

Appendix 2 - Investment Appraisal Case

Percutaneous Coronary Intervention and Complex Pacing

October 2018

(Replace original October 2016)

Version history

Version	Date Issued	Brief Summary of Change	Owner
1.09	27/09/2016	Final submission – PSHFT board approval	See front page
	15/03/2018	Business case supported at the STP Clinical Advisory Group	
	01/04/2018	Astra Zeneca audit of patients receiving PCI in Peterborough and Cambridgeshire shows 31% of patients receive within 72 hours	
	16/08/2018	Health Care Executive NWAFT business case, approve pilot Papworth NSTEAC (no business case)	
	10/09/2018	Commence pilot new NSTEAC pathway	
1.10	05/10/2018	Updated PCI business case for 18/19 tariff and costs	Kerrie Owen

Investment Appraisal Case

Percutaneous Coronary Intervention and Complex Pacing

Authors: Dr Jo Porter, Dr Brian Gordon, Dr Denise Braganza Cardiology Consultants
Clare Fielder, Melissa Fisher, Stella Hayes Cardiology Service Leads
Justin Wilkinson, Kerrie Owen E&M Business Support
Andre Moore Park Street Consulting

Date: October 2016

Updated October 2018

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1.09	27/09/2016	Final submission	See front page
1.10	05/10/2018	Updated for 1819 tariff and costs	Kerrie Owen

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1 Executive Summary

This investment will provide Percutaneous Coronary Intervention (PCI) and Complex Pacing for the growing population in the Peterborough City Hospital (PCH) catchment area of the North West Anglia NHS Foundation Trust (NWAFT) which serves areas with above average levels of death from coronary heart disease. Recently published data¹ shows that the average rate of deaths from coronary heart disease in England and Wales is 108.5 per 100,000 population, the rate in South Lincolnshire, served mainly by PCH is much higher. South Holland has a rate of 173.5, the fifth worst in the country, while South Kesteven has a rate of 123.2.

There has been recent improvement in the rate of premature death in Peterborough from 104.0 per 100,000 population in 2011 to 78.8 by 2014².

Providing this service in Peterborough instead of Papworth will greatly enhance patient experience by reducing the patient transfers between PCH and Papworth, minimise delays in patient care, and remove duplication of patient procedures carried out on both sites. It will also release the equivalent of two beds at PCH providing around half the bed capacity required to absorb the increased demand.

Papworth FT plan to relocate to the Cambridge Biomedical Campus on the Addenbrookes site from 2018. From that date, and based on around 400 patients in our catchment having up to a 140 mile round trip, this proposal will reduce travel time for patients in the Peterborough and South Lincolnshire area by up to 1,270 hours per year, as well as the associated commissioner patient transport costs.

This development is in line with the System Sustainability Plan to deliver cardiology services in a highly networked fashion across Cambridgeshire and Peterborough. It supports the plan for Papworth FT working together with PCH to provide improved 24/7 access to cardiology opinion at secondary care level. The STP plan also makes reference to Papworth FT and NWAFT investigating the clinical and financial case for the potential expansion of percutaneous coronary intervention (PCI) and complex device services being provided locally in Peterborough.

The PCH cardiology service is increasingly busy and recruitment is difficult due to the lack of subspecialist work which attracts the newer consultants. We have two unfilled consultant posts placing pressure on the team to cover all aspects of cardiology and the wider acute physician rota. This investment provides a wider scope of cardiology work that will assist in recruitment and retention of cardiologists to PCH, making the service clinically sustainable.

The proposed service will be fully compliant with the British Cardiovascular Intervention Society (BCIS) and British Heart Rhythm Society (BHRS) standards.

Capital investment of £2.23M is required; though originally phased will now all be required in year 3 2021/22. This is needed to re-configure a theatre and lab to accommodate anticipated growth of Percutaneous Coronary Intervention (PCI) and Complex Pacing capability at Peterborough City Hospital (PCH). Both services can initially start without capital investment. Running costs of £2.1M once fully established will attract an annual income of £2.7m and will generate a net surplus of £0.5m per annum. Over 10 years the investment is expected to generate a positive Net Present Value (NPV) of £1m.

The service would also facilitate the national drive toward seven day working.

¹ Mortality from coronary heart disease - Mortality from coronary heart disease: crude death rate, by age group, 3-year average, MFP 1 Jan 2013 to 31 Dec 2015 Available at <https://digital.nhs.uk/data-and-information/publications/clinical-indicators>

² NHS CCG IOF Instant Atlas available online at <http://tools.england.nhs.uk/ukoutcomes/flash/atlas.html>

The service will commence initially at a reduced level within existing space to fit with recruitment and mobilisation of the new service and will be at full capacity in 2021/22. The financial calculations have been based solely on the existing demand from the core catchment. The documented growth in population in Peterborough will improve the financial case as will the possibility that at some point in the future, patients from the wider catchment may choose PCH for their cardiac care.

If this opportunity is not pursued then NWAFT will find it harder to recruit and retain key staff as they are attracted to other centres providing a wider spread of cardiac work. The resilience of cardiac services for the wider health network will be reduced. There will be no release of bed capacity at PCH placing increasing pressure on the existing beds. There will be no seven day on-call cardiology working. Patients will continue to experience a sub-optimal experience due to the necessary transfer of care from PCH to New Papworth; cost of transport will increase with the longer journey to CBC compared to Papworth; PCH may lose existing diagnostic angiography work to Papworth.

1.1 Financial Summary

Figure 1 - Financial appraisal

Financial Appraisal: Complex Pacing & PCI - PCH Core Area Only											
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr 1-10
2018/19 Price Base	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s
Activity:											
Complex Pacing - start date Apr 2020		84	84	84	84	84	84	84	84	84	
PCI - start date Q2 2019	98	131	384	408	424	424	424	424	424	424	
Capital costs	-	-	2,238	-	-	-	-	-	-	638	2,875
Income											
Complex pacing	-	547	568	595	643	643	643	643	643	643	5,565
PCI	286	381	1,120	1,190	1,236	1,236	1,236	1,236	1,236	1,236	10,395
Urgent angiogram - non proceed	71	138	328	392	407	407	407	407	407	407	3,371
Outpatient follow up	12	33	66	71	75	75	75	75	75	75	631
Excluded devices	-	351	351	351	351	351	351	351	351	351	3,158
Total income	369	1,451	2,433	2,598	2,712	2,712	2,712	2,712	2,712	2,712	23,120
Expenditure											
Pay	384	667	795	795	795	795	795	795	795	795	7,412
Non-pay - Pacing	-	562	574	591	591	591	591	591	591	591	5,273
Non-pay - PCI	148	186	538	570	570	570	570	570	570	570	4,865
Non-pay - maintenance, lifecycle and Soft FM	-	-	71	71	71	71	71	71	71	71	564
Depreciation	-	-	76	76	76	76	76	76	76	76	604
PDC	-	-	76	73	70	68	65	62	60	71	545
Total expenditure	532	1,416	2,129	2,176	2,173	2,170	2,168	2,165	2,162	2,174	19,264
Total Direct Contribution	- 163	35	303	423	539	541	544	546	549	538	3,855
Discount Factor (3.5%)	0.96618	0.93351	0.90194	0.87144	0.84197	0.81350	0.78599	0.75941	0.73373	0.70892	
Net Present Value	-157	33	-1,681	430	513	498	483	469	455	-21	1,020
DCF	1.035										

Appendix A shows the full financial breakdown.

2 Strategic Case

2.1 National drivers and strategic aims

Increase in demand

Percutaneous Coronary Intervention (PCI) is an established treatment for symptomatic relief of stable ischaemic heart disease and for reducing morbidity and mortality in acute coronary syndromes. PCI activity in the UK has been steadily rising from 590 per million population (pmp) in 2000 to 1530 pmp in 2016 (BCIS Audit data, www.bcis.org.uk).

The ratio of PCI to isolated coronary artery bypass grafting (CABG) revascularisation for ischaemic heart disease has also been on the increase from 1.3 (2000) to 6.7 (2016) reflecting the developments in stent technology and adjunctive treatment options at the time of PCI. With this has been an expansion of non-surgical PCI centres to over 60% of all centres to accommodate the increasing workload and this is recognised and supported by the Department of Health (DoH), the British Cardiac Society and the British Cardiovascular Interventional Society (BCIS).

Complex pacing devices consist of cardiac resynchronisation therapy (CRT) and implantable cardioverter defibrillators (ICD), either alone or in combination.

A cardiac resynchronisation therapy device is designed to treat heart failure. A CRT device sends small, undetectable electrical impulses to both lower chambers of the heart to help them beat together in a more synchronised pattern. This improves the heart's ability to pump blood and oxygen to the body. They are established treatments for selected patients with heart failure and who are at increased risk of sudden cardiac death. They have been shown to reduce morbidity and mortality.

An implantable cardioverter defibrillator (ICD) is a small device that is placed in the chest or abdomen. Doctors use the device to help treat irregular heartbeats called arrhythmias

The most recent National Institute for Cardiovascular Outcomes Research (NICOR) national devices audit shows that numbers of implants have continued to rise over the past 10 years as they prevent more serious damage to the muscles in the heart caused by irregular heart rhythms, giving longer and better quality of life.

In England, ICDs increased from 40 per million population in 2003 to 94pmp in 2016. For CRT from 20pmp in 2003 to 201pmp in 2016. In addition, NICE technology appraisal guidance on implantation of these devices was updated in 2014 and expands the population who are now eligible to receive device therapy to patients with less symptomatic heart failure. This means implant numbers will continue to increase.

Sustainability and Transformation Plan

In Cambridgeshire and Peterborough, the NHS, general practice and local government have come together to develop a five-year Sustainability and Transformation Plan (STP) to improve the health and care of our local population and bring the system back into financial balance. The development of an STP has been led by chief executives, frontline staff and patients.

Cambridgeshire and Peterborough is one of the most, if not the most, challenged health systems in England, making it essential that we work together to develop robust plans for long-term change. We have in place strong, visible, collective leadership and a well-resourced programme of work to address:

- the health and care needs of our rapidly growing, increasingly elderly population
- significant health inequalities
- workforce shortages including recruitment and retention in general practice
- quality shortcomings, with two of our six NHS provider organisations in special measures

- inconsistent operational performance, particularly in meeting the 4-hour Accident and Emergency (A&E) standards
- financial challenges, which exceed those of any other STP footprint on a per capita basis, such that by 2021 we expect our collective NHS deficit, if we do nothing, to be £465m.

This business case supports these aims, most notably by addressing the significant health inequalities, workforce shortages in cardiology and financial challenges.

