GUIDELINES

Early management of unstable angina and non-ST segment elevation myocardial infarction: summary of NICE guidance

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Why read this summary?

Acute coronary syndromes are a common cause of morbidity and mortality, and they place a major burden on healthcare providers in both industrialised and developing countries. A range of drug treatments and invasive management strategies is available, but the potential to reduce ischaemic risk must be balanced against the increased risk of bleeding complications. This article summarises recommendations made in the National Institute for Health and Clinical Excellence (NICE) guideline for the management of unstable angina and non-ST elevation myocardial infarction, including risk assessment, drug treatment, invasive management, cardiac rehabilitation, and planning of discharge.1 Patients with acute coronary syndrome who do not have persistent ST segment elevation on their electrocardiogram (ECG) at presentation are classified as having non-ST elevation myocardial infarction if the serum troponin concentration is raised and as having unstable angina if it is normal.

Recommendations

NICE recommendations are based on systematic reviews of best available evidence and explicit consideration of cost effectiveness. When minimal evidence is available, recommendations are based on the experience and opinion of the Guideline Development Group (GDG) on what constitutes good practice.

Risk assessment

As soon as the diagnosis is made, formally assess the risk of future adverse cardiovascular events using an established risk scoring system (for example, global registry of acute cardiac events).2 [Based on observational study and registry database evidence] Include in the formal risk assessment:

- A full clinical history (including age, previous myocardial infarction, and previous percutaneous coronary intervention or coronary artery bypass grafting)
- A physical examination (including measurement of blood pressure and heart rate)
- A resting 12 lead ECG (looking particularly for dynamic or unstable patterns that indicate myocardial ischaemia)
- Blood tests (including concentrations of troponin I or troponin T, creatinine, glucose, and haemoglobin).

Classification of risk according to predicted 6 month mortality in patients with non-ST elevation myocardial infarction or unstable angina [Based on registry database evidence]

<table>
<thead>
<tr>
<th>Predicted 6 month mortality (%)</th>
<th>Risk category</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1.5</td>
<td>Lowest</td>
</tr>
<tr>
<td>1.5-3.0</td>
<td>Low</td>
</tr>
<tr>
<td>3.0-6.0</td>
<td>Intermediate</td>
</tr>
<tr>
<td>6.0-9.0</td>
<td>High</td>
</tr>
<tr>
<td>≥9.0</td>
<td>Highest</td>
</tr>
</tbody>
</table>

[All based on registry database evidence and the experience and opinion of the GDG]

Use the risk scoring system to predict six month mortality and hence the patient’s risk (table). Use this risk assessment to guide clinical management, balancing the benefit of treatment against any related adverse events. [Based on the experience and opinion of the GDG]

Antiplaet treatment

Offer a single loading dose of 300 mg aspirin as soon as possible and continue indefinitely unless contraindicated by bleeding risk or aspirin hypersensitivity. [Based on a high quality systematic review and cost effectiveness evidence]

Offer a loading dose of 300 mg clopidogrel in addition to aspirin to patients with a predicted six month mortality of more than 1.5%, or to patients who may undergo percutaneous coronary intervention within 24 hours of admission to hospital, unless contraindications (for example, excessive risk of bleeding) exist. [Based on moderate to high quality evidence from randomised controlled trials (RCTs) and cost effectiveness evidence]

Consider adding an intravenous glycoprotein IIa/IIIb inhibitor (eptifibatide or tirofiban) as part of early management for patients at intermediate or higher risk (predicted six month mortality >3.0%) who are scheduled to undergo coronary angiography (and follow-on percutaneous coronary intervention if indicated) within 96 hours of hospital admission. (This is an off-label use of eptifibatide and tirofiban, which do not have marketing authorisation for use with clopidogrel in the United Kingdom.) [Based on high quality systematic reviews, RCTs, and cost effectiveness evidence]

When determining whether a glycoprotein IIb/IIIa inhibitor should be offered, balance the potential reduction in ischaemic risk with any increased risk of bleeding. [Based on evidence from moderate to high quality systematic reviews and the experience and opinion of the GDG]
Practice outcomes and bleeding complications, compared with clinical assessment alone, to determine • The use of combined risk scoring systems (in addition to clinical assessment) of ischaemic comparative efficacy and cost effectiveness of different non-invasive tests (such as stress ECG, • The role of myocardial ischaemia testing in people after acute coronary syndrome and the FuTure research

guide; a version known as the “NICE guideline” that summarises the recommendations; and a comments, reanalysed the data where necessary, and modified the guideline.

