Acute Coronary Syndromes – the Case for Improvement
Suggested citation

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Disclaimer
The Australian Commission on Safety and Quality in Health Care has produced this Case for Improvement to support the implementation of the corresponding Clinical Care Standard. The Case for Improvement and the Clinical Care Standard support the delivery of appropriate care for a defined clinical condition and are based on the best evidence available at the time of development. Healthcare professionals are advised to use clinical discretion and consideration of the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian when applying information contained within the Clinical Care Standard. Consumers should use the information in the Clinical Care Standard as a guide to inform discussions with their healthcare professional about the applicability of the Clinical Care Standard to their individual condition.
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Acute Coronary Syndromes Clinical Care Standard

1 A patient presenting with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives care guided by a documented chest pain assessment pathway.

2 A patient with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives a 12-lead electrocardiogram (ECG) and the results are analysed by a clinician experienced in interpreting an ECG within 10 minutes of the first emergency clinical contact.

3 A patient with an acute ST-segment-elevation myocardial infarction (STEMI), for whom emergency reperfusion is clinically appropriate, is offered timely percutaneous coronary intervention (PCI) or fibrinolysis in accordance with the time frames recommended in the current National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the Management of Acute Coronary Syndromes. In general, primary PCI is recommended if the time from first medical contact to balloon inflation is anticipated to be less than 90 minutes, otherwise the patient is offered fibrinolysis.

4 A patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) is managed based on a documented, evidence-based assessment of their risk of an adverse event.

5 The role of coronary angiography, with a view to timely and appropriate coronary revascularisation, is discussed with a patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) who is assessed to be at intermediate or high risk of an adverse cardiac event.

6 Before a patient with an acute coronary syndrome leaves the hospital, they are involved in the development of an individualised care plan. This plan identifies the lifestyle modifications and medicines needed to manage their risk factors, addresses their psychosocial needs and includes a referral to an appropriate cardiac rehabilitation or another secondary prevention program. This plan is provided to the patient and their general practitioner or ongoing clinical provider within 48 hours of discharge.
Purpose

This document supports the implementation of the *Acute Coronary Syndromes Clinical Care Standard* by highlighting what is known about the evidence, best practice and current practice - and the opportunities to bring these closer together.

A Clinical Care Standard is a small number of quality statements that describe the clinical care that a patient should be offered for a specific clinical condition. A Clinical Care Standard supports:

- people to know what care may be offered by their healthcare system and to make informed treatment decisions in partnership with their clinician
- clinicians to make decisions about appropriate care
- health services to examine the performance of their organisation and make improvements in the care they provide.

While there are well-developed guidelines for managing acute coronary syndromes, not all patients are treated consistently, suggesting that there is a gap between knowledge and practice.\(^2\)

The causes for this variation may be as diverse as the possible solutions – and depend on the local and individual circumstances.

This document outlines the following for each quality statement:

- Why is it important?
- What is known about current practice?
- What could be achieved with more consistent application of the aspects of care described?

When possible, examples are provided showing how specific approaches or systems for implementing best practice have demonstrated measurable change.

This document will be of interest to a wide audience, including clinicians and health services, policy makers, health system managers, researchers and the general public, and all those with an interest in the implementation of the *Acute Coronary Syndromes Clinical Care Standard*. 
Acute coronary syndromes – the case for improvement

Acute coronary syndromes (ACS), including heart attacks, affect thousands of Australians. An estimated 69,900 people aged 25 and over had an acute coronary event in 2011, which equates to around 190 events per day. Coronary heart disease (CHD) – the underlying condition in ACS – contributed to 15 per cent of all deaths in Australia in 2011.3

The Acute Coronary Syndromes Clinical Care Standard aims to ensure that a person with a potential ACS receives optimal treatment from the onset of symptoms through to discharge from hospital.

