



*The NHS in Newcastle, North Tyneside
and Northumberland*

NEWCASTLE, NORTH TYNESIDE AND NORTHUMBERLAND GUIDELINES FOR SECONDARY PREVENTION AFTER MYOCARDIAL INFARCTION

March 2008

These resource notes should be read in conjunction with the laminated
summary

INTRODUCTION

This local guideline for the secondary prevention after myocardial infarction (MI) has reviewed the NICE clinical guideline for secondary prevention in primary and secondary care for patients following a myocardial infarction, CG048. It aims to interpret this national guideline for local implementation, aiming for integration between hospital and primary care. It was recognised that the use of troponin measurements to identify myocardial damage has led to patients with lesser degrees of myocardial damage now being diagnosed with acute MI, compared to some years ago, although at least some of the evidence for the recommendations for secondary prevention is from the literature which used other markers of myocardial infarction such as creatinine kinase release, with more damage occurring before detection. The group did not feel this was a problem providing patients with acute coronary syndrome, with plaque rupture and coronary thrombosis, were distinguished from patients with troponin release due to other reasons, some of which may be cardiac eg pulmonary oedema in the absence of acute coronary syndrome, and some non cardiac, eg sepsis, pulmonary embolism, chronic renal failure.

This guideline does not aim to make recommendations for immediate management in acute MI.

Patients who develop chronic heart failure should be managed in line with guidelines for management of chronic heart failure.

Prescribers should review patients for any contra-indications before initiating drugs. The drugs are recommended assuming there are no contra-indications to treatment, and no contra-indications develop. Drug costs have been reviewed to make recommendations about specific agents in a particular drug class, and information is provided to help prescribers choose cost effective options.

These local guidelines are intended for all clinicians in the Newcastle, North Tyneside and Northumberland areas involved in the management of patients after MI.

These guidelines make recommendations for the interventions for secondary prevention in patients who have had a myocardial infarction. The interventions should be offered to all people who are likely to benefit, irrespective of race, disability, gender, age, sexual orientation or religion. Information should be provided to patients in an accessible format and consideration should be given to mobility and communication issues, and being aware of sensitive and cultural issues.

HOW TO USE THE LOCAL GUIDELINE

The guideline has 2 parts; a summary which can be easily laminated and kept readily available, and a set of supporting resource notes. The notes contain each of the summary statements with some background detail and in some cases expands the summary statement providing more detailed guidance.

The summary is intended as an everyday reminder. The notes contain additional supporting information and clinicians should be familiar with these and use them to refer to for further clarification of management in individual patients as needed. The BNF should also be referred to as necessary.

GUIDELINES FOR SECONDARY PREVENTION AFTER MI

This local guideline addresses secondary prevention after MI and should be used as part of an overall management strategy for each individual patient.

MANAGEMENT IN PATIENTS AFTER ACUTE MI

- All patients offered long term treatment with;
Aspirin
Beta blockers; eg bisoprolol, atenolol if no LV dysfunction
ACE Inhibitors; eg ramipril, lisinopril
Statins; refer to FATS

All patients after MI should be offered treatment with these drugs as early as possible after acute MI, unless there are contra-indications. Patients who develop dyspepsia taking aspirin should be treated with the combination of a PPI and aspirin rather than switching to clopidogrel, with further investigation of the GI tract as appropriate (see other guidelines for indications for upper GI endoscopy). Dispersible aspirin tablets are preferred and enteric-coated aspirin is not recommended. In patients with left ventricular (LV) dysfunction, beta blockers licensed for use in heart failure may be preferred. ACE inhibitors should be started early (within 24 hours of acute MI), providing the systolic blood pressure is > 100mmHg and renal function allows. ACE inhibitors are first line, but an angiotensin II receptor antagonist may be substituted for an ACE inhibitor in patients who have been shown to be intolerant of ACE inhibitors. The combination of ACE inhibitors and angiotensin II receptor antagonists is not routinely recommended. Renal function and electrolytes must be monitored in patients treated with ACE inhibitors or angiotensin II receptor antagonists (see later section on communication and monitoring).