The guideline went through an external consultation with stakeholders. The GDG assessed the multi-disciplinary GDG discussed the evidence and formulated clinical recommendations. The guideline went through an external consultation with stakeholders. The GDG assessed the comments, reanalysed the data where necessary, and modified the guideline.

NICE has produced four different versions of the guideline: a full version; a quick reference guide; a version known as the “NICE guideline” that summarises the recommendations; and a version for patients and the public. All these versions are available from the NICE website (www. nice.org.uk.CG94). Future updates of the guideline will be published according to the NICE guideline development programme.

Future research

• The role of myocardial ischaemia testing in people after acute coronary syndrome and the comparative efficacy and cost effectiveness of different non-invasive tests (such as stress ECG, magnetic resonance imaging, echocardiography, and radionuclide scanning)
• The use of combined risk scoring systems (in addition to clinical assessment) of ischaemic outcomes and bleeding complications, compared with clinical assessment alone, to determine net clinical benefit
• Comparison of data on clinical outcomes (adverse cardiovascular events and bleeding complications) from cardiac registries with data collected in randomised controlled trials

Antithrombotic treatment

As with antiplatelet treatment, carefully consider the choice and dose of antithrombin in patients who have a high risk of bleeding associated with any of the following:
• Advancing age
• Known bleeding complications
• Renal impairment
• Low body weight.
[All based on the experience and opinion of the GDG]

Offer fondaparinux to patients who do not have a high bleeding risk, unless coronary angiography (and follow-on percutaneous coronary intervention if indicated) is planned within 24 hours of admission. [Based on evidence from a high quality RCT and cost effectiveness evidence]

Consider unfractionated heparin, with dose adjustment guided by monitoring of clotting function, as an alternative to fondaparinux for patients with clinically important renal impairment (creatinine >265 μmol/l) or if coronary angiography (and follow-on percutaneous coronary intervention if indicated) is planned within 24 hours of admission. [Based on the experience and opinion of the GDG]

Offer additional intravenous unfractionated heparin (50–100 U/kg) in the cardiac catheter laboratory to patients receiving fondaparinux who are undergoing percutaneous coronary intervention. [Based on moderate quality RCT evidence and the experience and opinion of the GDG]

As an alternative to the combination of a heparin plus a glycoprotein IIb/IIIa inhibitor, consider offering bivalirudin for patients who are:
• At intermediate or higher risk of adverse cardiovascular events (predicted six month mortality >3%)
• Not already receiving a glycoprotein IIb/IIIa inhibitor or fondaparinux
• Scheduled to undergo coronary angiography (with follow-on percutaneous coronary intervention if indicated) within 24 hours of admission.
[All based on evidence from moderate to high quality RCTs and cost effectiveness evidence]

As an alternative to the combination of a heparin plus a glycoprotein IIb/IIIa inhibitor, consider offering bivalirudin for patients undergoing percutaneous coronary intervention if both of the following apply:
• Patient at intermediate or higher risk of adverse cardiovascular events
• Patient not already receiving a glycoprotein IIb or IIIa inhibitor or fondaparinux.
[Based on evidence from moderate to high quality RCTs and cost effectiveness evidence]

Invasive management

Offer coronary angiography (with follow-on percutaneous coronary intervention if indicated) within 96 hours of first admission to hospital to patients who are at intermediate or higher risk (predicted six month mortality >3.0%) if they have no contraindications (such as active bleeding or comorbidity). Perform coronary angiography as soon as possible in patients who are clinically unstable or at high ischaemic risk. [Based on evidence from moderate to high quality RCTs and cost effectiveness evidence]

