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GUIDELINES

Post-MI clinical guidelines: variation in availability, development, content and implementation across the UK

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on behalf of the Follow Your Heart Steering
Committee

Follow your heart: optimal care after a heart attack – a guide for you and your patients

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Sponsor's statement

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HEART UK, the PCCS and Pfizer have come together in a novel three-way partnership – bringing together a broad mix of individual perspectives, skills and key experts – in a bid to minimise the significant variation in care and treatment of heart attack patients across the UK and promote improved and consistent patient care. Although facilitated by financial support from Pfizer, each of the organisations contributed equally through the Steering Group and enjoyed parity in decision-making.

Conflicts of interest

The Follow Your Heart partnership between HEART UK, the PCCS and Pfizer, has been financially supported by Pfizer. At the time of this research, Andrew Thomas, Ruth Bosworth and Dr Seleen Ong were employees of Pfizer, and Dr Alan Begg, Dr David Milne, Dr Jonathan Morrell, Dr Dermot Neely, Dr Michael Norton, Michaela Nuttall and Dr Malcolm Walker received honoraria for their contribution to the Follow Your Heart project, from Pfizer.

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Clinical guidelines are vital to improving patient outcomes by helping reduce practice variation, raising care standards, improving efficiency and maximising resource utilisation. To investigate the implementation/local adaptation of national guidance and approaches to post-myocardial infarction (MI) care across the UK, an assessment of the availability and implementation of local post-MI guidelines in England among primary care trusts (PCTs) and cardiac networks (CNs) was conducted. Secondly, a survey of UK GPs and nurses (n=1,003) was performed to establish awareness of guidelines and to investigate whether there are regional variations in the management of post-MI patients.

Fifteen post-MI clinical guidelines were obtained (PCTs – 8; CNs – 7) and analysed according to the following topics: lifestyle modifications, cardiac rehabilitation, therapeutic intervention, therapeutic targets and communication between primary and secondary care. Considerable regional variation in the recommendations were found – particularly with regard to therapeutic interventions and targets – with differing targets for blood pressure and cholesterol management. This was mirrored in the survey results, which also showed significant inconsistencies in clinical practice as reported by UK healthcare practitioners.

In conclusion, little consistency in the availability and content of local post-MI clinical guidelines, coupled with disparities in national guidelines, suggest the need for national post-MI guidance, built on existing evidence, endorsed by clinicians and patients, which will promote optimal care and reduce practice variation.

Introduction

Clinical guidelines are becoming an increasingly important component of clinical practice across Europe as governments, while facing spiralling healthcare costs, still have to maintain an overriding commitment to their citizens to provide best possible medical care. As systematically developed statements that incorporate research evidence and expert consensus views, clinical guidelines represent a means of assisting practitioners and patients on decisions about appropriate healthcare for specific circumstances.¹ Adherence to clinical guidelines, thus, will help to reduce practice variation, raise standards of care, improve efficiency in clinical management, standardise healthcare resource utilisation and ultimately improve health outcomes for the population.^{2,3} Clinical guidelines also serve to inform individuals and patient groups about the care that they can expect to receive with respect to certain illnesses. In our era of freely available information and increasingly sophisticated internet-based discussion, it is likely that guidelines will be used to benchmark and monitor clinical performance, at least informally.

Nowhere is the desire to improve clinical effectiveness greater than in the management of coronary heart disease (CHD). CHD is a common condition, a major cause of morbidity and mortality in the UK population and a significant burden to NHS resources, costing an estimated £3.2 billion in 2006.⁴

In a bid to understand the extent to which national guidance on CHD is being locally adapted (in the form of local post-myocardial infarction [MI] guidelines) and implemented, as well as to gauge regional variations in post-MI care, we undertook a qualitative research project that consisted of two parts. First, a survey of primary care trusts (PCTs)

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and cardiac networks (CNs) in England was undertaken to ascertain the existence and availability of current post-MI guidelines and explore any regional variations present. Second, a survey of general practitioners (GPs) and nurses was conducted, to establish the level of awareness of both national and local post-MI clinical guidance among primary healthcare professionals (HCPs) across the UK, and identify whether there are any reported variations in the management of post-MI patients. This latter phase of research included HCPs in England, Scotland, Wales and Northern Ireland, and allowed for comparisons to be made between the approach taken in England and that in the devolved nations, in addition to providing greater insight into the management of post-MI care across the whole of the UK.