An area of focus in the STP is to develop care networks, to move knowledge and not patients wherever possible and appropriate. If the business case is approved, our cardiologists already know how to provide both PCI and complex pacing and will use protocols for referrals, use best practice to determine treatment, build workforce resilience through an enhanced career development offer, and share out-of-hours rotas, offering flexibility to match staffing requirements with available physical capacity, all of which are part of the STP.

The STP also aims to reduce cost to the total system, as is shown in section 3, this proposal will make significant system wide financial savings or at least £0.5m per annum.

Local service provision

The local delivery of services has been emphasised, *Towards the Best Together (2008)*, to achieve equality of treatment in every part of the country and allow ready access to appropriate services for patients. In particular for coronary heart disease (CHD) this refers to the provision of facilities for coronary revascularisation (PCI and Coronary Artery By-pass Graft (CABG)) which is thought to be inappropriately underprovided for in the UK compared to other developed countries. More recently *Liberating the NHS – Commissioning for Patients (DoH 2010)* sets out clear aims for patient choice and local commissioning of services where appropriate. Local provision will reduce patient journey time by 54% saving 520 hours of travel per annum across the core catchment of Peterborough, North West Cambridgeshire, and South Lincolnshire.

For complex pacing, there are very limited providers in the East of England compared to other regions which results in increased travel time and reduced choice for patients. Appendix B shows the distribution of complex pacing provision and PCI centres nationally, and the scarcity around Peterborough.

Compliance with NICE Guidelines

NICE quality standard QS68 (2014) and the ESC guidelines for the management of acute coronary syndrome patients without persistent ST-segment elevation (2015) have defined an ideal pathway for patients admitted with non ST elevation Myocardial Infarction (NSTEMI) which includes angiography and if indicated follow on PCI by 72 hours after admission for patients at intermediate or higher risk (predicted mortality > 3.0%) and within 24 hours if clinically unstable. Refer Appendix E for the risk criteria mandating invasive strategy in NSTEMI-ACS. It is recommended that very high risk patients and those with ST elevation Myocardial Infarction (STEMI) are transferred to a centre with primary PCI facilities and for low risk patients a non-invasive strategy is suggested first line. In PCH currently patients are triaged and those with high risk features transferred to Papworth directly for a one stop procedure whilst those with lower risk features, or who may benefit from the input of DGH based sub-specialities, undergo a diagnostic procedure at PCH with a view then to discussion at an MDT meeting before deciding on a treatment strategy. A proportion of these patients will subsequently be transferred to Papworth for PCI at a separate sitting. The proposal will enable the one stop procedure for all low risk, intermediate or higher risk patients to occur at PCH with very high risk and STEMI patients still being transferred to Papworth or an alternative suitable provider.

There are ESC (2015) guidelines³ for the management of complex pacing.

Contribution to Monitor led enforcement planning

By providing PCI capability at PCH, the Trust will be eliminating avoidable costs from the Cambridgeshire and Peterborough health system associated with the transfer of patients between PCH and Papworth, and the frequent delays in provision of care that result in additional bed days. See Appendix C for an analysis of additional bed occupancy associated with transfer to Papworth. These savings together with reduced transport costs and avoidance of duplicate procedures will contribute to the savings required from PCH. In addition for NWAFT there will be some modest increase in income derived from PCI and Complex Pacing activity no longer going to Papworth.

Impact on 7 day working

Current provision is a five day service for angiography and bradycardia pacing. Only with new service development and recruitment/expansion, a six day service for PCI and all pacing would be provided, improving patient care and access. A seven day Cardiology on-call would follow for all patients enabling compliance with recent BCS (2016)⁴ guidance.

Impact on Mortality

The Myocardial Ischaemia National Audit Project (MINAP) database is a registry of patients with acute coronary syndromes admitted to hospitals in England and Wales. A review of 10 years worth of data from 2003 to 2013 has recently been published (Association of Clinical Factors and Therapeutic Strategies With Improvements in Survival Following Non-ST-Elevation Myocardial Infarction, 2003-2013; Hall et al , JAMA. 2016;316(10):1073-1082). Over this period there was a 30% relative decrease in unadjusted 6 months all-cause mortality predominantly driven by the increase in angiography and revascularisation rates. During this time the rate of coronary artery bypass surgery remained constant at < 5% however the rates of PCI increased from 10-33% confirming the significant mortality benefit of timely PCI in this group of patients.

Nationally, if patients are admitted directly to a PCI centre then the average wait to PCI is 60.8 hours compared to 82.1 hours if an interhospital transfer is involved (BCIS audit 2014). Locally, centres who have set up PCI on site have achieved PCI rates of 86% within 72 hours; an Astra Zeneca audit of the latest available national data (2016/17) showed that 37% of Peterborough patients transferred to Papworth within 72 hours of referral compared with a national average of 58%, with centre which provide PCI locally performing substantially better than those where patients were transferred between hospitals. For example, Kettering achieved a rate of over 90%. This strengthens the case of need for a locally delivered service.

2.1 Local drivers and strategic aims

CHD prevalence in Peterborough

CHD remains the leading cause of mortality amongst men and women in the UK. There are significant ethnic variations and increased prevalence in areas of high deprivation. Peterborough City Hospital serves a population of 507,000 spread across several CCGs.

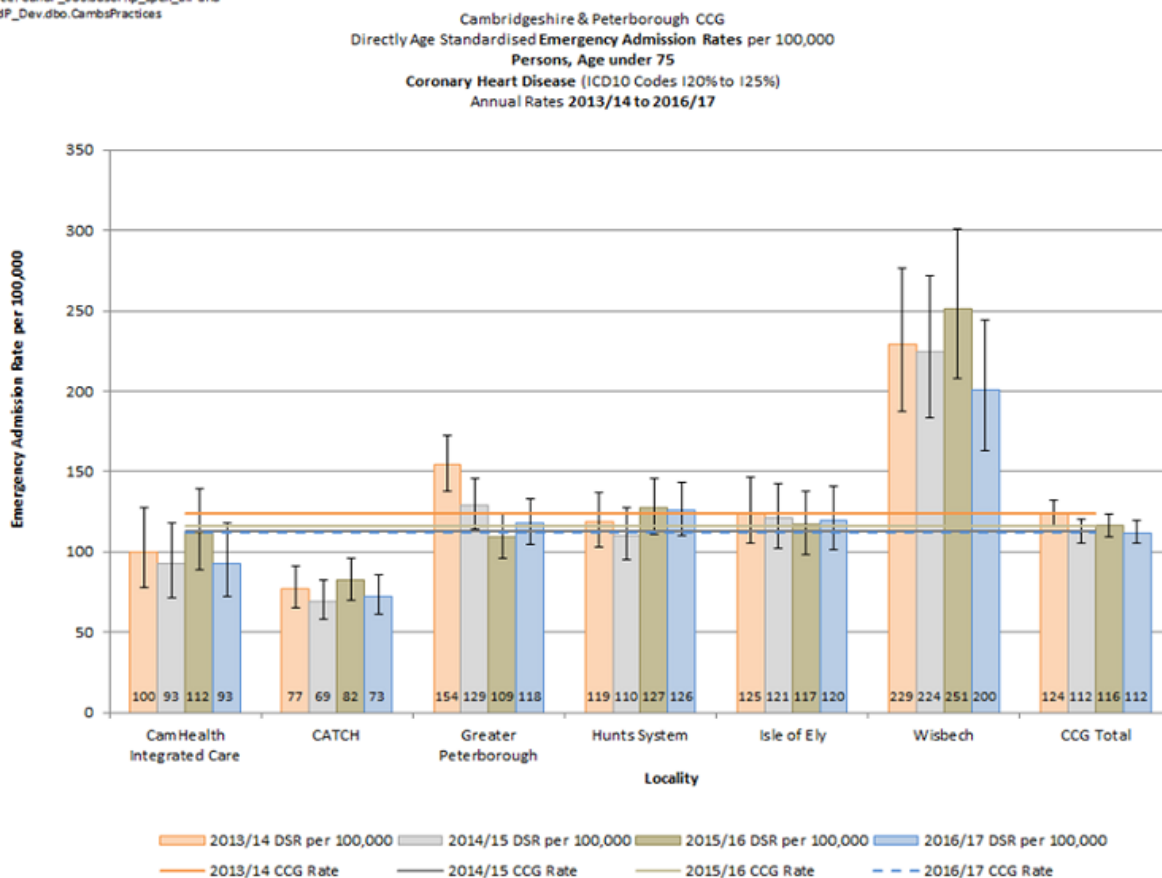
³ ESC (2015) *European Society of Cardiology - Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation* European Heart Journal (2016)37, 267–315 doi:10.1093/eurheartj/ehv320

⁴ BCS (2016) British Cardiovascular Society Working Group report: Out of Hours cardiovascular care: Management of Emergencies and Hospital Inpatients (Sept 2016)

Emergency admissions for coronary heart disease in Cambridgeshire and Peterborough have declined slightly across the CCG, although Wisbech which is jointly served by PCH and The Queen Elizabeth Hospital Kings Lynn is significantly higher than other areas.

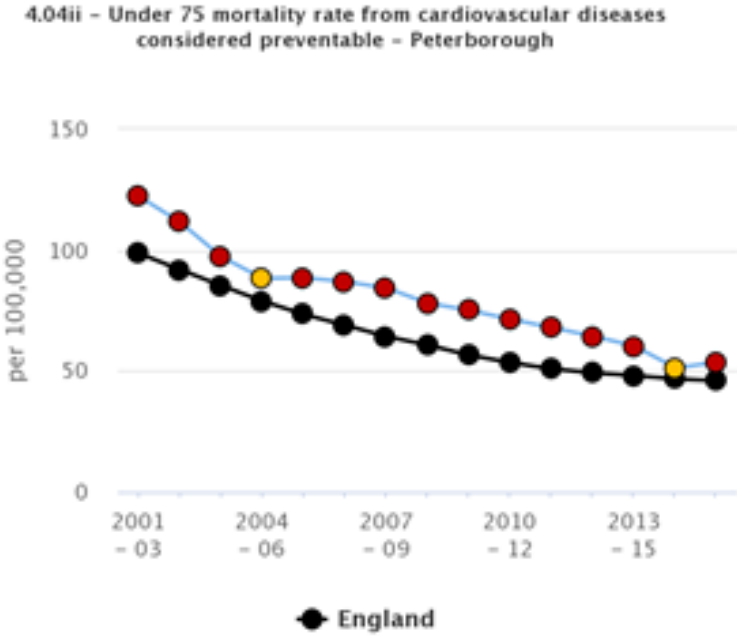
Figure 2 - Cambridgeshire and Peterborough CCG Emergency Admission rates for CHD (<75 years age)

source: CandP_SUS.SusCP.ip_spell_all and CandP_Dev.dbo.CambsPractices



The rate of preventable cardiovascular disease in Peterborough is higher than the average for England, and is declining at a similar rate (Figure 3)

