



**British Cardiovascular Society
Working Group Report:**

**Out-Of-Hours Cardiovascular Care:
Management of Cardiac Emergencies and
Hospital In-Patients**

September 2016

Preface

The provision of NHS services across 7 days per week is a government priority and both from a patient and from a medical perspective this makes sense. Patients should be able to access high quality services whatever time of day or night, or whatever day of the week they present to the healthcare system. As Sir Bruce Keogh, Medical Director of NHS England, stated: 'How quickly you have your scan and your tests, or start your treatment, should not depend on how sick you are or when you turn up'.

But cardiologists are aware of significant variation between hospitals in the delivery of care to patients with heart disease, particularly at night-time and over weekends ('out-of-hours'). Of course, some variation in the services provided by hospitals is appropriate as specialist heart services cannot be provided by all hospitals. On the other hand, all patients should have equitable access to appropriate care at all times.

Delivery of 'out-of-hours' cardiovascular care is of particular concern. Patients who require emergency treatment for heart disease should have immediate access to appropriate and timely investigation and treatment at any time of day or night. For many inpatients, however, the treatment pathway pauses overnight or at weekends as tests and senior medical staff may not be readily available. This variation in care can influence service quality and can delay discharge of patients from hospital with a knock-on effect for service delivery at other times during the week.

The British Cardiovascular Society commissioned a working group to gain some insight into the provision of 'out-of-hours' cardiovascular care across the United Kingdom. The working group report sets standards for the delivery of 'out-of-hours' cardiovascular services and makes recommendations to ensure equitable access to prompt, safe, effective and high quality care at all times.

I extend my thanks to the working group for delivering a comprehensive and timely report. The report presents challenges to cardiologists, other hospital healthcare professionals, hospital management teams, ambulance services and commissioners at a time when there are staff shortages and significant financial pressures on the NHS. Implementation of the recommendations will require collaboration between clinicians and between hospitals and it is likely there will be resource implications as well. But as cardiologists, we have a duty to deliver the best possible care to our patients and it is therefore important we address the issues raised by the report.



Dr Sarah Clarke
Consultant Cardiologist
President of the British Cardiovascular Society

September 2016

Lay Summary

Care of people with heart disease outside of normal working hours varies widely across NHS hospitals in the United Kingdom. In some hospitals there is only limited out-of-hours access to heart specialists and the current drive for '7-day services' has major implications for the delivery of heart disease services.

The British Cardiovascular Society commissioned a Working Group to examine out-of-hours care of adults admitted to hospital with heart disease, and to make recommendations about future practice. Surveys carried out by the Working Group suggest that limited capacity at weekends and over bank holidays may delay investigation and treatment, and prolong hospital stay, particularly for people with heart rhythm disturbances and heart attacks.

The Working Group proposed standards for provision of high quality emergency and out-of-hours care of people with heart disease. The standards emphasize the importance of:

- Access to the opinion of a heart specialist;
- Access to appropriate investigations;
- Pathways of care that are agreed between hospitals and across regions.

The Working Group made recommendations that have the potential to improve clinical outcomes and/or shorten hospital stay for people with heart disease. Implementation of these recommendations will take time, collaboration across regions and additional resources.



Background

The British Cardiovascular Society (BCS) is aware that provision of cardiovascular care outside of normal working hours (defined as week days 18:00-08:00 and weekends) varies widely across NHS hospitals. In some hospitals providing acute medical services, out-of-hours cardiovascular care is delivered by an acute physician, supported by a regional cardiology service. In other hospitals (typically larger district general hospitals and tertiary centres) consultant cardiologists operate on-call rotas. However, the roles and responsibilities of on-call cardiologists are often ill-defined and in some hospitals providing acute medical care there is only limited or no out-of-hours access to a consultant cardiologist.

The consequences of limited or poor out-of-hours cardiovascular care may be serious. For example, a recent Coroner's investigation recorded an avoidable death from complete heart block, where no one on duty at the admitting hospital was able to insert a temporary pacing wire, even though the hospital reportedly employed 5 consultant cardiologists. Limited (emergency only) facilities at weekends and bank holidays may also delay the investigation and treatment of some in-patients, prolong hospital stay, and increase pressure on beds.