Target doses

Drug	Target dose
Lisinopril	20mg od
Ramipril	10mg od
Atenolol	50mg – 100mg od
Bisoprolol	10mg od
Carvedilol	25 – 50mg bd
Candesartan	32mg od
Irbesartan	300mg od
Losartan	100mg od
Valsartan	160mg bd

Choice of agents

There was a consensus that ramipril or lisinopril were the preferred ACE inhibitors and bisoprolol the preferred beta blocker. If patients do not have heart failure or left ventricular (LV) dysfunction, atenolol is an alternative beta blocker. Metoprolol with its shorter duration of action, may be used in a few in whom there are concerns about

tolerability, particularly early in acute MI, but will often be switched to bisoprolol or atenolol before discharge. Bisoprolol is the preferred beta blocker in those with LV dysfunction. Carvedilol is more costly, but may be preferred in a few patients with heart failure and LV dysfunction.

FATS should be referred to for recommendations for statins.

The comparative costs of 28 days treatment (March 2008) of ACE inhibitors, angiotensin II receptor antagonist and beta blockers are summarised below.

Drug	Cost of 28 days Treatment*
ACE Inhibitors	
Lisinopril 2.5mg daily	£0.45
Lisinopril 5mg daily	£0.73
Lisinopril 10mg daily	£0.78
Lisinopril 20mg daily	£1.32
Enalapril 2.5mg daily	£0.41
Enalapril 5mg daily	£0.48
Enalapril 10mg daily	£0.59
Enalapril 20mg daily	£0.69
Ramipril 1.25 mg daily cap	£0.65
Ramipril 2.5mg daily cap	£0.86
Ramipril 5mg daily cap	£1.11
Ramipril 10mg daily cap	£1.46
Ramipril 1.25 mg daily tablets	£1.82
Ramipril 2.5mg daily tablets	£1.98
Ramipril 5mg daily tablets	£2.81
Ramipril 10mg daily tablets	£3.54
Perindopril 2mg daily	£9.81
Perindopril 4mg daily	£9.81
Perindopril 8mg daily	£9.81
Beta-Blocker	
Atenolol 25mg daily	£0.26
Atenolol 50mg daily	£0.29
Atenolol 100mg daily	£0.29
Metoprolol 50mg bd	£1.67
Metoprolol 100mg bd	£2.68
Metoprolol m.r. (Betaloc SA) 200mg daily	£4.56
Bisoprolol 1.25mg daily	£8.56
Bisoprolol 2.5mg daily	£4.90
Bisoprolol 3.75mg daily	£5.90
Bisoprolol 5mg daily	£2.39
Bisoprolol 7.5mg daily	£5.90
Bisoprolol 10mg daily	£1.7960
Carvedilol 3.125mg bd	£11.50
Carvedilol 6.25mg bd	£12.18

Drug	Cost of 28 days Treatment*
Carvedilol 12.5mg bd	£3.04
Carvedilol 25mg bd	£4.58
Angiotensin II receptor antagonists	
Candesartan 8mg daily	£9.89
Candesartan 16mg daily	£12.72
Candesartan 32mg daily	£16.13
Irbesartan 75mg daily	£10.29
Irbesartan 150mg daily	£12.57
Irbesartan 300mg daily	£16.91
Losartan 25mg daily	£16.18
Losartan 50mg daily	£12.80
Losartan 100mg daily	£16.18
Valsartan 40mg bd	£32.88
Valsartan 80mg bd	£32.88
Valsartan 160mg bd	£43.32

* Costs are based on prices given in the March 2008 editions of the 'Drug Tariff' and MIMs

- Clopidogrel in combination with aspirin; for limited duration (refer to local anti-platelet guidelines/ specific specialist advice)