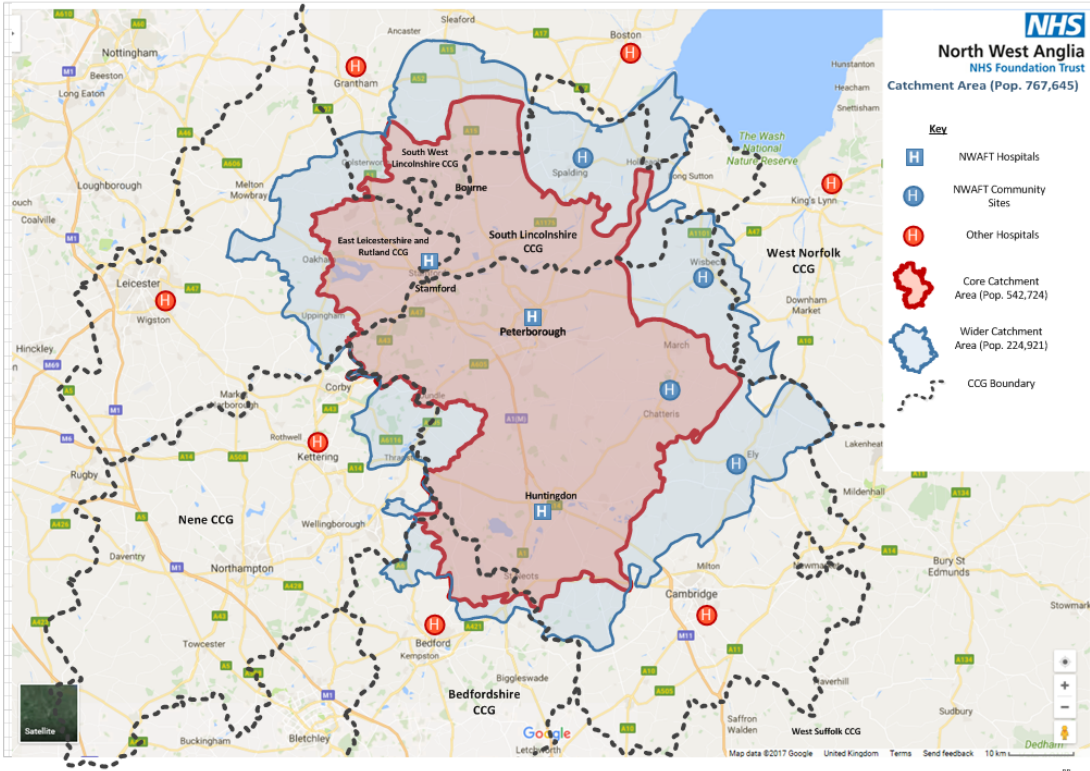
Figure 3 - Under 75 Mortality rate from cardiovascular diseases considered preventable Peterborough and all England average.



Source: Public Health England based on ONS data

The NWAFT catchment area is shown in Figure 4. The population served by the Peterborough City Hospital section of that catchment is forecast to grow by 11% to 2021, and South Lincolnshire by 4%; the older age groups, over 65, in which CHD is more prevalent are forecast to grow by 13% and 11% respectively adding 7,400 to the current 62,690.

Figure 4 - NWAFT Core and wider catchment area



Papworth role in current PCI pathway

Patients who have had an elective coronary angiogram for stable coronary artery disease and then need PCI are placed on a waiting list for elective intervention at Papworth with waiting times of 6-8 weeks, with the cases undertaken in the main by a PCH operator. Patients admitted with acute coronary syndromes who are high and intermediate risk based on established scoring systems are transferred as inpatients to Papworth for potential intervention with inherent delays so 72 hr target times are not being met adequately. Those patients with acute coronary syndromes who are lower risk have a diagnostic angiogram at Peterborough first and then are either transferred as inpatients for revascularisation or as an outpatient depending on anatomy and risk profile. A minority of patients (<3 per year) are referred, by patient preference, to Leicester. Patient follow up and rehabilitation is then undertaken back at Peterborough. See Appendix D for the current and proposed patient flows.

Papworth role in current complex pacing pathway

The majority of complex devices will be implanted along an elective pathway. Patients are seen in PCH by a consultant and that same consultant then has to refer to himself at Papworth and reapprove the procedure. The waiting time for the procedure is then 8-12 weeks. Once implanted, the patient will need specific technical follow up of the device and also clinical follow up of their heart failure. This is currently disjointed with device follow up at Papworth and clinical follow up at PCH.

Patients admitted with decompensated heart failure may be deemed appropriate for device therapy as an inpatient to prevent further hospitalisation. They will be transferred to Papworth with a wait time usually 5-7 days.

Patient benefits

Peterborough PCI patients will have a one stop service closer to home eliminating the disjoint of transferring to Papworth midway through the pathway. This also provides a quicker pathway for the majority of patients with less waiting time. Travel to Papworth for these patients will not be necessary, eliminating any potential transport issues for them and their families, and reducing delays to their care whilst they await bed availability at Papworth. Whilst the clinical quality will be expected to be the same in either case the patient experience will be better and the process much smoother and efficient.

Complex device patients will enjoy a seamless one stop service for device and clinical follow up both being arranged at the same visit, hence automatically reducing their need to attend device/heart failure related hospital appointments by 50%.

Papworth relocation

Papworth was forecast to move to the CBC in early 2018; this has now been put back to April 2019. This move was driven by the need for improved access to non-cardiac specialist diagnostic and clinical services, development of research opportunities with the University of Cambridge and delivery of modern healthcare facilities.

PCH already has non-cardiac specialist services, pertinently critical care, respiratory, renal, vascular and interventional radiology. Moreover this move will make the journey for Peterborough residents to the proposed New Papworth site more problematic as it will require use of the A14/M11 corridor, which is notorious for congestion. See Appendix H for the patient impact on journey times. Patients within the PCH Lincolnshire catchment area requiring regular complex device follow up will face a round trip journey of up to 150 miles. The increase in beds at the new site will be just 17 giving 310 in total. For Peterborough and Cambridgeshire the increase in the older population is significant in the coming decades, 14% to 2021. During the relocation itself there may be capacity pressures. Capacity for PCI and complex pacing at PCH will mitigate these risks and in the longer term, release some operating capacity at Papworth for the development of specialist tertiary centre work and,

system wide, help attainment of challenging targets for trans catheter aortic valve replacement (TAVI), cardiac surgery and Electrophysiology (EP) studies. PCH catchment patients have long waits for these procedures at present with documented deaths on the waiting list.

PCH capacity

Peterborough City Hospital has one dedicated cardiac catheter laboratory which is currently operational from Monday to Friday each week. A diagnostic angiogram service was established for both elective and inpatient cases in 2005, now performing 750 procedures a year. In Autumn 2011 a pacing service started. This work is undertaken by 3 consultants. Two of these consultants work a split site post with Papworth; one is trained in coronary intervention and the other in device implantation.

Archiving and image transfer already exists between Papworth and PCH with access to a Monday-Friday MDT meeting for discussion of inpatients. In addition there is support from a visiting Electrophysiologist monthly and a formal MDT meeting is held at PCH alternate weeks involving the resident interventional, device and non-invasive Cardiologists with two visiting Cardiothoracic Surgeons from Papworth. The cardiology service at PCH is supported by a 29 bedded ward, 12 bedded CCU, cardiac day ward, cardiac investigation department with ACS, Heart failure and Arrhythmia specialist nurses.

Fit with Cardiology plans and objectives

The initiative to introduce PCI and Complex pacing provision at PCH matches the criteria outlined in the cardiology steering group objectives in that it is:

- An opportunity to provide an elective and non-elective cardiology service under a sustainable system wide/networked model;
- Can be fast-tracked to deliver improved performance/capacity/efficiency;
- Is clinically led throughout, with agreed criteria for generating and appraising options for service improvement with explicit assessment of impact on quality and outcomes of care;
- Takes into account national standards and guidelines for the delivery of improvements in cardiology services;
- Is a proposal for a high quality, safe, affordable and sustainable cardiology service;
- The demand and capacity implications of the proposed improvements have been assessed and informed local systems.

Staff recruitment and retention

Provision of a wider range of cardiac procedures will strengthen the draw for cardiologists, nurses, cardiac physiologists and radiographers and enable PCH to attract resources more effectively. The working relationship with Papworth is integral to this approach and will be retained.

3 Economic Case

Patient savings

Peterborough patients will benefit from transferring PCI and complex pacing from Papworth to PCH, through reduced delays in care, elimination of duplicated angiograms see Figure 5 below, and significant reductions in travel. The economic consequence of these should not be underestimated but have not been included in this business case.

Figure 5 - Duplication of angiograms

Commissioner	CPCCG	SLCCG	ELRCCG	SWLCCG	Other	Total
Number of angios at PCH prior to transfer to Papworth (duplication)	37	18	1	1	2	59

The cost of angiography is included in the spell cost.

Commissioner savings

The economic case includes the costs incurred by commissioners from the current arrangement which will be virtually eliminated. These include a reduction in excess bed days, reduced transport costs and a reduction in the tariff paid for each spell due to different market forces factors (MFF).

Commissioner savings are summarised in Figure 6 below. This data was taken from 2015 when the original business case was approved, which demonstrates significant costs associated with delay. Transfer delays have continued to date.

Figure 6 - Potential commissioner savings for PCH transferred to Papworth for elective and urgent PCI

Commissioner	CPCCG	SLCCG	ELRCCG	SWLCCG	Other	Total
Number of spells Jan-Dec 2015	131	52	7	5	4	199
Spell cost	£326,004	£138,294	£17,807	£13,950	£10,693	£506,748
Total LOS	594	229	26	14	28	891
Potential bed day savings (1)	414.9	143.5	22.9	13.7	22.3	617
Potential cost savings	£227,699	£86,632	£15,704	£13,695	£9,064	£352,794
MFF saving	£4,281	£1,629	£295	£257	£170	£6,633
Total saving	£231,980	£88,260	£15,999	£13,952	£9,234	£359,427

Investment KPIs

The key performance indicators for the success of the project are anticipated to include:

- Patient experience of new service matches expectations of new service
 - Reduced travel times
 - Easier access
 - Familiar location
- Clinical sustainability of the cardiology team
 - Increased range of services available at PCH
 - Improved recruitment and retention

- Ability to meet out of hours and seven days services requirements
- Equivalent of two beds are freed up
 - Improved patient flow through current bed stock, reducing bed occupancy by 617 bed days for PCI patients who would otherwise have transferred to Papworth
 - Likely that beds will be used for other patients thereby contributing to achievement of 18 week target.
- Reduced cost to the commissioner
 - A reduction in outpatient attendances
 - Reduction in patient transport costs
 - Reduced excess bed days
- Income generated in excess or equal to costs incurred
 - All income contributes to covering the PFI costs of PCH
 - Any income over and above costs contributes to PCH financial position

Option appraisal

The following 5 options were evaluated:

1. Do nothing
2. Mon-Fri Elective service
3. Mon-Fri Elective and Urgent service
4. Six Day Urgent and Elective service
5. Seven Day Urgent and Elective service

Within these five options we also considered four options for configuring the labs.

