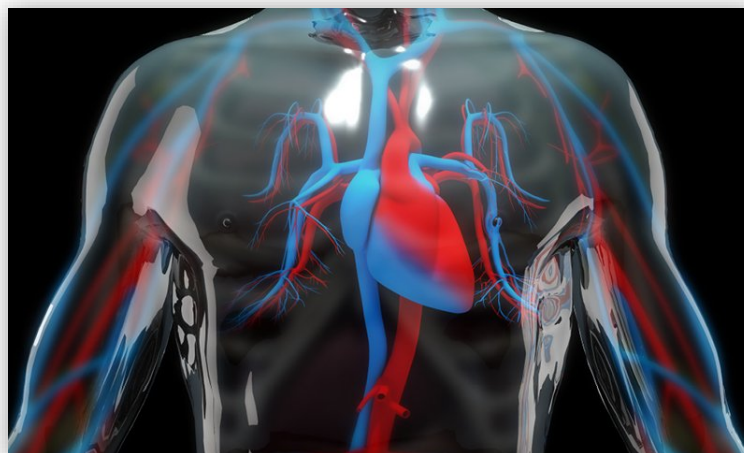


# National Heart Foundation of Australia & Cardiac Society of Australia and New Zealand

## Australian Clinical Guidelines for the Management of Acute Coronary Syndromes 2016 <sup>[1]</sup>



1. Chew DP, et al. Heart Lung Circ 2016; 25: 895–951.

# Prevalence

- Chest pain and acute coronary syndrome (ACS) symptoms are common presenting complaints in emergency departments (EDs).
- There were 68,200 ACS events recorded in 2012 [1].
- >500,000 patients present with chest pain in Australia each year, but  $\geq 80\%$  of all patients investigated for ACS do not have a diagnosis confirmed [1,2].
- There are significant health burdens and health sector costs associated with ACS diagnosis and assessment.



1. Australian Institute of Health and Welfare. 2014. Cardiovascular disease, diabetes and chronic kidney disease—Australian facts: Prevalence and incidence. 2. Cullen L, et al. Med J Aust 2015;202 (8):427–32.

# Background

- Aim is to provide a clinical guideline to assist the management of patients presenting with chest pain, due to suspected or confirmed ACS.
- Intended to replace the NHFA/CSANZ ACS guidelines of 2006 [1], addenda 2007 [2] and 2011 [3].
- These guidelines should be read in conjunction with:
  - ACS Clinical Care Standards developed by the Australian Commission for Safety and Quality in Health Care (ACSQHC) [4].
  - Australian Acute Coronary Syndromes Capability Framework developed by the Heart Foundation [5].

# Working Group

- An ACS Guideline Development Working Group was facilitated by the National Heart Foundation of Australia (NHFA) in partnership with Cardiac Society of Australia and New Zealand (CSANZ).
- The Working Group included a broad mix of health professionals, including a general practitioner, general physician, cardiac surgeon, pathologist, ambulance representative, cardiologists, emergency physicians, exercise physiologists, cardiac nurses and a consumer representative.



# The process for developing the guidelines

- Literature review:
  - informed by stakeholder consultation, the working group developed clinical questions on which the literature review was based
  - conducted by an external literature reviewer, who was appointed through an open tender process (KP Health)
  - included published studies from 2010 to 2015.



# The process for developing the guidelines

- Governance
  - Processes in place to ensure transparency, minimise bias, manage conflict of interest (COI) and limit other influences during development.
- Recommendations developed using
  - NHMRC (level of evidence)
  - GRADE methodology (strong or weak).



# The process for developing the guidelines

- Public consultation period of 30 days in April 2016 on the final draft.
- NHFA and CSANZ clinical committee and National Board approvals followed.
- Endorsed by key stakeholder organisations.
- Publication in peer review journals August 2016.



# What is new from previous guidelines?

- Recommendations are graded on the **strength of the evidence** and the **expected value** of the intervention.
- Recommendations focus on the interventions and therapies most likely associated with **improved outcomes**.
- Use of **practice points** to highlight aspects of care that are supported by limited evidence or modest benefits.
- Focus on pathways for the **assessment** of patients with suspected ACS.