The 2015 BCS workforce survey reported that there were 1389 consultant cardiologists in the United Kingdom, of which 13% contributed to general medical on-call and 54% contributed to cardiology on-call rotas. ¹ These numbers imply that around one third of the consultant cardiologist workforce does not currently contribute to an on-call rota of any sort. Similar data were reported by the Federation of the Royal Colleges of Physicians (RCP) of the United Kingdom in their 2014-15 census of consultant physicians, although the return rate was only 56.6%. ²

The BCS is aware that the job descriptions for some new consultant cardiologist posts do not include any out-of-hours responsibility or specify a cardiology 'advice-only on-call rota'. These posts have no requirement for the consultant cardiologist to attend, examine and treat patients in person.

The current drive for the provision of a '7-day service' within the NHS has major implications for the cardiology workforce and for the provision of out-of-hours cardiovascular care.

In response to these challenges, in September 2015 the BCS Executive commissioned a Working Group to examine the contribution of consultant cardiologists to the out-of-hours care of adults admitted to hospital with cardiovascular disease, and to make recommendations about future practice.

Terms of Reference

The agreed objectives of the Working Group were:

1. To develop intelligence about current models of out-of-hours care for adult patients in hospital with cardiovascular disease in the United Kingdom.
2. To assess variation in the involvement of consultant cardiologists in the care of adult patients with cardiovascular disease outside of normal working hours.
3. To identify examples of best practice in the delivery of cardiovascular care by consultant cardiologists outside of normal working hours.
4. To make recommendations on standards for the delivery of hospital care to patients with cardiovascular disease outside of normal working hours.
5. To present these recommendations to the BCS Executive within 1 year.

Out-of-hours care for children with heart disease was outside the remit of the Working Group.

The Working Group recognized the importance of distinguishing between the demands of providing emergency out-of-hours care (24/7 care) and the drive to extend the ordinary working day and/or enhance weekend services (7/7 care).

The Working Group did not have the appropriate expertise or time to fully evaluate the contribution of other staff groups (such as nurses and cardiac physiologists) to out-of-hours cardiovascular care. A recent review of cardiac physiology services in England identified the lack of a trained cardiac physiology workforce as a major barrier to the provision of comprehensive 24/7 and 7/7 cardiology services.³

Membership of the Working Group

The first meeting of the Working Group took place at the BCS offices on 9 September 2015.

The membership of the Working Group, the dates of its meetings, and the names and details of those who contributed to the project are listed in Appendix A.



Surveys

The Working Group set up two surveys with the aim of identifying significant variations and potential shortcomings in the delivery of out-of-hours care across the United Kingdom.

Trainees Survey

An online survey was circulated to all 850 members of the British Junior Cardiovascular Society (BJCA) who are on a formal cardiology training programme. 129 responses were received, representing a response rate of just over 15%. There was a relatively even spread of experience among the responders. The key findings were:

- 97% of the trainees participated in a cardiology and/or general medical on-call rota
- 38% reported that new cardiology admissions and referrals were not routinely seen by a consultant cardiologist within 24 hours at weekends or bank holidays
- 71% stated that cardiology inpatients were not routinely reviewed at weekends and bank holidays by a consultant cardiologist
- 29% of trainees participated in some elective (non-emergency) cardiology activity during weekends and on bank holidays
- Trainees generally felt well supported and reported that it was relatively easy to contact a consultant out-of-hours
- Trainees reported little or no problem with lack of equipment or facilities but did report problems with 'lack of personnel' for some out-of-hours procedures:
 - 73% said that their place of work had no personnel available for out-of-hours transoesophageal echocardiography (TOE)
 - 48% said that their place of work had no personnel available for out-of-hours permanent pacing
 - 40% said that their place of work had no personnel available for out-of-hours interrogation of implantable electronic devices
- Trainees were asked to rate the quality of out-of-hours cardiovascular care at their Trust on a scale of 1 to 7 and most rated it highly (average 6.1 for management of emergencies and 5.8 for in-patient care)
- Trainees were asked to make one recommendation that they felt would improve out-of-hours care at their Trust. The most frequent suggestions in descending order were:
 - Improved pacing and arrhythmia services
 - More junior staff/registrar (including taking registrars out of general internal medicine on-call)
 - Provision of out-of-hours cardiac physiology services for echocardiography and the management of implantable electronic cardiac devices
 - Extra/weekend lists for angiography and permanent pacing
 - Increased consultant input/presence

Regional Specialty Advisors

The Regional Specialty Advisors (RSAs) are consultant cardiologists who represent the BCS and RCP at a regional level. All 32 of the RSAs currently in post were contacted to contribute to this survey. Currently there are 7 vacant RSA positions notably including all of Scotland and Northern Ireland. RSAs were asked to complete a short on-line survey, which collected some basic data about the hospitals and staffing in their region. Details of these findings are available from the BCS (enquiries@bcs.com). Between January 15th and March 7th 2016, structured telephone interviews were conducted with 24 (75%) RSAs, who responded to the invitation to take part in the survey. The key findings were:

