National Institute for Health and Care Excellence

4-year surveillance (2016) – Myocardial infarction: cardiac rehabilitation and prevention of further cardiovascular disease (2013) NICE guideline CG172

Appendix A: Summary of new evidence from surveillance

Cardiac rehabilitation after an acute myocardial infarction (MI)

172 – 01	**What is the effectiveness of comprehensive cardiac rehabilitation versus standard care with no cardiac rehabilitation to improve outcome in patients after MI?**
172 – 02	**What is the effectiveness of exercise only cardiac rehabilitation versus standard care with no cardiac rehabilitation to improve outcome in patients after MI?**
172 – 03	**What is the effectiveness of comprehensive cardiac rehabilitation versus exercise only cardiac rehabilitation to improve outcome in patients after MI?**
172 – 04	**What is the effectiveness of an individualised cardiac rehabilitation programme versus a nonindividualised cardiac programme to improve outcome in patients after MI?**
172 – 05	**Are there any patients after MI in whom the exercise component of cardiac rehabilitation is not safe?**

Recommendations derived from these questions

1.1.1 All patients (regardless of their age) should be given advice about and offered a cardiac rehabilitation programme with an exercise component.

1.1.2 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.

1.1.3 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.

1.1.4 Patients with left ventricular dysfunction who are stable can safely be offered the exercise component of cardiac rehabilitation.

Surveillance decision

This review question should not be updated.

4-year surveillance summary

A meta-analysis[1] of 63 RCTs (n = 14,486) examined the effectiveness and cost-effectiveness of exercise-based cardiac rehabilitation for patients with coronary heart disease. Compared to a no exercise control, exercise-based cardiac rehabilitation was found to significantly reduce cardiovascular mortality and overall risk of hospital admission. However, there was no significant impact of rehabilitation on total mortality or on risk of myocardial infarction (MI), coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI). The review found exercise-based cardiac rehabilitation to be potentially cost-effective in terms of gain in quality-adjusted life years.

Five studies were identified that examined the effect of various types of cardiac rehabilitation programmes for patients with acute coronary syndrome:

- An RCT[2] (n = 128) examined the effect of a 4-week home-based self-management rehabilitation programme on quality of life, anxiety, depression, cardiac risk and unplanned visits to health services for community-dwelling patients with MI. The results showed that the intervention and control groups reported significant differences in physical activity, dependency, concerns over medication, anxiety level, body mass index (BMI), and unplanned cardiac-related emergency room visits. However, the direction of the effect is not stated in the abstract.
- An RCT[3] (n = 39) examined the effect of higher-intensity interval training (within the standard cardiac rehabilitation setting) on cardiorespiratory fitness in patients participating in phase II cardiac rehabilitation. The intervention was compared to moderate intensity continuous training. Results showed that the intervention significantly improved peak exercise capacity compared to the comparator. But there was no improvement in resting heart rate or blood pressure.
- A sub-analysis[4] (n = 50) of 2 RCTs (details not given) examined the effectiveness of an 8-week exercise-based cardiac rehabilitation programme on physical activity levels in patients following MI. The intervention was compared to usual medical care without the programme and a follow-up. Results showed that the intervention significantly increased moderate-to-vigorous physical activity levels and cardiorespiratory fitness in patients after MI compared to usual care.
- An RCT[5] (n = 97) investigated the effect of early cardiac rehabilitation on health related quality of life in patients with recent MI. The intervention comprised of a progressive walking programme as part of the unsupervised cardiac rehabilitation. Results showed significantly improved quality of life and functional capacity in in the intervention group compared to usual care.
- An RCT[6] (n = 50) investigated the effect of cardiac rehabilitation on quality of life in patients with acute coronary syndrome. The intervention took place firstly in hospital followed by a home-based period with telephone follow-ups and referrals to hospital. The intervention was compared to usual care but further details are not given. The results showed that cardiac rehabilitation significantly improved quality of life in patients with acute coronary syndromes, compared to usual care.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The new evidence suggests that cardiac rehabilitation programmes are clinically effective and cost-effective for patients with ACS or previous MI. This evidence is consistent with the current recommendations, which support the use of comprehensive cardiac rehabilitation programmes which give varied options to provide for different patient needs.

There is some evidence to suggest the addition of a home-based self-management programme within existing cardiac rehabilitation would have an impact on quality of life and other psychological factors, however the findings of this study are not clear. Any impact on CG172 is unlikely until further studies validate these findings.

New evidence is unlikely to change guideline recommendations.

172 – 06 **Which factors are associated with a person's uptake and adherence to cardiac rehabilitation programmes after an MI?**

172 – 07 **Which interventions designed to increase engagement in and/or adherence to cardiac rehabilitation programme after MI?**

Recommendations derived from these questions

1.1.5 Deliver cardiac rehabilitation in a non-judgemental, respectful and culturally sensitive manner. Consider employing bilingual peer educators or cardiac rehabilitation assistants who reflect the diversity of the local population.

1.1.6 Establish people's health beliefs and their specific illness perceptions before offering appropriate lifestyle advice and to encourage attendance to a cardiac rehabilitation programme.

1.1.7 Offer cardiac rehabilitation programmes designed to motivate people to attend and complete the programme. Explain the benefits of attending.

1.1.8 Discuss with the person any factors that might stop them attending a cardiac rehabilitation programme, such as transport difficulties.

1.1.9 Offer cardiac rehabilitation programmes in a choice of venues (including at the person's home, in hospital and in the community) and at a choice of times of day, for example, sessions outside of working hours. Explain the options available.

1.1.10 Provide a range of different types of exercise, as part of the cardiac rehabilitation programme, to meet the needs of people of all ages, or those with significant comorbidity. Do not exclude people from the whole programme if they choose not to attend specific components.

1.1.11 Offer single-sex cardiac rehabilitation classes if there is sufficient demand.

1.1.12 Enrol people who have had an MI in a system of structured care, ensuring that there are clear lines of responsibility for arranging the early initiation of cardiac rehabilitation.

1.1.13 Begin cardiac rehabilitation as soon as possible after admission and before discharge from hospital. Invite the person to a cardiac rehabilitation session which should start within 10 days of their discharge from hospital.

1.1.14 Contact people who do not start or do not continue to attend the cardiac rehabilitation programme with a further reminder, such as:

- a motivational letter
- a prearranged visit from a member of the cardiac rehabilitation team
- a telephone call
- a combination of the above.

1.1.15 Seek feedback from cardiac rehabilitation programme users and aim to use this feedback to increase the number of people starting and attending the programme.

1.1.16 Be aware of the wider health and social needs of a person who has had an MI. Offer information and sources of help on:

- economic issues
- welfare rights
- housing and social support issues.

1.1.17 Make cardiac rehabilitation equally accessible and relevant to all people after an MI, particularly people from groups that are less likely to access this service. These include people from black and minority ethnic groups, older people, people from lower socioeconomic

groups, women, people from rural communities, people with a learning disability and people with mental and physical health conditions.

1.1.18 Encourage all staff, including senior medical staff, involved in providing care for people after an MI, to actively promote cardiac rehabilitation.

Surveillance decision

These review questions should not be updated.

4-year surveillance summary

A systematic review[7] of 17 studies (n = 2172) compared the effect of home-based and supervised centre-based cardiac rehabilitation on mortality and morbidity, health-related quality of life, and modifiable cardiac risk factors in patients following an acute MI or revascularisation, or with heart failure. At 12 months follow-up, there was no significant difference between home and centre-based cardiac rehabilitation for measures of mortality, cardiac events, exercise capacity, modifiable risk factors and health related quality of life (significance not stated). Centre-based participants were found to have significantly lower high density lipoprotein, triglycerides and diastolic blood pressure. However, home-based participants showed significantly higher levels of programme completion and higher adherence to the programme (significance not stated). There was no significant difference in healthcare costs between the different types of cardiac rehabilitation.

An RCT[8] (n = 32) examined the effectiveness of an 8-week home-based cardiac rehabilitation programme on cardiorespiratory fitness and daily physical activity of patients recovering from MI. The programme comprised of health education sessions and an exercise programme that took place 3 times per week at home, over an 8 week period. The results showed significant improvements in measures of cardiorespiratory fitness, haemodynamics at peak exercise and heart rate recovery compared to a control group (health education session only). However, daily physical activity levels did not change in either group.

An RCT[9] (n = 212) examined the feasibility and effectiveness of cardiac rehabilitation conducted by a community model of shared care (SC-CR). After an initial visit to the hospital outpatient visit, the SC-CR was run by the GP who took responsibility of remaining rehabilitation, pharmacological treatment and risk factor management. In addition, the Municipal Health Care Centres provided courses on lifestyle interventions and health education and offered psychological support. The intervention was compared to the standard hospital-based cardiac rehabilitation. There was no significant difference between the groups in terms of adherence to the programmes, risk factor improvement, and rates of exercise training uptake. Those taking part on hospital-based cardiac rehabilitation had higher rates of adherence to dietary advice and health education (significance not stated).