Methods

Stage 1: Internet search and telephone interviews with cardiac networks in England

An internet search was carried out to gauge the availability of post-MI clinical guidelines from PCTs and CNs online. After an initial broad search using relevant terms, the top four PCTs by population in each Strategic Health Authority (SHA) region were identified and their websites searched for post-MI clinical guidelines. A similar strategy was employed for the 28 CNs in England, of which 25 had websites. Key patient group websites were also searched to identify what information is available for patients regarding their ongoing post-MI care and treatment.

After the internet search, efforts were made to contact all CNs directly. Initial contact was made via telephone or email. A call script was developed to ensure consistency in obtaining information. Key topics included:

- The existence of a post-MI clinical guideline
- How the guideline is made available to HCPs
- Whether adherence to the guideline is monitored
- The existence of information material for post-MI patients.

The guidelines identified were analysed for five main areas as pre-specified by the

Steering Committee: lifestyle modifications, cardiac rehabilitation, therapeutic intervention, clinical management targets and communication between primary and secondary care. These were deemed essential topics for inclusion in a post-MI guideline.

Stage 2: Primary care survey of GPs and nurses across the UK

In the second stage, a survey of GPs and nurses across the UK was conducted to establish the wider national picture. A total of 802 GPs and 201 practice nurses participated, with recruitment weighted to include proportional numbers of practitioners from each SHA region in England as well as Northern Ireland, Scotland and Wales. The HCPs completed an online survey of 61 questions to establish awareness of locally developed post-MI clinical guidelines and use of these versus national guidelines, as well as to identify any variation in clinical practice within the five key areas highlighted previously.

Results

Guideline research in England

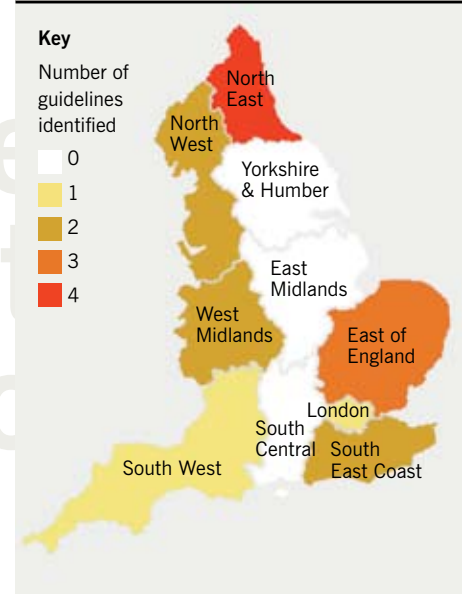
A total of 15 post-MI clinical guidelines within England were identified from the internet search and subsequent CN interviews (**figure 1**). Interviews were conducted with 18 out of the 28 CNs. Where interviews could not be conducted it was due to lack of availability of correct contact details, or inability to identify the appropriate individual to speak to.

The 15 guidelines obtained from PCTs (n=8) and CNs (n=7) were reviewed and the key findings, grouped according to the pre-specified areas of guidance and linked with results from the primary care survey, are summarised in **table 1**.

Cardiac network interviews in England

Information on dissemination and implementation of guidelines was also obtained – the 18 CNs with post-MI guidelines had a variety of distribution methods. One distributed guidance only on request from HCPs, while others sent it in hard copy or electronic format directly to each practice or individual GP in the area. Another network embedded their guidance on the computer operating systems of GPs.

Figure 1. Geographic distribution of English primary care trust and cardiac network post-myocardial infarction clinical guidelines identified, by strategic health authority (SHA) region



Only one network offered a training event to raise awareness and understanding of their guidance. CNs without specific post-MI guidance tended to promote awareness of national guidance; most commonly the National Institute for Health and Clinical Excellence (NICE) clinical guideline on secondary prevention of MI.

There was very little consistency between CNs with regards to ensuring implementation of guidance; most did not have specific programmes for implementation.

CNs were also asked about the existence of materials for post-MI patients. Only two out of the 18 CNs had developed specific patient materials, which included treatment cards and glossaries explaining medical terminology. These were distributed by the multi-disciplinary teams at tertiary centres. About half of the networks reported that they consult patients through forums or by inviting patient representatives to participate in their guideline development groups. Most CNs did not feel that it was their role to develop and distribute post-MI patient material, with over half expressing a view that the British Heart Foundation provides comprehensive patient information.

