

## 1. Context

### 7 Day services programme

The Government's Mandate to the NHS for 2016/17 sets a priority deliverable to:

*"Roll out 4 priority clinical standards in all relevant specialties to 25% of the population in 2016/17; by 2020 roll out 7 day hospital services to 100% of the population (with progress also made on the other six standards identified by the NHS Services, Seven Days a Week Forum), so that patients receive the same standards of care in hospitals, seven days a week."*

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### [NHS Services, Seven Days a Week Forum - Summary of Initial Findings, December 2013](#)

The 4 priority clinical standards are:

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- **Standard 2 - Time to consultant review**

All emergency admissions must be seen and have a thorough clinical assessment by a suitable consultant as soon as possible but at the latest within 14 hours of admission to hospital. Although the December 2013 document stipulated that the standard was to be measured 'from time of arrival' this has now been changed to reflect the original source document for this standard (Royal College of Physicians acute care toolkit 4).

- **Standard 5 - Access to diagnostics**

Hospital inpatients must have scheduled seven-day access to diagnostic services such as x-ray, ultrasound, computerised tomography (CT), magnetic resonance imaging (MRI), echocardiography, endoscopy, bronchoscopy and pathology. Consultant-directed diagnostic tests and their reporting will be available seven days a week:

- within 1 hour for critical patients;
- within 12 hours for urgent patients; and
- within 24 hours for non-urgent patients

- **Standard 6 - Access to consultant-directed interventions**

Hospital inpatients must have timely 24 hour access, seven days a week, to consultant-directed interventions that meet the relevant specialty guidelines, either on-site or through formally agreed networked arrangements with clear protocols, such as:

- critical care;
- interventional radiology;
- interventional endoscopy; and
- emergency general surgery.

- **Standard 8 - On-going review in high dependency areas**

All patients on the AMU, SAU, ICU and other high dependency areas must be seen and reviewed by a consultant twice daily, including all acutely ill patients directly transferred, or others who deteriorate. To maximise continuity of care consultants should be working multiple day blocks. Once transferred from the acute area of the hospital to a general ward patients should be reviewed during a consultant-delivered ward round at least once every 24 hours, seven days a week, unless it has been determined that this would not affect the patient's care pathway.

NHS England and NHS Improvement have joint responsibility for delivery, working with other organisations, to achieve this. To achieve the ambition of 25% of the population having access to 7 day hospital services by March 2017, a number of trusts have been identified to be early implementers. They are being supported to achieve the four priority clinical

standards from the Sustainable Improvement Team. In response to clinical feedback, NHS Improvement has clarified the guidance on the four priority clinical standards for providers completing the self-assessment survey.

#### Seven-day services: clarification of the four priority clinical standards

### **Urgent and Emergency Care Review and the 5 urgent network specialist services**

The U&EC Review aims to ensure that by 1st November 2017, 100% of five urgent network specialist services provide urgent care that meets the 4 prioritised 7DS clinical standards. These services are: major heart attack centres, paediatric intensive care units, major trauma centres, hyperacute stroke units and vascular surgery centres. The 23 U&EC Networks will have a key role in ensuring the services progress towards said achievement, and will be supported by the 4 regional U&EC PMOs.

## **2. Service-specific context**

ST-elevation Myocardial Infarction (STEMI) is a true emergency and outcomes are directly correlated with the time to treatment. Following the Department of Health's [National Infarct Angioplasty Project \(NIAP\)](#) (2008) England moved from a treatment strategy based on thrombolysis (clot busting drugs) to one requiring the highly specialised intervention of primary percutaneous coronary intervention (pPCI).

NICE [guidance on STEMI care](#) in 2013 confirmed pPCI as the preferred treatment pathway and in 2014 published a [quality standard on acute coronary syndromes](#).

About 75-80% of people with STEMI receive reperfusion therapy and [Myocardial Ischaemia Audit Project \(MINAP\)](#) data confirms that >97% of this reperfusion therapy is by pPCI. 20-25% of people with STEMI may not be appropriate for reperfusion therapy for a variety of reasons.

Detailed data relating to all percutaneous coronary intervention (PCI), including pPCI, is reported annually in the [British Cardiovascular Intervention Society Audit](#).

Outcomes are related to speed of treatment and it should be noted that at present in the NIAP this document door to balloon targets of less than 90 minutes are recommended – however a door to balloon time of less than 60 minutes is now recommended.