# What is new from previous guidelines?

- Guidance on:
  - **troponin testing** integrated into chest pain assessment pathways
  - patient groups not requiring **further testing**
  - duration of **cardiac monitoring**
  - prompt transfer of patients receiving **fibrinolysis** in STEMI
  - provision and timing of early **invasive management** in NSTEMI/ACS
  - reduced indication for **glycoprotein IIb/IIIa inhibition**
  - combination **antiplatelet and anti-thrombin** therapy
  - duration of **P2Y<sub>12</sub> inhibition**
  - reduced indication for **beta-blocker** therapy.

# Recommendations



# Initial assessment of chest pain

Recommendation	Grade
1. It is recommended that a patient with acute chest pain or other symptoms suggestive of an ACS receives a 12-lead ECG and this ECG is assessed for signs of myocardial ischaemia by an ECG-experienced clinician within 10 minutes of first acute clinical contact.	Strong III C
2. A patient presenting with acute chest pain or other symptoms suggestive of ACS should receive care guided by an evidence-based Suspected ACS Assessment Protocol (Suspected ACS-AP) that includes formal risk stratification.	Strong IA
3. Using serial sampling, cardiac-specific troponin levels should be measured at hospital presentation and at clearly defined periods after presentation using a validated Suspected ACS-AP in patients with symptoms of possible ACS.	Strong IA

# Practice points

- Oxygen supplementation
  - Routine use of oxygen therapy among patients with a blood oxygen saturation ( $\text{SaO}_2$ ) level  $> 93\%$  is not recommended, but its use when the  $\text{SaO}_2$  is below this level is advocated, despite the absence of clinical data [1,2].
  - Target  $\text{SaO}_2$  level for patients with chronic obstructive pulmonary disease is 88–92%.
- Initial aspirin therapy
  - In all patients with possible ACS and without contraindications, aspirin (300 mg orally) should be given as soon as possible after presentation.
  - Additional antiplatelet and anticoagulation therapy, or other therapies such as beta blockers, should not be given to patients without a confirmed or probable diagnosis of ACS.

1. Cabello JB, Burls A, Empananza JI, et al. Oxygen therapy for acute myocardial infarction. Cochrane Database Syst Rev 2013; (8): CD007160. 2. Stub D, Smith K, Bernard S, et al. Air versus oxygen in ST-segment-elevation myocardial infarction. Circulation 2015; 131: 2143-2150.