Table 1. Summary of the key findings from 15 guidelines obtained from primary care trusts (PCTs, n=8) and cardiac networks (CNs, n=7), grouped according to the pre-specified areas of guidance and linked with results from the primary care survey

Number of PCT/CN guidelines	Focus of guidelines	Primary care survey results ⁵
Lifestyle modifications		
13 out of 15 (87%)	Diet, weight management, exercise/physical activity, smoking cessation, alcohol reduction	Smoking cessation prioritised as most important intervention by 79% of respondents
Cardiac rehabilitation		
13 out of 15 (87%)	Psychological/social well-being, relaxation, exercise, return to work, social services and benefits, driving and travel, sexual activity	88% indicated that cardiac rehabilitation services were available in their area
Therapeutic interventions		
Blood pressure		
ACE inhibitors 12 out of 15 (80%)	Recommended agents include ramipril, perindopril and lisinopril – specific dose recommendations vary	High level of prescribing throughout the UK of
Beta blockers 12 out of 15 (80%)	Recommended agents include atenolol, bisoprolol, carvedilol and metoprolol – specific dose recommendations vary	<ul style="list-style-type: none"> • ACE inhibitors (92%) • Beta blockers (83%)
Calcium channel blockers and angiotensin receptor antagonists. Each included in 1 out of 15 (7%)		
Blood lipids		
Statins 13 out of 15 (87%)	Some guidelines recommend only generic statins while others recommend higher-intensity statins if cholesterol levels are not adequately controlled Simvastatin 40 mg usually recommended first-line	Simvastatin 40 mg first-line treatment of choice in statin-naïve post-MI patients (56%) Simvastatin 40 mg also therapy option of choice in ACS patients (45%)
Antiplatelets		
Aspirin and clopidogrel 12 out of 15 (80%)		High level of prescribing throughout the UK (88%)
Targets		
Blood pressure		
8 out of 15 (53%)	Targets vary – most guidelines recommend treating to 140/90 mmHg, although one recommends 150/90 mmHg (consistent with QOF ⁸)	Respondents more likely to follow JBS-2 ⁹ (130/80 mmHg – 53%) than QOF ⁸ (150/90 mmHg – 42%) However, respondents in the East Midlands (53%) and the North East (47%) more likely to follow QOF
Blood lipids		
8 out of 15 (53%)	Targets vary, but include: <ul style="list-style-type: none"> • TC <5 mmol/L and LDL <3 mmol/L or 30% reduction in these parameters, whichever is greater • TC <4 mmol/L and LDL-C <2 mmol/L 	Considerable variation in clinical practice Most commonly followed include QOF cholesterol targets ⁸ (33%) and NICE lipid modification clinical guideline recommendations ¹⁰ (33%) JBS-2 cholesterol targets ⁹ most commonly followed in the North West, whereas respondents in the East Midlands (41%) and South West (38%) more likely to follow QOF targets
Communication between primary and secondary care		
9 out of 15 (60%)	Main channel of communication assumed to be discharge summary Referral back to secondary care advised in cases of recurrent cardiovascular events or failure of risk factor control	Most commonly used discharge letters are generic (57%) – respondents in only three regions more likely to receive a tailored letter (East of England [57%], South Central [59%] and the South East Coast [63%]) Routine verbal exchange between primary and secondary care reported by only 5% of respondents

Key: ACE = angiotensin-converting enzyme; ACS = acute coronary syndrome; JBS = Joint British Societies; LDL-C = low-density lipoprotein cholesterol; MI = myocardial infarction; NICE = National Institute for Health and Clinical Excellence; QOF = Quality and Outcomes Framework; TC = total cholesterol

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UK primary care survey⁵*Development of post-MI clinical guidelines*

Results from the primary care survey suggest that local post-MI guidelines were most likely to be developed by local hospitals (49%) and PCTs (46%) with only 21% of respondents attributing the development of local guidance to CNs. Although about two-thirds of UK HCPs were aware of local post-MI guidance in their area, the results of the survey showed that NICE clinical guidance was, nevertheless, preferentially followed by the majority (60%) of HCPs in the UK; 65% in England in contrast to 78% in Wales and 44% in Northern Ireland. In Scotland, Scottish Intercollegiate Guidelines Network (SIGN) guidance was the most closely followed (55%), with only 15% of HCPs in Scotland following NICE guidance for post-MI care.

Definitions of the patient population

There was very little consensus among primary HCPs on the definition of the patient population for which the guidelines were intended.

Twenty-six per cent of respondents looked to NICE guidance for a definition of post-MI, 25% followed definitions found within the local PCT formulary, but 23% admitted to not knowing what defines a post-MI patient.

