Guideline 14.2 – Acute Coronary Syndromes: Initial Medical Therapy

Summary

To whom does this guideline apply?

This guideline applies to adults.

Who is the audience for this guideline?

This guideline is for use by first responders and health professionals in the prehospital and emergency department setting.

Summary of Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. Supplemental oxygen should only be initiated if the patient has hypoxemia, signs of heart failure, or shock [Good Practice Statement].
2. Oxygen saturation monitoring should guide oxygen therapy [Good Practice Statement].
3. Nitrates can be used for symptom relief and resolution of ST depression [Good Practice Statement].
4. Opioids such as morphine or fentanyl can be used as first-line analgesia for ongoing chest discomfort that is unresponsive to nitrates [Good Practice Statement].
5. Aspirin administration is recommended with a loading dose of 300 mg followed by regular dosing at 75 to 150 mg daily [Good Practice Statement].
6. ANZCOR suggests anticoagulation with either subcutaneous enoxaparin, intravenous unfractionated heparin (UFH) or other agents in patients with acute coronary syndrome (ACS) [Good Practice Statement].
7. Switching between agents should be avoided [Good Practice Statement].

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1.0 | Symptomatic Therapy

There are several therapies in patients with Acute Coronary Syndromes (ACS) that provide relief for symptoms.

Supplemental oxygen should be initiated if the patient has hypoxaemia (oxygen saturation (SpO_2) < 94% or < 88% with chronic obstructive pulmonary disease (COPD)/known carbon dioxide (CO_2) retention), or signs of heart failure or shock. The use of oxygen saturation monitoring is useful in guiding oxygen therapy.[1, 2] Oxygen supplementation does not improve outcomes among patients without hypoxemia,[3] and hyperoxaemia is potentially harmful in uncomplicated myocardial infarction.[4] Supplemental oxygen is not advised to treat breathlessness where target SpO_2 is achieved with air. In patients with ACS where peripheral oxygen saturations are unobtainable due to poor tissue perfusion, oxygen should be administered.

Nitrates may also be used for symptom relief and resolution of ST depression, with intravenous nitrate being more effective than sublingual nitrate.[5] However, there are no data to suggest a benefit from nitrates outside of symptom control.[6] It is reasonable to consider the early administration of nitrates in selected patients without contraindications.

Opioids such as morphine or fentanyl are traditionally used as first line analgesia for patients with ongoing symptoms of chest discomfort and titrated to relieve pain. Opioids have, however, been associated with slower uptake and delayed onset of antiplatelet action and further research is required regarding the possibility of harm suggested in some studies.[7-11] Though current recommendations do not prohibit the use of opioids, they should only be used for significant ongoing chest pain unresponsive to nitrates. Trials into non opioid analgesia are ongoing.

In the specific setting of cocaine/stimulant-associated chest pain, lorazepam and nitrates may be useful in the alleviation of chest pain.

In general, non-steroidal anti-inflammatory drugs (excluding aspirin) should not be administered in patients with suspected ACS as they could be harmful.[12]

2.0 | Antiplatelet and Anticoagulant Therapy

2.1 | Aspirin administration

The early administration of aspirin with a loading dose of 300 mg followed by regular dosing at 75 to 150 mg daily is recommended in people with suspected ACS where contraindications such as true anaphylaxis or bleeding disorder have been excluded.[5, 13] They should be directed to chew the

tablet (which should not be enteric coated).[2] Dispersible aspirin may also be used.

Aspirin has been shown to be similar to thrombolysis in reducing ST-elevation myocardial infarction (STEMI) mortality and provides an additive benefit when administered with thrombolysis (ISIS 2).

There is currently limited evidence to directly support the strategy of dispatcher directed or bystander administration of aspirin, however, it is a reasonable approach if the carer can exclude a history of true anaphylaxis or bleeding disorder.[14]

2.2 | Antiplatelet Agents

Ticagrelor is a pyrimidine derivative and is effective without the need for biotransformation. It is the preferred drug, in conjunction with aspirin, for ACS. Additionally, it has a quicker offset of action so that recovery of platelet function is faster. It is more effective in decreasing death from vascular causes, myocardial infarction, or stroke in comparison to clopidogrel in ACS (9.8% vs 11.7%, $p<0.001$), though ticagrelor was associated with a higher rate of non-procedure related bleeding. The other adverse effects of ticagrelor include dyspnoea, increased frequency of mostly asymptomatic ventricular pauses, and asymptomatic increases in uric acid. Dosing for ACS includes a 180 mg loading dose followed by a 90 mg twice daily maintenance dose.

Clopidogrel: Clopidogrel is a prodrug with variable response and should only be used for ACS when ticagrelor or prasugrel are unavailable or are precluded by an unacceptably high bleeding risk.[5]

Prasugrel: Prasugrel is a newer thienopyridine, that produces more rapid and consistent platelet inhibition.[17] Prasugrel is one of the preferred antiplatelet options, in addition to aspirin, for ACS. Prasugrel is administered as a loading dose of 60 mg followed by 10 mg daily maintenance dose. At the time of writing, prasugrel is no longer available for clinical use in Australia or New Zealand, however this may be subject to change.

Timing: Among STEMI patients, administration can occur in either the prehospital or in-hospital setting, but there is insufficient evidence to change any existing local practice.[2]

There is insufficient evidence to support the administration of a second antiplatelet agent in non-ST segment myocardial infarction (NSTEMI) prior to angiography.