Coronary heart disease is still a major health burden

Hospitalisation rates and CHD deaths have declined over the past two to three decades, probably as a result of improvements in treatment and prevention.3 Despite these gains, CHD is the most common chronic disease cause of death and accounts for the greatest burden of disease in Australia.3 With the ageing of the population, one estimate suggests that the number of people living with CHD could double, along with a 73 per cent increase in new CHD by 2045. Correspondingly, 42 per cent of men and 30 per cent of women aged 25 in 2005 are predicted to develop CHD in their lifetime.4 As more people survive heart attacks, preventing further events and related disability is critical for reducing the health burden associated with coronary heart disease in Australia.

Treatment and outcomes for acute coronary events differ for different groups

People in remote and rural locations still have a higher rate of CHD mortality than their urban counterparts.5

Despite well-developed guidelines for managing ACS, not all people receive appropriate treatment. Variation exists between the rates of invasive treatment (angiography and percutaneous coronary intervention [PCI]) received by people in metropolitan compared to non-metropolitan areas, and between treatment of people in low and high-risk groups.2

Aboriginal and Torres Strait Islander peoples experience coronary events, such as heart attacks, at rates three times those of other Australians.6 Compared with other patients, Aboriginal and Torres Strait Islander peoples admitted to hospital with ACS are twice as likely to die in hospital from CHD, while also experiencing lower levels of angiography and invasive procedures.7

* This figure includes both myocardial infarctions and unstable angina as per the relevant national indicator; the latter uses the term “heart attack” when reporting this data for ease of understanding.2,9
Preventing recurrence needs to start at the first admission for an acute coronary syndrome

Hospitalisations for ACS have increased since the 1990s but the average length of stay in hospital has decreased. While most hospital stays are for three days or more, stays of one day or less are more frequent in all age groups than they were in the late 1990s, due in part to advances in medical procedures. Nonetheless, one-third of patients admitted for CHD are readmitted within 24 months, with readmissions accounting for up to a third of the total costs of atherothrombotic disease. It is likely that at least some of these readmissions (and associated costs) could be prevented by reducing the gaps between recommended and current care.

Systems of care can improve outcomes

Clinical pathways and clinical care networks that cross hospital and health service boundaries have been shown to improve outcomes for people with an ACS. The need for coordinated systems of care to manage acute events and prevent future recurrences is vital.

An integrated, systems-based approach supported by health services and networks of services is therefore central to the delivery of patient-centred care identified in this Clinical Care Standard.

Key elements of this approach include:

• an understanding of the capacity and limitations of each component of the system across metropolitan, regional and remote settings, including pre-hospital care, within and across hospitals, through to community and other support services

• clear lines of communication across components of the system

• appropriate coordination so that patients receive timely access to optimal care regardless of how or where they enter the system.
Quality statement 1 – Immediate management

A patient presenting with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives care guided by a documented chest pain assessment pathway.

Why is this important?

Acute chest pain is a common symptom of acute coronary syndromes (ACS). However, not all patients with an ACS have chest pain and not all chest pain is due to an ACS.

Non-standardised or inconsistent approaches to assessment expose patients to the risk of missed diagnosis, with the greatest risk being that patients may be discharged to home, and subsequently suffer a fatal heart attack. Patients sent home with undiagnosed myocardial infarction (MI) or unstable angina have a 30-day mortality rate almost double that of those who are hospitalised (5.5 per cent compared with 9.8 per cent).\(^13\)

Chest pain assessment pathways could help to reduce emergency department (ED) overcrowding by streamlining processes. ED overcrowding reduces the effectiveness of care to those in highest need.\(^2\)

While patients with an ST-segment-elevation myocardial infarction (STEMI) are usually identified, diagnosing other patients with chest pain who are at the highest risk of a myocardial infarction is challenging, particularly for those presenting with less typical signs and symptoms. Of patients who present with undifferentiated chest pain in Australia, it is estimated that only 10–15 per cent are finally diagnosed with an ACS.\(^15,16\)

Evidence-based pathways can help differentiate between low-risk patients who can be safely discharged from the ED for outpatient follow up, and high-risk patients who need immediate investigation and treatment.\(^15,16\)

What is current practice?