Implementation of post-MI clinical guidance

There appeared to be different methods in clinical guideline implementation in the different nations. In England, monitoring adherence to local post-MI clinical guidelines was largely undertaken by audits, which were either practice-led (49%) or PCT-led (45%). On the other hand, respondents in Scotland and Wales had softer influences on guideline adherence; 58% of Scottish HCPs were influenced by local commitments to follow local guidance and Welsh HCPs felt that agreements with secondary care (60%) were important to encourage adherence. Most of the respondents from Northern Ireland (67%) said they were generally influenced by peer pressure (please note small base size in Wales and Northern Ireland). Where applicable, 39% of UK respondents felt that local post-MI clinical guideline implementation was monitored through the achievement of Quality and Outcomes Framework (QOF) targets for the relevant indicators.

Discussion

Results from this study suggest that there is considerable variation in the availability, recommendations and implementation of post-MI clinical guidelines in the UK, both between and within regions. One important finding, which may underpin the reasons for this variation, is the lack of consistency in the organisation that develops and implements post-MI clinical guidelines. In some areas, guidelines are developed and disseminated by local hospitals, whereas in other areas, PCTs undertake this responsibility. CNs are least likely to develop local post-MI guidance with a significant number stating that this responsibility should be devolved to PCTs.

In England, CNs appear to have varying influence among nurses and GPs, who more commonly use guidance recommended by PCTs (47%) and/or their own practice (46%) compared to CN-developed guidance (24%). However, this level of influence varied across regions, with more respondents from the East of England (38%) and the North East (37%) indicating they would follow guidelines developed by CNs.

The differences in the recommendations of post-MI clinical guidance, with particular regard to therapeutic interventions and targets, may not be surprising given that there are some inconsistencies between national clinical guidelines for secondary MI prevention. For example, the cholesterol treatment targets for post-MI patients range from total cholesterol (TC) <5 mmol/L (National Service Framework [NSF] for CHD 2000,⁶ SIGN⁷ and QOF⁸) to TC <4 mmol/L and/or low-density lipoprotein cholesterol (LDL-C) <2 mmol/L (Joint British Societies [JBS-2]⁹ and NICE¹⁰). Alignment to these differing recommendations may well be a key factor resulting in the variation seen in this study. In addition, few CNs in England had the means of ensuring their guidelines were updated regularly – potentially a further reason for inconsistencies. Finally, the post-MI clinical guidance obtained from PCTs and CNs in this study suggest that there may be differences in defining the patient population for whom the guideline is intended. For example, one network specified guidance for non-ST elevation MI (NSTEMI) patients, whereas another distinguished between

acute coronary syndrome (ACS) patients and MI patients. This may be a reason for the differing opinions of UK HCPs on post-MI definitions leading to variations in clinical practice.

Interviews with CNs revealed that most did not have specific programmes for guideline implementation. This, coupled with the finding that there is substantial variation in the recommendations of both national and local post-MI clinical guidance, may explain why clinical management of such patients varied considerably. For example, the NICE lipid modification clinical guideline¹⁰ recommends the use of a higher-intensity statin (defined as a statin used in doses that produce greater cholesterol lowering than simvastatin 40 mg) without delay in patients with ACS. However, 44% of HCPs in England and 51% in Wales indicated that simvastatin 40 mg would be their first-choice therapy option in this group. It would appear that although 65% of respondents in England and 78% of respondents in Wales reported that they chose to follow NICE guidance, actual clinical practice may differ. Another key driver of clinical practice is the QOF – 28% of UK respondents indicated that this would most commonly influence treatment selection. QOF provides a monitoring framework for adherence to certain aspects of secondary prevention, incentivised by payments linked to achieving percentages of target figures. Although general practices achieve extremely high percentages in this annual audit, the targets for treatment are benchmarked at minimum audit standards and many important aspects of follow-up care are not monitored. There are concerns that this may distort the provision of care and contribute to the ongoing variation in clinical practice in this high-risk patient population.

It is important to note that this is a qualitative study and, while it has generated some very interesting conclusions, it has some limitations. The number of post-MI clinical guidelines identified may have been limited by the following factors. First, some guidelines may have been located on websites that were password protected and, therefore, not publicly available. Second, the initial research phase focused entirely on England and prioritised only the top four PCTs by

population in each SHA; relevant guidelines may well have been missed. Third, our initial assumption that most post-MI clinical guidance is developed by PCTs and CNs may have been wrong as 49% of respondents acknowledged that guidelines were developed locally by hospitals. We were not able to assess whether guidance developed by hospitals focuses solely on pathways of care in the immediate acute phase post-MI or whether it extends to guidance on continuing secondary prevention post-MI. Finally, we were unable to conduct interviews, and thereby identify any relevant clinical guidelines, with 10 out of the 28 CNs.