Figure 7 - Lab configuration options

	Lab requirement
Current	1 Lab x5 days
Option A	1 Lab x5days 1 Theatre x5 mornings (0830-1230) x3 Evenings emergency cover (1700-2000)
Option B	1 Lab x6 days (x3 Evenings emergency cover)
Option C	2 Labs x5 days (x3 Evenings emergency cover)

The number of patients applicable to each option is shown in Figure 8 below. Map in 2.2 above shows the core and non-core catchment for PCH.

Figure 8 - Number of patients forecast from the core area and also the core plus wider catchment area per annum.

Lab option	Elective		Urgent 5 Day		Urgent 6 Day		Urgent 7 Day		TOTAL	
	Core	Core + Wider	Core	Core + Wider	Core	Core + Wider	Core	Core + Wider	Core	Core + Wider
1	0	0	0	0	0	0	0	0	0	0
2	268	521	0	0	0	0	0	0	268	521
3	268	521	102	205	0	0	0	0	370	726
4	268	521	0	0	123	246	0	0	391	767
5	268	521					144	287	412	808

Appendix G shows indicative Cath Lab schedule for the current Cath Lab.

Non-Financial Benefit Criteria & Scoring

The non-financial options appraisal was undertaken by the following staff:

- Dr Jo Porter, Clinical Lead and Consultant Cardiologist
- Dr Denise Braganza, Consultant Cardiologist
- Dr Brian Gordon, Consultant Cardiologist
- Stella Hayes, Lead Nurse Cardiology
- Keith Reynolds, Assistant Director of Strategy and Planning
- Justin Wilkinson, Business & Service Improvement Manager
- Paul Lamb, Deputy Director of Finance
- Kerrie Owen, Assistant Business Manager E&M

Each option was assessed against weighted criteria. The criteria are shown in the Figure 9 below:

Figure 9 - Weighted criteria

Benefit Criteria		Weighting
1	Improvement in the quality of patient care and experience.	30%
2	Improvement in service resilience and ensuring capacity to meet demand.	30%
3	Improvement in staff recruitment and retention, both short and long term.	15%
4	Alignment with national, regional and PCH strategy.	15%
5	Increase in the cost-effective utilization of the PCH PFI asset.	10%
Total		100%

The scoring matrix is shown in Figure 10 below:

Figure 10 - Scoring matrix

Ranking		Criteria
0	Unacceptable	Option cannot meet the minimum criteria
1	Poor	Effort required to enable option to meet minimum criteria
2	Acceptable	Option meets minimum criteria
3	Good	Option exceeds minimum criteria
4	Very Good	Option meets or exceeds all criteria

The outcome of the non-financial appraisal is shown in Figure 11 below:

Figure 11 - Outcome of non-financial appraisal

Benefit Criteria	1		2		3		4		5		Totals	
	Weight 30		Weight 30		Weight 15		Weight 15		Weight 10			
Option	Raw	W'td	Raw	W'td	Raw	W'td	Raw	W'td	Raw	W'td	Raw	W'td
1	0	0	0	0	0	0	0	0	0	0	0	0
2	1	30	1	30	0	0	0	0	1	10	3	70
3	2	60	2	60	3	45	3	45	3	30	13	240
4	4	120	4	120	4	60	4	60	4	40	20	400

5	4	120	4	120	3	45	4	60	4	60	19	385
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Comparison of options against benefit criteria

Figure 12 - scoring detail of qualitative evaluation

Benefit Criteria	Option 1	Option 2	Option 3	Option 4	Option 5
	Do nothing	Mon-Fri Elective service	Mon-Fri Elective and Urgent service	Six Day Urgent and Elective service	Seven Day Urgent and Elective service
	Score: 0	Score: 70	Score: 240	Score: 400	Score: 385
Improvement in the quality of patient care and experience i.e. provision of local service.	This will not improve patient care and experience as local patients will have to travel to Papworth or to Cambridge (when Papworth moves) for treatment.	Provision of elective service. Expected patient numbers – 268 PCI and 84 complex pacing.	Provision of 5 day elective and urgent service. Expected patient numbers – 370 PCI and 84 complex pacing.	Provision of 6 day elective and urgent service. Expected patient numbers – 391 PCI and 84 complex pacing.	Provision of 7 day elective and urgent service. Expected patient numbers – 412 PCI and 84 complex pacing.
Reduction in length of stay and improved bed capacity.	This will not reduce length of stay or improve bed capacity.	This will reduce length of stay and improve bed capacity but only for elective patients.	This will reduce length of stay and improve bed capacity substantially for elective and urgent patients across 5 days.	This will reduce length of stay and improve bed capacity substantially for elective and urgent patients across 6 days.	This will reduce length of stay and improve bed capacity substantially for elective and urgent patients across 7 days.
Improvement in staff recruitment and retention, both short and long term.	This will not improve recruitment and retention as evidenced by the current vacancy factor.	This is expected to moderately improve recruitment and retention.	This is expected to substantially improve recruitment and retention.	This is expected to substantially improve recruitment and retention.	This is expected to substantially improve recruitment and retention
Alignment with national, regional and NWAFT strategy.	No alignment.	Aligns with regional and national strategy regarding capacity provision	Aligns with regional and national strategy regarding capacity provision.	Aligns comprehensively with regional and national strategy regarding capacity and extended weekend working.	Aligns comprehensively with regional and national strategy regarding capacity and extended weekend working.
Increase in the cost-effective utilisation of the PCH PFI asset.	No benefit.	Some financial benefit but limited to elective activity.	Extended financial benefit relating to elective and urgent activity across 5 days.	Extended financial benefit relating to elective and urgent activity across 6 days	Extended financial benefit relating to elective and urgent activity across 7 days.

Qualitative Ranking of Options

On the basis of the qualitative evaluation, the various options are ranked in Figure 13 below, with option 4 – the six day urgent and elective service ranked highest:

Figure 13 - Ranked outcome of qualitative evaluation

Option	Description	Score	Ranking
4	Six Day Urgent and Elective service	400	1
5	Seven Day Urgent and Elective service	385	2
3	Mon-Fri Elective and Urgent service	240	3
2	Mon-Fri Elective service	70	4
1	Do nothing	0	5

Options Appraisal - Financial

Summary

Figure 14 - Financial headline summary

Financial Appraisal: Complex Pacing & PCI - PCH Core Area Only											
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr 1-10
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s
2018/19 Price Base											
Activity:											
Complex Pacing - start date Apr 2020		84	84	84	84	84	84	84	84	84	
PCI - start date Q2 2019	98	131	384	408	424	424	424	424	424	424	
Capital costs	-	-	2,238	-	-	-	-	-	-	638	2,875
Income											
Complex pacing	-	547	568	595	643	643	643	643	643	643	5,565
PCI	286	381	1,120	1,190	1,236	1,236	1,236	1,236	1,236	1,236	10,395
Urgent angiogram - non proceed	71	138	328	392	407	407	407	407	407	407	3,371
Outpatient follow up	12	33	66	71	75	75	75	75	75	75	631
Excluded devices	-	351	351	351	351	351	351	351	351	351	3,158
Total income	369	1,451	2,433	2,598	2,712	2,712	2,712	2,712	2,712	2,712	23,120
Expenditure											
Pay	384	667	795	795	795	795	795	795	795	795	7,412
Non-pay - Pacing	-	562	574	591	591	591	591	591	591	591	5,273
Non-pay - PCI	148	186	538	570	570	570	570	570	570	570	4,865
Non-pay - maintenance, lifecycle and Soft FM	-	-	71	71	71	71	71	71	71	71	564
Depreciation	-	-	76	76	76	76	76	76	76	76	604
PDC	-	-	76	73	70	68	65	62	60	71	545
Total expenditure	532	1,416	2,129	2,176	2,173	2,170	2,168	2,165	2,162	2,174	19,264
Total Direct Contribution	- 163	35	303	423	539	541	544	546	549	538	3,855
Discount Factor (3.5%)	0.96618	0.93351	0.90194	0.87144	0.84197	0.81350	0.78599	0.75941	0.73373	0.70892	
Net Present Value	-157	33	-1,681	430	513	498	483	469	455	-21	1,020
DCF	1.035										

Benefits / Case of need

- Care closer to home for PCH patients:
 - Avoidance of journeys to Papworth on the Cambridge Biomedical Campus for patients and relatives.
 - Treatment in usual/familiar place of care.

- Shorter waiting times for in-patients, saving 617 bed days p.a.
 - Procedures can be scheduled promptly saving unnecessary waiting.
 - Bed days freed up obviating need for additional capacity otherwise required to cope with growth in demand.
- One-stop procedures and reduced need to transfer patients between hospitals:
 - Reduction in costs for Patient Transport Service (PTS) and ambulance service.
 - Eliminates double spells and double punctures for those 199 patients seen at both institutions.
 - Reduction by up to 50% of follow/up appointments for all complex pacing patients by a single PCH appointment combining separate appointments at Papworth (devices) and PCH (heart failure).
- Compliance with NICE guidelines:
 - Time to treatment for PCH catchment PCI patients reduced, see Appendix D.
 - No NICE time to treatment for complex devices. Current waiting time from decision to proceed currently 10-12 weeks. Ideally should be nearer 4, some patients are decompensated and admitted whilst waiting.
 - Numbers of cases from the PCH core area are sufficient to exceed the recommended numbers required.
- Increased travel times with Papworth’s move to Cambridge Biomedical Campus:
 - Cambridge Biomedical Campus further away from Peterborough than existing Papworth site and involving the country’s busiest road, the A14.
 - The A14 is undergoing £1.8 Billion upgrade over the next few years that will further exacerbate journey times.
- Improved patient choice:
 - A “close to home” choice will be available.
- Development of an existing effective angiography service:
 - Creates resilience in the provision of PCI and Complex Pacing across the local health system.
 - Secures resources and capacity at a time of service relocation (Papworth to Cambridge Biomedical Campus) and with higher than average growth in demand.
- Increased capacity against rising patient numbers:
 - Adds to the capacity across Cambridgeshire & Peterborough to meet forecast population rise.
 - Creates capacity in the centre of greatest need in Peterborough.
- Ability to deliver a 7/7 general Cardiology on-call service at PCH:
 - Enhancement of response across the north of the county, South Lincolnshire and Northamptonshire.
- Additional activity for PCH:
 - In the current difficult climate additional activity at PCH will reduce the deficit and improve financial performance.
- Improved efficiency and financial benefit for the local healthcare economy:
 - Reduces costs for the system overall, releasing cash to support growth.
- Improved prospects for recruitment and retention:
 - Current difficulties experienced in recruitment will be significantly reduced as the service will be providing the expected range of care for a Cardiology department.