3.0 | Anticoagulants

3.1 | Anticoagulants in Non-ST Elevation Acute Coronary Syndrome (NSTEACS)

In people presenting with NSTEACS, anticoagulation with either subcutaneous enoxaparin, or

intravenous unfractionated heparin (UFH) is the preferred treatment strategy.[22] This recommendation includes those managed with an initial conservative approach or a planned invasive approach. The use of bivalirudin remains controversial, with several conflicting trials and meta-analyses and a potential concern of increased stent thrombosis risk.[5, 23-27] With current available evidence, bivalirudin may be considered in selected cases, such as in heparin induced thrombocytopenia (HIT).

3.2 | Anticoagulants in STEMI treated with Fibrinolysis

In patients with STEMI in the pre-hospital and emergency department (ED) setting, parenteral anticoagulation should be given until revascularisation.[11] In patients with STEMI managed with fibrinolysis, anticoagulation with either enoxaparin (first dose intravenous (omit if > 74 years) followed by subcutaneous) or intravenous UFH is reasonable. The patient should not be switched from enoxaparin to UFH or vice versa as this has been shown to be associated with an increased bleeding risk.

3.3 | Anticoagulants in STEMI treated with PCI

Anticoagulation is recommended in all patients with STEMI, and UFH or enoxaparin are preferred. Pre-hospital administration of UFH is reasonable as part of a coordinated system of care. While there are no randomized data assessing UFH in primary PCI, there is a large body of experience with this agent.[11] Enoxaparin may be considered a safe and effective alternative to UFH in the patient with STEMI undergoing PCI. To avoid increased bleeding risks, patients initially treated with enoxaparin or UFH should not be switched to the other agent.[11, 28] The administration of anticoagulants in patients with suspected STEMI and a planned primary percutaneous coronary intervention (PPCI) can occur in-hospital or in the pre-hospital setting.[2]

Data surrounding bivalirudin are mixed with several trials suggesting bivalirudin may reduce bleeding complications compared to UFH, while others identified an increased rate of stent thrombosis observed in patients treated with bivalirudin in the first 24 hours.[25, 27, 29-33] There are other agents that are used less commonly in the hospital setting such as fondaparinux which may be considered in STEMI in some situations.[35]

3.4 | Glycoprotein IIBIIIA inhibitors

Routine use of glycoprotein (GP) IIb/IIIa inhibitors in the pre-hospital setting increases bleeding risk without improving outcomes, and therefore is not recommended.[11, 33, 36]

4.0 | Optimal Medical Therapy for Primary and Secondary Prevention

There are several additional medical therapies that have been proposed for ACS patients to reduce myocardial ischaemia and recurrent major cardiovascular events and improve long-term survival. Therapeutic options in the pre-hospital and emergency setting that should be specifically addressed include the routine use of antiarrhythmics, beta blockers, angiotensin converting enzyme (ACE) inhibitors and 3-hydroxy-3-methyl-glutaryl-coenzyme A (HMG CoA)-reductase inhibitors.

4.1 | Antiarrhythmics

There is no high-level evidence to suggest that the prophylactic use of antiarrhythmics improves outcomes in patients with ACS, and negative effects on early mortality have been described.[37, 38] Serious arrhythmias such as ventricular fibrillation (VF) and ventricular tachycardia (VT) may occur in ACS and should be treated according to advanced life support guidelines, but the prophylactic use of antiarrhythmic agents is not recommended.[11]

4.2 | Beta Blockers

Beta-blockers lower heart rate and myocardial contractility, thereby reducing myocardial oxygen consumption, which is useful in the setting of ischemia. Early administration within 24 hours of admission is reasonable provided there are no contraindications to treatment. However, in patients at risk of cardiogenic shock early initiation of beta-blockers pre-hospital or in ED is associated with increased risk of death or shock compared to patients treated later but within 24 hours. Similarly, routine use of intravenous (IV) beta blockers in the pre-hospital setting or during initial assessment in the ED is not supported by the available evidence.[40] Of note, beta-blockers should not be given in patients with probable coronary vasospasm or cocaine use due to the risk of alpha-mediated vasoconstriction without beta-mediated vasodilation.

About this Guideline

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Questions/PICOs:	This guideline has been developed from the previous ANZCOR guideline 2016 and questions included in the ILCOR 2015 and 2022 CoSTR
Method:	Literature review of the most recent acute coronary syndrome and related guidelines from the Australian Heart Foundation / Cardiac Society of Australia and NZ (2016), the European Society of Cardiology (2020) in addition to related ILCOR reviews to produce a locally relevant document.
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Other consultation:	N/A
Worksheet:	N/A
Approved:	December 2024
Guideline superseded:	Guidelines 14.0, 14.1, 14.1.2, 14.2, 14.3

4.3 | Other drugs

There is little data to support the routine use of calcium channel blockers in the pre hospital and emergency setting. Reductions in mortality have not been reported in this setting[58].

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Abbreviations

Abbreviation	Meaning/Phrase
ACE	Angiotensin converting enzyme
ACS	Acute coronary syndrome
ANZCOR	Australian and New Zealand Committee on Resuscitation
ARC	Australian Resuscitation Council
CO_2	Carbondioxide
COPD	Chronic obstructive pulmonary disease
ED	Emergency department
HIT	Heparin induced thrombocytopenia
HMG CoA	3-hydroxy-3-methyl-glutaryl-coenzyme A
IV	Intravenous
MI	Myocardial infarction
NSTEACS	Non-ST elevation acute coronary syndrome
NSTEMI	Non-ST elevation myocardial infarction
PCI	Percutaneous coronary intervention
PPCI	Primary percutaneous coronary intervention
SpO_2	Oxygen saturation
STEMI	ST elevation myocardial infarction
UFH	Unfractionated heparin
VF	Ventricular fibrillation
VT	Ventricular tachycardia

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