Duration of treatment with the combination of aspirin and clopidogrel will be determined by the type of MI (ST elevation MI or non ST elevation MI) and the type of reperfusion and revascularisation treatment. Further recommendations are included in the local anti-platelet guidelines. Life long treatment with the combination of aspirin and clopidogrel is not routinely recommended (there are a few notable exceptions) and in all patients the duration of dual anti-platelet treatment should be known, documented in hospital care and communicated to primary care. The recent clinical history of all patients in whom clopidogrel is being discontinued should be known and reviewed. Aspirin should be continued long term. Those with dyspepsia taking aspirin should be considered for treatment with a proton pump inhibitor. Clopidogrel monotherapy should be considered in those with aspirin hypersensitivity.

- Eplerenone; if heart failure, LVEF \leq 40% and within 3 to 14 days of MI

Patients with any symptoms and signs of heart failure early after MI require an assessment of LV function. Those with LV ejection fraction \leq 40% and who are within 3 to 14 days of the acute event should be considered for treatment with eplerenone, preferably once treated with an ACE inhibitor. These patients require a careful assessment and monitoring of renal function and electrolytes prior to, and during treatment (see later section about communication and monitoring). Patients were not randomised in the clinical trial examining the efficacy of eplerenone after MI if

creatinine was > 220 micromol/l and or potassium > 5 mmol/l. If patients are already treated with an aldosterone antagonist such as spironolactone, this may be continued or eplerenone substituted. The mean follow up in the trial examining the efficacy of eplerenone after MI was 16 months and patients in whom eplerenone is initiated at the time of the acute MI should continue treatment unless contra-indications develop. There is no evidence on which to make any recommendations about switching to spironolactone.

- Cardiac rehabilitation considered in all patients (see resource notes)

Comprehensive cardiac rehabilitation

All patients (regardless of their age) should be given advice about and offered a cardiac rehabilitation programme with an exercise component, including those with left ventricular dysfunction who are stable. Programmes should adapt the exercise component to meet the needs of older patients and those with significant co-morbidity.

Cardiac rehabilitation programmes should provide a range of options, and patients should be encouraged to attend all those appropriate to their clinical needs. Patients should not be excluded from the entire programme if they choose not to attend certain components.

If a patient has cardiac or other clinical conditions that may worsen during exercise, these should be treated if possible before the patient is offered the exercise component of cardiac rehabilitation. For some patients, the exercise component may be adapted by an appropriately qualified healthcare professional.

The heart manual is used locally as a tool to support rehabilitation, and currently all patients are also offered access to a phase 3 structured programme. The value of offering a menu goal setting programme is being explored locally.

Patient engagement

Systems are already in place locally to encourage patient engagement and should be maintained. All health professionals, including senior medical staff, involved in providing care for patients after acute MI should promote cardiac rehabilitation and should take into account patients' wider health and social needs. The NICE guideline includes that this may involve addressing economic, welfare rights, housing or social support issues.

Rehabilitation should be accessible and meet the needs of all patients (taking account of factors such as age, gender, disability, other mental and physical co-morbidities, the needs of people from disadvantaged communities, black and ethnic minority groups and rural areas), and current programmes reflect this. Patients' health beliefs and levels of health literacy should be considered.

Programmes should include an exercise component with meets the needs of older patients and those with significant comorbidity, and any transport issues addressed.

Health education and information

Incorporated into current rehabilitation programmes, and all patients should receive accurate information, including about return to work, driving, travel and return to activities of daily living.

Psychological and social support

Stress management is part of the current programmes, and is supported by the heart manual. Complex psychological intervention, such as cognitive behavioural therapy is not routinely recommended, but is available for selected patients. Those with anxiety and depression should be managed in line with guidelines for this.

Partners and carers should be involved in cardiac rehabilitation if the patient wishes.