An RCT[10] (n = 120) investigated the effect of a smartphone-based home service delivery of cardiac rehabilitation (CAP-CR) compared with a control of a centre-based programme of cardiac rehabilitation for patients post-MI. Both groups took part in their cardiac rehabilitation programme for 6 weeks, followed by a 6 month self-maintenance period. Compared to the control group, the CAP-CR group showed significantly higher uptake, adherence and completion of their cardiac rehabilitation programme. The CAP-CR group also showed slight weight reduction (significance not stated), and significant improvements in emotional state and quality of life (results in comparison to control not stated).

An RCT[11] (n = 375) examined whether a theory-based invitation compared to a standard invitation could increase attendance of cardiac rehabilitation programmes for patients with acute MI or coronary revascularisation. The wording of the theory-based invitation was based on the “theory of planned behaviour” and the “common sense model of illness perception”. A motivational leaflet was also added to some invitations. Attendance of cardiac rehabilitation programmes was significantly higher with the theory-based letter compared to the standard wording. The

motivational leaflet did not have any significant effect on attendance.

Topic expert feedback

A topic expert has highlighted that there are many benefits of including patients and partners in cardiac rehabilitation programmes. This is written into the 'Standards and Core Components' of the British Association for Cardiovascular Prevention and Rehabilitation guideline book to support the standards (currently in press).

Impact statement

The majority of new evidence suggests that offering cardiac rehabilitation in a range of settings (i.e. at home as well as in the clinic) is beneficial in terms of completion rates and adherence. This is supportive of CG172 recommendations, which suggest offering cardiac rehabilitation in a choice of venues and at different times of the day (recommendation 1.1.9).

There was new evidence identified to support the use of smartphone technology to deliver cardiac rehabilitation at home. Although significant improvements were found in terms of uptake, adherence and completion rates, the trial was relatively small and no further evidence was identified in the review. The results were also inconclusive with respect to the effect on quality of life and emotional state. Any impact on CG172 is unlikely until further studies validate these findings.

Finally, new evidence was identified which supported the use of 'theory-based' wording in the invitation letters to attend cardiac rehabilitation. The same study also found no effect of motivational leaflets in addition to the invitation letter in terms of attendance. CG172 recommends inviting patients to attend cardiac rehabilitation as soon as possible (recommendation 1.1.13) and suggests the use of a motivational letter (recommendation 1.1.14) to encourage people to attend. Given that the motivational leaflet described in the new evidence is separate from an invitation letter, it is thought this is not relevant to current recommendations. Until further evidence on the use of specific 'theory-based' wording is available, it is unlikely that this evidence would impact the guideline.

New evidence is unlikely to change guideline recommendations.

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172 – 08 What education and/or information best aids patients after MI to (i) reduce their risk of subsequent cardiac problems (ii) return to a full and normal life (daily activities, driving, exercise, employment, leisure activities, sexual activities)

Recommendations derived from this question

1.1.19 Comprehensive cardiac rehabilitation programmes should include health education and stress management components.

1.1.20 A home-based programme validated for patients who have had an MI (such as The heart manual) that incorporates education, exercise and stress management components with follow-ups by a trained facilitator may be used to provide comprehensive cardiac rehabilitation.

1.1.21 Take into account the physical and psychological status of the patient, the nature of their work and their work environment when giving advice on returning to work.

1.1.22 Be up to date with the latest Driver and Vehicle Licensing Agency (DVLA) guidelines. Regular updates are published on the DVLA website.

1.1.23 After an MI without complications, people who wish to travel by air should seek advice from the Civil Aviation Authority. People who have had a complicated MI need expert individual advice.

1.1.24 People who have had an MI who hold a pilot's licence should seek advice from the Civil Aviation Authority.

1.1.25 Take into account the patient's physical and psychological status, as well as the type of activity planned when offering advice about the timing of returning to normal activities.

1.1.26 An estimate of the physical demand of a particular activity, and a comparison between activities, can be made using tables of metabolic equivalents (METS) of different activities (for further information please refer to the Centers for Disease Control and Prevention website). Advise patients how to use a perceived exertion scale to help monitor physiological demand. Patients who have had a complicated MI may need expert advice.

1.1.27 Advice on competitive sport may need expert assessment of function and risk, and is dependent on what sport is being discussed and the level of competitiveness.

Surveillance decision

This review question should not be updated.

4-year surveillance summary

An RCT[12] (n = 151) examined the effect of enhanced cardiac rehabilitation with stress management training (CR+SMT) in comparison to standard cardiac rehabilitation (CR) and no rehabilitation at all for outpatients with coronary heart disease. Patients in the CR+SMT group had a significantly greater reduction in composite stress levels and lower rates of clinical events compared with the CR group. Both intervention groups showed significant improvements in coronary heart disease biomarkers and lower event rates in comparison to the non-CR group.

An RCT[13] (n = 1947) examined the effect of an individualised educational intervention on knowledge, attitudes and beliefs in comparison to usual in-hospital education for patients with acute coronary syndrome. As well as the in-hospital education which both groups received, the intervention group received an additional 40 minute one-to-one individualised education session which was delivered using motivational interviewing techniques and repeated at 1 month and 6 months later. Results showed a significant effect on mean knowledge, attitude and belief scores at 3 and 12 months (authors do not state direction of effect).

An RCT[14] (n = 40) examined the effect of an individualised education programme that started early in cardiac care unit on self-efficacy, rehabilitation programme attendance, feasibility and satisfaction in patients with acute coronary syndrome. The intervention comprised of an early needs-oriented educational session in the cardiac care unit as well as another session on the ward addressing risk factors, medication and self-management followed by referral to cardiac rehabilitation. The intervention was compared to standard care. Results show that the intervention group had significantly better self-efficacy scores on the ability to control symptoms. However, when authors controlled for age, there was no significant difference in results. Attendance of cardiac rehabilitation was reported to be higher and satisfaction with the intervention was reported to be 'high' in the intervention group, however significance was not stated.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The new evidence supports the use of stress management programmes within the context of cardiac rehabilitation, which is in line with the current CG172 recommendations (1.1.28).

There was some evidence to support the use of individualised education sessions to improve knowledge, attitudes and beliefs, however the results available at this point were inconclusive. One study showed an impact (direction of effect unclear) of the sessions on knowledge, attitudes and beliefs, whilst the other study showed no significant effect of the sessions. Additionally, the impact on clinical outcomes is not clear. Therefore, it is unlikely that this new evidence will impact on the guideline at this time and further research is needed.

New evidence is unlikely to change guideline recommendations.

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172 – 09 **What psychological and social (carers) support best aids people after MI to reduce their risk of subsequent cardiac problems and to promote their return to a full and normal life?**

172 – 10 **What is the incidence of anxiety and depression in patients after MI and how can patients be identified? (can be crossreferenced to the Anxiety & Depression guidelines)**

Recommendations derived from this question

1.1.28 Offer stress management in the context of comprehensive cardiac rehabilitation.

1.1.29 Do not routinely offer complex psychological interventions such as cognitive behavioural therapy.

1.1.30 Involve partners or carers in the cardiac rehabilitation programme if the patient wishes.

1.1.31 For recommendations on the management of patients with clinical anxiety or depression, refer to Anxiety (NICE clinical guideline 113), Depression in adults (NICE clinical guideline 90) and Depression in adults with a chronic physical health problem (NICE clinical guideline 91).

Surveillance decision

This review question should not be updated.

4-year surveillance summary

Telephone-delivered support

An RCT[15] (n = 150) examined the effectiveness of a 6-month centralised depression care programme for patients with elevated depressive symptoms 2-6 months after an acute coronary syndrome (ACS). The intervention comprised of telephone-delivered problem solving treatment and was compared to usual depression care (locally determined after a physician notification of patient symptoms). Results showed that depressive symptoms decreased significantly in the intervention group compared to the usual care group.

A secondary analysis of the 'ProActive Heart' RCT[16] (n = 430) looked at the effect of a telephone-delivered health coaching programme on depression and anxiety for MI patients. The intervention comprised of 10 telephone-delivered 'health coaching' sessions over a 6-month period and was compared to usual care. Results showed significant reductions in anxiety scores for the intervention group compared to usual care. No significant difference in depression scores was observed.

An RCT [17,18] (n = 121) examined the efficacy and feasibility of the telehealth programme 'MoodCare' on depression in ACS patients with low mood. The intervention integrated depression management into a cardiovascular disease risk reduction programme and was compared to usual care. At 6-month follow-up[17], results showed a significant decrease in depression scores when compared to usual care. This effect was reported to be more pronounced in patients with a history of depression. At 12-month follow-up[18], results showed a significant decrease in depression

scores only for patients with a clinical diagnosis of major depressive disorder at baseline.