Published data are not available about the rate of missed MI in Australia, or the proportion of hospitals that use chest pain assessment pathways. However, there is considerable variation in procedures and treatments for how chest-pain patients are managed across the country\(^2\), suggesting that treatment is not always evidence based. Research has demonstrated that different protocols for assessing chest pain, including the specific tests used, are associated with different rates of MI and other serious outcomes after the patient is discharged from the ED. This research suggests there is value in a more standardised approach.\(^16,17\)

What could be achieved?

Using a standardised chest pain assessment pathway, it is possible to streamline the investigation and management of patients with chest pain, with very low rates of major adverse cardiac outcomes – less than one per cent.\(^15–17\)

As well as reducing adverse consequences of misdiagnosis, total ED length of stay can be significantly reduced.\(^16\) This can contribute to achieving national emergency access targets (NEAT) that aim to ensure patients are either admitted, discharged, or referred on within four hours of presenting to the ED, which will improve access and reduce waiting times for all ED patients.
Quality statement 2 – Early assessment

A patient with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives a 12-lead electrocardiogram (ECG), and the results are analysed by a clinician experienced in interpreting an ECG, within 10 minutes of the first emergency clinical contact.

Why is this important?
Establishing ECG changes is the key diagnostic step for identifying the most lethal and time-critical type of heart attack – STEMI. The earlier the ECG can be carried out and correctly interpreted, the more likely it is the patient will receive prompt reperfusion treatment, restoring blood flow to the heart and reducing the risk of heart tissue damage or death. The closer to symptom onset that reperfusion occurs, the better.

In Australia, guidelines recommend a PCI should be performed within 90 minutes of first medical contact and fibrinolysis within 30 minutes, for patients with a STEMI. When a pre-hospital ECG can be performed in the ambulance, treatment can often start earlier – either through paramedic-administered fibrinolysis or by facilitated transfer to a PCI-capable hospital. Delays imposed by distance (particularly in rural areas) and the fact that patients often present several hours after their first symptoms make rapid ECG assessment even more crucial.

What is current practice?
In Australia, around 50 per cent of patients with chest pain arrive at hospital by ambulance. In some parts of Australia, the ECG is now performed in an ambulance by a trained paramedic, allowing much faster diagnosis and streamlining of treatment, including transfer to the most appropriate treatment location.

For those who come to ED independently, it may take longer for the first ECG to be conducted.

By specifying a time frame of 10 minutes, the Clinical Care Standard indicates the importance of achieving fast diagnosis – whether the patient is first seen in hospital or by paramedics. The time frame of 10 minutes is consistent with an Australasian Triage Category score of 2.
What could be achieved?

Obtaining an ECG result within 10 minutes of first emergency clinical contact will enable the early diagnosis of more patients with STEMI, allowing faster activation of emergency processes required to provide timely reperfusion. A pre-hospital diagnosis of STEMI can help the hospital prepare for reperfusion or direct the patient to a hospital equipped to perform PCI. In rural and remote areas, fibrinolysis may start before hospital arrival.18

Acquiring an ECG before arrival with advance hospital notification has been shown to reduce the relative risk of short-term mortality by 30–40 per cent compared to standard care, according to pooled international studies.20

Time to treatment was nearly halved by one hospital network using an ambulance-based pre-hospital 12-lead ECG to facilitate transfer to the cardiac catheterisation lab when needed. ‘Door-to-balloon’ time was reduced from a median of 100 minutes to 54 minutes compared with patients who came by ambulance without an ECG or came themselves to the ED.11

Figure: Systems of care in Australia demonstrating improved outcomes for patient with STEMI.11,12,18

SA Integrated Cardiovascular Clinical Network12
- Onsite ECG, point of care testing and acute medicines in rural setting
- Remote ECG interpretation and facilitated transfer
- 22% reduced odds of 30-day mortality (odds ratio = 0.78; confidence interval 0.65–0.93)

Monash MonAMI project11
- 12-lead ECG triage by ambulance, catheterisation lab activation
- Reduced ‘door to balloon’ times (90% to 42% within 90 mins)