Sexual activity

The subject of sexual activity should be raised in the context of cardiac rehabilitation and aftercare if this is appropriate. After recovery patients can be reassured that there is no increased risk of triggering a subsequent event compared to if they have never had a MI. Patients should resume sexual activity when they are comfortable to do so. The following table provides estimates of activities with the equivalent energy expenditure (from Cooper A, et al (2007) 'Clinical Guidelines and Evidence Review for Post Myocardial Infarction: Secondary prevention in primary and secondary care for patients following a myocardial infarction' London: National Collaborating Centre for Primary Care and Royal College of General Practitioners).

Metabolic equivalent of energy expenditure for varying levels of activity	
Activity	Metabolic equivalent of energy expenditure (MET) (1 MET \approx 3.5 mL O₂/kg per minute)
Sitting quietly in chair	1
Walking at ground level	2
Walking at 3mph	3
Sexual activity pre-orgasm	2-3
Sexual activity during orgasm	3-4
Vigorous sexual activity	5-6
Cycling at 10mph	6-7
Walking to stage 4 of the Bruce protocol on the treadmill	13

Patients with erectile dysfunction and who are more than 6 months after MI and are stable may be treated with a phosphodiesterase type 5 (PDE5) inhibitor e.g. sildenafil. A PDE5 inhibitor should be avoided in those treated with nitrates and or nicorandil. In these patients the indications for nitrates and nicorandil should be reviewed and alternatives considered, before a patient is refused treatment with a PDE5 inhibitor. Prescribers should discuss with patients being prescribed sublingual GTN, the need to

avoid using this within at least 24 to 48 hours of taking a PDE5 inhibitor¹, and make a note that they have done so on the prescription.

- Ensure lifestyle changes addressed
 - Healthy eating, alcohol within safe limits, increase physical activity, reduce / avoid overweight & obesity, stop smoking
 - Offer all smokers referral to stop smoking services, consider nicotine replacement therapy (NRT)
 - Omega-3 ethyl ester supplements if not sufficient oily fish (for 7g omega-3 fatty acids/week) and within 3 months of MI

Advice about lifestyle changes is part of cardiac rehabilitation, and should be incorporated into on-going management plans for all patients after MI. Patients should be advised to eat a Mediterranean style diet (more bread, fruit, vegetables and fish; less meat and replace butter and cheese with products based on vegetable and plant oils).

Patients who drink alcohol should be advised to keep weekly consumption within safe limits (no more than 21 units per week for men, or 14 units for women), and avoid binge drinking.

Advice about diet should include advice to increase consumption of oily fish, aiming for 7g of omega-3 fatty acids per week (appendix 1). However if this cannot be achieved and patients are within of 3 months of the acute MI, omega-3 acid ethyl ester supplements should be considered.

Patients should be advised not to take supplements containing beta carotene which may be harmful, and should be advised not to take anti-oxidants (vitamin C or E) or folic acid to lower their cardiovascular risk.

Dietary advice should be consistent and tailored to the individual.

Patients should be advised to increase their physical activity, aiming to increase exercise capacity, and advice on physical activity should involve a discussion about current and past activity levels and preferences. The benefit of exercise may be enhanced by tailored advice from a suitably qualified professional.

Patients should be advised to be physically active for 20–30 minutes a day to the point of slight breathlessness. Patients who are not achieving this should be advised to increase their activity in a gradual, step-by-step way, aiming to increase their exercise capacity. They should start at a level that is comfortable, and increase the duration and intensity of activity as they gain fitness.

All patients who smoke should be advised to quit. Those who are motivated to do so should be offered referral to the stop smoking clinic and considered for nicotine replacement therapy (NRT).

People who are overweight or obese should be offered advice and support to reduce their weight. Some may considered for more specialist management.