Other therapy

An RCT[19] (n = 60) examined the efficacy of 'Eye Movement Desensitization and Reprocessing' therapy (EMDR) on depression in patients during the 4 months after their MI. The intervention comprised of three 45-90 minute sessions on alternate days and was compared to a control group who did not receive EMDR therapy. Results showed a significant decrease in depression scores for the intervention group over time and a significant increase in depression scores for the control group. The resulting between-group difference in depression scores post-intervention was significant.

An RCT [20] (n = 101) examined the effect of adding a short-term humanistic-existential psychotherapy to standard cardiological therapy for post AMI patients who had recently undergone complete revascularisation with urgent/emergent angioplasty. The intervention was compared to usual care of standard cardiological therapy. Primary endpoint outcomes included re-infarction, death, stroke, revascularisation, life-threatening ventricular arrhythmias, and the reoccurrence of typical angina. Results showed that compared to usual care, the intervention group had significantly lower incidence of primary endpoint; a result driven by lower incidence of recurrent angina and of new comorbidities. The intervention group also reported fewer re-hospitalisations, a better NYHA class, higher quality of life, and lower depression (significance not stated).

An RCT[21] (n = 70) examined the effectiveness of a cardiac rehabilitation programme with a family-centred empowerment model (FCEM) compared to a control of standard home-based cardiac rehabilitation programme for patients with MI. The FCEM group showed significant improvement in quality of life, perceived stress and state anxiety compared to control. However there was no difference in trait anxiety between groups.

A subgroup analysis of the 'Beating Heart Problems' RCT[22] (n = 42) looked at the effect of a behaviour change and mood management programme on psychological outcomes in patients who 1. had experienced an acute cardiac event and 2. who had a score higher than 13 on the Beck Depression Inventory. The 8-week group-centred intervention was based on cognitive behavioural therapy and motivational interviewing. Compared to usual care, the intervention group showed significantly greater improvements in depression symptoms, self-rated health, and gains in confidence in managing depression and anger.

Topic expert feedback

A topic expert has highlighted that there is a need to apply specialist psychological interventions within cardiac rehabilitation settings, delivered by appropriately trained practitioners such as applied psychologists. They suggested that this section should focus on psychological interventions and support separately.

The topic expert also highlighted that there are many benefits of including patients and partners in cardiac rehabilitation programmes. This is written into the 'Standards and Core Components' of the British Association for Cardiovascular Prevention and Rehabilitation guideline book to support the standards (currently in press).

Impact statement

New evidence was identified to support a range of psychological interventions to address depression and anxiety in patients with MI. There was some evidence to suggest that telephone-delivered health coaching and problem-solving therapy might reduce depression and anxiety symptoms. This evidence links to feedback from one topic expert, who called for specialised psychological support to be integrated into cardiac rehabilitation programmes.

Evidence was also found for the use of other specialised therapies ('Eye Movement Desensitization and Reprocessing', 'humanistic existential' psychotherapy, and mood management programme), which all showed positive results on depression levels. However, there was only one study identified for each intervention and each trial had a relatively small sample size.

Despite this new evidence, the recognition, assessment, and management of depression and anxiety is already covered in CG91. CG172 currently links to CG91 in recommendation 1.1.31 therefore no impact on CG172 is currently expected.

There was also new evidence to support the use of the family-centred empowerment model within standard cardiac rehabilitation. This links to feedback from a topic expert who highlighted the benefits of incorporating partners into cardiac rehabilitation. The feedback also supports the current recommendation (1.1.30) on involving partners or carers in the cardiac rehabilitation programme if the patient wishes. Until there is more evidence on whole family involvement or specifically the family-centred empowerment model, it is unlikely that this new evidence will change this recommendation.

In conclusion, some new evidence was identified to support the use psychological interventions for patients with ACS who have depressive or anxiety symptoms. This new evidence is supported by expert opinion. However, given that the management of depression and anxiety is already covered in CG91 and also that CG172 currently links to this guideline, the new evidence is unlikely to affect the guideline at present.

New evidence is unlikely to change guideline recommendations.

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172 – 11 What is the incidence of sexual dysfunction in patients after MI and how can patients be identified who would require referral to a specialist unit?

Recommendations derived from this question

1.1.32 Reassure patients that after recovery from an MI, sexual activity presents no greater risk of triggering a subsequent MI than if they had never had an MI.

1.1.33 Advise patients who have made an uncomplicated recovery after their MI that they can resume sexual activity when they feel comfortable to do so, usually after about 4 weeks.

1.1.34 Raise the subject of sexual activity with patients within the context of cardiac rehabilitation and aftercare.

1.1.35 When treating erectile dysfunction, treatment with a PDE5 (phosphodiesterase type 5) inhibitor may be considered in men who have had an MI more than 6 months earlier and who are now stable.

1.1.36 PDE5 inhibitors must be avoided in patients treated with nitrates or nicorandil because this can lead to dangerously low blood pressure.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Lifestyle changes after an MI

172 – 12 What is the effectiveness of changing dietary regime from the pre-infarct diet?

Recommendations derived from this question

1.2.1 Advise people to eat a Mediterranean-style diet (more bread, fruit, vegetables and fish; less meat; and replace butter and cheese with products based on plant oils).

1.2.4 Advise people not to take supplements containing beta-carotene. Do not recommend antioxidant supplements (vitamin E and/or C) or folic acid to reduce cardiovascular risk.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 13 What is the most effective method of delivering dietary advice?

Recommendations derived from this question

1.2.5 Offer people an individual consultation to discuss diet, including their current eating habits, and advice on improving their diet.

1.2.6 Give people consistent dietary advice tailored to their needs.

1.2.7 Give people healthy eating advice that can be extended to the whole family.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 14 What is the clinical and cost effectiveness of omega-3 fatty acids in all patients with myocardial infarction?

Recommendations derived from this question

1.2.3 Do not offer or advise people to use the following to prevent another MI:

- Omega-3 fatty acid capsules
- Omega-3 fatty acid supplemented foods.

If people choose to take omega-3 fatty acid capsules or eat omega-3 fatty acid supplemented foods, be aware that there is no evidence of harm).

Surveillance decision

This review question should not be updated.

4-year surveillance summary

An RCT[23] (n = 258) examined the effect of omega-3 acid ethyl esters on left ventricular remodelling after acute MI. Patients were assigned to 6 months of high-dose omega-3 fatty acids or placebo. Results showed that

patients with omega-3 fatty acids experienced a significant reduction of left ventricular systolic volume index and non-infarct myocardial fibrosis in comparison with placebo. Patients with omega-3 fatty acid also underwent significant reductions in serum biomarkers of systemic and vascular inflammation and myocardial fibrosis. There were no adverse events associated with high-dose omega-3 fatty acid therapy.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The new evidence suggests a beneficial effect of omega-3 fatty acids on left ventricular remodelling after acute MI, however this is only based on one study. The current guidance does not recommend offering or advising omega-3 fatty acids. With this in mind, until there is further evidence to validate these findings, the new evidence is unlikely to change current guidance.

New evidence is unlikely to change guideline recommendations.

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172 – 15 What is the clinical and cost effectiveness of oily fish consumption in all patients with myocardial infarction?

Recommendations derived from this question

1.2.2 Do not routinely recommend eating oily fish for the sole purpose of preventing another MI. If people after an MI choose to consume oily fish, be aware that there is no evidence of harm, and fish may form part of a Mediterranean-style diet.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 16 What is the effectiveness of low/ moderate alcohol consumption versus high alcohol consumption to improve outcome in patients after MI?

172 – 17 What is the effectiveness of no/ low/moderate alcohol consumption versus high alcohol consumption to improve outcome in patients after MI?

Recommendations derived from these questions

1.2.8 Advise people who drink alcohol to keep weekly consumption within safe limits (no more than 21 units of alcohol per week for men, or 14 units per week for women) and to avoid binge drinking (more than 3 alcoholic drinks in 1–2 hours).

Surveillance decision

Recommendations under these questions should be removed. They will be replaced with a cross referral to the most recent guidance from the Department of Health on how to keep health risks from drinking alcohol to a low level.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback

A topic expert highlighted that the latest guidance from the Department of Health is a maximum of 14 units per week for men and women. The recommendation is therefore currently not in line with the most up-to-date advice on alcohol limits.

Impact statement

Although no evidence was identified in this area, the topic expert feedback highlights the need for this recommendation to be removed and replaced with a cross-referral to the most recent guidance issued from the Department of Health on alcohol limits.

New evidence identified that may change current recommendations.