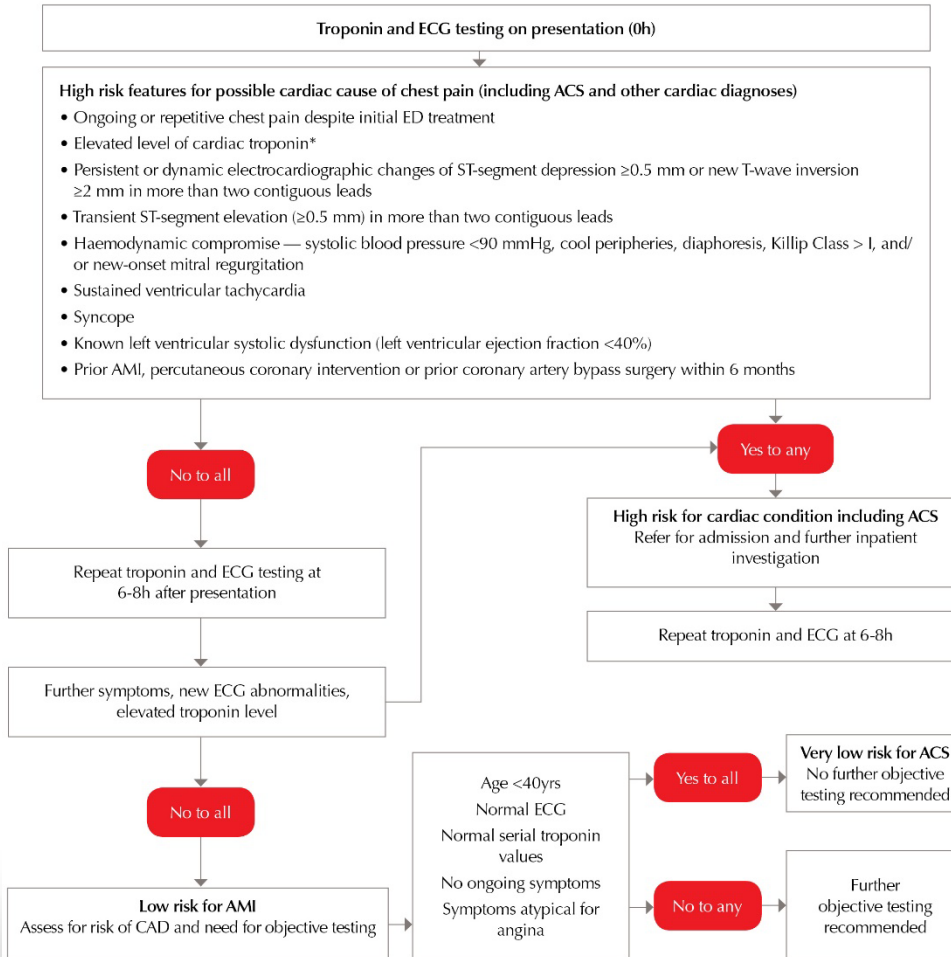


# Initial assessment of chest pain

Recommendation	Grade
4. Non-invasive objective testing is recommended in intermediate-risk patients, as defined by a validated Suspected ACS-AP, with normal serial troponin and ECG testing and who remain symptom-free.	Weak IA
5. Patients in whom no further objective testing for coronary artery disease (CAD) is recommended are those at low risk, as defined by a validated Suspected ACS-AP: age <40 years, symptoms atypical for angina, in the absence of known CAD, with normal troponin and ECG testing, and who remain symptom-free.	Weak III-3C
6. The routine use of validated risk stratification tools for ischaemic and bleeding events (e.g. GRACE score for ischaemic risk or CRUSADE score for bleeding risk) may assist in patient-centric clinical decision-making in regards to ACS care.	Weak IIIB

# Assessment protocols for suspected ACS

**IMPORTANT NOTICE:** Management protocols never replace clinical judgement. The care outlined in this protocol must be altered if it is not clinically appropriate for the individual patient.



- Point of care assays
- Sensitive lab-based assays
- Highly sensitive lab-based assays

Note: It is important to validate the local Suspected ACS assessment protocol (Suspected ACS-AP). We recommend evaluating three components: Routinely monitor and assess patients receiving the local Suspected ACS-AP; continuously evaluate adherence to the Suspected ACS-AP; conduct ongoing assessment of the 30-day outcome associated with the application of the Suspected ACS-AP. \*Elevated troponin defined as >99th percentile of a normal reference population.



# Differential diagnosis of causes of chest pain

Ischaemic cardiovascular causes	<ul style="list-style-type: none"><li>• ACS (e.g. acute myocardial infarction, unstable angina)</li><li>• Stable angina</li><li>• Severe aortic stenosis</li><li>• Tachyarrhythmia (atrial or ventricular)</li></ul>
Non-ischaemic cardiovascular causes of chest pain	<ul style="list-style-type: none"><li>• Aortic dissection (tear between the layers of the wall of the aorta) and expanding aortic aneurysm</li><li>• Pulmonary embolism</li><li>• Pericarditis and myocarditis</li><li>• Gastrointestinal causes (e.g. gastro-oesophageal reflux, oesophageal spasm, peptic ulcer, pancreatitis, biliary disease)</li></ul>
Non-cardiovascular causes	<ul style="list-style-type: none"><li>• Musculoskeletal causes (e.g. costochondritis, cervical radiculopathy, fibrositis)</li><li>• Pulmonary (e.g. pneumonia, pleuritis, pneumothorax)</li><li>• Other aetiologies (e.g. sickle cell crisis, herpes zoster)</li></ul>

# Causes of troponin elevation\*

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- Cardiac contusion, or other trauma including surgery, ablation, pacing, frequent defibrillator shocks
- Congestive heart failure – acute and chronic
- Coronary vasculitis, e.g. SLE, Kawasaki syndrome
- **Aortic dissection**
- Aortic valve disease
- Hypertrophic cardiomyopathy
- Tachy- or bradyarrhythmias, or heart block
- Stress cardiomyopathy (Takotsubo cardiomyopathy)
- Rhabdomyolysis with cardiac injury
- **Pulmonary embolism**, severe pulmonary hypertension
- Renal failure
- **Acute neurological disease, including stroke or subarachnoid haemorrhage**
- Infiltrative diseases, e.g. amyloidosis, haemochromatosis, sarcoidosis, and scleroderma
- Inflammatory diseases, e.g. myocarditis or myocardial extension of endo-/pericarditis
- Drug toxicity or toxins e.g. anthracyclines, CO poisoning
- **Critically ill patients, especially with respiratory failure or sepsis**
- **Hypoxia**
- **Burns, especially if affecting > 30% of body surface area**
- Extreme exertion
- False positives: Cross reacting heterophile antibodies