Some key points are as follows:

- Reperfusion therapy (pPCI) should be provided as quickly as possible and necessitates a 24x7 interventional cardiology service. [The British Cardiovascular Intervention Society has provided guidance on best practice of these services](#) ([http://www.bcis.org.uk/documents/7A3\\_BCIS\\_STEMI\\_Guidelines\\_July\\_2016.pdf](http://www.bcis.org.uk/documents/7A3_BCIS_STEMI_Guidelines_July_2016.pdf))
- pPCI for STEMI is commissioned by [NHSE Specialised Services](#)
- The service specification for pPCI requires a 24x7 service
  - Number of centres providing 24x7 service in England in 2014 = 49
  - Number of centres providing pPCI services in England in 2014 but not 24x7 = 20
- Number of patients affected in England 20,823 in 2013
- Year-on-year trend - numbers are fairly steady
- Regional variation - there is something of a north/south gradient (rates of STEMI are

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roughly 400-500 per million for North and Midlands, 350-400 per million for East Anglia, South Central, and 300-350 per million for Essex, Kent).

- Standard of Care: there are 2 process measures in common use, both of which emphasise time to treatment because delays are universally acknowledged to correlate with worse outcomes:
  - Call-to-balloon time - this is the time (in minutes) from the instant the patient or relative first calls for medical help to the time when an instrumenta device is used to try to reopen ~~is passed into~~ the blocked coronary artery.
  - Door-to-balloon time - this is the time (in minutes) from the patient entering the first hospital to the time when a device is used to try to reopen an instrument is passed into the blocked artery.
  - Standards of care are:
    - C-to-B time - less than 150 minutes in more than 75% of cases
    - D-to-B time - less than 60~~90~~ minutes in more than 75% of cases
- Actual performance:
  - 2014 audit data shows that there are variations between hospitals, but most are achieving the standards and most are improving year-on-year. Some delays may be clinically appropriate so an aspiration of 100% would not be valid, though the current standard could be made a little more challenging
- One problem area is the delay in treatment for those patients who are either taken, or self-present, to a non 24x7 pPCI hospital first and are then transferred to a 24x7 pPCI centre. This inter-hospital transfer (IHT) carries, on average, a 40minute delay to treatment. This results in the standard of achieving a Call-to-Balloon time of < 150 minutes being achieved in 90% of patients taken directly to a pPCI hospital but in only 51% of those patients who underwent IHT.
- Possible solutions:
  - Most pPCI centres regularly review the patient pathway of those patients who required an IHT and feedback to the ambulance service if necessary. There has been a slight fall in the proportion of patients who require transfer in this way (22.5% in 2011, 18.6% in 2012 and 18.5% in 2013).
  - Consider changing some limited hours (non- 24x7) pPCI centres to 24/7 pPCI centres. This would have potentially major staffing and resource implications for limited gain.
  - Consider full implementation of the pPCI service specification and direct STEMI patients picked up by ambulances only to 24x7 centres, and encourage patients to activate the emergency services rather than self-present to their local hospital.
- 30-day mortality rates for STEMI are 8.1%, about one third lower than in 2003/4 (see [MINAP data](#) page 8), translating into 110 fewer deaths from STEMI each month in England & Wales over that decade. How much further decline, if any, is achievable for STEMI mortality is difficult to say, particularly as the data are not risk adjusted and the population being treated is getting older with greater co-morbidity.
  - However, assuming the same case mix and an absolute reduction in 30-day mortality of 0.5% one could calculate that roughly an extra 44 lives could be saved per year.

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### 3. Guidance

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### 3.1 NHS England Guidance including specialised commissioning

STEMI services fall under Specialised Commissioning and the Clinical Reference Group (CRG) ~~which is being~~ ~~has recently been~~ re-formed ~~at present~~. Service specifications/policy documents have not yet been reviewed and been modified/updated, but are likely to be so over the next 6-12 months. However, as regards STEMI, the existing service specification can be found at:

<https://www.england.nhs.uk/wp-content/uploads/2013/06/a09-cardi-prim-percutaneous.pdf>

The core standards are below:

#### Institutional facilities

- pPCI centres should operate 24 hours a day, 7 days a week, 365 days a year as per European Society of Cardiology (ESC) guidance.
- A centre performing pPCI requires at least two cardiac catheterisation laboratories.
- pPCI centres should have contingencies (or Business Continuity Plans) to deal with rare occasions when the service has to be temporarily withdrawn (adverse weather, major power failure etc.)
- Full resuscitation facilities including a defibrillator, intra-aortic balloon counter-pulsation, and an anaesthetic backup must be readily available in any catheterisation laboratory undertaking pPCI. Biochemistry, haematological, and blood transfusion laboratories should be immediately accessible.
- A dedicated multidisciplinary team comprising catheterization laboratory and recovery nurses, radiographers, and technicians will be in place.
- pPCI centres need appropriate support from other clinical disciplines, particularly anaesthetic and intensive care services.

#### Institutional volumes

- pPCI centres should perform an absolute minimum of 150 pPCI patients per annum as per British Cardiovascular Intervention Society (BCIS) guidance.

#### Individual operator volumes

- Current guidelines suggest that a minimum of 75 PCI (not pPCI) procedures per operator per year is required to maintain competence as an independent operator—that is, one who can decide on PCI as appropriate management, plan the strategy, and perform the PCI.

One of the outstanding challenges will be to ensure that all STEMI centres run a 24x7 service. This is supported in this specification, in NICE guidance, and by specialist societies. This would help ensure compliance also with 7 Day Services objectives.

Specialised commissioning also covers the use of complex devices, such as implantable cardiac defibrillators (ICDs), which are relevant to a minority of those who have had STEMI, but this is not strictly part of the acute management pathway. See:  
[NHS England service specification on implantable cardiac defibrillators](#)

CCGs commission rehabilitation, which is an important component of recovery from STEMI, and is covered by NICE guidance (see below)

### **3.2 National Guidance i.e. NICE**

#### **NICE Quality Standard - Acute Coronary syndromes**

NICE quality standards are a concise set of prioritised statements designed to drive measurable quality improvements within a particular area of health or care. The quality standard is expected to contribute to improvements in the following outcomes for patients with acute coronary syndromes:

- deaths from cardiovascular diseases
- length of hospital stay
- adverse effects of interventions (for example, bleeding and stroke)
- incidence of further heart attacks.

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There are 6 quality standards in this document - 1, 5 & 6 directly relate to STEMI diagnosis and management:

Statement 1. Adults with a suspected acute coronary syndrome are assessed for acute myocardial infarction using the criteria in the universal definition of myocardial infarction.

Statement 5. Adults who are unconscious after cardiac arrest caused by suspected acute STEMI are not excluded from having coronary angiography (with follow-on pPCI if indicated).

Statement 6. Adults with acute STEMI who present within 12 hours of onset of symptoms have primary PCI, as the preferred coronary reperfusion strategy, as soon as possible but within 120 minutes of the time when fibrinolysis could have been given.

#### **NICE Guidance - Management of ST-elevation myocardial infarction**

This clinical guideline offers evidence-based advice on the care and treatment of adults with spontaneous onset of myocardial infarction with ST-segment elevation.

pPCI 'timeliness' is a key part of this guideline. This is addressed in detail, so commissioner and professionals delivering services for people with STEMI can plan their configuration in such a way that outcomes are optimal. The guideline also covers procedural pPCI issues, the use of antiplatelet and antithrombin agents, and improving outcomes for the minority of people still receiving fibrinolysis.

The recommendations in this guideline relate only to people with a diagnosis of STEMI

#### **NICE Guidance - Management of unstable angina and non-ST elevation MI**

Although this document relates primarily to NSTEMI management it has been left in as the NICE quality standards have been derived partly from this guidance and the one relating to management of STEMI

#### **NICE Guidance - Cardiac rehabilitation and prevention after MI guideline**

This offers evidence-based advice on secondary prevention for patients in primary and secondary care after an MI. New and updated recommendations on cardiac rehabilitation, lifestyle changes, drug therapy and communication of diagnosis. This will be a core part of the ongoing management of patients post STEMI.

### **3.3 National Clinical Guidance e.g. Royal Colleges and Specialist Associations**

#### **DH Policy – National Infarct Angioplasty Project Final Report (2008):**

See:

[http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_089452.pdf](http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_089452.pdf)  
[http://www.bcis.org.uk/resources/documents/niap\\_final\\_report.pdf](http://www.bcis.org.uk/resources/documents/niap_final_report.pdf)

This 2008 report was the final report from The National Infarct Angioplasty Project (NIAP) - an observational study set up by the Department of Health in collaboration with the British Cardiovascular Society and British Cardiovascular Intervention Society to test the feasibility of developing angioplasty services as the initial treatment for heart attack across England. These are known as primary angioplasty or pPCI services.