Ambulance Service of NSW – rural pilot study18
- Paramedics trained in ECG and fibrinolysis
- 73% of STEMI patients received fibrinolysis in 120 mins of symptom onset
Quality statement 3 – Timely reperfusion

A patient with an acute ST-segment-elevation myocardial infarction (STEMI), for whom emergency reperfusion is clinically appropriate, is offered timely percutaneous coronary intervention (PCI) or fibrinolysis in accordance with the time frames recommended in the current National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the Management of Acute Coronary Syndromes.¹

In general, primary PCI is recommended if the time from first medical contact to balloon inflation is anticipated to be less than 90 minutes, otherwise the patient is offered fibrinolysis.

Why is this important?

Treatment of STEMI is time critical. Reducing the time between symptom onset and restoration of blood flow to cardiac muscle has a direct impact on the extent of permanent damage to the heart, long-term disability and death in these patients.¹⁸

The appropriate choice of therapy depends on a number of factors, including how soon PCI can be performed and the time since symptom onset. While distance and access to PCI-capable facilities can affect the choice of reperfusion, the timeliness of reperfusion is crucial.

What is current practice?

An Australian national audit of STEMI patients²¹ found:

- 90 per cent of patients presented within a time from symptom onset that allowed for reperfusion (less than 12 hours)
- 67 per cent of patients received any reperfusion therapy – either primary PCI or fibrinolysis
- 23 per cent of patients received the reperfusion therapy within the optimal time frame.

Approximately eight per cent of patients who had a STEMI died within 12 months of hospital admission, regardless of their treatment. However, STEMI patients who received timely reperfusion therapy were much more likely to be alive after 12 months than those who received late reperfusion therapy or none at all.²¹

Australian patients with STEMI²¹:

- 90 per cent presented in time for reperfusion (<12 hours)
- 67 per cent received any reperfusion
- 23 per cent received timely reperfusion.

What could be achieved?

Extending timely reperfusion to all patients with STEMI could prevent an estimated 23 deaths and 213 recurrent MIs or strokes per 10,000 presentations.²²

One Australian cardiac network was able to double the number of PCIs performed within recommended time frames from 42 per cent to 90 per cent. The service model included paramedic field triage and pre-hospital notification in a metropolitan healthcare network including three hospitals, only one of which had a PCI facility.¹¹
Quality statement 4 – Risk stratification

A patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) is managed based on a documented, evidence-based assessment of their risk of an adverse event.

Why is this important?
Underestimating a patient’s risk of a future major adverse cardiac event can reduce the likelihood of them receiving timely, intensive treatment. Objective risk assessment tools can help clinicians to accurately predict risk.

Clinical data from Australia and internationally demonstrate that physician perceptions of risk are quite varied and less accurate than risk prediction undertaken through established risk scoring methods. Underestimating clinical risk appears to be associated with an increase in late mortality.

What is current practice?
Retrospective studies have found a ‘treatment-risk’ paradox – suggesting that high-risk patients are less likely to receive treatment using objective risk prediction tools such as the Global Registry of Acute Coronary Events score (GRACE) or the Thrombolysis In Myocardial Infarction (TIMI) score. In one Australian study, 19 per cent of high-risk patients with NSTEACS received early coronary angiography compared to 34 per cent of low-risk patients. From the same data, 18 per cent of high-risk patients received reperfusion compared with 88 per cent of low-risk patients.

While patient complexity (age, multiple morbidity) can justifiably affect treatment decisions, the risk conferred by such factors may sometimes be overestimated, so that high-risk patients who are most likely to benefit do not receive treatment. Under-treatment of high-risk patients has been shown even after compensating for age and other factors that might increase the risks of therapy.

While integrated into the recommendations of national and international clinical practice guidelines, no clinical trials have formally evaluated a strategy of objective risk assessment versus physician impression in guiding care among patients with ACS.

Data that describe how often patients are managed using a documented, evidence-based assessment of risk is not currently available.