Offer conservative management without early coronary angiography to patients at low risk (predicted six month mortality ≤3.0%). If a patient subsequently experiences ischaemia or ischaemia is demonstrated on testing, offer coronary angiography (with immediate percutaneous coronary intervention if indicated). [Based on evidence from moderate to high quality RCTs, cost effectiveness evidence, and the experience and opinion of the GDG]

When advising patients about the choice of revascularisation strategy (percutaneous coronary intervention or coronary artery bypass surgery), take account of coronary angiographic findings, comorbidities, and the benefits and risks of each intervention. [Based on evidence from moderate quality RCTs and cohort studies]

When the role of revascularisation or the revascularisation strategy is unclear, resolve this by discussion involving an interventional cardiologist, cardiac surgeon, and other relevant healthcare professionals. Discuss the choice of revascularisation strategy with the patient. [Based on the experience and opinion of the GDG]

Testing for ischaemia

For patients who have been managed conservatively and have not had coronary angiography, consider ischaemia testing before discharge to detect and quantify inducible ischaemia. [Based on moderate quality cohort studies]
Assessing left ventricular function
In all patients who have had a myocardial infarction, assess left ventricular function. [Recommendation from NICE clinical guidelines 3]

In all patients with unstable angina, consider assessing left ventricular function. [Based on the experience and opinion of the GDL]

Rehabilitation and discharge planning
Before discharge offer patients advice and information about:
• Their diagnosis and arrangements for follow-up [Based on NICE clinical guideline 3]
• Cardiac rehabilitation [Based on NICE clinical guideline 3]
• Managing cardiovascular risk factors and drugs for secondary prevention [Based on NICE clinical guidelines 3–4]
• Lifestyle changes. [Based on NICE clinical guideline 3]

Overcoming barriers
Implementing this guideline will require increased use of risk scoring systems to improve risk stratification and identification of people with unstable angina and non-ST elevation myocardial infarction who would probably benefit from recommended drugs and invasive treatments. Using fondaparinux as the standard antithrombin drug will require a change in current practice, but this drug is easy to administer as a single, non-weight adjusted daily dose, and it does not require titration unless renal function is particularly impaired (serum creatinine >265 µmol/l). The recommendation for coronary angiography (with follow on percutaneous coronary intervention if indicated) within 96 hours of first hospital admission for those with a predicted six month mortality greater than 3% will require systems to be developed for early access to interventional cardiology services. Clinical judgment is required to balance the potential for reducing ischaemic risk with the increased risk of bleeding complications, although emerging clinical scoring systems for bleeding risk may prove helpful.

Influenza as a life changing event
Pandemic flu is nothing new, and in the three years from 1889 the world was, as now, in its grip. The year 1891 found a little known Dr Conan Doyle struggling to build an ophthalmic practice in two rented rooms, one to be a consulting room and the other a waiting room, close to Harley Street. He later wrote that both proved to be waiting rooms, so that it was from there that he was able to submit for publication his first successful Sherlock Holmes stories, collected in The Adventures of Sherlock Holmes.

Then in August of that year Conan Doyle contracted influenza. He dramatised the event—justifiable perhaps as 18 months earlier his sister Annette had died of influenza. “For a week I was in great danger and then found myself as weak as a child and as emotional, but with a mind as clear as crystal. It was then… I saw how foolish I was to waste my literary earnings in keeping up an oculist’s room in Wimpole Street, and I determined… to trust forever to my power of writing… I should at last be my own master. No longer should I have to conform to professional dress or try to please anyone else.”

The same month Conan Doyle terminated his medical practice and sold his eye instruments (for £6 and 10 shillings), The Adventures of Sherlock Holmes was dedicated to his Edinburgh teacher Dr Joseph Bell. Bell returned the compliment in a review in The Bookman: “Conan Doyle’s education as a student of medicine taught him how to observe, and his practice, both as a general practitioner and a specialist, has been a splendid training for a man such as he is, gifted with eyes, memory and imagination… Such are the mysteries of his trade as a diagnostician… if in addition the doctor is a born storyteller.”

