council.". *Circulation* 2007;116:2501-12.
2. 2005 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Part 5: Acute coronary syndromes. *Resuscitation* 2005;67:249-69.
3. O'Connor RE, Bossaert L, Arntz HR, et al. Part 9: acute coronary syndromes: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*;122:S422-65.
4. Aroney CN, Aylward P, Chew DP, et al. 2007 addendum to the National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the management of acute coronary syndromes 2006. *Med J Aust* 2008;188:302-3.
5. Guidelines for the management of acute coronary syndromes 2006. *Med J Aust* 2006;184:S9-29.
6. Libby P, Ridker PM, Hansson GK. Inflammation in atherosclerosis: from pathophysiology to practice. *J Am Coll Cardiol* 2009;54:2129-38.
7. Arntz HR, Bossaert LL, Danchin N, Nikolaou NI. European Resuscitation Council Guidelines for Resuscitation 2010 Section 5. Initial management of acute coronary syndromes. *Resuscitation*;81:1353-63.
8. O'Connor RE, Brady W, Brooks SC, et al. Part 10: acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*;122:S787-817.
9. Dumas F, Cariou A, Manzo-Silberman S, et al. Immediate percutaneous coronary intervention is associated with better survival after out-of-hospital cardiac arrest: insights from the PROCAT (Parisian Region Out of hospital Cardiac Arrest) registry. *Circ Cardiovasc Interv*;3:200-7.