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\*Life-threatening, non-coronary conditions highlighted in bold





# Markers of increased risk with confirmed ACS

Risk classification	Clinical characteristic
Very high	<ul style="list-style-type: none"> <li>• Haemodynamic instability, heart failure, cardiogenic shock or mechanical complications of MI</li> <li>• Life-threatening arrhythmias or cardiac arrest</li> <li>• Recurrent or ongoing ischaemia i.e. chest pain refractory to medical treatment, or recurrent dynamic ST-segment and/or T-wave changes, particularly with intermittent ST-segment elevation, de Winter T-wave changes, or Wellens' syndrome, or widespread ST-segment elevation in two coronary territories</li> </ul>
High	<ul style="list-style-type: none"> <li>• Rise and/or fall in troponin level consistent with MI</li> <li>• Dynamic ST-segment and/or T-wave changes with or without symptoms</li> <li>• GRACE Score &gt;140</li> </ul>
Intermediate	<ul style="list-style-type: none"> <li>• Diabetes mellitus</li> <li>• Renal insufficiency (GFR&lt;60mL/min/1.73m<sup>2</sup>)</li> <li>• LVEF &lt;40%</li> <li>• Prior revascularisation: PCI or CABG</li> <li>• GRACE score &gt;109 and &lt;140</li> </ul>

GRACE, Global Registry of Acute Coronary Events; GFR, glomerular filtration rate; LVEF, left ventricular ejection fraction; PCI, percutaneous coronary intervention; CABG, coronary artery bypass grafting; MI, myocardial infarction