It is only fair to add that Conan Doyle had already struggled for a decade to make a literary living and had not found writing an easy escape route from medicine. The career change that was dedicated

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A PATIENT’S JOURNEY

Cardiomyopathy

Liana Daley,1 Jackie Gordon,2 Charlotte Weston,2 Kathy Webb-Peploe3

This patient reflects on the background to her cardiomyopathy, possible contributory factors, and the ways in which she has come to terms with it.

My journey started last autumn at work. Feeling “off colour” and nauseous, I went to my local accident and emergency department. It was quite amusing because they took my temperature and it was so low they asked me, “Are you alive?” I was admitted to the Royal Sussex County Hospital and stayed there for two months, during which time I was diagnosed with cardiomyopathy.

I had been aware that my physical strength had been diminishing. Previously, I had always been the one to stride out in front; yet when walking with my mother lately I had been unable to keep up. It was unfortunate as the cardiomyopathy came just when I was starting to get my life together. I was at my fittest and I was eating better. I was riding my bike and was running marathons. But the cardiomyopathy had been lying dormant for a while.

Feelings of guilt

The doctors asked me lots of intrusive questions, which didn’t help my feelings much; they implied that I drank a lot. They thought I was drinking half a bottle of gin a day. Subsequently, I found I was the only person of whom they asked these questions about my alcohol intake. It went round the ward like wild fire, and the nurses suddenly labelled me an alcoholic. Obviously I felt guilty about the whole thing; I’d brought it on myself. I was probably drinking about three bottles of wine a week. I really had cut it down, as previously I

A PSYCHIATRIST’S PERSPECTIVE

I was asked to see Liana by her cardiology team, who had concerns that her mood was low. I introduced myself in my habitual manner, as a psychiatrist who works in the general hospital and who specialises in the interaction between physical and mental health. At first, Liana seemed unenthusiastic about speaking to me and immediately said that she didn’t want to talk about death, so we didn’t, though I think that for both of us death was the elephant in the hospital bay. However, that did not mean that we talked about unimportant matters. Liana spoke eloquently about the blame that she experienced, particularly from the medical profession, which made her angry; and about feeling guilty that perhaps she was indeed to blame for her condition—both for the cardiomyopathy and the subsequent stroke. She had been a moderately heavy drinker but thought she had reduced her alcohol intake to a level that was compatible with good health. It was interesting to note her comments about how better continuity of support from professionals might have helped. She expressed her sadness at the sudden and unexpected loss of her youthful energy and hope for the future. In terms of how she coped, she began by telling us she was “laid back,” suggesting to me that this attribute had helped her come to terms with her condition. Importantly she spoke about the importance of being able to relinquish control—that she now was unable to do very much and was reliant on others. However, her determination to survive longer than her original prognosis was also evident, and her strength of mind was in large part getting her through this. It was surprised by how, in her heart, she perceived her whole self as “ugly” and not just the appearance of her claw-like paralysed hand. I was struck by her dignity and beauty, and her ability to describe her experience with such clarity. Her sad tale was interspersed with moments of real (often black) humour.

Jackie Gordon

A CARDIOLOGIST’S PERSPECTIVE

Cardiomyopathy is disease of the heart muscle that results in abnormal cardiac function. Patients can experience a range of symptoms according to the degree of cardiac dysfunction: from being completely asymptomatic to experiencing major health problems such as heart failure, increased risk of thromboembolism, and sudden cardiac death, commonly the result of arrhythmias.

There are various forms and causes of cardiomyopathy. The commonest form is dilated cardiomyopathy, in which the left ventricle or both ventricles are dilated with impaired contraction. Causes of this condition include ischaemia, excessive alcohol intake, thyroid disorders, and valvular lesions. Management is often concerned with treating the underlying cause. Accordingly, clinicians often have to ask many questions to help differentiate what may have led to the cardiomyopathy. This may explain why our patient perceived the doctor’s behaviour as probing and prying. Liana was referred to the Royal Brompton Hospital in London for a second opinion. While she was there cardiac transplantation was discussed; she was not a candidate for cardiac transplantation because of her alcoholic liver disease (although she had been abstinent for some time) and the substantial residual functional impairment from her stroke. Other management options are largely symptomatic and are principally directed towards treatment of developing heart failure; and the prevention of thromboembolism and sudden death. If patients are identified as being at high risk of major arrhythmic events, implantable cardioverter defibrillators should be considered as they are useful in preventing sudden death. Seventy per cent of patients with dilated cardiomyopathy are dead within five years. Prognosis depends largely on the degree of heart failure and the impairment in ventricular function.