- All but one of the RSAs reported that there was a comprehensive regional service for 24/7 delivery of primary percutaneous coronary intervention (PPCI) for treatment of ST-segment elevation myocardial infarction (STEMI).
 - There were significant concerns about the sustainability of PPCI rotas with current levels of staffing
 - Wide variation was reported in the provision and payment for rest periods following on-call duties
 - There was variation in the activation process for the PPCI team, with some networks reporting a high frequency of inappropriate call-outs.
- Cardiologist cover out-of-hours
 - At many larger PPCI centres a second cardiologist provided cover for general cardiology.
 - Very few centres had additional sub-specialist on-call rotas for electrophysiology, pacing or imaging.
 - Some arrangements for sub-specialist opinions (e.g. expert electrophysiology advice) were 'informal'.
 - Some hospitals provided no consultant cardiologist cover at weekends.
 - Loss of cardiac networks was considered to be a significant factor in fragmenting clinical services and reducing opportunities for optimal resource utilisation.
- Lack of middle-grade (specialist registrar or Trust doctor employed at registrar grade) medical cover and physiologist support were seen as major barriers to the provision of 7/7 services including elective and urgent catheter laboratory based procedures (e.g. investigation of non-ST segment elevation myocardial infarction [NSTEMI], electrophysiology, pacemaker and device implantation) and echocardiography.
- Recruitment of consultant cardiologists and other allied healthcare professionals in cardiovascular medicine is challenging in many hospitals, especially in smaller DGHs without PPCI.
- All RSAs confirmed that there were delays in delivering patient care over the weekend period. RSAs were asked to grade the severity of treatment delays from 1 (not at all) to 10 (severe) for 3 patient sub-sets. There was a wide spread of scores but mean scores were:

Permanent Pacing	7.0
NSTEMI	5.8
General Cardiology	5.4

Delays in delivering patient care over the weekend were of particular concern in hospitals without a cardiologist on-call at weekends.



- Echocardiography provision out-of-hours
 - This is delivered by middle grade medical staff in most large cardiology centres.
 - Only a few centres have a trained physiologist on call for echocardiography.
 - Smaller hospitals had less robust arrangements and occasionally would need to transfer a patient for urgent echocardiography to another hospital with out-of-hours service provision.

- Temporary pacing provision out-of-hours
 - Many smaller hospitals do not offer an out-of-hours temporary pacing service, often because clinicians with the necessary skills to insert a pacing wire are not available and/or because it is thought that evidence favours rapid transfer for permanent pacemaker implantation.
 - Robust arrangements for temporary pacing are generally only in place in larger centres that also provide 24/7 PPCI.

Current Limitations

The Working Group concluded that the quality of out-of-hours care is currently limited by factors that fall into two categories:

1. Capacity

Staff. Many of those who took part in the surveys reported that out-of-hours cardiovascular care was compromised by workforce shortages. Robust and sustainable on-call consultant cardiology rotas cannot be delivered in areas where it has proved difficult to recruit and retain consultant cardiologists. Equally, many smaller institutions have insufficient medical staff to deliver sustainable middle grade cardiology rotas.

Whilst there is wide variation in the provision of cardiovascular care between countries across Europe, it is notable that the number of cardiologists per capita is lower in the United Kingdom than many comparable countries.⁴ The BCS workforce survey 2015 estimated that there are 1389 consultant cardiologists and 58 vacant posts in the United Kingdom for a population of 64.1 million, or 22 cardiologists per million population.¹

Moreover, there is a national shortage of cardiac physiologists, and our surveys identified this as a major barrier to improving out-of-hours services at weekends. In 2015 BCS and the Society for Cardiological Science and Technology (SCST) published a Strategic Review of Physiology Services in England, which concluded that the current cardiac physiology workforce is inadequate to meet demand, with marked variations in access to cardiac physiology services, and that urgent action is required to address the shortfall. The review also recommended that the provision of cardiac physiology services should be extended over 7 days, but that this would require an expansion of the cardiac physiology workforce.³ The Working Group believes that the devolved nations face similar challenges.

Beds. The investigation and treatment of patients who need to be transferred to a cardiac centre is often delayed by a lack of beds in the receiving unit. This is a particular problem at weekends when throughput slows because beds are occupied by patients awaiting services that are only available on weekdays.