There are a number of risks to the current situation as shown in Figure 15:

Figure 15 – Risks of the status quo

Current risks	Likelihood Score	Severity Score	Overall Rating
---------------	------------------	----------------	----------------

Inability to recruit cardiology consultants without active cardiac catheter lab	5	5	25
Increasingly adverse impact on patient experience and travel	5	4	20
Adverse impact on achieving 18 week targets	4	4	16
Loss of activity in the diagnostic angiography service at PCH.	3	5	15
Failure to develop existing skills leading to staff leaving for other centres	2	4	8

4 Commercial Case

Note, there are no consultants included in these figures, as the team already has two unfilled consultant posts and one locum post, the combined budget for which will deliver the required activity.

There are options for staffing the rota which will meet the requirement for all interventionalists being on a primary PCI rota.

Options for Collaboration with Papworth

1. <ul style="list-style-type: none">• Papworth Surgical Backup• Papworth for PPCI (emergency transfer) + very high risk NSTEMI (transfer within 2 hours)	3 Operators: <ol style="list-style-type: none">1. Current PCH operator to continue sessions at Papworth + continue on PPCI rota at Papworth2. Visitor from Papworth to undertake elective/ACS sessions at PCH longterm + continue on PPCI rota at Papworth3. PCH based operator to join out of hours on call PPCI service at Papworth
2. <ul style="list-style-type: none">• Papworth Surgical Backup• Papworth for PPCI (emergency transfer) + very high risk NSTEMI (transfer within 2 hours)	3 Operators: <ol style="list-style-type: none">1. Current PCH operator to continue sessions at Papworth + continue on PPCI rota at Papworth2. Visitor from Papworth to undertake elective/ACS sessions at PCH short-term (until > 400 cases pa) to facilitate setting up + continue on PPCI rota at Papworth3. PCH based operator to join out of hours on call PPCI service at Papworth
3. <ul style="list-style-type: none">• Papworth Surgical Backup• Papworth for PPCI (emergency transfer) + very high risk NSTEMI (transfer within 2 hours)	3 Operators: <ol style="list-style-type: none">1. Current PCH operator to continue sessions at Papworth + continue on PPCI rota at Papworth2. PCH based operator to join out of hours on call PPCI service at Papworth3. PCH based operator to join out of hours on call PPCI service at Papworth

- 4.
- Papworth Surgical Backup
 - Papworth for PPCI (emergency transfer) + very high risk NSTEMI (transfer within 2 hours)

- 3 Operators:
1. Current PCH operator to continue sessions at Papworth + continue on PPCI rota at Papworth
 2. PCH based operator to join out of hours on call PPCI service at Papworth
 3. PCH based operator to join out of hours on call PPCI service with a different provider

- 5.
- Papworth Surgical Backup
 - Papworth for PPCI (emergency transfer) + very high risk NSTEMI (transfer within 2 hours)

- 3 Operators:
1. Current PCH operator to continue sessions at Papworth + continue on PPCI rota at Papworth
 2. PCH based operator to join out of hours on call PPCI service with a different provider
 3. PCH based operator to join out of hours on call PPCI service with a different provider

We will discuss these options with Papworth, but our preference is Option 1 as this meets all the clinical safety standards at lowest cost to the health system.

Cardiac Physiological and Angiography Clinical Staffing

Figure 16 - Staffing changes from existing to proposed

Combined Cardiac & Angio Staffing:			
Band	current wte	new wte	change
8A	1.0	1.0	0.0
7	4.0	4.0	0.0
6	4.6	10.2	5.6
5	10.2	12.2	2.0
4	0.0	1.0	1.0
3	0.5	4.0	3.5
2	5.6	3.2	-2.4
	24.9	34.6	9.7
		new wte	
Consultant		2.0	
Radiographer		2.7	
Admin		4.8	
Phased appointments to support extended working hours, weekends & on-call rotas			

The reasons for the proposed non-medical staffing levels are:

- BCIS states that there has to be two trained nurses (band 5 or above) in the lab at any one time during procedures.
- Longer working hours. An early and a late shift will be required. (Currently there is one shift pattern).
- There will be an increase in Pre Assessment Clinics and follow up clinics.
- 6 day working and additional on call commitments.
- Creation of an on call physiologist rota.

This represents an increase of five more clinical staff (equates to an increase of 7.0 WTE) over a 5 year period.

Increase from 2 to 7 Band 6 – Senior Cardiac Physiologists:

- To support on-call rota to cover PCI and pacing service.
- To support the NICE recommendations regarding NSTEMI patients undergoing an echocardiogram to assess LV function within 48hrs of presentation.
- To enable 6 day working for diagnostic tests at a senior level (lone working) and a longer working day (0800 – 2000).
- To support the expansion of the pacing service both on and off site – expansion is due to the complex pacing service which involves an increase in the follow-up and optimisation checks required. For patients who have complex devices there is an increase of 1-2 checks per year including remote monitoring from the home. (Dependent on patients, symptoms etc.)
- To enable the department to be compliant with the BHRS – British Heart Rhythm Society (formerly HRUK) guidelines relating to Clinical Service Guidance in relation to Implantation and Follow-up Cardiac Rhythm Management Devices in Adults (January 2015) see Appendix F.
- To enable to the department to be complaint with the NICE and BSE (British Society of Echocardiography) guidelines with regards to Heart Failure (HF) and ACS/NSTEMI patients

– particularly in relation to cardiac ultrasound (echocardiogram). Increase in CRT optimisation clinics and Heart Failure clinics will also see an increase in demand put upon the echocardiogram service due to an increase in patients requiring in-depth studies being performed.

- To enable the department to provide a highly specialised follow-up clinics for patients requiring optimization of their CRT/ICD device – optimization involves x1 senior physiologists to be in attendance in clinic with specialised knowledge of both echocardiography and device optimization with support from another allied health professional (AHP)
- Increase in CRT/ICD clinics will occur due to complexity – currently patients with non-complex devices are seen once a year. For complex devices patient review occurs 1-2 times per year and includes remote monitoring from the home.
- To enable the department to provide on-call cover for patients who will attend out of hours with device complications requiring urgent checks/re-programming.

Increase from 0 to 1 Band 4 (Senior Cardiac Assistant Practitioner):

- Support Senior Cardiac Physiologists during complex pacing follow-up clinics as per BHRS guidelines. Pacemaker clinics.
- To work within the cardiac catheter lab (once deemed competent) during non-PCI or pacing implantation cases – thereby freeing a Cardiac Physiologist to be involved in complex procedures – this will support 6 day working in the department.
- Involved during Arrhythmia Clinics (fitting of long term ambulatory devices, analyses and reporting of ambulatory tests once deemed competent) - thereby freeing a Cardiac Physiologist to be involved in complex procedures.
- Involvement in the Heart Failure clinics – for patients being considered for ICD/CRT ambulatory monitors maybe considered to assess ectopy burden prior to device/treatment selection.
- Involvement during optimization of devices in clinic to ensure patient receives full benefit of device.

Increase from 0.48 to 3 Band 3 (Assistant Cardiac Practitioner):

- Involved during Arrhythmia Clinics (fitting of long term ambulatory devices, analyses and reporting of ambulatory tests once deemed competent) - thereby freeing a Cardiac Physiologist to be involved in complex procedures. This will also aide in lowering the current waiting times from 4-5weeks to 2 weeks
- Support 7day working within the department
- Provide cover in HF clinics for patients requiring diagnostic tests prior to CRT/ICD selection

Band 3 Administrative and Secretarial requirements for Complex pacing and PCI 2.00 WTE

Requirements for audit and data input, increased audit arrangements will be needed to comply with:

- National databases BCIS-CCAD and NICOR.
- Regional audit (East Anglian regional PCI audit).
- Local audit.

When attend for pre-assessment patients need booking onto system and on the day of procedure. These personnel will assist with effective list management, for both waiting list and the daily schedule arrangements.

Band 3 Administrative support 1.00 WTE Cardiology Investigations Department

Every patient needing the procedure will be booked locally, this requires them to be booked onto PAS and TOMCAT. Patient letters will need collating and sending out, they will need to be available to manage incoming queries and contacting patients directly if arrangements alter. These processes are part of the 'cardiology booking team' responsibilities and will be undertaken by the Band 3/4 team. Band 2 support for reception and general clerical duties will enable to booking team to be released from these tasks and support 6 day working.

Medical Secretary Band 2 1.8 WTE

This increase in establishment will cover the additional activity generated by the PCI patients from their outpatient appointment to their actual procedure. The clinical admin and associated correspondence i.e. GP letters will need transcribing and typing.

Validation of Etrack pathways for PCI patients, and a predicted increase in general admin due to increased outpatient follow ups.

Location

The PCI and Complex Pacing service can start within the existing Cath Lab requiring some additional equipment only. As the service builds up there will be a need to fit out additional cathlab to provide the full service to PCH core patients. This is expected to be in year 2019/20 and the financial analysis shows this.