Kathy Webb-Peploe

This is one of a series of occasional articles by patients about their experiences that offer lessons to doctors. The BMJ welcomes contributions to the series. Please contact Peter Lapsley (plapsley@bmj.com) for guidance.
was drinking a bottle of wine a day. I knew I did have a problem and it had been ongoing for a number of years. I think they forget that I’m a child of the ’80s, so no one was telling us how much to drink or smoke. I keep trying to justify my cardiomyopathy; it may have been the drinking—that certainly contributed to it—but there are other possible reasons, too. It could have been a viral illness. But there’s more guilt when it’s related to alcohol, at least for me as a woman.

I feel guilty about drinking because it’s limiting my life. It’s brought me to the situation I’m in now. After I had my pacemaker put in I had a stroke. I have very little understanding of what happened, but the doctors wanted to go down the same path of believing it was my alcohol intake because it was convenient; it was a good way to label me again. Everybody took the doctors’ word, not my word.

**My ugly side**

After the stroke my left hand and leg were affected. So along with my breathlessness I now had an ugly side. Ugly is a strong word. My self image is no longer my own. It’s not me anymore; it’s tubes and tablets. I don’t look in the mirror anymore; the girl I see looks out with eyes that look ill. I don’t look nice. My body has changed so much. Previously I was tall and quite athletic looking; now I’m small and I have to ask people for help with everything.

**Coping and accessing support**

They told me it was my heart, but it actually made no difference to me, I’m quite a laid back person. I wasn’t aware of a support group. You don’t get any support until they discharge you; which is odd. I could have used the support earlier. I’ve had three heart failure nurses because I’ve moved wards so much; I’ve not built up any sort of relationship with them. It might have helped if

I’d had the same heart failure nurse throughout.

If I could give advice to someone with cardiomyopathy I would tell them to keep a notepad because doctors talk very fast, especially men. In terms of coping, I would suggest watching lots of television and being prepared to relinquish control to your carers as you will be stuck in bed, unable to do anything. I laugh with my mum and friends because I’m classified as disabled and get the best seats on the bus and concessions at the cinema.

I was told originally that I had six months to live but I’ve gone past that. In hospital my next of kin were called as the doctors didn’t think I was going to make it, but I was never going to let that happen. I haven’t really discussed it with my family but I suppose I should be thinking about my funeral. Night times can be especially scary as you start to ruminate about what’s happened in the day.

I wonder where this year has gone and realise that I’ve spent it largely in hospital. It has been the most boring period of my life.

Unfortunately Liana Daley died a few weeks before publication, but we knew she was pleased to have contributed.

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### 10 MINUTE CONSULTATION

**Hoarse voice**

O Judd,¹ I B Colvin²

A 38 year old woman who is a teacher presents with a three week history of hoarse voice after a common cold. It is intermittent, with normal voice in between. She reports a sensation of having phlegm in the throat that constantly needs to be cleared.

**What you should cover**

Hoarseness has a prevalence of 6% in the general population, rising to 11% for professional voice users (30% of the workforce). Most episodes are benign and resolve with vocal hygiene (see box). Laryngeal cancer is an important, but rare, cause of hoarseness (5/100 000 in males and 1/100 000 in females). Most patients with laryngeal cancer have risk factors, mainly smoking, high alcohol intake, and increasing age (72% of cancers occur over the age of 60). Heavy smoking and drinking are synergistic risk factors, and together increase risk 80-fold.

**History taking**

- Intermittent symptoms are less worrying than progressive hoarseness.
- Red flags are: persistent hoarseness lasting more than three weeks, difficulty or pain on swallowing, haemoptysis, earache with normal otoscopy, weight loss, and heavy smoking or alcohol intake.
- Associated symptoms of throat clearing, globus phenomenon (a sensation of a lump in the

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**USEFUL RESOURCES**

- British Heart Foundation (www.bhf.org.uk)—Provides information about cardiomyopathy.
- Publications also available
  - Cardiomyopathy Association (www.cardiomyopathy.org)—Provides information and support for the different types of cardiomyopathy.
  - Telephone helpline: 0800 018 1024
throat), and cough are common; they are usually benign, multifactorial in aetiology, and resolve with good vocal hygiene.