2. Organisation

The effective delivery of cardiovascular services is limited by a variety of organizational blocks including the absence of clear management pathways, robust arrangements for rapid inter-hospital transfer, allocation of dedicated beds, and network wide planning.

The PPCI program, facilitated by the now disbanded cardiovascular networks, has been an outstanding success because it has overcome these problems and therefore provides a good model for organizing other elements of the out-of-hours cardiac service (e.g. management of complex arrhythmia/bradycardias).

Nevertheless, the PPCI program has proved very demanding and is placing great pressure on some elements of the workforce. Moreover, concentrating services and resources in primary PCI centres risks diminishing services and deskilling the medical and non-medical staff in other hospitals.



Several studies have reported that patients admitted to hospital at weekends are sicker and at higher risk of mortality than patients admitted during the working week. Adjustment for potential confounding variables does not fully account for the excess weekend mortality.⁵ Nevertheless, it is unclear whether any such differences in mortality can be attributed to differences in quality of care or to residual confounding. We are unaware of any United Kingdom data describing a weekend effect in cardiovascular care.

The impact of these problems is difficult to quantify but there are unquestionably unwanted delays in delivering urgent cardiovascular care. The British Cardiovascular Intervention Society (BCIS) national audit reports that fewer than 50% of patients who undergo percutaneous coronary intervention (PCI) after admission with an NSTEMI are currently treated within 72 hours (the NICE Quality Standard).⁶ Moreover delays are consistently longer for patients who require inter-hospital transfer.⁷

The Working Group is aware of a number of initiatives to reduce these delays. For example, in one study, a novel care pathway facilitating rapid inter-hospital transfer of patients with suspected NSTEMI was associated with a reduction in the median length of hospital stay from 9 to 3 days.⁸

Similarly, the introduction of a fast track pathway for referral of high risk NSTEMI patients (GRACE score >140) to the Golden Jubilee National Hospital, Glasgow is thought to be saving the region 175 bed days a month; it has been estimated that the introduction of a 24 hour service would save an additional 242 bed days a month.⁹



The Keogh Review of Urgent and Emergency Care

A major multi-faceted review of urgent and emergency NHS care in England is underway.

Three elements of this are particularly relevant to this report:

1. Urgent and Emergency Care Networks¹⁰

23 Urgent and Emergency Care Networks have been established across England and are about to undertake a stocktake of all their sites and services before determining how to configure critical care pathways. The new networks, together with their commissioners and providers, are required to compose 'Sustainability and Transformation Plans (STPs)' that will describe how patients will access specialist services, irrespective of how they enter the urgent care system in the NHS. The STPs are intended to recognise the value of hospitals collectively working within specialist networks, with agreed referral pathways and standards for care, information sharing, decision support systems, and formal ambulance protocols.

The British Cardiovascular Society has been invited to participate in this work and the Working Group has drawn up recommendations with this in mind.

2. Ambulance Services¹¹

Proposals for ambulance services suggest that transport to hospital A&E Departments by ambulance will no longer be the default option. The proposals set out plans to reconfigure and fully integrate ambulance services into one or more Urgent and Emergency Care Networks, with a single triage system, consistent response protocols, and universal referral rights.

3. Seven Day Services¹²

As part of the implementation of seven day services, hospital Trusts are expected to meet 10 clinical standards drawn up by the national medical director, Sir Bruce Keogh.

Trusts are expected to meet four priority standards by the end of this financial year:

- Time to first consultant review: all emergency admissions must be seen and have a thorough clinical assessment by a suitable consultant within 14 hours of arrival at hospital.
- Access to diagnostics: hospital inpatients must have scheduled seven day access to diagnostic services, with targets for consultant-directed diagnostic tests and completed reporting.
- Access to consultant-directed interventions: 24 hour access for inpatients to consultant-directed interventions, either on-site or through formal network arrangements.
- On-going review: twice daily consultant ward rounds in critical-care areas; once daily consultant review for general ward patients, seven days a week, unless it has been determined that this would not affect the patient's care pathway.

The Working Group took all these developments into consideration when developing its recommendations.



RECOMMENDATIONS

The Working Group makes the following recommendations in the belief that they have the potential to improve clinical outcomes and/or shorten patient hospital stay.

Implementation will take time, collaboration across regions and between hospitals, and will require additional resources.