Conclusion

The findings from this qualitative study suggest that there is little consistency in the availability and content of local post-MI clinical guidance. This may contribute to the significant variation in clinical practice, as reported by GPs and nurses, when managing post-MI patients. The availability of national clinical guidance for this patient population does not appear to address the issue of practice variation – although the majority of respondents indicated that they follow NICE clinical guidance, this did not always translate into actual clinical practice. These findings indicate that, in some areas, patient care may not be optimal.

Ultimately, the success of a clinical guideline is measured by its ability to promote evidence-based best clinical care

and improve clinical outcomes by reducing practice variation. Guidelines should be built on existing evidence and endorsed by both clinicians and patients.

In a bid to minimise this significant variation in practice across the UK and promote improved and consistent patient care, HEART UK, the Primary Care Cardiovascular Society (PCCS) and Pfizer have come together in a novel three-way partnership to support the development of new guidance to help clinicians manage post-MI patients. Although facilitated by financial support from Pfizer, each of the three organisations contribute equally and enjoy parity in decision-making, bringing together the right mix of individual perspectives, skills and key experts in the field to collaboratively drive this project.

The guidance, which will be supported by the current evidence base, is intended to represent optimal care and treatment with both HCP and patient components recognising the crucial role of the patient and their families in the achievement of best clinical outcomes ●

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Conflict of interest

At the time of this research, SO was an employee of Pfizer. DM and JM both received funding for their contribution to the Follow Your Heart project, which is being financially supported by Pfizer.

Key messages

- Clinical guidelines are vital to improving patient outcomes by helping reduce practice variation, raising care standards, improving efficiency and maximising resource utilisation
- There is considerable variation in the availability, recommendations and implementation of post-myocardial infarction (MI) clinical guidelines in the UK
- Although healthcare professionals refer to national clinical guidelines as a key driver influencing patient care, actual clinical practice often differs
- There is a need for national post-MI guidance, built on existing evidence, endorsed by clinicians and patients, which will promote optimum care and reduce practice variation

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Follow your heart: optimal care after a heart attack – a guide for you and your patients

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clinical guidance, optimal care, patient partnership, post-myocardial infarction

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Considerable variation exists in adherence to and implementation of post-myocardial infarction (post-MI) clinical guidelines in the UK. The Follow Your Heart Steering Group has consolidated existing clinical evidence and published guidance into a consensus of succinct recommendations for optimal post-MI management, which includes separate healthcare professional and patient-focused components. This guidance should help encourage two-way dialogues between patients and healthcare professionals, reduce practice variation, raise standards of care, maximise healthcare resource utilisation and improve outcomes in post-MI patients. It is our intention to develop and widely disseminate a simple algorithm for healthcare professionals and for patients that summarises the guidance.

Introduction

Coronary heart disease (CHD) remains the leading cause of mortality in the UK with over 94,000 attributable deaths in 2006,¹ the majority of which were the result of a myocardial infarction (MI). Approximately half of those who suffer an MI die within 28 days,² however, with modern technology, procedures and new drugs, increasing numbers survive a heart attack, resulting in 1.4 million post-MI survivors in the UK.³ If patients do not receive optimal post-MI care, the individual and socio-economic burden is significant. In monetary terms this is estimated to be around £9 billion per year when both direct and indirect costs are included.⁴

Clinical guidance

Current evidence suggests that adherence to clinical guidelines may reduce practice variation and standardise healthcare resource utilisation thus raising standards of care and ultimately improving health outcomes for the population.^{5,6} The National Institute for Health and Clinical Excellence (NICE) has published several guidelines of relevance to the management of CHD, in particular, clinical guidance on the secondary prevention of MI published in 2007.⁷ The National Health Service (NHS) is expected to implement NICE guidelines, however, frequently, insufficient attention is devoted to drawing-up effective strategies for their adoption and implementation. As a consequence, implementation varies across the country depending on the healthcare infrastructure, resources available and priorities of the primary care and acute trusts.⁸

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Current practice

To understand the extent to which guidance on the clinical management of post-MI patients is made available to healthcare professionals (HCPs) and implemented, we undertook a qualitative survey involving Primary Care Trusts (PCTs) and cardiac networks in England, and HCPs (general practitioners [GPs] and nurses) across the UK. The results suggest that there is considerable variation in the awareness of recommendations, their availability and implementation, with consequent variations in the clinical management of post-MI patients as reported by HCPs.⁹ While both GPs and nurses refer to national guidelines, such as those provided by NICE, as a key driver in influencing patient care, the results from this study indicate that actual clinical practice may differ.