5 Financial Case

Figure 17 - Costing summary

Financial Appraisal: Complex Pacing & PCI - PCH Core Area Only											
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr 1-10
2018/19 Price Base	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s
Activity:											
Complex Pacing - start date Apr 2020		84	84	84	84	84	84	84	84	84	
PCI - start date Q2 2019	98	131	384	408	424	424	424	424	424	424	
Capital costs	-	-	2,238	-	-	-	-	-	-	638	2,875
Income											
Complex pacing	-	547	568	595	643	643	643	643	643	643	5,565
PCI	286	381	1,120	1,190	1,236	1,236	1,236	1,236	1,236	1,236	10,395
Urgent angiogram - non proceed	71	138	328	392	407	407	407	407	407	407	3,371
Outpatient follow up	12	33	66	71	75	75	75	75	75	75	631
Excluded devices	-	351	351	351	351	351	351	351	351	351	3,158
Total income	369	1,451	2,433	2,598	2,712	2,712	2,712	2,712	2,712	2,712	23,120
Expenditure											
Pay	384	667	795	795	795	795	795	795	795	795	7,412
Non-pay - Pacing	-	562	574	591	591	591	591	591	591	591	5,273
Non-pay - PCI	148	186	538	570	570	570	570	570	570	570	4,865
Non-pay - maintenance, lifecycle and Soft FM	-	-	71	71	71	71	71	71	71	71	564
Depreciation	-	-	76	76	76	76	76	76	76	76	604
PDC	-	-	76	73	70	68	65	62	60	71	545
Total expenditure	532	1,416	2,129	2,176	2,173	2,170	2,168	2,165	2,162	2,174	19,264
Total Direct Contribution	- 163	35	303	423	539	541	544	546	549	538	3,855
Discount Factor (3.5%)	0.96618	0.93351	0.90194	0.87144	0.84197	0.81350	0.78599	0.75941	0.73373	0.70892	
Net Present Value	-157	33	-1,681	430	513	498	483	469	455	-21	1,020
DCF	1.035										

Costing assumptions

Activity and income

- The base case level of activity represents activity that is within PCH's "core" catchment area based on actual activity information supplied by Papworth.
- Activity lines used are those currently used on PCH core area patients at Papworth.
- It has been estimated that 75% of patients will take up Cardiac Rehab (conservative as all patients will be offered rehab).
- The activity phasing used is consistent with the current Cardiology team and anticipated recruitment levels.
- Complex Pacing - expected start date of 1/04/20.
- PCI - expected start date of 1/07/19. Full roll out from 1 April 2020.
- 18/19 tariffs have been applied and uplifted for NWAFT's Market Forces Factor (MFF).
- All pacemaker patients will have two follow up outpatient appointments per annum.
- All PCI and angiogram patients will have one follow up outpatient appointment per annum.
- As per BCIS activity assumptions, it is expected that 38.9% of patients will have an angiogram but will not proceed to PCI.
- 10% of urgent PCI patients are expected to have a multi-vessel procedure i.e. 3+ stents.
- The programme shows only appropriate activity that would have been undertaken at Papworth on PCH core area patients transferring to PCH.

- The target population for Pacing and PCI show a growth of 3.72% year on year. This has not been factored in to the activity and income as no equivalent factor is available for costs or tariffs.

Pay

- All WTE staffing requirements are as defined by the Cardiology Project Team.
- The WTE has been phased in line with the activity phasing expectation.
- Mid-point pay costs have been used (including on-costs).

Non-Pay

- Stenting costs are based on supplier quotes and BCIS averages in terms of consumables required.
- 10% of all PCIs will be multivessel requiring additional stenting consumables.
- Pacing device costs are based on supplier quotes.
- ICD/CRTD device costs are excluded from tariff i.e. this expenditure will be cost neutral as will be passed on to commissioners as per PbR rules.
- All costs include VAT where appropriate.
- No potential consumable rebates have been applied.

6 Management Case

Arrangements for management and delivery

Key tasks are:

- a) procurement and installation of equipment:
 - i. The equipment needs to be compatible with/same brand as existing to ensure interoperability and reduce the training burden. Having equipment from the same manufacturer and all staff familiar with that range has a positive impact on patient safety
 - ii. Opportunities exist to schedule procurement with existing equipment purchases/renewals already in the capital plan. This has a reducing influence on costs.
 - iii. The ramp up phase following mobilisation is designed to minimise capital expenditure whilst ensuring that forecast demand can be dealt with.
- b) recruitment of additional staff:
 - i. Timing of recruitment to mesh with delivery and installation of equipment so that necessary training and familiarisation can be completed prior to service commencement.
 - ii. Additional staff are planned to be recruited as the demand requires and the service grows.

Project management

The project will be managed by the Cardiology Service Team supported by Keith Reynolds Associate Director of Planning and Strategy. Resource required is loaded towards the mobilisation phase.

Constraints/dependencies

The critical dependency is the building of a 2nd Cathlab by converting the current Pacing and CCU4 areas into a space for an interventional system to enable full roll out.

High Level Project Plan

The proposed implementation timeline is set out in Figure 18 below:

Figure 18 – Proposed implementation timeline

Action	Due Date
Obtain Trust Board sign off of OBC	Oct 16
Obtain NHSE and CCG approval and ensure reflected in October STP plan Include in 19/20 commissioning intentions.	Dec 18
Commence BCIS audit process. <i>The BCIS audit process is planned for five months to allow a degree of slippage. Experience from elsewhere shows that the audit process is usually completed in a little over three months.</i>	Jan19
Commence recruitment: <ul style="list-style-type: none">• Complex pacing.	Jan 20

• PCI.	Jan 19
Commence complex pacing. <i>The consultant identified for this work currently sees the patients from the PCH core area at Papworth. Suitable patients only will be seen at PCH.</i>	Jan 21
Obtain BCIS approval. <i>See above.</i>	Jan-Jun 19
Commence PCI.	Jul 19
Construct second cath lab	FY22

There are a number of risks to the success of this service development as follows:

Figure 19 - Delivery risks

Potential Risks and Mitigation	Likelihood Score (A)	Severity Score (B)	Overall Risk (A x B)
<p>Failure to obtain commissioner approval.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) C & P commissioners have confirmed informally that they will support service developments which form part of the STP which this service development does. b) PCH Cardiology to undertake Lincolnshire CCG and NHS England engagement to explain patient benefits and system savings. c) Formal commitment to be obtained as part of the business case approval process. 	3	5	15 (significant)
<p>Failure to recruit staffing on time.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) Provision of complex pacing and PCI will further enhance the attractiveness of the PCH Cardiology service and improve recruitment potential. b) Mobilisation plan shows a planned build up to full capacity in 2018/19 allowing sufficient recruitment time. 	2	5	10 (Moderate)
<p>Demand exceeds capacity, i.e. activity is higher than the estimates used in this business case.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) The baseline case used in this proposal covers appropriate activity from the PCH core area which it is reasonable to expect will use services at PCH. 	2	2	4 (low)






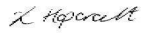


Potential Risks and Mitigation	Likelihood Score (A)	Severity Score (B)	Overall Risk (A x B)
<ul style="list-style-type: none"> b) The service has a phased implementation plan so adjustment can be made to capacity to meet the actual service demand. c) The lab capacity plan also has options for use on a second half day if needed. d) Activity variances have been modelled to ensure the robustness of the financial analysis. 			
<p>Demand fails to reach the levels indicated.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) Current demand within the PCH core area supports the PCI figure of 391. b) The population profile for Peterborough predicts demand for PCI above the national average. c) The population growth for the older age group in Peterborough is forecast to be well above the national average. 	1	4	4 (low)
<p>Failure to obtain BCIS approval on first application.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) The project timeline allows five months for this process to cater for unforeseen issues. 	1	4	4 (low)
<p>Reduction in tariffs.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) Any reduction in tariff will be based on the changing national costs of carrying out the procedures covered by this proposal. Therefore, reduced income would be matched with reduced costs. 	2	4	8 (low)
<p>Delay in completion of Theatre fire remedial works.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> a) The project plan includes a strategy for dealing with any delay to the fire remedial works and preserves the start date. (to be confirmed.) b) Longer working days and weekends can be scheduled 	2	3	6 (low)
<p>Failure to find a partner organisation to provide cover.</p> <p><u>Mitigation</u></p>	1	5	5 (low)

Potential Risks and Mitigation	Likelihood Score (A)	Severity Score (B)	Overall Risk (A x B)
a) First choice existing partner Papworth b) Other possibilities exist			

7 Information for Post-implementation Review

- Service commencement as per project plan.
- Installation of all equipment by planned service commencement date.
- Recruitment, induction and training of staff by service commencement dates.
- Patient volumes as per forecast.
- Achievement of forecast reduction in bed days for this patient cohort.
- Pay and non-pay costs as per forecast/budget.

8 Stakeholder Agreement

NAME	POSITION	SIGNATURE	DATE
Sue McIntosh	Project Sponsor		14/10/16
Stella Hayes	Project Manager		10.9.16
Jo Porter	Clinical Lead		10/9/16
Jon Naylor	CD Support		14/10/16
Justin Wilkinson/Kerrie Owen	CD Support		10/9/16
Wyn Hughes	Medical Devices Group Chair	N/A	
N/A	PAGIT Group Chair or Vice Chair		
John White	Estates and Facilities Project Manager		
Lynne Evans	Senior Buyer Projects	N/A at this stage	
Kate Hopcraft	DDoF Performance, Information & Contracting		14/10/16
Bozena Krogulec	Capital Accountant		12/10/16
Amanda Parry	Finance Business Partner		14/10/16
Paul Boughton	Financial Planning & Analysis Team		12/9/16
Paul Lamb	Capital Committee Chair		
	IMG Chair		