Proposed Standards

The Working Group recommends that the British Cardiovascular Society promotes the following standards for provision of high quality emergency and out-of-hours cardiovascular care:

24/7 Standards

1. All hospitals with an acute unselected medical take should have immediate access to a consultant cardiology opinion. The designated consultant should be available to attend the patient personally. If this is not possible (for example in small hospitals without a cardiology on-call rota), telephone advice may be acceptable provided that arrangements for immediate transfer to a more specialised unit are in place.
2. All hospitals with an acute unselected medical take should have 24/7 on-site availability of ECG and echocardiography.
3. All networks (or regions) should have clear pathways for 24/7 provision of:
 - a) Reperfusion therapy for patients with STEMI
 - b) Care of patients with NSTEMI
 - c) Emergency (temporary and permanent) pacing
 - d) Management of complex arrhythmias including ventricular tachycardia
 - e) Interrogation and reprogramming of implantable electronic cardiac devices
 - f) Infective endocarditis.

7/7 Standards

1. Any diagnostic or therapeutic procedure (e.g. angiography/PCI for NSTEMI, implantation of electronic cardiac devices) that needs to be done before a patient can be discharged from hospital, should be provided on a 7 day basis.
2. All hospital in-patients with a primary diagnosis of cardiovascular disease should be reviewed by a consultant at least once a day, unless it has been determined that this would not affect the patient's care pathway.



Consultant Cardiologists

Cardiovascular disease accounts for approximately 30% of all acute medical admissions in the UK. Many of these patients require urgent specialist investigation such as echocardiography or coronary angiography and there is good evidence to show that in many situations outcomes are better when the patient is managed by a consultant cardiologist. There is great demand for out-of-hours consultant cardiology time but the UK has fewer consultant cardiologists per head of population than most European countries.⁴ It is therefore important to ensure that all patients have equitable access to consultant cardiology expertise and that the out-of-hours workload is shared across the consultant cardiology workforce.

Recommendations

All consultant cardiologists should be expected to contribute to both the planning and delivery of out-of-hours care of patients with cardiovascular disease.

The contribution of individual consultants will depend on their sub-specialty skills.

Consultant cardiologists who do not provide out-of-hours services to their base hospital should be expected to contribute to regional or network-wide on-call rotas.

Job plans must fully recognise out-of-hours work, provide sufficient recovery time after any on-call session, and support sustainable careers.

Telephone advice only rotas are inadequate unless they are supported by care pathways that can provide rapid transfer and face to face specialist cardiology input if necessary.

The practice of advertising 'no on-call' jobs to help fill unpopular/vacant posts is counterproductive and should be discouraged.

Network Wide and Regional Services

The skilled application of a wide range of specialist investigations, treatments and procedures can improve the outcome of many acute cardiovascular illnesses. Many cardiologists have developed sub-specialty interests such as the management of complex arrhythmias, coronary intervention, imaging, congenital and inherited cardiac disease, and heart failure. Although very few consultant cardiologists have the necessary expertise to provide definitive care for every possible inpatient episode, all cardiologists must be capable of the initial management of all acute and emergency presentations of cardiovascular disease. Thereafter, out-of-hours care arrangements within individual hospitals and across regions must provide equitable access to all sub-specialty skills. The Working Group believes this can only be achieved by detailed planning at network or regional level.

The creation of new Urgent and Emergency Care Networks in England offers an opportunity to redesign and improve out-of-hours cardiology services through local Sustainability and Transformation Plans (STPs) and may be relevant to the devolved nations.

Recommendations

Out-of-hours cardiovascular care should be planned at network or regional level.

All hospitals receiving acute medical admissions should be involved in the design of local



out-of-hours care pathways for patients with acute cardiovascular disease.

Established pre-hospital triage systems (for example those used to support the PPCI service) should be used to direct patients with acute cardiac problems to the most appropriate service.

The Ambulance Service

Some cardiovascular conditions that require urgent or emergency specialist attention can be competently identified by ambulance crews (e.g. STEMI, complete heart block, ventricular tachycardia and other tachyarrhythmias) who can then ensure that the patient is taken directly to the most appropriate hospital. Patients with other conditions such as acute heart failure, infective endocarditis, and NSTEMI are not always easy to triage and will generally require assessment at a local hospital before determining whether they require admission to a specialist unit. Moreover, existing hospital in-patients may develop unexpected cardiovascular complications that mandate transfer for urgent specialist cardiac care (e.g. post-operative myocardial infarction or arrhythmia).