¹ Glyceryl trinitrate should not be taken for at least 48 hours after a dose of tadalafil and 24 hours after sildenafil or vardenafil

- Further cardiological assessment (refer to resource notes)
LV function, ischaemic risk, arrhythmic risk if LVEF \leq 35%

This should be considered by the cardiologist responsible for the patients care. All patients should be considered, taking into account co-morbidities, for further cardiological assessment. Assessment of LV function may be required as an in-patient to inform further in-patient management, but in some may be as an out-patient. Patients may have coronary angiography and revascularisation during admission, but others may have non-invasive assessments. Those with a LV ejection fraction \leq 35% should be considered for further assessment in line with the recommendations of the NICE technology appraisal guidance 95; Implantable cardioverter defibrillators for arrhythmias.

- Ensure communication between hospital care and primary care, and arrangements for monitoring (see resource notes)

After an acute MI information from secondary care should include confirmation of the diagnosis and appropriate results of investigations, future management plans and advice on secondary prevention.

Monitoring

Patients treated with ACE inhibitors and eplerenone require arrangements for biochemical monitoring to be known, communicated to the GP and the patient to be aware of these.

In general, the GP will be responsible for ensuring that patients who are treated with ACE inhibitors, but not eplerenone, have renal function and electrolytes measured within a week or two of discharge with further checks as the dose of ACE inhibitor is up-titrated and until the patient is stable.

Relatively few patients will be treated with eplerenone; GPs will be less familiar with its use and hyperkalaemia is more likely in these patients who will also generally be treated with an ACE inhibitor. It is important that drugs are only stopped or reduced when necessary to minimise the adverse effects of drug withdrawal on remodelling early after infarction in these high risk patients. At present, the cardiologist will be responsible for ensuring that patients treated with eplerenone have renal function and electrolytes measured, during the first 4 weeks post discharge, until longer term follow up in primary care. Monitoring is recommended at baseline, 48 hours, 1 week, 4 weeks and then 3 monthly after initiation of eplerenone, and 1 week after any dose titration.

Patients treated with ACE inhibitors should have renal function and electrolytes measured at least annually once stable and some, for example with renal impairment, may require more frequent monitoring. Patients with chronic heart failure should be managed in line with the chronic heart failure guidelines.

Patients treated with eplerenone should have renal function and electrolytes measured every 3 months.

All patients should have a repeat lipid profile measured within 12 weeks of discharge and then annually.

MANAGEMENT IN PATIENTS WITH MI IN THE PAST (> 1 YEAR)

It is recommended that primary health care teams review their existing disease registers to identify patients with a MI in the past and ensure they are optimally managed. In all cases the diagnosis of a previous MI should be certain and if not the patient may require further cardiac assessment first.

- All patients should be treated with
Aspirin
ACE Inhibitors eg ramipril, lisinopril
Statins; refer to FATS

All patients should be offered treatment with these drugs if there are no contraindications. Details of choice of ACE inhibitor are included in 'Management in patients after acute MI' section (above).

- Beta blockers if already treated. Initiated if not already treated if LV dysfunction, increased risk of further cardiovascular events, and or other compelling indications eg bisoprolol, atenolol if no LV dysfunction

If patients have been treated with beta blockers after an acute MI, treatment should be continued long term.

No randomised controlled trials were found which examined the effectiveness of initiating beta blockers in patients with preserved LV function who have had an MI in the past and in whom beta blockers were not initiated at the time of the MI. However, there is clear evidence of benefit in those with LV dysfunction and these patients should be treated, preferably with a beta blocker recommended in chronic heart failure and left ventricular dysfunction, unless there are contra-indications.

Many patients may have had an assessment of LV function after the MI previously, and patient's notes should be reviewed. In addition to looking for the results of an echocardiograph, the notes should also be reviewed for the results of other imaging modalities used to assess LV function such as gated heart scans, gated spect images during myocardial perfusion imaging, and left ventriculography during coronary angiography. In those with no such information, the results of an ECG should be reviewed. If this is normal the diagnosis of a previous MI should be reviewed to ensure it was accurate. In those with a definite MI in the past who are asymptomatic and have a normal ECG, LV dysfunction is very unlikely. Those with an abnormal ECG in whom LV function is unknown, will require an assessment of LV function if this will influence management.