Rationale for new post-MI guidance

The survey provided a compelling rationale for the development of new post-MI guidance that consolidates existing clinical evidence and published guidelines, with the intention of presenting optimal patient care and treatment. To this end, HEART UK, the Primary Care Cardiovascular Society (PCCS) and Pfizer have come together in a novel three-way partnership to develop new guidance containing separate components for clinicians and patients, and uniquely recognise the importance of patients and their families in achieving best clinical outcomes.

Myocardial infarction

MI forms part of the spectrum of acute coronary syndromes (ACS), characterised by a combination of three diagnostic criteria: clinical history, electrocardiogram (ECG) changes and appropriate troponin changes.¹⁰ ACS, therefore, encompasses unstable coronary artery disease from unstable angina to transmural MI.¹¹ We believe that all patients with ACS should be offered the same preventive opportunities as MI patients.

Cardiac rehabilitation and ongoing care

The short and long-term survival of post-MI patients is dependent upon modification of risk factors that are integral for development and progression of cardiovascular disease. Patients achieving substantial improvement in risk factors improve their outlook in terms of survival and reduced re-admissions to hospital.

Cardiac rehabilitation provides the link in post-MI care between secondary and primary care, and collaboration between both parties is vital to achieve optimal outcomes. An individualised plan should be developed for each patient, and initiated prior to hospital discharge. Patients need to understand that their ongoing care lies mainly within primary care with specialist intervention as required.

Cardiac rehabilitation supports the implementation of lifestyle modification linked into locally available services. The programme should be all-encompassing to enable patients to understand, and take responsibility for their recovery and their continued health. It should introduce the concept of risk, the importance of cardiovascular risk factors, and the usefulness of agreed individualised targets. Improved adherence to an agreed management plan including the use of cardioprotective drugs to help prevent further cardiac events is the desired outcome. The MyAction programme¹² based on the results of EuroAction is a useful example.¹³

The programme should address specific areas of concern to post-MI patients and their partners, with an emphasis on new or ongoing symptoms, allaying of misconceptions and encouragement to resume a normal, but healthier lifestyle. It should address sexual dysfunction, psychological and social issues, as well as occupational factors. Patients should be screened for clinical levels of anxiety and depression so that severe problems may be identified and referred to specialist services, if required.

Both primary and secondary care should have defined pathways to monitor effective continuity of care, which ideally, should conform to auditable British Association of Cardiac Rehabilitation (BACR) standards.¹⁴

Lifestyle modification

Lifestyle changes are essential to improve cardiovascular health, particularly post-MI (table 1),^{7,15-23} and, wherever possible, all family members should be encouraged to adopt positive lifestyle changes together.

Table 1. Key points for lifestyle modification following a myocardial infarction

Eat a healthy, balanced diet¹⁵	<ul style="list-style-type: none"> • Consider a Mediterranean-style diet. Increase fresh food intake and reduce processed foods¹⁶ • Eat less fat. Reduce intake of foods high in saturated fat, e.g. fatty and processed meat, full-fat dairy products, biscuits, cakes, pastries and some convenience snack foods. Opt for unsaturated fats, e.g. sunflower and olive oil (polyunsaturated and monounsaturated fat)¹⁷ • Eat more fruit and vegetables – at least five portions of different types a day – fresh, frozen or dried¹⁸ • Choose wholegrain and high-fibre foods, e.g. wholegrain rice/pasta, wholemeal bread, oats, seeds, nuts, pulses, etc.¹⁹ • Eat oily fish, at least two portions a week to provide omega-3 (e.g. salmon, trout, mackerel),²⁰ consider 1 g Omacor per day as an alternative • Reduce salt intake, aim for <6 g a day.²¹ Beware of hidden salt content • Consider foods enriched with plant sterols or stanols, e.g. yoghurt, milk, margarine spreads²²
Limit alcohol intake⁷	<ul style="list-style-type: none"> • Drink alcohol in moderation: women ≤1–2 units/day, men ≤2–3 units/day
Increase physical activity⁷	<ul style="list-style-type: none"> • Be physically active, e.g. take the stairs, walk to shops, wash the car • Aim for at least 20–30 minutes of moderate activity each day to the point of mild breathlessness, e.g. walking, jogging, cycling, dancing or swimming
Do not smoke²³	<ul style="list-style-type: none"> • Post-MI patients should not smoke • Smokers should be offered medication for smoking cessation and referred to local stop-smoking services
Manage weight²³	<ul style="list-style-type: none"> • Balance energy intake with energy expenditure • Advice should be provided to individuals when body mass index (BMI) >25 kg/m² or those with an increased waist circumference • If overweight aim to lose around 0.5 kg/1 lb per week