Although the outcome of treatment may be time dependent, in many situations ambulance service response time targets for inter-hospital transfer are not equivalent to community based call targets because the patient is deemed to be in a “place of safety”. In some circumstances this can introduce potentially life threatening delays and the Working Group believes that there are instances where the ambulance services should give patients with acute cardiovascular conditions who are already in a healthcare facility the same priority as those who present in the community.

Recommendation

National service standards should be agreed to ensure that appropriate priority is given to patients who require transport between hospitals for specialist cardiovascular investigation, intervention or treatment.

Support Services

High quality cardiovascular care requires support services including those provided by specialist nurses, cardiac physiologists, imaging services (particularly CT and MRI), and haematology and biochemistry services.

Consultant cardiologists cannot deliver optimal care without the necessary infrastructure and support services. Effective weekend working will only be possible if these services are available.

Recommendations

Out-of-hours cardiovascular services should only be extended if and when appropriate support services are in place.

In the first instance priority should be given to increasing availability of out-of-hours echocardiography, implantable electronic device management and support for catheter laboratory procedures.



Cardiac Catheterisation

Most cardiac catheterisation laboratories in the UK operate on an 'emergency only' basis at night and weekends. In-patients who are listed for non-emergency procedures at the weekend may therefore have to wait several days before they can undergo a catheter laboratory procedure. In some circumstances this may expose the patient to additional risks and in the majority of cases it will delay discharge. Seven day working would even out the workload, shorten average length of stay and make it easier for services to meet the NICE Quality Standards for the management of acute coronary syndromes.⁶

The British Cardiovascular Intervention Society has prepared a 'Position Statement for Facilities and Emergency Medical Staffing' for the provision of primary angioplasty for STEMI.¹³

Recommendation

Individual networks should ensure that patients with ACS have access to cardiac catheterisation facilities in compliance with NICE Quality Standards (QS68).⁶ In many circumstances this may require provision of additional catheter laboratory capacity, including weekend lists.

Bradycardia/Arrhythmia Services

The surveys undertaken by the Working Group highlighted many perceived deficiencies in the management of patients with complex arrhythmias and in patients who require emergency cardiac pacing. Indeed, this was clearly identified as the weakest service and the one most in need of change.

NHS England was already aware of problems in this area and this has prompted the British Heart Rhythm Society (BHRS) to produce a position statement (see Appendix B).

The Working Group endorses the BHRS statement and agrees that the NHS should provide nationwide access to early permanent pacing. Temporary transvenous pacing can then be restricted to those with bradycardia who are haemodynamically unstable at rest, or who have bradycardia related ventricular arrhythmias.

Recommendations

All providers and networks should implement the recommendations of the BHRS position statement, dated January 2016:

Patients presenting to the ambulance service with arrhythmia emergencies, such as complete heart block, should be directed to a hospital where such patients can be safely and appropriately managed. Such hospitals must have the facilities and staff to insert temporary pacing wires on a 24/7 basis and to offer permanent pacemaker implantation within 24 hours, if indicated.

Patients presenting to emergency departments with arrhythmia emergencies should be stabilized and directed to appropriate specialist care. If transfer to another hospital is necessary this request should be considered an immediate, time critical, life-saving intervention.



Patients who develop a serious arrhythmia such as symptomatic complete heart block, while in hospital for another reason, must be treated as a medical emergency and need to be assessed and managed by appropriate specialist physicians. If this service is not available in that hospital, then transfer to another hospital is necessary and this should be considered an immediate, time critical, lifesaving intervention.

NHS England (and its counterparts in Scotland, Wales and Northern Ireland) should work, through its regional teams, with the ambulance service to ensure that all hospitals that provide emergency care have an arrhythmia emergency plan that provides emergency treatment in house or immediate transfer to a designated specialist centre.

Echocardiography

Echocardiography delivered out-of-hours is a vital component of safe and effective cardiovascular care and must be of sufficient quality to diagnose common cardiac emergencies and accurately guide treatment. Most echocardiography is provided out-of-hours by cardiology registrars, many of whom have not undertaken or completed formal training in echocardiography and are not certified as competent. There is a national shortage of cardiac physiologists and the provision of robust echocardiography services out-of-hours is therefore challenging.

The trainees' survey described above confirmed that a significant proportion of trainees are required to undertake echocardiography when not fully trained. Many trainees also suggested that establishing an out-of-hours cardiac physiology service would greatly improve out-of-hours care.