What could be achieved?
Employing objective risk assessment may assist in reducing the major adverse cardiac events that result from the under-treatment of high-risk patients across the spectrum of ACS.

More consistent estimation of risk may help shared decision making and communication with patients and their carers, making it easier to weigh up the benefits and risks of different treatment options.

† Risk assessment tools for consideration include:
   i. Global Registry of Acute Coronary Events score (GRACE)
   iii. Thrombolysis In Myocardial Infarction (TIMI) Risk Score for UA/NSTEMI
   ii. Acute Coronary Syndromes Treatment Algorithm
   
   ACS Risk Calculator

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Clinical Care Standards
Treatment rates and risk in NSTEMI patients

Note: Risk was categorised according to the TIMI score; reperfusion includes fibrinolytic therapy and angioplasty.\(^2^3\)
Quality statement 5 – Coronary angiography

The role of coronary angiography, with a view to timely and appropriate coronary revascularisation, is discussed with a patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) who is assessed to be at intermediate or high risk of an adverse cardiac event.

Why is this important?

While not every patient with a NSTEACS should have an angiogram, the potential treatment benefits and risks should be discussed with all patients at high or intermediate risk.

Australian national audit data (ACACIA) show considerable risk of adverse cardiac outcomes in the first 12 months after hospital admission for NSTEACS. Rates of death, MI, or stroke within 12 months were similar for patients with NSTEACS (16 per cent) and STEMI (17 per cent). For all ACS, 12-month mortality was reduced for patients who had coronary angiography during their acute admission (adjusted hazard ratio of 0.53).

International data from randomised trials show a three per cent absolute risk reduction in cardiovascular death or non-fatal MI for NSTEACS patients randomised to routine coronary angiography (and revascularisation as appropriate) compared to intervention based on persistent or refractory symptoms. For highest-risk patients, the absolute difference was 11 per cent over five years.

What could be achieved?

Patients receiving coronary angiography before discharge from acute care, experience a 47 per cent lower relative rate of late mortality. It has been estimated that a further 16 lives could be saved per 10,000 presentations of NSTEMI if coronary angiography occurred within 72 hours of admission. As 65 to 70 per cent of all MIs are NSTEMIs, the impact of improved management could be substantial.

What is current practice?

Currently, there is significant variation nationally in the use of diagnostic coronary angiography. While 60 per cent of ACS patients in principal referral hospitals receive angiography, only 40 per cent of those in regional centres do so. This suggests that not all patients are receiving the same opportunity to access treatment.

Several studies show that patients at highest risk (according to GRACE or TIMI) are least likely to receive invasive management. In one study, only 19 per cent of NSTEACS patients categorised as high risk according to their TIMI score had early coronary angiography compared with 34 per cent of low-risk patients.
Quality statement 6 – Individualised care plan

Before a patient with an acute coronary syndrome leaves the hospital, they are involved in the development of an individualised care plan. This plan identifies the lifestyle modifications and medicines needed to manage their risk factors, addresses their psychosocial needs and includes a referral to an appropriate cardiac rehabilitation or another secondary prevention program. This plan is provided to the patient and their general practitioner or ongoing clinical provider within 48 hours of discharge.

Why is this important?

Patients who have previously experienced a coronary heart event are at high risk of a subsequent event. As patients generally spend less time in hospital for the treatment of an ACS because of treatment advances in recent years, in-hospital management may tend to focus on acute treatment with less time spent planning follow-up care. Hospital-based cardiac rehabilitation services may be less relevant to patients whose post-operative recovery is faster after PCI than after bypass surgery (coronary artery bypass graft [CABG]). Most patients require education and support to adhere to exercise, diet and medication regimes. In most cases this will happen in the community, but encouragement from the treating cardiologist or physician can strongly influence adherence.

What could be achieved?

Extending the use of and adherence to guideline-recommended therapies for at least 12 months could prevent 104 deaths and 191 recurrent heart attacks or strokes within the first 12 months, per 10,000 ACS patients.

The cost of treating recurrent events is substantial. In one Australian hospital, re-hospitalisations within 24 months accounted for almost a third of the annual costs of atherothrombotic disease admissions. CHD made up 74 per cent of these admissions.