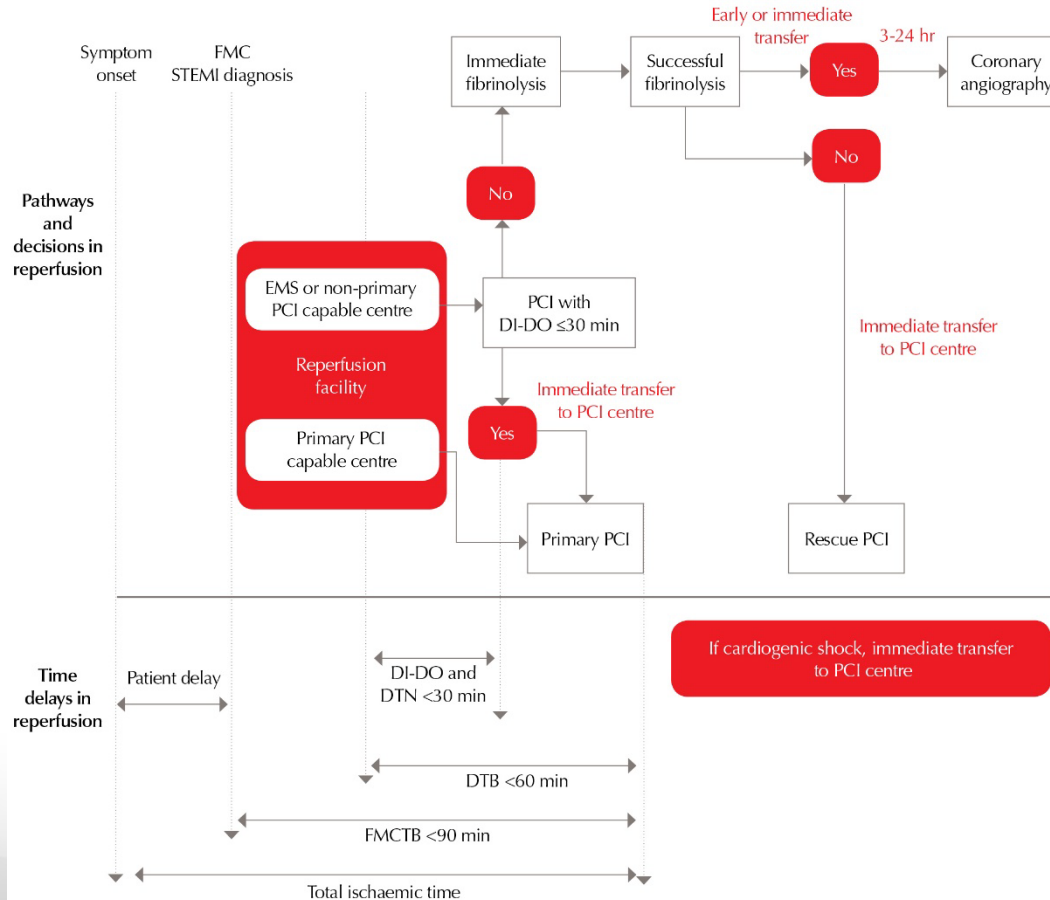


# Acute reperfusion and invasive management

Recommendation	Grade
1. For patients with ST elevation myocardial infarction (STEMI) presenting within 12 hours of symptom onset, and in the absence of comorbidities that influence the individual's overall survival, emergency reperfusion therapy with either primary percutaneous coronary intervention (PCI) or fibrinolytic therapy is recommended.	Strong IA
2. Primary PCI is preferred for reperfusion therapy in patients with STEMI if it can be performed within 90 minutes of first medical contact; otherwise fibrinolytic therapy is preferred for those without contra-indications.	Strong IA
3. Among patients treated with fibrinolytic therapy who are not in a PCI-capable hospital, early or immediate transfer to a PCI-capable hospital for angiography, and PCI if indicated, within 24 hours is recommended.	Weak IIA
4. Among patients treated with fibrinolytic therapy, for those with $\leq 50\%$ ST recovery at 60–90 minutes, and/or with haemodynamic instability, immediate transfer for angiography with a view to rescue angioplasty is recommended.	Strong IB

# Decision-making and timing considerations in reperfusion for STEMI

Decision-making and organisation of reperfusion strategies within 12 hours of first medical contact (FMC) with ideal time interval for interventions



DI-DO, door in to door out time; DTB, door to balloon time; EMS, emergency medical service; FMC, first medical contact; FMCTB, first medical contact to balloon time; PCI, percutaneous coronary intervention; STEMI, ST elevation myocardial infarction

Adapted from ESC. Eur Heart J 2012;33 :2569-619.

# Invasive management in NSTEMACS

Recommendation	Grade
1. Among high- and very high-risk patients with non ST elevation acute coronary syndromes (NSTEMACS) (except Type 2 MI), angiography with coronary revascularisation (PCI or coronary artery bypass grafts) where appropriate is recommended.	Strong IA
2. Patients with NSTEMACS who have no recurrent symptoms and no risk criteria are considered at low risk of ischaemic events, and can be managed with a selective invasive strategy guided by provocative testing for inducible ischaemia.	Strong IA
3. Among patients with NSTEMACS <u>with very high-risk criteria</u> (ongoing ischaemia, haemodynamic compromise, arrhythmias, mechanical complications of MI, acute heart failure, recurrent dynamic or widespread ST-segment and/or T-wave changes on ECG), an immediate invasive strategy is recommended (within 2 hours of admission).	Strong IIC
4. In the absence of very high-risk criteria, for patients with NSTEMACS <u>with high-risk criteria</u> (GRACE score >140, dynamic ST-segment and/or T-wave changes on ECG, or rise and/or fall in troponin compatible with MI) an early invasive strategy is recommended (within 24 hours of admission).	Weak IC
5. In the absence of high-risk criteria, for patients with NSTEMACS <u>with intermediate-risk criteria</u> (such as recurrent symptoms or substantial inducible ischaemia on provocative testing), an invasive strategy is recommended (within 72 hours of admission).	Weak IIC

# Pharmacology for ACS

Recommendation	Grade
1. Aspirin 300 mg orally initially (dissolved or chewed) followed by 100–150 mg/day is recommended for all patients with ACS in the absence of hypersensitivity.	Strong IA
2. Among patients with confirmed ACS at intermediate to very high-risk of recurrent ischaemic events, use of a P2Y <sub>12</sub> inhibitor (ticagrelor; or prasugrel; or clopidogrel) is recommended in addition to aspirin. (ticagrelor or prasugrel preferred).	Strong IA
3. Intravenous glycoprotein IIb/IIIa inhibition in combination with heparin is recommended at the time of PCI among patients with high-risk clinical and angiographic characteristics, or for treating thrombotic complications among patients with ACS.	Strong IB
4. Either unfractionated heparin or enoxaparin is recommended in patients with ACS at intermediate to high risk of ischaemic events.	Strong IA
5. Bivalirudin (0.75 mg/kg IV with 1.75 mg/kg/hr infusion) may be considered as an alternative to glycoprotein IIb/IIIa inhibition and heparin among patients with ACS undergoing PCI with clinical features associated with an increased risk of bleeding events.	Weak IIB