Other patients at increased risk of further cardiovascular events and or with other compelling indications for beta blockers should also be treated.

- Other drugs if initiated after acute MI; review planned duration

Some drugs eg clopidogrel may have been initiated after an acute MI with the intention that these be continued for a planned duration. This should be agreed by the cardiologist, and communicated to primary care. Patients must be reviewed prior to any drugs being stopped to ensure it is still appropriate to stop them.

- Ensure lifestyle changes addressed
Healthy eating, alcohol within safe limits, increase physical activity, reduce / avoid overweight/ obesity, stop smoking
Offer all smokers referral to stop smoking services, consider NRT

Further information is available in the 'Management in patients after acute MI' section (above).

- Consider further cardiological assessment (refer to resource notes)
LV function, ischaemic risk if new / worsening angina, arrhythmic risk if LVEF \leq 35%

Patients with a MI in the past with chronic heart failure should be managed in line with the heart failure guidelines.

Patients with a MI in the past and without heart failure may need further assessment if this was not done before. For assessment of LV function see notes above about initiating beta blockers. Referral to a cardiologist to consider the need for coronary revascularisation should be considered particularly in patients who develop symptoms of new or worsening angina and patients with LV ejection fraction \leq 35% should be considered for referral for assessment of arrhythmic risk.

- Patient and carer support; appropriate information and education

Patients with ischaemic heart disease, including those with a previous MI, should be offered appropriate information and education about their condition.

Notes

- Optimise blood pressure control; local guidelines

All patients should have optimal control of blood pressure. Further details, including target blood pressure, are included in the local hypertension guidelines.

- Substitute angiotension II receptor antagonist if proven ACE inhibitor intolerance

See the recommendations for drugs in the 'Management in patients after acute MI' section.

- Warfarin in selected patients; refer to resource notes

The NICE post MI guidelines recommend considering the addition of aspirin in those with acute MI requiring treatment with moderate dose warfarin (INR 2-3) for another indication (eg AF, LV thrombus) if there is a low risk of bleeding. There was a consensus locally that recommendations for management of patients with an indication for warfarin were difficult as many patients after acute MI will have had PCI and require treatment with aspirin and clopidogrel. In practice, cardiologists will need to review the indications for antiplatelet agents and anticoagulation, and bleeding risk in individual patients and agree treatment. It is important that such decisions are clearly documented, and communicated to primary care, including when any agents should be stopped or restarted.

In patients with a MI in the past, in whom there is another indication for chronic warfarin treatment, the addition of aspirin is not recommended for secondary prevention post MI.

- Rate limiting calcium channel blockers are not routinely recommended; avoid in acute MI with heart failure/ LV dysfunction; refer to resource notes

The NICE post MI guidelines make the following recommendations;

Calcium channel blockers should not routinely be used to reduce cardiovascular risk after an MI.

If beta-blockers are contraindicated or need to be discontinued, diltiazem or verapamil may be considered for secondary prevention in patients without pulmonary congestion or left ventricular systolic dysfunction.

For patients who are stable after an MI, calcium channel blockers may be used to treat hypertension and/or angina. For patients with heart failure, amlodipine should be used, and verapamil, diltiazem and short-acting dihydropyridine agents should be avoided in line with 'Chronic heart failure' (NICE clinical guideline 5).

There was a consensus that the local guidelines should emphasise that secondary prevention with diltiazem or verapamil is not routinely recommended, but that these agents might be considered in patients with acute MI, who can not be treated with a beta blocker and in whom there have been no symptoms or signs of heart failure and left ventricular function was preserved. Secondary prevention with calcium channel blockers is not recommended in patients with a MI in the past.