What is current practice?

Whether patients receive guideline-recommended medications on discharge or a referral to cardiac rehabilitation varies greatly, according to data from the Australian SNAPSHOT ACS study. Overall, 64 per cent of all ACS patients received four or more guideline-recommended therapies on discharge. Only 46 per cent were formally referred to cardiac rehabilitation. Variation between metropolitan and rural centres was also observed.

In an earlier study, of the 76 per cent of patients discharged on four or more recommended medicines, 22 per cent were no longer adherent after six months.
Acute coronary syndromes (ACS): The spectrum of acute clinical presentations resulting from underlying CHD, including myocardial infarction (heart attack) and angina. These are further categorised on the basis of ECG and other investigations as ST-segment-elevation myocardial infarction (STEMI), non-ST-segment-elevation myocardial infarction (NSTEMI) and unstable angina.

Acute myocardial infarction: A condition where there is evidence of myocardial necrosis (cell death) consistent with acute myocardial ischaemia. Acute myocardial infarction is a type of acute coronary syndrome, typically referred to as a ‘heart attack’, where the supply of blood to the heart muscle is blocked. STEMI and NSTEMI are both forms of myocardial infarction.

Angina: Chest pain due to obstruction or spasm of the coronary artery. Unstable angina is part of the spectrum of acute coronary syndromes and is a more severe form of angina (see Unstable angina).

Atherosclerosis: A process in which fatty and fibre-like deposits build up on the inner walls of arteries, often forming plaques that can then cause blockages. It is the main underlying condition in heart attack, angina, stroke and peripheral vascular disease.

Atherothrombotic disease: Conditions with a similar pathology (manifestations of disease) involving the formation of a blood clot (thrombosis) in addition to atherosclerosis. Generally this occurs in ischaemic stroke, CHD and peripheral arterial disease.

Cardiac event: Any severe or acute cardiovascular condition including acute myocardial infarction, unstable angina and cardiac death.

Cardiac rehabilitation: The sum of activities required to favourably influence the underlying cause of CHD, as well as the best physical, mental and social conditions, so that patients resume as normal a place as possible in the community.

Cardiac rehabilitation program: Describes all measures used to help people with heart disease return to an active and satisfying life and to prevent recurrence of cardiac events.

Care plan (individualised): A written agreement between a consumer and health professional and/or social services to help manage day-to-day health. This information is identified in a health record.

Carers: People who provide unpaid care and support to family members and friends who have a disease, disability, mental illness, chronic condition, terminal illness or general frailty. Carers include parents and guardians caring for children.

Clinician: A healthcare provider, trained as a health professional. Clinicians include registered and nonregistered practitioners, or a team of health professionals, who provide direct clinical care.

Coronary angiography: A procedure in which a special X-ray of the heart’s arteries (the coronary arteries) is taken to see if they are narrowed or blocked. It involves the insertion of a catheter (a long thin tube) into an artery in the groin or arm, which is then moved up inside the artery until it reaches the heart.

Coronary heart disease: Caused by a slow build-up of fatty deposits on the inner wall of the blood vessels that supply the heart muscle with blood (the coronary arteries). These fatty deposits gradually clog the arteries and reduce the flow of blood to the heart.

Coronary revascularisation: Procedures used to restore good blood supply to the heart, for example, PCI or coronary angioplasty (which involves inserting a catheter with a balloon into a narrowed coronary artery, and inflating the balloon to open up the artery and restore blood flow).

Door-to-balloon time: The duration of time from the point of arrival at a PCI facility to the first inflation of a balloon inside the blocked coronary artery during a PCI procedure. A door-to-balloon time of 90 minutes or less is recommended to expedite time to reperfusion.

Electrocardiogram (ECG): A non-invasive test that records the electrical activity of the heart. A 12-lead ECG records 12 different electrical views of the heart simultaneously.