Good echocardiography facilities are essential for the management of patients with heart failure and the Working Group recognises that significant investment will be required to meet current NICE standards. These specify, inter alia, that patients with new suspected heart failure should undergo transthoracic Doppler 2D echocardiography within 48 hours of presentation, using high-resolution equipment, operated by experienced operators trained to the relevant professional standards.^{14,15}

New models of service provision are being implemented and evaluated across the UK. These may help to identify innovative good practice and facilitate the introduction of an effective 7/7 service.

Recommendations

Emergency echocardiography should ideally be provided by a cardiac physiologist or clinician who has British Society of Echocardiography (BSE) accreditation or equivalent and who demonstrates their continuing competence through specific revalidation in echocardiography.

Where this is not currently deliverable, echocardiography should be provided by staff trained in a recognised and appropriate point of care certification scheme run in co-ordination with an accredited echocardiography department and with clear processes to deliver an appropriate diagnostic level scan within 24 hours.

The BCS and RCP working with the BSE and the College for Acute Medicine should rapidly agree (or develop) standards for point of care cardiac ultrasound in the acute medical or cardiovascular setting that provide safe and appropriate goal directed cardiac ultrasound.



Other solutions (such as remote expert review by an accredited individual) may be acceptable if they meet the equivalent standards.

Extension of routine echocardiography services to include weekends (7/7 services for full diagnosis) should be provided to the same standard (i.e. by accredited staff) as current weekday services.

The staffing crisis in cardiac physiology, and especially in echocardiography should be addressed at national level.

References

1. BCS workforce survey 2015. https://www.bcs.com/pages/news_full.asp?NewsID=19792455
2. Federation of the Royal Colleges of Physicians of the UK. Census of consultant physicians and higher specialty trainees in the UK, 2014-15: data and commentary. London: Royal College of Physicians, 2016. <https://www.rcplondon.ac.uk/projects/outputs/2014-15-census-uk-consultants-and-higher-specialty-trainees>.
3. Strategic review of cardiac physiology services in England: final report (2015). Society for Cardiological Science and Technology; British Cardiovascular Society. Available at https://www.bcs.com/pages/news_full.asp?NewsID=19792384 and http://www.scst.org.uk/resources/SRCPS_Final_Report_12_05_2015.pdf.
4. Block P, Weber H, Kearney P. Manpower in cardiology II in western and central Europe (1999-2000). *Eur Heart J* 2003; 24:299-310.
5. Freemantle N, Ray D, McNulty D, Rosser D, Bennett S, Keogh BE et al. Increased mortality associated with weekend hospital admission: a case for expanded seven day services? *BMJ* 2015; 351:h4596.
6. Acute coronary syndromes in adults. NICE quality standard [QS68]. <https://www.nice.org.uk/guidance/qs68>.
7. BCIS audit 2014. http://www.bcis.org.uk/pages/page_box_contents.asp?PageID=824.
8. Gallagher SM, Lovell MJ, Jones DA, Ferguson E, Ahktar A, Buckhoree Z et al. Does a 'direct transfer protocol reduce time to coronary angiography for patients with non-ST-elevation acute coronary syndromes? A prospective observational study. *BMJ Open* 2014; 4: e005525
9. Personal communication: Dr Mitchell Lindsay, Operational and Strategic Lead, Golden Jubilee National Hospital, Glasgow.
10. Role and Establishment of Urgent and Emergency Care Networks. NHS England. <http://www.nhs.uk/NHSEngland/keogh-review/Documents/Role-Networks-advice-RDs%201.1FV.pdf>.
11. Clinical models for ambulance services. Transforming urgent and emergency care services in England. Urgent and Emergency Care Review. <http://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR-ambulance-guidance-FV.PDF>.
12. NHS Services, Seven Days a Week. NHS Paper 121315. <https://www.england.nhs.uk/wpcontent/uploads/2013/12/brd-dec-13.pdf>.
13. McCarthy PA, Blackman DJ, Hildick Smith D, Banning AP on behalf of the British Cardiovascular Intervention Society. Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction. Position statement for Facilities and Emergency Medical Staffing May 2016.
14. Acute heart failure: diagnosis and management in adults. NICE quality standard [QS103] Published date: December 2015 <https://www.nice.org.uk/guidance/qs103>.
15. Chronic heart failure in adults: management. NICE guidelines [CG108] Published date: August 2010. <https://www.nice.org.uk/Guidance/CG108>.