	FIC Chair		
	Trust Board Chair		

9 Appendix

9.1 Appendix A – Financial Analysis



UPDATED - Pacing
and PCI Costing @ Oct

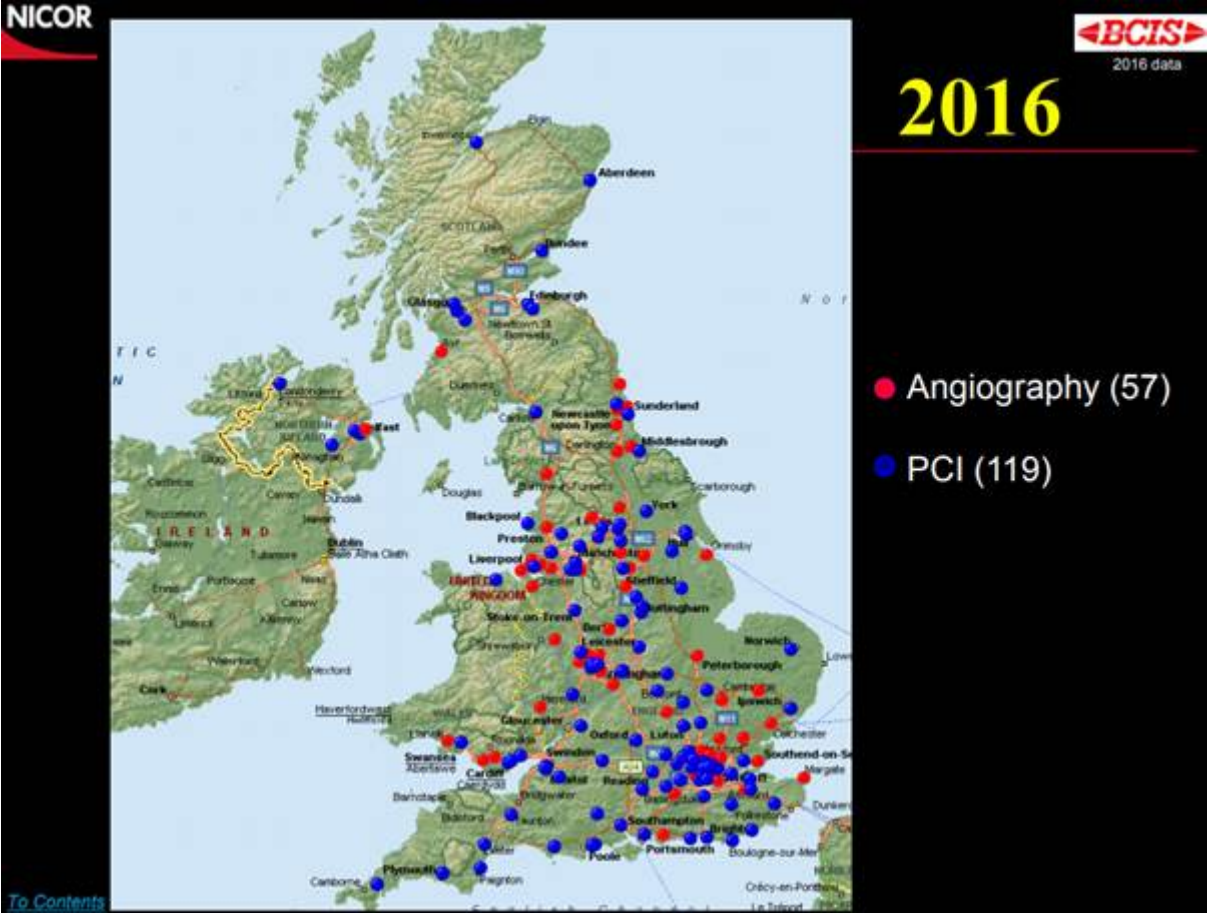
9.2 Appendix B – Distribution of implanting provision and PCI nationally

Map showing complex pacing centres highlighting the lack of provision in the East of England. Each star is an implanting centre- bigger stars are multiple centres close together.

The East of England is less well provided for. The new Papworth will be 37 miles to the south and the furthest north device patient is in Grantham 37 miles north.



Map showing PCI centres across the United Kingdom which highlights the lack of provision in the East of England.

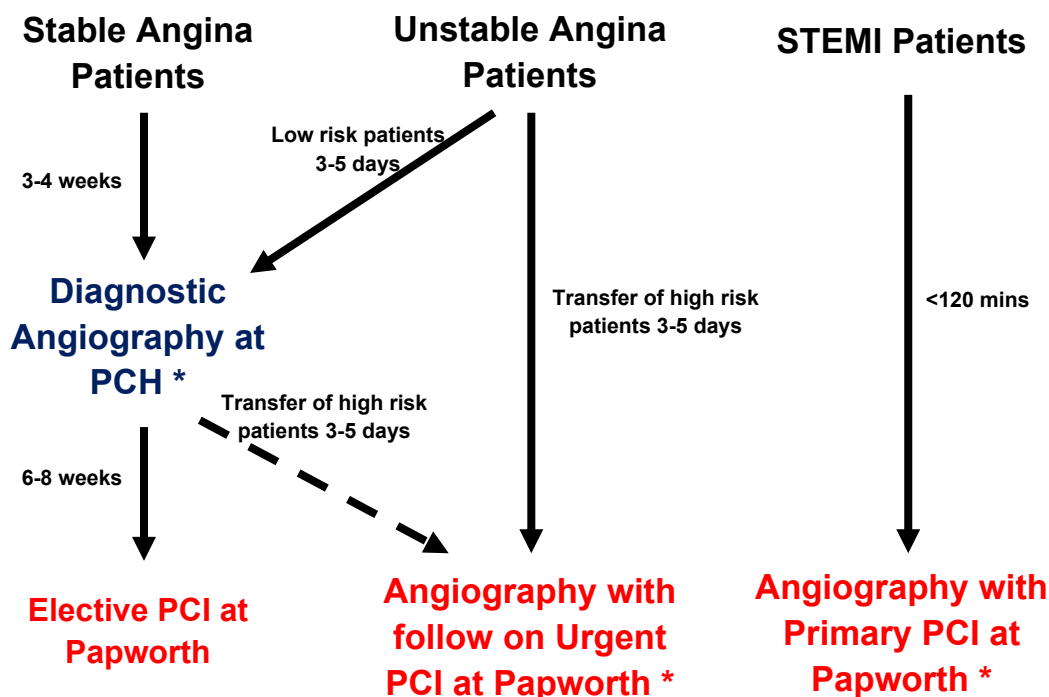


9.3 Appendix C – Bed occupancy associated with transfer of patients to Papworth

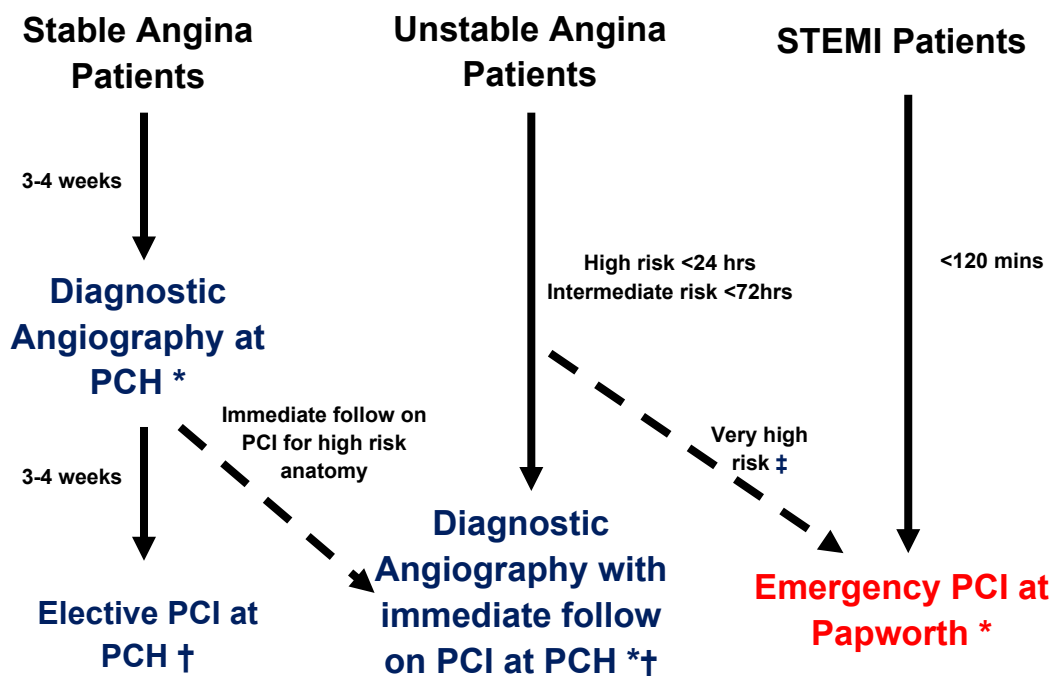
Patients transferred to Papworth for PCI (1 and 2) - 1 January 2015 to 31 January 2016									
Table 1									
Commissioner	06H00	99D00	03W00	04Q00	08D00	09W00	12A00	13P00	Total
	C & P	S Lincs	E Lei & Ru	SW Lincs					
Number of spells	131	52	7	5	1	1	1	1	199
Spell cost	£326,004	£138,294	£17,807	£13,950	£3,328	£3,183	£999	£3,183	£506,748
Total LOS	594	229	26	14	6	10	1	11	891
%age of cases	66%	26%	3.5%	2.5%	0.5%	0.5%	0.5%	0.5%	
cum %age cases	66%	92%	95%	98%	98%	99%	99%	100%	
Potential bed day savings (1)	414.9	143.5	22.9	13.7	4.7	8.6	1.6	7.4	617
Potential cost savings	£227,699	£86,632	£15,704	£13,695	£2,629	£2,734	£1,554	£2,149	£352,794
MFF saving	£4,281	£1,629	£295	£257	£49	£51	£29	£40	£6,633
Total saving	£231,980	£88,260	£15,999	£13,952	£2,678	£2,785	£1,583	£2,189	£359,427
(1) Total length of stay less difference between admission date and fit for procedure date							PSHFT MFF		1.060237741
Average bed day tariff							Papworth MFF		1.08017138
							Saving		0.9815
							Cost saving		1.9%
Table 2									
Commissioner	06H00	99D00	03W00	04Q00	08D00	09W00	12A00	13P00	Total
Number of angios at PCH	37	18	1	1	0	1	0	1	59
Cost of angio included in spell cost in table 1									
Commissioner									
03W00	East Leicestershire and Rutland CCG								
04Q00	South West Lincolnshire CCG								
06H00	Cambridgeshire and Peterborough CCG								
08D00	Haringey CCG								
09W00	Medway CCG								
12A00	South Gloucestershire CCG								
13P00	Birmingham Crosscity CCG								
99D00	South Lincolnshire CCG								

9.4 Appendix D – Current and proposed patient pathways

Current Pathway



New Pathway



*Subgroup managed medically or with surgery
 † After discussion in a cardiology MDT it is envisaged that a small subgroup of patients will be referred for PCI in a tertiary centre

‡ Very high risk as per 2015 guidelines for the management of ACS NSTEMI

9.5 Appendix E – Risk criteria mandating invasive strategy in NSTEMI-ACS

Table 13 Risk criteria mandating invasive strategy in NSTEMI-ACS

Very-high-risk criteria
• Haemodynamic instability or cardiogenic shock
• Recurrent or ongoing chest pain refractory to medical treatment
• Life-threatening arrhythmias or cardiac arrest
• Mechanical complications of MI
• Acute heart failure
• Recurrent dynamic ST-T wave changes, particularly with intermittent ST-elevation
High-risk criteria
• Rise or fall in cardiac troponin compatible with MI
• Dynamic ST- or T-wave changes (symptomatic or silent)
• GRACE score >140
Intermediate-risk criteria
• Diabetes mellitus
• Renal insufficiency (eGFR <60 mL/min/1.73 m ²)
• LVEF <40% or congestive heart failure
• Early post-infarction angina
• Prior PCI
• Prior CABG
• GRACE risk score >109 and <140
Low-risk criteria
• Any characteristics not mentioned above

CABG = coronary artery bypass graft; eGFR = estimated glomerular filtration rate; GRACE = Global Registry of Acute Coronary Events; LVEF = left ventricular ejection fraction; PCI = percutaneous coronary intervention; MI = myocardial infarction.