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172 – 18 **What is the effectiveness of regular physical activity versus a sedentary lifestyle to improve outcome in patients after MI?**

172 – 19 **What is the level of physical activity which increases physical work capacity versus physical activity which does not increase physical work capacity**

172 – 20 **What is the effectiveness of regular physical activity versus a sedentary lifestyle to improve outcome in patients after MI?**

Recommendations derived from this question

1.2.9 Advise people to undertake regular physical activity sufficient to increase exercise capacity.

1.2.10 Advise people to be physically active for 20–30 minutes a day to the point of slight breathlessness. Advise people who are not active to this level 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.

1.2.11 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.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 21 Smoking cessation

Recommendations derived from this question

1.2.12 Advise all people who smoke to stop and offer assistance from a smoking cessation service in line with Brief interventions and referral for smoking cessation (NICE public health guidance 1).

1.2.13 All patients who smoke and who have expressed a desire to quit should be offered support and advice, and referral to an intensive support service (for example, the NHS Stop Smoking Services) in line with Brief interventions and referral for smoking cessation (NICE public health guidance 1). If a patient is unable or unwilling to accept a referral they should be offered pharmacotherapy in line with the recommendations in Smoking cessation services (NICE public health guidance 10).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 22 Weight management

Recommendations derived from this question

1.2.14 After an MI, offer all patients who are overweight or obese advice and support to achieve and maintain a healthy weight in line with Obesity (NICE clinical guideline 43).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Drug therapy

172 – 23 Overall drug therapy

Recommendations derived from this question

1.3.1 Offer all people who have had an acute MI treatment with the following drugs:

- ACE (angiotensin-converting enzyme) inhibitor
- dual antiplatelet therapy (aspirin plus a second antiplatelet agent)
- beta-blocker

- statin.

1.3.2 Ensure that a clear management plan is available to the person who has had an MI and is also sent to the GP, including:

- details and timing of any further drug titration
- monitoring of blood pressure
- monitoring of renal function

1.3.3 Offer all people who have had an MI an assessment of bleeding risk at their follow-up appointment.

1.3.4 Offer an assessment of left ventricular function to all people who have had an MI.

Surveillance decision

This review question should not be updated.

4-year surveillance summary

Colchicine

An RCT[24] (n = 532) examined whether 0.5mg of colchicine a day (off-label use) can reduce the risk of cardiovascular events in patients with clinically stable coronary disease. The median follow-up time was 3 years. Patients were already receiving aspirin and/or clopidogrel and statins. Compared to those not treated with colchicine, significantly fewer patients treated with colchicine reached the primary endpoint of acute coronary syndrome, out-of-hospital cardiac arrest, or non-cardioembolic ischemic stroke.

L-Carnitine

A systematic review[25] of 13 studies (n = 3629) evaluated the effects of L-carnitine on morbidity and mortality for patients with acute MI. L-carnitine is not currently licenced for this indication. Results showed that compared to placebo or control, L-carnitine was associated with a significant reduction in all-cause mortality, ventricular arrhythmias and angina. There was no difference between treatment and control for reinfarction or heart failure.

Vorapaxar

Four relevant RCTs[26-29] were identified evaluating the use of vorapaxar in patients with MI or ACS. However, guidance on vorapaxar is covered by the in-development technology appraisal of Atherothrombotic events - vorapaxar [ID616].

Other drug therapy

Two further papers were identified which looked into the effect of 2 drugs currently in development with no marketing authorisation or licence in the UK. One RCT[30] looked at the effect of darapladib in preventing ischemic events and the other RCT[31] looked at the effect of losmapimod on cardiovascular outcomes for patients with MI. These papers will not be considered in this surveillance review because they do not currently have a licence to be used in the UK.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The new evidence highlights the off-label use of colchicine and L-carnitine which are not currently listed in the recommendations for this review question. Firstly, the long-term use of the anti-inflammatory drug colchicine is shown to reduce acute coronary syndrome, out of hospital cardiac arrest, or non-cardioembolic ischemic stroke. However, as this is just one study and there is currently no license for the use of colchicine for this indication in the UK, more evidence is needed to validate these findings before they might affect CG172.

New evidence was found on the off-label use of the food supplement L-cartinine for patients with MI. Although there were positive effects on some clinical outcomes, there was no effect of treatment on reinfarction. Furthermore, there has been no further evidence identified beyond 2013. Therefore at this point, it is unlikely that new evidence will affect the guideline until further research is available.

New evidence is unlikely to change guideline recommendations.

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172 – 24 What is the clinical and cost effectiveness of adding ACE inhibitors versus placebo to improve outcome in people after an MI and is there an optimal duration?

Recommendations derived from this question

1.3.10 Offer an ACE inhibitor to people who have had an MI more than 12 months ago. Titrate to the maximum tolerated or target dose (over a 4–6-week period) and continue indefinitely.

Surveillance decision

This review question should not be updated.

4-year surveillance summary

ACE inhibitors

An RCT[32] (n = 28) compared the effects of ramipril or losartan on biomarkers of heart failure (NT-proBNP and EF), endogenous fibrinolysis (PAI-1) and platelet aggregation (CT) in STEMI patients after PCI. The intervention group received ramipril or losartan for 6 months alongside dual anti-platelet therapy (DAPT) whilst the control group received DAPT only. There were no significant differences between ramipril and losartan on any of the biomarkers. However, when compared to the DAPT only group, treatment with either ramipril or losartan significantly improved antiplatelet function (increased CT).

A post-hoc propensity score analysis[33] (n = 716) of the 'SMILE' RCT looked at how the risk profile of patients is associated with the use of zofenopril over ramipril in patients with AMI complicated by left ventricular dysfunction. However zofenopril is not currently available in the UK and therefore not discussed further.

A post-hoc analysis[34] of the EUROPA trial (n = 7534) examined how the ACE inhibitor perindopril might cause additional benefits to patients on beta-blockers compared to placebo plus beta-blocker. All patients received their standard medication. In the original trial, perindopril reduced cardiovascular outcomes in low-risk stable coronary artery disease patients. Results of the post-hoc analysis showed that perindopril with beta-blocker significantly reduced the relative risk of the composite endpoint of cardiovascular death, nonfatal MI, and resuscitated cardiac arrest compared to placebo with beta-blocker. Addition of perindopril also reduced fatal or non-fatal MI and hospitalisation for heart failure.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The new evidence supports the use of ACE inhibitors alongside DAPT regardless of risk profile, which is consistent with current recommendations. There is some evidence to suggest that use of ACE inhibitors is also suitable for patients with beta blockers, this is supportive of recommendation 1.3.1 which

states that all people who have had an acute MI should be treated with the following drugs: ACE inhibitor, dual antiplatelet therapy, beta-blocker and statin. As the new evidence supports the current recommendations, there is no impact on the guideline.

New evidence is unlikely to change guideline recommendations.

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172 – 25 Is there an optimal time for ACE inhibitors to be initiated in people who have had an MI?

Recommendations derived from this question

1.3.5 Offer people who present acutely with an MI an ACE inhibitor as soon as they are haemodynamically stable. Continue the ACE inhibitor indefinitely.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 26 How frequently should renal function tests, including serum potassium, be monitored in patients treated with ACEI and/or ARBs after MI?

Recommendations derived from this question

1.3.9 Renal function, serum electrolytes and blood pressure should be measured before starting an ACE inhibitor or ARB and again within 1 or 2 weeks of starting treatment. Patients should be monitored as appropriate as the dose is titrated upwards, until the maximum tolerated or target dose is reached, and then at least annually. More frequent monitoring may be needed in patients who are at increased risk of deterioration in renal function. Patients with chronic heart failure should be monitored in line with Chronic heart failure (NICE clinical guideline 108).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 27 Is early dose titration of ACE inhibitors in hospital more clinically and cost effective than dose titration over an extended period of time in people who have had a MI?

Recommendations derived from this question

1.3.6 Titrate the ACE inhibitor dose upwards at short intervals (for example, every 12–24 hours) before the person leaves hospital until the maximum tolerated or target dose is reached. If it is not possible to complete the titration during this time, it should be completed within 4–6 weeks of hospital discharge.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 28 What is the clinical and cost effectiveness of adding ACE inhibitors versus ARBs or in combination versus ACE inhibitors to improve outcomes in people after an MI?

Recommendations derived from this question

1.3.7 Do not offer combined treatment with an ACE inhibitor and an angiotensin II receptor blocker (ARB) to people after an MI, unless there are other reasons to use this combination.

1.3.8 Offer people after an MI who are intolerant to ACE inhibitors an ARB instead of an ACE inhibitor.

1.3.11 Offer people who have had an MI more than 12 months ago and who are intolerant to ACE inhibitors an ARB instead of an ACE inhibitor.

Surveillance decision

The review question should not be updated.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback

It has been noted that a drug safety update has been released since the publication of CG172 which is on the combination use of medicines from different classes of renin-angiotensin system blocking agents which includes ACE and ARBs. The update advises that combination use of medicines from two classes of RAS blocking agents (ACE-inhibitors, ARBs, or aliskiren) is not recommended.