# Practice points

- Choosing between P2Y<sub>12</sub> inhibitors
  - Given their superior efficacy, ticagrelor and prasugrel are the preferred first-line P2Y<sub>12</sub> inhibitors.
- Timing of P2Y<sub>12</sub> initiation: Based on limited data
  - Ticagrelor or clopidogrel should be commenced soon after diagnosis but due consideration should be given to ischaemic and bleeding risk, the likelihood of need for CABG and the delay to angiography.
  - Prasugrel should be commenced immediately following diagnosis among patients undergoing primary PCI for STEMI, or after the coronary anatomy is known among those undergoing urgent PCI. Initiation of prasugrel prior to coronary angiography outside the context of primary PCI is not recommended.

# Practice points

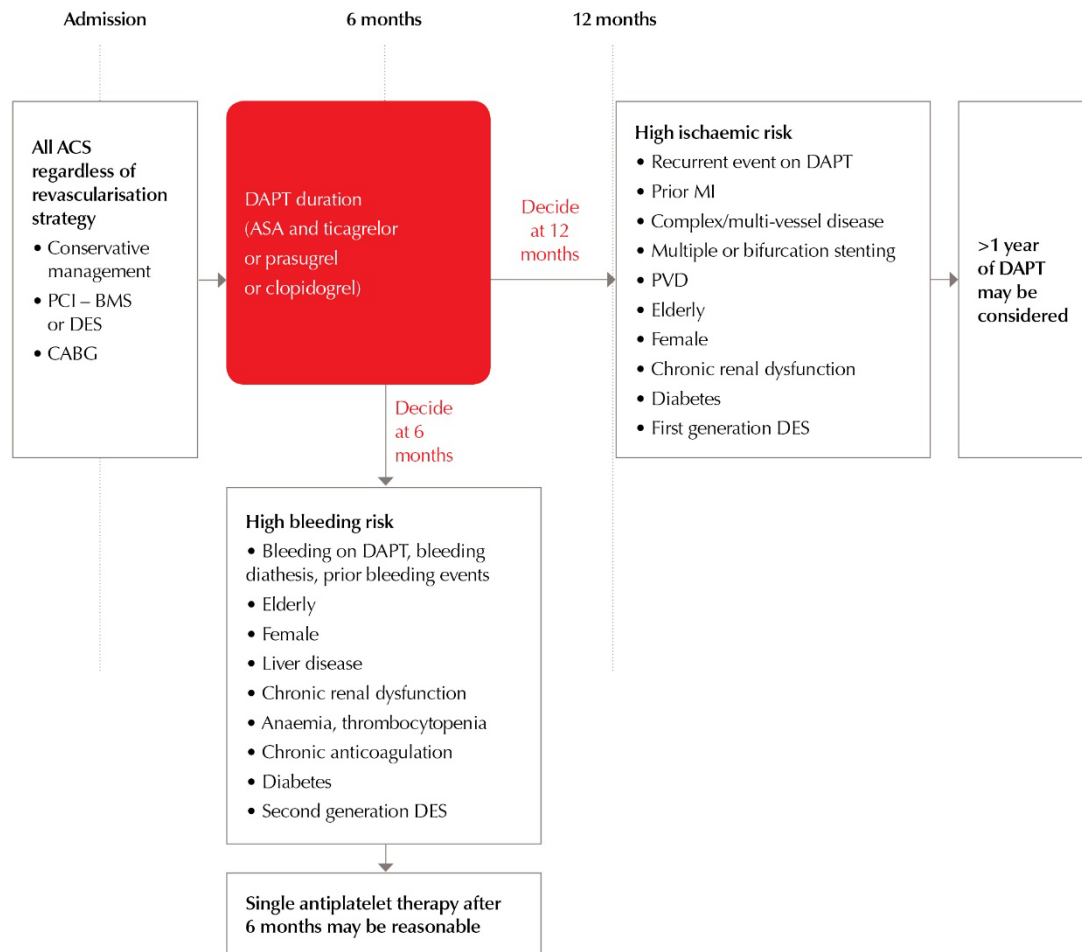
- In patients with a strong long-term indication for anticoagulation (i.e. mechanical heart valves, atrial fibrillation (AF) with CHA2DS2VASC score  $\geq 2$ ):
  - anticoagulant should be continued at reduced dose
  - and clopidogrel used, rather than ticagrelor or prasugrel.