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Table 2. Optimal treatment targets following a myocardial infarction

Treatment area	Optimal target
Blood pressure	<ul style="list-style-type: none"> • <130/80 mmHg²³ • <125/75 mmHg for patients with chronic kidney disease (CKD)²⁷
Cholesterol	<ul style="list-style-type: none"> • TC <4.0 mmol/L^{23,28} • HDL-C >1.0 mmol/L for males and >1.2 mmol/L for females²⁹ • Non-HDL-C <2.8 mmol/L²⁴⁻²⁶ • LDL-C <2.0 mmol/L²³ • Blood test must be fasting for LDL-C (otherwise non-fasting LDL-C calculation invalid)²³
Blood sugar	<ul style="list-style-type: none"> • HbA_{1c} <6.5%²³
Weight	BMI ²³ <ul style="list-style-type: none"> • <25 kg/m² Waist circumference ²⁹ <ul style="list-style-type: none"> • Europids <ul style="list-style-type: none"> o Male <94 cm o Female <80 cm • South Asians and Chinese <ul style="list-style-type: none"> o Male <90 cm o Female <80 cm

Key: BMI = body mass index; HbA_{1c} = glycosylated haemoglobin; HDL-C = high-density lipoprotein cholesterol; LDL-C = low-density lipoprotein cholesterol; TC = total cholesterol

- Titrate upwards at short intervals, e.g. every two weeks
- Aim for maximum tolerated or target dose of the individual drug.

Pre-testing and monitoring

Urea, creatinine and electrolytes should be measured:⁷

- Prior to initiation
- Within two weeks of initiation and at each dose increment
- Every 6–12 months thereafter (more frequently if clinically appropriate).

Antiplatelet agents

For **all** post-MI patients:

- Aspirin 75 mg daily for life.⁷

Use clopidogrel as an add-on therapy in patients with:

- Non-ST elevation MI (NSTEMI) ACS and who are moderate-to-high risk of MI or death, continue for 12 months⁷

- ST-elevation MI (STEMI), continue for at least four weeks (unless indications for continuing, e.g. percutaneous coronary intervention [PCI])⁷

- PCI with stent insertion – duration of therapy as determined at the time of PCI.³³

Consider clopidogrel monotherapy for patients with aspirin hypersensitivity.⁷

Beta blockers

For **all** post-MI patients:

- Commence beta blocker before discharge from hospital, e.g. bisoprolol⁷
- If evidence of left ventricular systolic dysfunction use beta blocker licensed for heart failure⁷
- Titrate up to target, or maximum tolerated dose⁷
- Clinical experience suggests that treatment should continue indefinitely.¹¹

Warfarin

For **particular** post-MI patients:⁷

- For patients with existing indication for anticoagulation (e.g. atrial fibrillation, mechanical heart valve, left ventricular thrombus) continue warfarin. Consider addition of aspirin if risk of bleeding is low

Goal of intervention

The goal of intervention is to achieve optimal control of all modifiable cardiovascular risk factors (table 2).²³⁻²⁹ Primary targets for lipid lowering are total cholesterol and low-density lipoprotein cholesterol (LDL-C). However, many patients are monitored with non-fasting serum samples, and non-high-density lipoprotein cholesterol (non-HDL-C, fasting or non-fasting) has been recommended as an alternative to calculated LDL-C,^{24,25} and may be a stronger predictor of cardiovascular outcomes on statin treatment (2.8 mmol/L non-HDL-C is equivalent to 2.0 mmol/L LDL-C).²⁶

Therapeutic interventions

Lipid-lowering therapy

For patients with previous MI:

- Simvastatin 40 mg daily (if patient is statin naive)²⁸
- Follow-up at three months to ensure cholesterol target met; if not switch to more potent statin, i.e. atorvastatin 40–80 mg daily or rosuvastatin 10–40 mg daily³⁰
- If target not met with maximum tolerated dose of statin, consider adding ezetimibe 10 mg daily³¹

- Simvastatin 80 mg daily is not recommended due to concerns regarding its tolerability/potential for side effects.³²

For patients presenting with acute MI or ACS:

- Higher-intensity statin therapy,²⁸ e.g. atorvastatin 80 mg is recommended.

Pre-testing and monitoring

Baseline liver function (transaminases) should be less than three times normal level.²⁸

- Prior to initiation
- Three months after initiation or titration
- Measure at 12 months (but not again unless clinically indicated).

Measure lipid profile:²³

- Three months after initiation
- Three months after any further titration
- Annually once target achieved.