Impact statement

Although no new evidence was identified in the surveillance review searches, a drug safety update has been published which supports recommendation 1.3.7. As the drug safety update does not moderate the recommendation, a footnote will not be needed and the guideline is not affected.

New evidence is unlikely to change guideline recommendations.

172 – 29 What is the most clinically and cost effective combination of antiplatelet and anticoagulant therapies for people who have had an MI and an indication for anticoagulation?

Recommendations derived from this question

1.3.22 Take into account all of the following when thinking about treatment for people who have had an MI and who have an indication for anticoagulation:

- bleeding risk
- thromboembolic risk
- cardiovascular risk.

1.3.23 Unless there is a high risk of bleeding, continue anticoagulation and add aspirin to treatment in people who have had an MI who otherwise need anticoagulation and who:

- have had their condition managed medically or
- have undergone balloon angioplasty or
- have undergone CABG surgery.

1.3.24 Continue anticoagulation and add clopidogrel to treatment in people who have had an MI, who have undergone percutaneous coronary intervention (PCI) with bare-metal or drug-eluting stents and who otherwise need anticoagulation.

1.3.25 Offer clopidogrel with warfarin to people with a sensitivity to aspirin who otherwise need anticoagulation and aspirin and who have had an MI.

1.3.26 Do not routinely offer warfarin in combination with prasugrel or ticagrelor to people who need anticoagulation and who have had an MI.

1.3.27 After 12 months since the MI, continue anticoagulation and take into consideration the need for ongoing antiplatelet therapy, taking into account all of the following:

- the indication for anticoagulation
- thromboembolic risk
- bleeding risk
- cardiovascular risk
- the person's wishes.

1.3.28 Do not add a new oral anticoagulant (rivaroxaban, apixaban or dabigatran) in combination with dual antiplatelet therapy in people who otherwise need anticoagulation, who have had an MI.

1.3.29 Consider using warfarin and discontinuing treatment with a new oral anticoagulant (rivaroxaban, apixaban or dabigatran) in people who otherwise need anticoagulation and who have had an MI, unless there is a specific clinical indication to continue it.

4-year surveillance summary

Triple therapy vs dual therapy

A meta-analysis[35] of 1 RCT and 5 cohort studies (n = 7259) examined the effects of triple antithrombotic therapy (TT) compared to dual therapy (DT) in patients after PCI. To note, TT is defined as aspirin plus antiplatelet with oral anticoagulant. Whereas DT is defined as oral anticoagulant plus antiplatelet (in this case, clopidogrel). The average follow-up time was 1.4 years. The results showed that there was no significant difference between groups in all-cause mortality, stent thrombosis, MI, stroke, and major bleeding.

A systematic review[36] of 14 observational studies (n = not stated) compared the safety and efficacy of DT and TT in patients with ACS and a long-term indication for anticoagulation. Results showed in 1-5 year follow-up, no significant difference between treatment groups for odds of mortality or stroke. However, nonfatal MI and major bleeding was found to be more common in the TT group at 1-5 year follow-up compared to the DT group.

Topic expert feedback

Two ongoing trials were highlighted by a topic expert concerning recommendations 1.3.28 and 1.3.29. These trials are looking at the use of new oral anticoagulants (REDUAL with dabigatran; PIONEER with rivaroxaban) in combination with DAPT after insertion of a stent. The results of these trials may have consequences on these recommendations in future.

Another ongoing trial (ADAPTT) was highlighted outside of the surveillance review which investigates the rate of bleeding events for different patient groups receiving antiplatelet therapy with or without an anticoagulant. It is an observational cohort study which aims to quantify the incidence of bleeding events (major and minor) in three cohorts of patients exposed to aspirin and various DAPT and triple therapy with an oral anticoagulant. The three cohorts include patients with PCI, CABG and those with ACS but undergoing no procedure. Data will be derived from the Clinical Practice Research Database. The results of the study will aim to help doctors to choose drugs that are more appropriate for individual patients' specific needs, which will reduce the risk of bleeding and increase adherence to treatment.

Impact statement

There was mixed evidence to support the use of triple therapy over dual therapy. In one review little difference was found between the two treatment options in terms of clinical outcomes, however another review of observational studies found that non-fatal MI and major bleeding was more common with triple therapy. This is broadly supportive of current recommendations which highlight risk of bleeding with antiplatelet therapy in combination with anticoagulant and currently do not recommend offering new oral anticoagulants in combination with DAPT in patients who otherwise need anticoagulation.

A topic expert has highlighted two ongoing trials on the use of new oral anticoagulants with DAPT after PCI which could have an impact on the guideline in future. Additionally, the ongoing ADAPTT study investigating bleeding events in patients receiving antiplatelet therapy (with or without anticoagulant) may also have an impact on this guidance. However before the results of these trials are available, there is no current impact on CG172.

New evidence is unlikely to change guideline recommendations.

172 – 30 Is there an optimal time for a beta-blocker to be initiated in people who have had an MI?

Recommendations derived from this question

1.3.30 Offer people a beta-blocker as soon as possible after an MI, when the person is haemodynamically stable.

1.3.31 Communicate plans for titrating beta-blockers up to the maximum tolerated or target dose – for example, in the discharge summary.

Surveillance decision

This review question should not be updated.

4-year surveillance summary

An observational study[37] (n = 2679) highlighted by a topic expert assessed the association between early and prolonged beta-blocker treatment and mortality after acute MI. Patients included in the study had acute MI but were without heart failure or left ventricular dysfunction. Results showed that early beta-blocker use was significantly associated with reduced 30 day mortality in patients with acute myocardial infarction, and discontinuation of β blockers at one year was not associated with higher five year mortality.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

An observational study was highlighted which supports the recommendation to offer a beta-blocker as soon as possible after an MI. Because this evidence is supportive of current recommendations, there is no impact on CG172 at this point.

New evidence is unlikely to change guideline recommendations.

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172 – 31 What is the clinical and cost effectiveness of adding a beta-blocker versus placebo to improve outcome in people after a MI i) with and ii) without left ventricular dysfunction and is there an optimal duration?

Recommendations derived from this question

1.3.32 Continue a beta-blocker for at least 12 months after an MI in people without left ventricular systolic dysfunction or heart failure.

1.3.33 Continue a beta-blocker indefinitely in people with left ventricular systolic dysfunction.

1.3.34 Offer all people who have had an MI more than 12 months ago, who have left ventricular systolic dysfunction, a beta-blocker whether or not they have symptoms. For people with heart failure plus left ventricular dysfunction, manage the condition in line with Chronic heart failure (NICE clinical guideline 108).

1.3.35 Do not offer people without left ventricular systolic dysfunction or heart failure, who have had an MI more than 12 months ago, treatment with a beta-blocker unless there is an additional clinical indication for a beta-blocker.

Surveillance decision

This review question should be updated.

4-year surveillance summary

A meta-analysis[38] of 7 observational studies (n = 10,857) evaluated the effectiveness of oral beta-blocker therapy in patients with STEMI who underwent PCI and who had preserved left ventricular ejection fraction. Follow-up times for the included studies ranged from 6 months to 5.2 years. Results showed that based on the pooled estimate, oral beta-blocker therapy was associated with a significant reduction in all-cause mortality.

A meta-analysis[39] of 60 randomised trials (n = 102,003 patients without left ventricular dysfunction) evaluated the efficacy of beta-blockers in MI and their required duration of usage. Trials containing more than 50% of patients that had undergone reperfusion or were receiving aspirin/statin were classed as being in the 'reperfusion era' and were compared to 'pre-reperfusion era' trials. Findings show that beta-blockers significantly reduced mortality in the pre-reperfusion era but not the reperfusion era. In the pre-reperfusion era, beta-blockers were found to significantly reduce cardiovascular mortality, MI and angina. In the reperfusion era (considered current practice), beta blockers were found to significantly reduce MI and angina but increase heart failure, cardiogenic shock and drug discontinuation. Benefits for recurrent MI and angina in the reperfusion era appeared to be short term (30 days).

Finally, an observational study[37] (n = 2679) highlighted by a topic expert assessed the association between early and prolonged beta-blocker treatment and mortality after acute MI. Patients included in the study had acute MI and were without heart failure or left ventricular dysfunction. Results showed that early beta-blocker use was significantly associated with reduced 30 day mortality in patients with acute myocardial infarction, and discontinuation of beta-blockers at one year was not associated with higher five year mortality.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

There was evidence to support the use of beta-blockers after MI in people with preserved left ventricular ejection fraction, as already advised in recommendation 1.3.32. However, further evidence was found to suggest that there are risks associated with long term treatment. One large meta-analysis indicated that although beta-blockers seem to have a short term benefit on recurrent MI and angina, there is a risk of increased heart failure, cardiogenic shock and drug discontinuation in the long term. The increased risk was only found in patients who had undergone reperfusion, which is current practice in the UK and therefore of relevance to this guideline.