- Hoarseness after prolonged use of the voice, or strain, suggests a benign cause.
- Ask about gastro-oesophageal reflux disease. Consider using the reflux symptom index (RSI) questionnaire; it is quick to use in general practice, validated, and useful.
- “One airway” atopic disease may be contributory, especially if there is chronic nasal congestion and mouth breathing. Ask about asthma, rhinitis, and inhaled steroids.
- Hoarseness often follows viral upper respiratory tract illness.
- Rarely, associated symptoms of intrathoracic malignancy (for example, lung cancer invading the left recurrent laryngeal nerve causing unilateral vocal cord palsy), hypothyroidism, or neurological disease (parkinsonism, myasthenia, motor neurone disease) are present.
- Explore the patient’s fears; many are worried about cancer.

Examination

- Weigh the patient and compare against records.
- Examine the neck and thyroid. Red flags are lumps and lymphadenopathy.
- Examine the mouth for candidiasis.
- Weigh the patient and compare against records.
- Examine the mouth for candidiasis.
- Respiratory and neurological examination, if indicated.

Vocal hygiene advice for patients

Avoid

- Cigarette smoke, dry atmospheres, dust, fumes
- Alcohol, caffeine, decongestant drugs
- Throat lozenges—they can dry out your throat
- Gargling with aspirin
- Fatigue, lack of sleep, and eating late at night
- Shouting, whispering, screaming, singing, straining your voice
- Prolonged periods of speaking without rest
- Repetitive throat clearing and coughing

Try

- Resting your voice
- Yawning and humming to relax your voice box
- Sleeping for longer
- Good hydration—minimum of six glasses of water a day
- Regular steam inhalation (without additives such as menthol)
- Humidifying your environment—place a bowl of water near a radiator
- To remedy habitual throat clearing; resist the temptation to clear your throat; instead, sip ice cold, carbonated water every time you feel the need to clear your throat or cough, for at least four days and four nights

USEFUL RESOURCES

For the clinician

Hoarseness—article written for doctors on PatientUK website (www.patient.co.uk/showdoc/A0009966)

Resources and where to find voice clinics—British Voice Association (www.british-voice-association.com)


For the patient

Voice Care Network UK offers support at www.voicercare.org.uk

National Center for Voice and Speech website has vocal health information at www.ncvs.org/e-learning/health.html

What you should do

- NICE advises an urgent chest x ray for hoarseness persisting more than three weeks, especially if the patient is a heavy drinker or smoker aged over 50. If the x ray is positive, refer urgently for suspected lung cancer. If negative, refer urgently for suspected head and neck cancer.
- Red flag symptoms or signs should prompt urgent referral for suspected head and neck cancer.
- Stopping smoking and reducing alcohol consumption is of paramount importance.
- Advise vocal hygiene in every case. Consider providing this in a leaflet to aid compliance and save time during the consultation (for example, print out the box).
- Treat any possible contributing conditions; optimise treatment of asthma or rhinitis, and treat oral candidiasis related to inhaled steroids and advise on prevention.
- Trial of a proton pump inhibitor or liquid alginate may be reasonable in patients with symptoms of gastro-oesophageal reflux disease (RSI >13), but meta-analysis has not shown that proton pump inhibitors are efficacious for laryngeal symptoms presumed secondary to the disease.
- Antibiotics are ineffective for hoarseness after upper respiratory tract infection.
- Consider routine referral to ear, nose, and throat specialists for non-persistent, recurrent cases that do not meet criteria for urgent referral and fail to resolve with treatment in primary care. The team will examine the vocal cords with a nasal endoscope to identify causes such as cord polyps, nodules, granulomata, and oedema (Reinke’s oedema). Many centres provide a voice clinic in conjunction with speech and language therapists.

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