Fibrinolysis: Specialised drug treatment to dissolve a blood clot blocking a coronary artery during a heart attack. If given early enough, this treatment can reduce damage to the heart muscle. May also be referred to as thrombolysis.

First emergency clinical contact: The time when a patient first encounters a clinician.
**Health record**: Information about a patient held in paper form or electronically. The health record may comprise clinical records (such as medical history, treatment notes, observations, correspondence, investigations, test results, photographs, prescription records and medication charts), administrative records (such as contact and demographic information, and legal and occupational health and safety records) and financial records (such as invoices, payments and insurance information).

**Health service**: A service responsible for the clinical governance, administration and financial management of unit(s) providing health care. A service unit involves a grouping of clinicians and others working in a systematic way to deliver health care to patients and can be in any location or setting, including a pharmacy, clinic, outpatient facility, hospital, patient’s home, community setting, practice and clinicians’ rooms.

**Heart attack**: Life-threatening emergency that occurs when a vessel supplying blood to the heart muscle is suddenly blocked completely by a blood clot. This term is commonly used to refer to an acute myocardial infarction.

**Hospital**: A licensed facility providing healthcare services to patients for short periods of acute illness, injury or recovery.

**Individualised care plan**: See Care plan.

**Medicine**: A chemical substance given with the intention of preventing, curing, controlling or alleviating disease, or otherwise improving the physical or mental welfare of people. Prescription, non-prescription and complementary medicines, irrespective of their administration route, are included.

**Myocardial ischaemia**: Reduced blood flow to the heart muscle.

**Non-ST-segment-elevation myocardial infarction (NSTEMI)**: A type of myocardial infarction identified by what is seen on the electrocardiogram. In a NSTEMI, the artery is only partly blocked, so only part of the heart muscle being supplied by that artery is affected.

**Non-ST-segment-elevation acute coronary syndrome (NSTEACS)**: A condition where patients have acute chest pain but do not have persistent ST segment elevation in their electrocardiogram. NSTEACS is further divided into unstable angina and non-ST-segment-elevation myocardial infarction.

**Percutaneous coronary intervention (PCI)**: An invasive procedure that restores blood flow through a blocked coronary artery. A special balloon is inserted to open the blocked artery at the point of narrowing, without the need for heart surgery. After PCI is performed, a stent (an expandable metal tube such as a coil or wire mesh) is delivered to the newly dilated site where it is expanded and left in place to keep the artery open.

**Pre-hospital care**: Emergency medical care provided in the community and in transit to hospital.

**Reperfusion**: The restoration of blood flow (and therefore oxygen supply) to an area of heart muscle that has been deprived of circulation for a period of time (e.g. as a result of a heart attack).

**Risk factor**: Any variable (e.g. smoking, abnormal blood lipids, elevated blood pressure, diabetes) that is associated with a greater risk of a health disorder or other unwanted condition or event.

**Secondary prevention**: Health care designed to prevent recurrence of cardiovascular events (e.g. heart attack) or complications of cardiovascular disease in patients with diagnosed cardiovascular disease. It involves medical care, modification of behavioural risk factors, psychosocial care, education and support for self-management (including adherence to prescribed medicines), which can be delivered in various settings. An example of an evidence-based secondary prevention strategy is cardiac rehabilitation.

**ST-segment-elevation myocardial infarction (STEMI)**: An acute heart attack for which the diagnosis has been made by a 12-lead ECG test. A heart attack occurs when an area of plaque within a coronary artery ruptures and forms a blood clot, suddenly blocking the supply of blood to a part of the heart muscle and depriving it of oxygen.

**Thrombosis**: Clotting of blood; the term is usually applied to clotting within a blood vessel due to disease, as in a heart attack or a stroke.

**Unstable angina**: A form of angina that is more dangerous than normal angina but less so than a heart attack. It can feature chest pain that occurs at rest; in someone who already has angina it can be marked by new patterns of onset with exertion or by pain that comes on more easily, more often or for longer than previously, and may be caused by a blockage in the blood vessel. Unstable angina is a form of non-ST-segment-elevation acute coronary syndrome (NSTEACS).
References


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