Similarly, an observational study highlighted by a topic expert indicated that discontinuation of beta-blockers at one year is not associated with higher 5-year mortality. This result questions the utility of prolonged beta-blocker treatment in patients without left ventricular dysfunction.

Taken together, the new evidence provides two areas for consideration regarding prolonged beta-blocker treatment in people without left ventricular dysfunction after an MI. First there may be an increased risk of heart failure, cardiogenic shock and drug discontinuation. Second, there may be no mortality benefit of continuing beta-blockers beyond one year. Currently, recommendation 1.3.32 states 'continue a beta-blocker for at least 12 months after an MI in people without left ventricular systolic dysfunction or heart failure'. The new evidence could impact this recommendation as it clarifies the timeframe in which beta-blockers might be beneficial for this group.

New evidence identified that may change current recommendations.

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172 – 32 **What is the effectiveness of adding calcium channel blocker versus placebo to improve outcome in (i) patients after MI without LV dysfunction? (ii) patients after MI with LV dysfunction?**

172 – 33 **What is the potential harm of adding the following: calcium channel blocker or thiazide diuretic or alpha blocker versus placebo in (i) patients after MI with LV dysfunction in whom further blood pressure lowering is warranted? (ii) patients after MI without LV dysfunction in whom further blood pressure lowering is warranted?**

Recommendations derived from this question

1.3.36 Do not routinely offer calcium channel blockers to reduce cardiovascular risk after an MI.

1.3.37 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.

1.3.38 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, use amlodipine, and avoid verapamil, diltiazem and short-acting dihydropyridine agents in line with Chronic heart failure (NICE clinical guideline 108).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 34 **What is the effectiveness of adding potassium channel activators versus placebo to improve outcome in patients after MI?**

Recommendation derived from this question

1.3.39 Do not offer nicorandil to reduce cardiovascular risk in patients after an MI.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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172 – 35 **How frequently should renal function, including serum potassium, be monitored in patients post MI treated with eplerenone?**

172 – 36 **What is the effectiveness of adding eplerenone versus placebo to improve outcome in patients after MI?**

Recommendation derived from this question

1.3.40 For patients who have had an acute MI and who have symptoms and/or signs of heart failure and left ventricular systolic dysfunction, initiate treatment with an aldosterone antagonist licensed for post-MI treatment within 3–14 days of the MI, preferably after ACE inhibitor therapy.

1.3.41 Patients who have recently had an acute MI and have clinical heart failure and left ventricular systolic dysfunction, but who are already being treated with an aldosterone antagonist for a concomitant condition (for example, chronic heart failure), should continue with the aldosterone antagonist or an alternative, licensed for early post-MI treatment.

1.3.42 For patients who have had a proven MI in the past and heart failure due to left ventricular systolic dysfunction, treatment with an aldosterone antagonist should be in line with Chronic heart failure (NICE clinical guideline 108).

1.3.43 Monitor renal function and serum potassium before and during treatment with an aldosterone antagonist. If hyperkalaemia is a problem, halve the dose of the aldosterone antagonist or stop the drug.

Surveillance decision

The review question should not be updated.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback

It has been noted that a drug safety update has been released since the publication of CG172 which is on the spironolactone and renin-angiotensin system drugs in heart failure. The purpose of the update is to remind healthcare professionals that concomitant use of spironolactone with ACEi or ARB increases the risk of severe hyperkalaemia, particularly in patients with marked renal impairment, and should be used with caution and to regularly monitor serum potassium levels and renal function. The same advice applies regarding concomitant use of eplerenone with ACEi or ARB in heart failure.

Impact statement

Although no new evidence was identified in the surveillance review searches, a drug safety update has been published which is relevant to recommendation 1.3.43 under this question. As the drug safety update does not moderate the recommendation, a footnote will not be needed and the guideline is not affected.

New evidence is unlikely to change guideline recommendations.

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172 – 37 **What is the effectiveness of adding statins versus placebo to improve outcome in patients after MI?**

172 – 38 **What is the effectiveness of adding high dose statin (more potent cholesterol lowering) versus low dose statin (less potent cholesterol lowering) to improve outcome in patients after MI?**

172 – 39 **What is the effectiveness of adding early statin therapy versus delayed statin therapy to improve outcome in patients after MI?**

Recommendation derived from this question

1.3.44 Statin therapy is recommended for adults with clinical evidence of cardiovascular disease in line with Statins for the prevention of cardiovascular events (NICE technology appraisal guidance 94) and Lipid modification (NICE clinical guideline 67).

Recommendations about statins and other lipid lowering agents have been removed from the update of the guideline. Recommendations on the use of statins and other lipid lowering agents can be found in Lipid modification (NICE clinical guideline 67) and Statins for the prevention of cardiovascular events (NICE technology appraisal guidance 94).

Surveillance decision

This review question should not be updated.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback

Two topic experts highlighted the need to make reference to the recent media coverage on the use of statins and the detrimental impact this has had health and adherence to medication. A topic expert referred to two recently published studies which show that uptake rate and adherence to statins is low since the negative media coverage and that this is having consequent health impacts on patients at risk.

Impact statement

Recommendations relating to statins and other lipid lowering agents are no longer covered in this guideline and are covered in CG67 and TA94. Therefore it is unlikely that this evidence will affect the guideline.

Antiplatelet therapy

172 – 40 **In people with a proven MI in the past who were not initiated on dual antiplatelet therapy (clopidogrel, prasugrel or ticagrelor in combination with aspirin), should this be initiated?**

172 – 41 **What is the optimal duration that clopidogrel should be continued in patients after an MI?**

Recommendations derived from these questions

1.3.12 Offer aspirin to all people after an MI and continue it indefinitely, unless they are aspirin intolerant or have an indication for anticoagulation.

1.3.13 Offer aspirin to people who have had an MI more than 12 months ago and continue it indefinitely.

1.3.14 For patients with aspirin hypersensitivity, clopidogrel monotherapy should be considered as an alternative treatment.

1.3.15 People with a history of dyspepsia should be considered for treatment in line with Dyspepsia (NICE clinical guideline 17).

1.3.16 After appropriate treatment, people with a history of aspirin-induced ulcer bleeding whose ulcers have healed and who are negative for *Helicobacter pylori* should be considered for treatment in line with Dyspepsia (NICE clinical guideline 17).

This guidance incorporates NICE technology appraisal guidance 236 on ticagrelor for the treatment of acute coronary syndromes. Guidance on prasugrel for the treatment of acute coronary syndromes has not been incorporated in this guidance because this technology appraisal is currently scheduled for update. For further information about this appraisal, see the NICE website.

1.3.17 Ticagrelor in combination with low-dose aspirin is recommended for up to 12 months as a treatment option in adults with acute coronary syndromes (ACS) that is, people:

- with ST-segment-elevation myocardial infarction (STEMI) – defined as ST elevation or new left bundle branch block on electrocardiogram – that cardiologists intend to treat with primary percutaneous coronary intervention (PCI) or
- with non-ST-segment-elevation myocardial infarction (NSTEMI).

This recommendation is from Ticagrelor for the treatment of acute coronary syndromes (NICE technology appraisal guidance 236).

1.3.18 Offer clopidogrel as a treatment option for up to 12 months to:

- people who have had an NSTEMI, regardless of treatment[1]
- people who have had a STEMI and received a bare-metal or drug-eluting stent.

1.3.19 Offer clopidogrel as a treatment option for at least 1 month and consider continuing for up to 12 months to:

- people who have had a STEMI and medical management with or without reperfusion treatment with a fibrinolytic agent.

1.3.20 Continue the second antiplatelet agent for up to 12 months in people who have had a STEMI and who received coronary artery bypass graft (CABG) surgery.

1.3.21 Offer clopidogrel instead of aspirin to people who also have other clinical vascular disease, in line with Clopidogrel and modified-release dipyridamole for the prevention of occlusive vascular events (NICE technology appraisal guidance 210), and who have:

- had an MI and stopped dual antiplatelet therapy or
- had an MI more than 12 months ago.

Surveillance decision

The recommendations in this section will potentially overlap with the antiplatelet therapy section in the update of CG94 – Unstable angina and NSTEMI: early management.

For this reason, it is proposed that recommendations relating to antiplatelet therapy for patients without an indication for anticoagulation should be stood down in CG172. A cross-referral will be made to the updated version of NICE guideline CG94 once it is published.

Choice of agent

4-year surveillance summary

Ticagrelor

A subgroup analysis[40] (n = 21,162) of the PEGASUS-TIMI 54 RCT evaluated the safety and efficacy of ticagrelor in patients with peripheral artery disease (PAD) and prior MI. However, use of ticagrelor for up to 3 years is covered in the published technology appraisal 'Ticagrelor for preventing atherothrombotic events after myocardial infarction' so will not be considered in this surveillance review.