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs)

For **all** post-MI patients:⁷

- Commence ACE inhibitor, e.g. ramipril, perindopril. If the patient is intolerant of ACE inhibitors use an ARB, e.g. losartan

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and International Normalised Ratio (INR) target range is 2–3

- If unable to tolerate aspirin or clopidogrel, consider moderate-intensity treatment with warfarin (target INR 2–3) for up to four years
- Where combination therapy (warfarin and an antiplatelet agent) is being considered, an individualised risk/benefit analysis is warranted.

Aldosterone antagonists

For **particular** post-MI patients with clinical evidence of heart failure:⁷

- For patients with significant clinical symptoms and/or signs of heart failure and significant evidence of left ventricular systolic dysfunction, consider treatment with an aldosterone antagonist licensed for post-MI treatment. Initiate 3–14 days post-MI and preferably after introduction of ACE inhibitor
- If spironolactone is already prescribed at low dose for pre-existing heart failure, continue, or replace with eplerenone in patients intolerant to spironolactone.

Pre-testing and monitoring

Urea, creatinine and electrolytes should be measured.⁷

- Prior to initiation
- One week after initiation
- Two weeks after initiation
- Monthly thereafter for three months and subsequently at three-to-six monthly intervals
- If hyperkalaemia becomes a problem, the dose should be halved or the drug stopped.

Note: It is each clinician’s responsibility to check for contraindications to the introduction or titration and potential interactions of medication (and consult the *British National Formulary* and appropriate *Summaries of Product Characteristics (SPCs)*) before prescribing.

Integrated communication

Good communication between secondary and primary care, community services and the patient is essential.⁷

The hospital discharge summary post-MI is vitally important to:³⁴

- Confirm diagnosis
- Provide results of investigations performed and future investigations required
- Document any in-hospital complications and resulting interventions
- Provide details of medication prescribed with guidance on up-titration
- Provide recommendations on testing the patient’s relatives
- Include the patient’s agreed care plan.

All patients should receive an individualised management plan which:

- Is culturally sensitive
- Contains evidence-based information
- Includes input from the patient and carers/family
- Provides recommendations on daily living (e.g. driving, returning to work, etc.)³⁵
- Documents what to expect of primary care services.

The patient should receive a printed copy of the discharge summary when leaving hospital with a date for a follow-up appointment.

The community team and the patient should be notified of the outcome of follow-up attendances in specialist care.

Discussion

The Follow Your Heart Steering Group, a multi-disciplinary group comprising of clinical practitioners from primary and secondary care, representatives from HEART UK, PCCS and Pfizer and a patient representative, identified a need for new post-MI guidance, which consolidated existing clinical evidence and published guidelines. We have developed succinct guidance, with components for healthcare practitioners and for patients and their carers, for the optimal management of the post-MI patient following discharge from hospital. We have used an approach that not only informs HCPs, providing them with clear clinical guidance to ensure increased uptake of preventive therapies and comprehensive patient monitoring, but also informs the patient of what they should expect. This should provide patients with a greater understanding of their condition and encourage an active role in their ongoing management with increased

personal responsibility for their future health and wellbeing.

Following hospital discharge, the post-MI patient journey should continue across organisational boundaries with effective communication between all agencies as outlined. Timely referral from hospital through all phases of cardiac rehabilitation, to ongoing structured care and follow-up within general practice will be encouraged. This guidance will help inform the development of locally agreed protocols and encourage long-term lifestyle and exercise programmes. The patient and carer experience of that journey will be improved with pro-active involvement in individual care plans ensuring that each experience will be part of a process to improve clinical outcomes.

Conclusion

In clinical practice, many post-MI patients receive sub-optimal care following discharge from hospital. We have sought to address this by consolidating the available evidence and guidance into an easily digestible format, with components for HCPs and patients. The guidance highlights the key aspects for optimal patient management, which,

Key messages

- The Follow Your Heart Steering Group has identified a need for simple, consistent, evidence-based post-myocardial infarction (post-MI) guidance tailored to primary care practitioners and their patients
- We have consolidated existing clinical evidence and published guidance into a consensus of recommendations for optimal care, which include separate healthcare professional and patient-focused components
- This guidance should help encourage two-way dialogues between patients and healthcare professionals, reduce practice variation, raise standards of care, maximise healthcare resource utilisation and improve outcomes in post-MI patients

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we anticipate, will lead to improvements in the care and quality of life of the post-MI survivor. It is the intention of the Steering Group to develop and widely disseminate a simple algorithm for HCPs and patients that summarises the guidance ●

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through the Steering Group and enjoyed parity in decision-making.

Conflict of interest

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