# Practice points

- Duration of triple therapy should be determined by bleeding risk:
  - HAS-BLED score  $<3$ , consider 3–6 months of triple therapy and then aspirin or clopidogrel with oral anticoagulation (OAC) up to 12 months
  - HAS-BLED score  $\geq 3$ , consider 1 month of triple therapy and then aspirin or clopidogrel with OAC up to 12 months
  - Patients with AF at low thromboembolic risk (CHA<sub>2</sub>DS<sub>2</sub>VASC score = 1) should be managed with dual antiplatelet therapy for 12 months, beyond which OAC may be considered
  - routine concurrent use of a proton pump inhibitor should be considered for the duration of triple therapy.



# Considerations for dual antiplatelet therapy (DAPT) in patients with ACS



ACS, acute coronary syndromes; ASA, aspirin; BMS, bare metal stents; CABG, coronary artery bypass grafting; DAPT, dual antiplatelet therapy; DES, drug-eluting stents; MI, myocardial infarction; PCI, percutaneous coronary intervention; PVD, peripheral vascular disease



# Discharge management

Recommendation	Grade
1. Aspirin (100–150 mg/day) should be continued indefinitely unless it is not tolerated or an indication for anticoagulation becomes apparent.	Strong IA
2. Clopidogrel should be prescribed if aspirin is contraindicated or not tolerated.	Strong IA
3. Dual-antiplatelet therapy with aspirin and a P2Y <sub>12</sub> inhibitor (clopidogrel or ticagrelor) should be prescribed for up to 12 months in patients with ACS, regardless of whether coronary revascularisation was performed. The use of prasugrel for up to 12 months should be confined to patients receiving PCI.	Strong IA
4. Consider continuation of dual-antiplatelet therapy beyond 12 months if ischaemic risks outweigh the bleeding risk of P2Y <sub>12</sub> inhibitor therapy; conversely consider discontinuation if bleeding risk outweighs ischaemic risks.	Weak IIC

# Discharge management

Recommendation	Grade
5. Initiate and continue indefinitely, the highest tolerated dose of HMG-CoA reductase inhibitors (statins) for a patient following hospitalisation with ACS unless contraindicated or there is a history of intolerance.	Strong IA
6. Initiate treatment with vasodilatory beta-blockers in patients with reduced left ventricular (LV) systolic function (LV ejection fraction [EF] $\leq 40\%$ ) unless contraindicated.	Strong IIA
7. Initiate and continue angiotensin converting enzyme (ACE) inhibitors (or angiotensin receptor blockers) in patients with evidence of heart failure, LV systolic dysfunction, diabetes, anterior myocardial infarction or co-existent hypertension.	Strong IA
8. Attendance at cardiac rehabilitation or undertaking a structured secondary prevention service is recommended for all patients hospitalised with ACS.	Strong IA

# Practice Points

Individualisation of cardiac rehabilitation/secondary prevention service referral:

- A wide variety of prevention programs improve health outcomes in patients with coronary disease.
- Following discharge from hospital, patients with ACS and their companion(s) should be referred to an individualised preventive intervention according to personal preference, values and the available resources.
- Services can be hospital-based, in primary care, the local community or in the home.



# Working group acknowledgement

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- Professor Yusuf Nagree
- Ms Sue Sanderson
- Associate Professor Clara Chow
- Mr Ross Proctor
- Professor Anne-Maree Kelly



# Endorsement

- Australasian College for Emergency Medicine
- Australian Cardiovascular Health and Rehabilitation Association
- Royal College of Pathologists of Australasia
- Internal Medicine Society of Australia and New Zealand
- The Australasian Cardiovascular Nursing College
- Council of Remote Area Nurses of Australia
- Australian and New Zealand Society of Cardiac and Thoracic Surgeons
- Australian Commission on Safety and Quality in Health Care