Prasugrel

An RCT[41] was identified which compared the efficacy of prasugrel with clopidogrel for older patients with ACS. However, use of prasugrel is covered in the published technology appraisal 'Prasugrel with percutaneous coronary intervention for treating acute coronary syndromes' so will not be considered in this surveillance review.

Prasugrel vs clopidogrel

Two papers[42,43] were identified which report secondary findings from the TRILOGY ACS study, an RCT which compared the effectiveness of prasugrel with clopidogrel for patients with ACS without revascularisation. The prasugrel technology appraisal described above is for patients with revascularisation. The original trial demonstrated that treatment with prasugrel and aspirin improved outcomes compared to clopidogrel and aspirin. The secondary analysis are as follows:

- One analysis[43] (n = 7243) examined whether primary endpoints from the TRILOGY ACS trial were affected by angiography status of the patients at enrolment. Results showed that at 30-month follow-up, fewer patients who had angiography reached the primary endpoint of cardiovascular death, MI, or stroke than patients without angiography. For those who had angiography, the proportion of patients who reached primary endpoint was significantly lower in the prasugrel group compared to the clopidogrel group. For those without angiography, there was no significant difference between treatment groups for primary endpoint. Finally, bleeding outcomes tended to be higher in prasugrel group, however this difference was not significant and angiography status also showed no effect.
- A second analysis[42] (n = 7243) looked at the effect of prasugrel or clopidogrel on health related quality of life (HRQoL). Patients were stratified by angiography status and also whether they had experienced non-fatal events. At 24 month follow-up, results showed that patients treated with prasugrel had significantly higher HRQoL scores compared to the clopidogrel group. There was no difference

in HRQoL scores for different treatment groups when patients were stratified by angiography status. However, for patients with non-fatal clinical events, those treated with clopidogrel reported a larger loss in HRQoL compared to the prasugrel group.

Optimal DAPT

An RCT[44] (n = 840) explored the safety and efficacy of personalised 'optimal' antiplatelet therapy for patients with high on-treatment platelet reactivity (HPR) who underwent coronary stenting for ACS. The optimal treatment started with 150mg/day clopidogrel with aspirin and switched to triple therapy with added cilostazol after 3 days if repeat platelet function assay showed HPR, otherwise known as 'clopidogrel resistance'. It is noted that cilostazol is not currently licensed for this indication in the UK. The optimal treatment group was compared to standard DAPT. Results showed that at one year follow-up, optimal therapy was associated with significantly lower incidence of the primary endpoint (a composite measure of all-cause death, MI, clinically driven target vessel revascularisation, or stroke) compared to standard DAPT. This effect was mainly due to the reduction in TVR and was sustainable up to 2-year follow-up. There was no significant difference in bleeding rates between the two groups.

Topic expert feedback

A topic expert has highlighted a need for all guidance on clopidogrel, ticagrelor and prasugrel to be in line with the technology appraisals. They also referred to the recently published TA on the extended use of ticagrelor post MI (TA430).

Impact statement

New evidence was found on ticagrelor use beyond 12 months however this is covered by TA430 therefore no impact on CG172 is expected. New evidence was also found on prasugrel however this is covered by TA317 therefore no impact on CG172 is expected.

There was new evidence from a large RCT to show that DAPT involving prasugrel may be a better treatment option for patients having with revascularisation over clopidogrel. Similarly, patients treated with prasugrel were also found to have a higher health related quality of life compared to clopidogrel. There are currently no recommendations on the choice of antiplatelet drug to use in DAPT. This evidence could contribute to new advice in this area and therefore has the potential to impact the guideline.

Finally, further evidence was identified to support the use of 'optimised' antiplatelet therapy with cilostazol for patients with high on-treatment platelet reactivity, otherwise known as clopidogrel resistance. Although results showed a beneficial effect of this personalised therapy, more evidence is needed to validate these findings because there has only been one study in this area eligible for this review. Furthermore, cilostazol is not currently licensed for this indication in the UK.

The recommendations in this section will potentially overlap with the antiplatelet therapy section in the update of CG94 – Unstable angina and NSTEMI: early management, which is currently undergoing update. For this reason, it is proposed that recommendations relating to antiplatelet therapy for patients without an indication for anticoagulation should be stood down in CG172. A cross-referral should be made to the updated version of NICE guideline CG94 once it is published.

New evidence identified that may change current recommendations.

Duration of treatment

4-year surveillance summary

A network meta-analysis[45] of 10 RCTs (n = 31,666) investigated the clinical outcomes of different dual antiplatelet therapy (DAPT) durations. For each included study, DAPT duration was classified as 1. 'shorter' vs 'longer'; and 2. six months or shorter, 1 year, or longer than 1 year. Findings showed that 'shorter' DAPT was associated with significantly lower all-cause mortality, compared with 'longer' DAPT, this was mainly attributable to lower non-cardiac mortality (cardiac mortality showed no change). 'Shorter' DAPT was also associated with a lower risk of major bleeding, but a higher risk of MI and stent thrombosis (no significance stated). In more detail, patients treated with 6-month or shorter DAPT and 1-year DAPT had higher risk of MI and stent thrombosis but lower risk of mortality compared to patients with DAPT for longer than 1 year (no significance stated). Patients treated with 6-month or 'shorter' DAPT had similar rates of mortality, MI and stent thrombosis but lower rates of major bleeding than patients treated with 1-year DAPT (no significance stated).

A meta-analysis[46] of 10 RCTs (n = 32,136) examined the optimum duration of DAPT after implantation of a drug-eluting stent. Included studies compared continued use with shorter duration of DAPT in patients 3 months after stent implantation. Results showed that longer DAPT resulted in a significantly larger reduction in stent thrombosis and MI compared to shorter DAPT. However longer DAPT also significantly increased occurrence of major bleeding compared to shorter DAPT. All cause deaths were significantly lower in the shorter DAPT group. There were no differences between groups for incidence of cardiac deaths or stroke.

Another meta-analysis[47] of 3 RCTs (n = 16,265) looked at the efficacy and safety of extended thienopyridine therapy (antiplatelet therapy) after drug-eluting stent implantation. A comparison was made between 12 months treatment with aspirin alone and >12 months treatment with additional thienopyridine plus aspirin after 12-month DAPT. Results showed that incidences of MI and stent thrombosis in the >12 month thienopyridine group were significantly lower than in the 12 month aspirin only group. However, bleeding risk was significantly higher in the >12 month thienopyridine group. The risk of stroke and cardiac death were similar between the two groups.

A further meta-analysis[48] of 10 RCTs (n = 32,827) compared the efficacy and safety of three different treatment durations of DAPT for patients following PCI with drug-eluting stents. Short term (<12 months) and extended (>12 months) was compared to the standard 12 month therapy. Results showed that compared to 12 month DAPT, the short term course was associated with a significant reduction in major bleeding, with no significant differences in ischaemic or thrombotic outcomes. Extended DAPT yielded a significant reduction in the odds of MI and stent thrombosis compared to 12 month therapy, however major bleeding significantly increased. All cause but not cardiovascular death was also significantly increased with extended therapy compared to 12 month.

Two meta-analysis[49,50], of 3 RCTs (n = 5622)[49] and 5 RCTs (n = 9979)[50] compared the potential benefits and risks of short-term DAPT with long-term DAPT for patients after insertion of drug-eluting stents. Results of one study[49] found that there was no significant difference between duration of DAPT groups for rates of the combined end point of either cardiac death, MI, stroke, all-cause death, and cardiac death. However, there was a significantly increased incidence of stroke and TIMI major bleeding for those treated with long-term DAPT.

The other meta-analysis[50] again showed no significant difference between groups for rates of all-cause death, cardiac death, MI, but also for cerebrovascular accidents, and stent thrombosis. Again, there was a significantly increased incidence of thrombosis in MI (TIMI) and TIMI major bleeding for those treated with long-term DAPT.

An RCT[51] (n = 2514) investigated the efficacy of long term DAPT in patients who received drug-eluting stents and who were free of major adverse cardiovascular events and major bleeding for at least 12 months. Patients received either aspirin alone or clopidogrel plus aspirin for 24 months. Results showed that there was no significant difference between

groups for the composite endpoint of cardiac caused death, myocardial infarction or stroke. There was also no difference between groups for incidence of major bleeding.