Although now historical this project was initiated when the clinical evidence for pPCI had become strong, but the feasibility and cost-effectiveness of establishing wholesale change in the STEMI pathway was uncertain. The NIAP report concluded it was feasible and cost effective and so encouraged a change in practice, which took place over the subsequent few years. The findings of NIAP remain relevant to Urgent and Emergency Care Networks and Commissioners in their configuration of acute services.

#### **DH Policy – Cardiovascular Disease Outcomes Strategy (2013)**

This document covers the spectrum of cardiovascular disease and actions to deliver improved outcome for patients.

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## **4. Relevant data and intelligence including national audits**

### **Myocardial Ischaemia National Audit Projects**

#### **Cardiac Interventions (PCI) Audit**

#### **Cardiac Rehabilitation Audit**

## 5. Key areas of required attention

One of the outstanding challenges is to ensure that all STEMI centres run a 24x7 service (Currently about 20% of STEMI centres do not offer this service). This is supported in the NHS England service specification, in NICE guidance, and by specialist societies. Another related problem is that not all hospital centres offer echocardiography access at weekends (though all 24x7 pPCI centres do). Resolution of both of these issues would help ensure compliance with 7 Day Services objectives.

A further area of focus is on paramedic diagnosis and transfer directly to a major heart attack centre whilst ensuring there is robust and swift systems for the minority of patients requiring immediate hospital to hospital transfer.

Another is to achieve greater consistency of care for patients who are resuscitated following out of hospital cardiac arrest (OHCA). OHCA may be due to STEMI or NSTEMI and there is significant variation with respect to which hospitals the ambulance service takes such patients, and their management when admitted to these hospitals. A consensus document, under the auspices of the NCDs for Heart Disease and for Urgent & Emergency Care, should be available by early 2017 and is intended to help Urgent & Emergency Care Networks and Commissioners (both Specialised and CCGs) in their planning of services.

## 6. Other relevant documents

### [BCIS - Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction. Position statement for Facilities and Emergency Medical Staffing \(July 2016\)](#)

This document aims to standardise crucial staffing elements of Network/Institutional provision of care allowing optimisation of emergency care for these critically ill patients and was written to inform discussions in urgent emergency care networks and STPs. The key recommendations have been replicated below.

#### 1. Institutional Facilities for pPCI:

##### Key Recommendations:

- All pPCI centres should provide a STEMI service 24 hours a day, 7 days a week, year-round.
- All pPCI centres should have a minimum of two adjacent cardiac catheterisation laboratories.
- All pPCI centres should undertake a minimum of 150 pPCI cases per year unless there is extreme geographical isolation to justify a lower volume service.
- Services should be configured to achieve "call-to-balloon time" of <150 minutes in ≥75% of patients (excluding cardiogenic shock and out-of-hospital arrest).
- Optimal performance of the in-hospital service can be measured by a "door-to-balloon" time < 60 minutes in ≥75% of patients (excluding cardiogenic shock and out-of-hospital arrest).

#### 2. Staffing Standards:

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## 2.1 Primary PCI rotas:

### Key Recommendations

- The maximum frequency of on-call rota for any individual should not be more frequent than 1:6
- A Consultant Interventional Cardiologists rota will include:-
  - One half-day of compensatory rest for each full day of consecutive on-call in lower volume centres (<400 pPCI procedures per year)
  - One full day of compensatory rest for each full day of consecutive on-call in higher volume centres (≥400 pPCI procedures per year)

## 2.2 Primary PCI operators:

### Key Recommendations

- All Interventional Cardiologists should participate in an agreed 24/7 pPCI rota
- All Interventional Cardiologists should undertake a minimum of 20 pPCI procedures per year
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### [Annual Cardiac Workforce Surveys by British Cardiovascular Society and Royal College of Physicians](#)

The BCS has conducted a data collection exercise on the United Kingdom Cardiology Consultant workforce since 2010. The aims are to establish an accurate estimate of the workforce and particularly to facilitate workforce planning – this document covers the most recent survey in 2015.