- Low risk patients after acute MI; refer to resource notes

The full version of the NICE post MI guidelines (Cooper A, et al (2007) 'Clinical Guidelines and Evidence Review for Post Myocardial Infarction: Secondary prevention in primary and secondary care for patients following a myocardial infarction' London: National Collaborating Centre for Primary Care and Royal College of General Practitioners) includes the issue that some patients may be at low risk of further cardiac

events and the benefits of some long term drug treatments may be very low. It was agreed that this should be recognised in the local guideline. Some low risk patients may not wish to continue all agents long term, eg beta blockers. This decision will be informed by the estimated size of benefit, patient tolerability and patient preferences. These decisions require an informed discussion between a cardiologist and the patient, and communicated to primary care. This would be done at follow up, not immediately post MI and all patients should be treated initially.

- All patients should have sublingual GTN available

Sublingual GTN is not indicated for secondary prevention, but it was agreed that patients with a history of MI should have GTN available in case they develop angina and that this would be incorporated into the local guideline (also see notes about prescribing of PDE5 inhibitors with sublingual GTN in the section on recommendations about sexual activity in the 'Management in patients after acute MI' section (above).

- Do not recommend anti-oxidants or folic acid to lower cardiovascular risk and avoid beta carotene supplements.

See section about lifestyle changes in 'Management in patients after acute MI' (above).

APPENDIX 1

Omega-3 fatty acids content of various oily fish; amount required to provide approximately 1 g of EPA plus DHA per day (7g per week)

These are estimates from the reference quoted and are intended to be used by clinicians discussing with patients their intake of oily fish. It is not intended to make recommendations that patients consume exact portion sizes. There may be some differences in stated amount of fish required from other sources in the literature because omega-3 fatty acid content does vary.

Patients should be encouraged to consume at least 2 large servings of oily fish per week aiming for a total of 7g of omega-3 fatty acids per week.

Fish	Amount required to provide approximately 1 g of EPA plus DHA per day (ounces)
Canned tuna	12 ounces
Fresh tuna	2.5 to 12 ounces
Herring	1.5 to 2 ounces
Mackerel	2 ounces
Salmon	1.5 to 4.5 ounces
Sardines	2 to 3 ounces
Trout	3 to 3.5 ounces
Source: P.M. Kris-Etherton, W.S. Harris, L.J. Appel. "Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease." <i>Circulation</i> . 2002;106:2747.	
The intakes of fish given are very rough estimates because oil content can vary markedly with species, season, diet, packaging and cooking methods .	

APPENDIX 2

Membership of the guideline development group

Dr Jane Skinner, Consultant Community Cardiologist, The Newcastle upon Tyne Hospitals NHS Foundation Trust (lead for guideline development)

Dr Phil Adams, Consultant Cardiologist, The Newcastle upon Tyne Hospitals NHS Foundation Trust

Dr Colin Doig, Consultant Cardiologist, Northumbria Healthcare NHS Foundation Trust (North Tyneside Hospital, Wansbeck Hospital, Hexham Hospital)

Dr Richard Edwards, Consultant Cardiologist, The Newcastle upon Tyne Hospitals NHS Foundation Trust

Mrs Rosie England, Lead Pharmaceutical Advisor (commissioning), NHS North of Tyne, and represented by Susan Turner, Pharmaceutical Advisor, Northumberland Care Trust

Mrs Lisa English, Community Cardiology co-ordinator, North Tyneside PCT

Mrs Zahra Irannejad, Lead Pharmaceutical Advisor, Newcastle PCT

Mrs Margaret King, Programme Manager, Community Cardiac Care, Newcastle PCT

Dr Sam Nath, Consultant Cardiologist, Northumbria Healthcare NHS Foundation Trust (North Tyneside Hospital, Wansbeck Hospital, Hexham Hospital)