Another RCT[52] (n = 11,648, 3576 with MI) assessed the risks and benefits of 30 vs 12 months of DAPT compared to placebo in patients undergoing coronary stent implantation with and without MI. Results reported for patients with MI only. Patients treated with 30-months DAPT had significantly reduced stent thrombosis, MI, and major cardiovascular and cerebrovascular events compared with 12 month DAPT and placebo. However this was also associated with significantly increased bleeding

An RCT[53] (n = 9961) compared 12 and 30 months of DAPT after insertion of a drug-eluting stent. After 12 months treatment with thienopyridine therapy (clopidogrel or prasugrel) plus aspirin, patients were randomised to receive a further 18 months of thienopyridine or placebo. Both groups continued to take aspirin. Results showed that when compared to placebo, continued thienopyridine treatment significantly reduced rates of stent thrombosis and major cardiovascular and cerebrovascular events (a composite measure of death, MI, or stroke). The rate of MI was also significantly lower in the thienopyridine group. However, the rate of death from any cause and the rate of moderate to severe bleeding was significantly higher in the thienopyridine group. There was also an elevated risk of stent thrombosis and MI in both groups during the 3 months after discontinuation of thienopyridine treatment (no significance stated).

Ticagrelor

Two papers were identified which provide further results from the PEGASUS-TIMI 54 RCT described above[54,55]. However, use of ticagrelor for up to 3 years is covered in the published technology appraisal 'Ticagrelor for preventing atherothrombotic events after myocardial infarction' so will not be considered in this surveillance review.

Topic expert feedback

A topic expert noted that there are lots of new anti-platelet therapies to consider which should impact the current guidance. Another topic expert has highlighted a general comment to include an amalgamation of clopidogrel, ticagrelor and prasugrel in line with technology appraisals. They also referred to the recently published for the extended use of ticagrelor post MI (TA430)

Impact statement

The current recommendations advise continuing treatment with clopidogrel for up to 12 months after an MI. However, the new evidence provides further insight into the optimal duration of treatment with not just clopidogrel, but also with other antiplatelet drugs used in DAPT. The majority of findings indicated that DAPT duration for longer than 1 year seemed to lower the risk of MI and stent thrombosis in patients post-PCI with or without stent insertion. However, this result is also accompanied by increased risk of major bleeding and higher mortality. Therefore, it is likely that the new evidence will affect the recommendations both in terms of antiplatelet drugs available but also the optimal timeframe of treatment.

New evidence was also found on ticagrelor use beyond 12 months however this is covered by TA430 therefore no impact on CG172 is expected.

The recommendations in this section will potentially overlap with the antiplatelet therapy section in the update of CG94 – Unstable angina and NSTEMI: early management, which is currently undergoing update. For this reason, it is proposed that recommendations relating to antiplatelet therapy for patients without an indication for anticoagulation should be stood down in CG172. A cross-referral should be made to the updated version of NICE guideline CG94 once it is published.

New evidence identified that may change current recommendations.

Coronary revascularisation after an MI

172 – 42 **Are there stable patients who don't benefit prognostically from revascularisation?**

172 – 43 **Are there stable patients after MI who a) benefit prognostically from revascularisation b) those who don't benefit prognostically?**

Recommendation derived from this question

1.4.1 Offer everyone who has had an MI a cardiological assessment to consider whether coronary revascularisation is appropriate. This should take into account comorbidity.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Selected patient subgroups

172 – 44 **Patients with hypertension**

Recommendation derived from this question

1.5.1 Treat hypertension in line with Hypertension (NICE clinical guideline 127).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

172 – 45 **Patients with left ventricular systolic dysfunction**

Recommendation derived from this question

1.5.2 Patients who have left ventricular systolic dysfunction should be considered for an implantable cardioverter defibrillator in line with Implantable cardioverter defibrillators for arrhythmias (NICE technology appraisal guidance 95).

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Communication of diagnosis and advice

172 – 46 Communication of diagnosis and advice

Recommendation derived from this question

1.6.1 After an acute MI, ensure that the following are part of every discharge summary:

- confirmation of the diagnosis of acute MI
- results of investigations
- incomplete drug titrations
- future management plans
- advice on secondary prevention.

1.6.2 Offer a copy of the discharge summary to the patient.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Editorial and factual corrections identified during surveillance

During surveillance editorial or factual corrections were identified.

- CG172 recommendations 1.3.15 and 16 refer to CG17 “Dyspepsia” guideline which CG184 has replaced. This would need updating to refer to the correct guideline.
- Recommendation 1.3.44 in CG172 refers to CG67 regarding statins and other lipid lowering agents (CG67 has now been replaced by CG181).
- Recommendation 1.2.14 refers to CG43 Obesity prevention (now updated and replaced by CG189 Obesity: identification, assessment and management).

Research recommendations

Prioritised research recommendations

At 4-year and 8-year surveillance reviews of guidelines published after 2011, we assess progress made against prioritised research recommendations. We may then propose to remove research recommendations from the NICE version of the guideline and the NICE database for research

recommendations. The research recommendations will remain in the full versions of the guideline. See NICE's research recommendations process and methods guide 2015 for more information.

These research recommendations were deemed priority areas for research by the Guideline Committee; therefore, at this 4-year surveillance review time point a decision **will** be taken on whether to retain the research recommendations or stand them down.

We applied the following approach:

- New evidence relevant to the research recommendation was found and an update of the related review question is planned.
  - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.
- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.
  - The research recommendation will be retained because there is evidence of research activity in this area.
- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.
  - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database because further research is unlikely to impact on the guideline.
- Ongoing research relevant to the research recommendation was found.
  - The research recommendation will be retained and evidence from the ongoing research will be considered when results are published.
- No new evidence relevant to the research recommendation was found and no ongoing studies were identified.
  - The research recommendation will be removed from the NICE version of guideline and the NICE research recommendations database because there is no evidence of research activity in this area.
- The research recommendation would be answered by a study design that was not included in the search (usually systematic reviews or randomised controlled trials).
  - The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.
- The new research recommendation was made during a recent update of the guideline.
  - The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

RR – 01 In people who have not undergone revascularisation after an MI, does clopidogrel and placebo have a better outcome than clopidogrel and aspirin?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

The research recommendation will be removed from the NICE version of guideline and the NICE research recommendations database because there is no evidence of research activity in this area.

RR – 02 Does continuing beta-blocker treatment beyond 1 year after an MI improve outcomes for people with normal left ventricular systolic function?

- New evidence relevant to the research recommendation was found and an update of the related review question is planned.

Surveillance decision

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

RR – 03 Is treatment with an oral anticoagulant, aspirin and clopidogrel preferable to treatment with an oral anticoagulant and clopidogrel in people who have had an MI, have an indication for oral anticoagulation and are treated either medically, by primary PCI or by coronary artery bypass grafting surgery?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

Surveillance decision

The research recommendation will be retained because there is evidence of research activity in this area.

RR – 04 What characteristics are associated with uptake and adherence to cardiac rehabilitation after an acute MI when rehabilitation is started early?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.

Surveillance decision

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database because further research is unlikely to impact on the guideline.

RR – 05 In people who have had a STEMI who undergo primary PCI with a bare-metal stent, and 4 weeks of aspirin and clopidogrel, is there an additional benefit to continuing clopidogrel for a further 11 months?

New evidence relevant to the research recommendation was found and an update of the related review question is planned in the update of NICE guideline CG94.

Surveillance decision

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

Other research recommendations

The following research recommendations were not deemed as priority areas for research by the guideline committee.

RR – 06 What is the optimal duration of treatment with the combination of aspirin and clopidogrel, compared with aspirin alone, in patients with ST elevation MI treated with thrombolysis?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 07 Could a discontinuation trial of ACE inhibitors in patients without LV dysfunction determine the clinical and cost effectiveness of long-term secondary prevention treatment in patients after an MI?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 08 What is the clinical and cost effectiveness of treatment with spironolactone compared with eplerenone in patients with heart failure early after myocardial infarction?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 09 What strategies are effective in improving the uptake and adherence to comprehensive cardiac rehabilitation in patients who have had an MI?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 10 What strategies are effective in improving the uptake and adherence to comprehensive cardiac rehabilitation in patients who have had an MI and are

from under represented groups such as minority ethnic groups, women, the elderly and those on low incomes or with physical or mental comorbidities who have had an MI?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 11 Added value of the non-exercise components of the cardiac rehabilitation programmes

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 12 What is the clinical and cost effectiveness of omega-3-acid ethyl esters treatment in all patients after MI s

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 13 What encourages the maintenance of regular exercise and a Mediterranean style diet beyond the period of comprehensive cardiac rehabilitation?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 14 What strategies are effective in improving the uptake and adherence to comprehensive cardiac rehabilitation in patients who have had an MI?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 15 What strategies are effective in improving the uptake and adherence to comprehensive cardiac rehabilitation in patients who have had an MI and are from under represented groups such as minority ethnic groups, women, the elderly and those on low incomes or with physical or mental comorbidities who have had an MI?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 16 Added value of the non-exercise components of the cardiac rehabilitation programmes

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 17 What is the clinical and cost effectiveness of omega-3-acid ethyl esters treatment in all patients after MI s

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

RR – 18 What encourages the maintenance of regular exercise and a Mediterranean style diet beyond the period of comprehensive cardiac rehabilitation?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

Surveillance decision

This research recommendation will be considered again at the next surveillance point.

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