# Publications

## Executive summary in MJA

## Full document in HLC

Guideline summary

**National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand: Australian clinical guidelines for the management of acute coronary syndromes 2016**



Derek P Chew<sup>1</sup>, Ian A Scott<sup>2,3</sup>, Louise Cullen<sup>4,5</sup>, John K French<sup>6</sup>, Tom G Briffa<sup>7</sup>, Philip A Tideman<sup>8</sup>, Stephen Woodruffe<sup>9</sup>, Alistair Kerr<sup>10</sup>, Maree Branagan<sup>11</sup>, Philo EG Aylward<sup>12</sup>

**T**hese clinical guidelines have been developed to assist in managing patients presenting with chest pain suspected to be caused by an acute coronary syndrome (ACS) and those with confirmed ACS. The development of these guidelines has been informed by reviews of the literature dealing with key aspects of chest pain assessment and ACS care, as well as broad consultation with local opinion leaders, stakeholder groups and the public. The recommendations focus on the core clinical and system-based components of care most associated with improved clinical outcomes. As such, these guidelines should be read in conjunction with the *Acute coronary syndromes clinical care standard*, developed by the Australian Commission on Safety and Quality in Health Care, and the *Australian acute coronary syndromes capability framework*, developed by the National Heart Foundation of Australia (NHFA). Guidance regarding both the strength of evidence supporting the recommendations and their potential impact on outcomes is provided to assist in informing clinical practice.<sup>1,2</sup> Additional guidance regarding the timing and considerations informing the use of therapies and management strategies is given in the accompanying practice advice. A full version of the NHFA and Cardiac Society of Australia and New Zealand (CSANZ) Australian clinical guidelines for the management of acute coronary syndromes 2016 is available at: <http://heartfoundation.org.au/for-professionals/clinical-information/acute-coronary-syndromes>.

**Methods**

The NHFA, in partnership with the CSANZ, has undertaken an update to the NHFA/CSANZ Guidelines for the management of acute coronary syndromes 2006 and addenda of 2007 and 2011.<sup>3,4</sup> The updated guideline will provide a synthesis of current evidence-based guidance for health professionals caring for patients with ACS.

The ACS Guideline Development Working Group comprised an Executive and the four writing groups of which it had oversight, covering the topics of chest pain, ST segment elevation myocardial infarction (STEMI), non-ST segment elevation ACS (NSTEMI/ACS) and secondary prevention. In addition, a Reference Group included representatives from stakeholder groups, patient endorsing organisations and regional experts. The Working Group comprised a broad mix of health professionals, including a

1. Department of Cardiology, Monash University, Australia, 2. Department of Internal Medicine, Flinders University Hospital, Adelaide, SA, 3. School of Health and Behavioural Sciences, University of Central Queensland, QLD, 4. Australian Centre for Health Services Research, Melbourne, VIC, 5. Department of Emergency Medicine, Royal Melbourne and Western Hospital, Melbourne, VIC, 6. Coronary Care and Cardiac Catheterisation Research, Liverpool Hospital, Sydney, NSW, 7. School of Population Health, University of Western Australia, Perth, WA, 8. Department of Cardiology, St Vincent's, Victoria, Australia, 9. Victoria Cancer Treatment Centre and Heart Risk and Stroke, Ipswich Hospital, Ipswich, QLD, 10. Cardiology, Flinders Medical Centre, Adelaide, SA, 11. National Heart Foundation of Australia, Melbourne, VIC, 12. Cardiology Department, Prince of Wales Clinical Centre, Adelaide, SA. @heartfoundation.org.au • 08 8204 9400 • www.heartfoundation.org.au

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**POSITION STATEMENT**

**National Heart Foundation of Australia & Cardiac Society of Australia and New Zealand: Australian Clinical Guidelines for the Management of Acute Coronary Syndromes 2016**

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1. Chew DP, et al. Med J Aust 2016; 205: 128-133. 2. Chew DP, et al. Heart Lung Circ 2016; 25: 895-951.



# Resources on NHFA website

- PowerPoint presentations for health professionals
  - Short and longer versions
- COI register and governance document (for the working group during development of the guidelines)
- Treatment algorithm for STEMI (print version)
- Assessment protocols for suspected ACS (print versions)
  - Using point of care, sensitive and highly sensitive assays
- Resources available at: <http://heartfoundation.org.au/for-professionals/clinical-information/acute-coronary-syndromes>.





# Questions