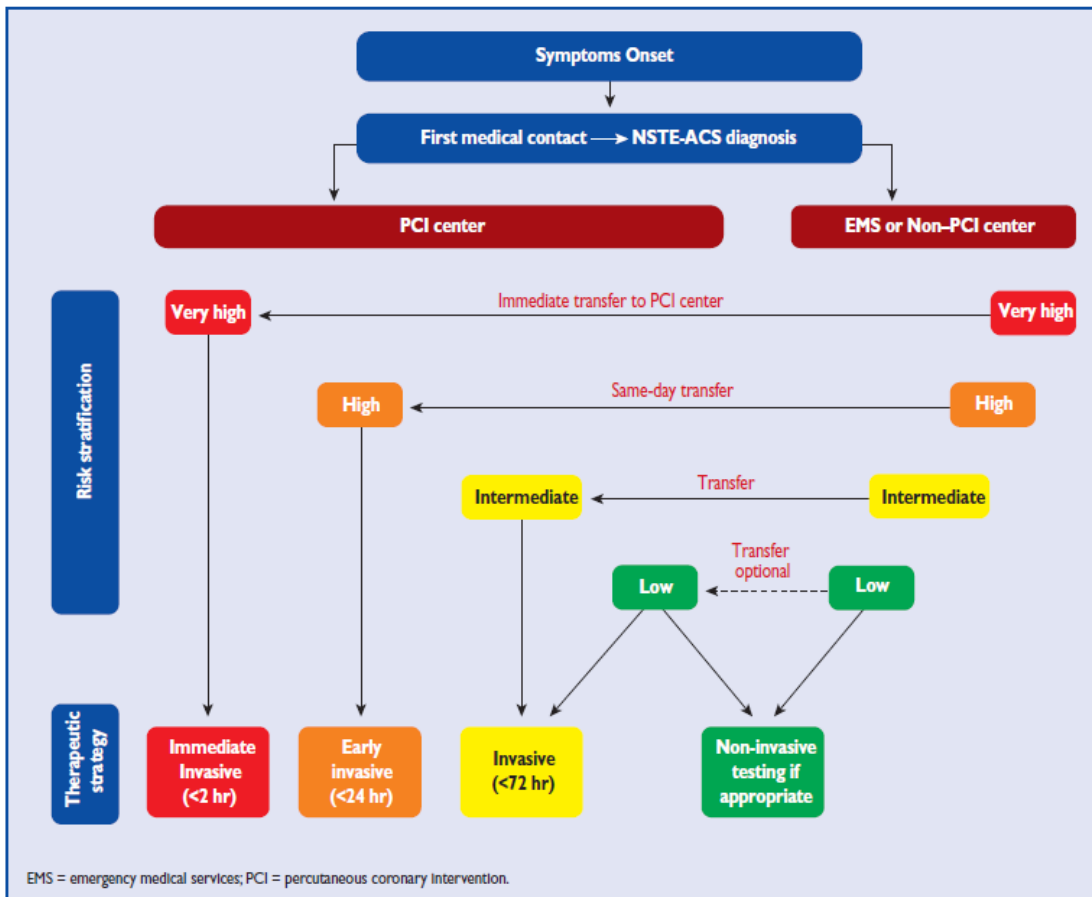


Figure 6 Selection of non-ST-elevation acute coronary syndrome (NSTEMI-ACS) treatment strategy and timing according to initial risk stratification.

9.6 Appendix F – British Heart Rhythm Society guidelines.

BHRS – British Heart Rhythm Society (formerly HRUK) guidelines relating to Clinical Service Guidance in relation to Implantation and Follow-up Cardiac Rhythm Management Devices in Adults (January 2015):

“STAFFING QUALIFICATIONS AND TRAINING

All device implants and device follow up centres must have a designated clinical head of department (HoD). The HoD may either be a specialist registered physician or a specialist healthcare scientist. The healthcare scientist(physiologist) lead who is undertaking unsupervised device follow-up must hold BHRS, EHRA or IBHRE certification and have the knowledge and skills equivalent to Agenda for Change band 7. Depending on the clinic throughput, it is recommended that the clinic should be run by two staff, one of whom meets the lead role competencies.

2.1 HIGHLY SPECIALISED CARDIAC PHYSIOLOGIST

- a. A qualified cardiac physiologist (BSc Clinical Physiology or equivalent) with the knowledge and skills equivalent to Agenda for Change band 7*
- b. Evidence of post-graduate training in cardiac rhythm management techniques, e.g. holds appropriate certification with BHRS, EHRA or IBHRE*
- c. Hold current ILS or ALS accreditation*
- d. Evidence of continuing professional development (CPD) in cardiac rhythm management*

4. ICD/CRT FOLLOW UP CLINICS

There should be a clearly defined protocol documenting the lines of communication and support between the lead cardiac physiologist for the ICD and CRT follow-up service and the consultant cardiologist responsible for the on-site service to ensure that clinical governance requirements are met. ICD and CRT follow-up clinics should not be undertaken without a designated physician available on site. There should be a 24hr emergency service available to deal with patients admitted for multiple shock delivery or non-delivery of appropriate therapy. This should consist of an appropriately trained cardiac physiologist and an appropriately trained cardiologist, either on site or with clearly defined, documented and agreed protocols with other implanting centres to provide emergency on-site treatment.

9.7 Appendix G – Proposed Cath Lab schedule
 Cath lab Capacity

	Monday	Tuesday	Wednesday	Thursday	Friday
8.30	Proceed	Proceed	Proceed	Proceed	Proceed
8.50					
9.10					
9.30					
9.50	Proceed	Proceed	Proceed	Proceed	Proceed
10.10					
10.30					
10.50					
11.10					
11.30	Proceed	Proceed	Proceed	Proceed	Proceed
11.50					
12.10					
12.30					
12.50					
13.10	Proceed	Proceed	Proceed	Proceed	Proceed
13.50					
14.00					
14.20					
14.40					
15.00	Proceed	Proceed	Proceed	Proceed	Proceed
15.20					
15.40					
16.00					
16.20					
16.40	uPPM	uPPM	ePPM	ePPM	loop/box
17.00					
17.20					
17.40	ePPM	uPPM	ePPM	ePPM	loop/box
18.00					
18.20	ePPM	uPPM	uPPM	ePPM	ePPM
18.40					
18.50					
19.00					
19.20	ePPM	uPPM	ePPM	ePPM	ePPM
19.30					

Key	
Proceed (10)	elective PCI (5)
ePPM (12)	uPPM (2)
CRT (6)	loop/box (2)

Indicative slots per week in brackets . The cath lab will be re-opened as needed out of hours for emergency pacing / temporary pacing wire insertion. At the weekend it is envisaged the lab will be opened on Saturday

(and if needed Sunday) for high / intermediate risk patients. PPCI patients and very high risk ACS patients will be transferred emergently to Papworth at all times.

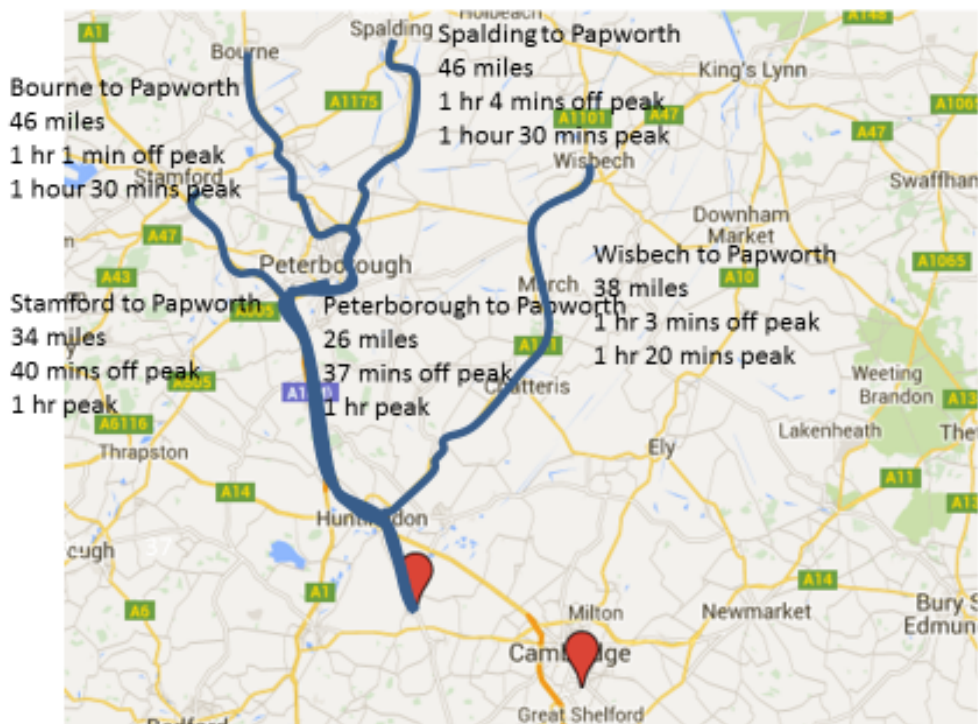
9.8 Appendix H – Travel times for PCH catchment patients to Papworth at CBC

- 30-80% increase in travel time following move to Cambridge Biomedical Campus (CBC)
- Longest travel time 2hr 10m (130 mins peak from Spalding)
- Travel time from Peterborough is 1 hour 50 mins at peak time (40 miles)
- Off peak travel time range from just under an hour to over 1½ hours
- Furthest travel distance to Papworth in PCH catchment is 68 miles from Spalding compared to 19 miles to PCH

	No. of PCI	PCH			Papworth (Cambridge Biomedical Campus)			Total travel reduction PCI at PCH No of pts x additional hours travel x return journey			
		Miles	Off peak mins	Peak mins	Miles	Off peak mins	Peak mins	Off peak mins	Off peak hrs	Peak mins	Peak hrs
Pboro	231	3	9	12	40	55	110	10,626	354	22,638	755
Stamford	33	13	20	22	44	58	110	1,254	42	2,904	97
Bourne	17	16	35	35	61	79	130	748	25	1,615	54
Spalding	35	19	35	40	68	93	130	2,030	68	3,150	105
Wisbech	84	22	40	40	44	77	110	3,108	104	5,880	196
Total	400							17,766	593	36,187	1,207

Peak = Monday 12 September 2016 departing 7.30am Off peak = Monday 12 September 2016 departing 2pm using Google maps.

Peterborough and South Lincolnshire residents already have long travel distances to the existing Papworth site.



Google map travel distances and times to Papworth hospital off peak = Wednesday at 2pm, peak = Thursday leaving at 7.30am

This will increase significantly when Papworth moves to the new Papworth site next to the Addenbrookes in Cambridge.



Google map travel distances and times to Papworth hospital off peak = Wednesday at 2pm, peak = Thursday leaving at 7.30am