APPENDIX A

Membership

Core Membership

Nicholas Boon (Chair, Past President BCS)
Robert Henderson (Deputy Chair, BCS Honorary Secretary)
Anita Donley / Andrew Goddard (jointly representing Royal College of Physicians)
Iain Findlay (Scotland Representative)
Kevin Fox (BCS VP Clinical Standards)
Alan Keys (CCP (UK) President/Patient Representative)
Nick Linker (British Heart Rhythm Society)
Guy Lloyd (British Society of Echocardiography)
Jim McLenachan (Tertiary Centre Representative)
Nik Patel (District General Hospital)
Keith Pearce (Consultant Cardiac Physiologist)
Afzal Sohaib (BJCA President/Trainees Rep)

Ex Officio Members and Advisors

Sarah Clarke (BCS President)
Huon Gray (National Clinical Director for Heart Disease, NHS England)
Ian Haig (Director of Operations, St Bartholomew's Hospital, London)
Beccy Holmberg (Business Consultant)
Steve Holmberg (Medical Director, Brighton & Sussex University Hospitals NHS Trust)
Charles Knight (Managing Director, St Bartholomew's Hospital, London)
Jubin Joseph (deputy for Afzal Sohaib)
Phil McCarthy (British Cardiovascular Intervention Society)
Neil Smith (former BCS Head of Membership and Communications)
Steven Yeats (former BCS Chief Executive Officer)

Formal Meetings

9 September 2015
23 October 2015
10 December 2015
29 January 2016
10 March 2016

Minutes available on request



Appendix B

Position Statement on the out-of-hours Management of Bradyarrhythmia Emergencies

Nick Linker and Mark Earley on behalf of BHRS Council, January 2016

Introduction

In cardiac rhythm management there is a particular issue in the provision of emergency pacing. In the UK there are a limited number of hospitals designated as pacing centres and even fewer have expertise in implantable cardioverter defibrillators (ICDs). Hospitals that implant pacemakers may not necessarily offer a 24 hour emergency pacing service.

Heart block

Patients with complete heart block (CHB) can have extremely slow heart rates or long pauses in the heart beat causing presyncope, syncope, or haemodynamic instability. It is often an unstable condition that can be fatal if untreated. Although heart block cases are relatively common, the majority of these can be managed without emergency out-of-hours pacing, however, for some patients if there is haemodynamic compromise or ventricular arrhythmia, prompt access to transvenous pacing can be lifesaving.

BHRS position statement

It is the aim of BHRS that there should be nationwide early access to permanent pacing and that temporary transvenous pacing should be restricted to those with bradycardia who are haemodynamically unstable at rest, or who have bradycardia related ventricular arrhythmias.

In NHS England's 2013 'Cardiovascular Disease Outcomes Strategy' – a key goal is that emergency cardiovascular care should be available 24 hours a day, 7 days a week. In line with this, all patients who require emergency pacing should have access to appropriate specialist care at all times.

Patients presenting to the ambulance service with arrhythmia emergencies, specifically complete heart block, should be directed to a hospital where such patients can be safely and appropriately managed. An ECG should be recorded by the paramedics and accompany the patient. Such hospitals must have the facilities and staff to insert temporary pacing wires on a 24/7 basis and to offer permanent pacemaker implantation within 24 hours, if indicated. The specifics of how this is delivered will be up to individual Clinical Networks to decide in consultation with the ambulance service, hospitals and cardiologists within that Network. However, it has been nationally agreed with the ambulance services that they are prepared to utilise established pathways such as those in place for PPCI to deliver such patients to these hospitals. Again, it is up to the individual cardiologists, hospitals and Networks to determine how this service will be delivered within the hospital.

Patients presenting to emergency departments with arrhythmia emergencies, specifically complete heart block should be stabilised and then directed by the admitting physicians to the appropriate specialist care. If transfer to another hospital is necessary, the ambulance service should be contacted and a request made for an interfacility transfer. This request should be considered an immediate, time critical, lifesaving intervention.

Patients who are already in hospital for another reason, who develop symptomatic complete heart block must be treated as a medical emergency and need to be assessed and managed by appropriate specialist physicians. If transfer to another hospital is necessary,



the ambulance service should be contacted and a request made for an inter-facility transfer. This request should be considered an immediate, time critical, lifesaving intervention.

It is acknowledged that these services can only be provided at present in a limited number of hospitals during working hours and fewer out-of-hours. NHS England (and its counterparts in Scotland, Wales and Northern Ireland) through its regional teams should work with the ambulance service to develop a framework that ensures all hospitals that have acute admissions or emergency departments have an arrhythmia emergency plan with either the ability to provide emergency treatment in house or to have an agreement with a named specialist centre who will accept immediate transfer of these patients.