Dr Mike Scott, GP Representative North of Tyne and Newcastle GP

Dr Caroline Sprake, North Tyneside GP (for email comments)

Mr Glyn Trueman, Formulary Pharmacist, The Newcastle upon Tyne Hospitals NHS Foundation Trust

Dr John Warrington, Northumberland GP (for email comments)

Mrs Alice Whincup, Cardiac Rehabilitation Nurse, Northumberland Care Trust

Ms Rachael Wiedman, Cardiology Pharmacist, Northumbria Healthcare NHS Foundation Trust (North Tyneside Hospital, Wansbeck Hospital, Hexham Hospital)

Declared conflicts of interest

JSS was the clinical advisor for the NICE post secondary prevention GL and has received travel grants from various pharmaceutical companies to attend educational meetings in the past, CD and MK have both received funding from various pharmaceutical companies for training, PCA has received honoraria and travel grants to attend educational meetings from various pharmaceutical companies, SN has received honoraria and travel grants to attend educational meetings from various pharmaceutical companies, MS has received honoraria from various pharmaceutical companies and funding to support practice based initiatives in Newcastle West locality.

Date for guideline review

March 2011

SECONDARY PREVENTION AFTER MYOCARDIAL INFARCTION

Please use in conjunction with the resource document/notes
It is assumed that patients with contraindications will be identified and excluded (refer to the BNF)

MANAGEMENT IN PATIENTS AFTER ACUTE MI

- All patients offered long term treatment with;
Aspirin
Beta blockers, eg bisoprolol, atenolol if no LV dysfunction
ACE Inhibitors eg ramipril, lisinopril
Statins; refer to FATS
- Clopidogrel in combination with aspirin; for limited duration (refer to local anti-platelet guidelines/ specific specialist advice)
- Eplerenone; if heart failure, LVEF \leq 40% and within 3 to 14 days of MI
- Cardiac rehabilitation considered in all patients (see resource notes)
- Ensure lifestyle changes addressed
Healthy eating, alcohol within safe limits, increase physical activity, reduce / avoid overweight & obesity, stop smoking
Offer all smokers referral to stop smoking services, consider nicotine replacement therapy (NRT)
Omega-3 ethyl ester supplements if not sufficient oily fish (for 7g omega-3 fatty acids/week) and within 3 months of MI
- Further cardiological assessment (refer to resource notes)
LV function, ischaemic risk, arrhythmic risk if LVEF \leq 35%
- Ensure communication between hospital care and primary care, and arrangements for monitoring (see resource notes)

MANAGEMENT IN PATIENTS WITH MI IN THE PAST (> 1 YEAR)

- All patients should be treated with
Aspirin
ACE Inhibitors eg ramipril, lisinopril
Statins; refer to FATS
- Beta blockers if already treated. Initiated if not already treated if LV dysfunction, increased risk of further cardiovascular events, other compelling indications eg bisoprolol, atenolol if no LV dysfunction
- Other drugs if initiated after acute MI; review planned duration
- Ensure lifestyle changes addressed
Healthy eating, alcohol within safe limits, increase physical activity, reduce / avoid overweight & obesity, stop smoking
Offer all smokers referral to stop smoking services, consider NRT
- Consider further cardiological assessment (refer to resource notes)
LV function, ischaemic risk if new / worsening angina, arrhythmic risk if LVEF \leq 35%
- Patient and carer support; appropriate information and education

NOTES

- Optimise blood pressure control in all patients; local guidelines
- Substitute angiotension II receptor antagonist if proven ACE inhibitor intolerance
- Warfarin in selected patients; refer to resource notes
- Rate limiting calcium channel blockers are not routinely recommended; avoid in acute MI with heart failure/ LV dysfunction; refer to resource notes
- Low risk patients after acute MI; refer to resource notes
- All patients should have sublingual GTN available
- Do not recommend anti-oxidants or folic acid to lower cardiovascular risk and avoid beta carotene supplements