

Cardiovascular project

Financial analysis

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Executive summary

The table below is a summary of the direct costs to commissioners and providers of implementing the recommendations in the model of care. The table is separated into the three separate workstreams and then each of the individual recommendations are addressed in turn.

Table 1: Summary of costs to commissioners and providers of implementing the proposed cardiovascular model of care.

	Commissioner £'000	Provider £'000
Vascular surgery		
Market forces factor	(92)	
Increase uptake of endovascular aneurysm repair to 70%	(372)	186
Reduce length of stay following carotid endarterectomy surgery		150
Reduce length of stay following lower extremity arterial bypass		430
TOTAL – Vascular surgery	(464)	766
Cardiac surgery		
Reduce cardiac valve excess bed days to that of the best performing unit	47	
Reduce coronary bypass excess bed days to that of the best performing unit	285	
Increase mitral valve repair	290	
Reduce pre-transfer length of stay for non-elective cardiac surgery (to maximum of five days)		2,800
Reduce post-operative length of stay		2,300
TOTAL – Cardiac surgery	622	5,100
Cardiology		
Reduce double admission of high risk NSTEMI patients	1,000-4,000	
Reduce admission of low risk NSTEMI patients	850-3,400	
Increase electrophysiology uptake	(4,100)-(2,000)	
TOTAL – Cardiology	(2,250)-5,400	



Introduction

As part of the development of the model of care for cardiovascular services in London, the cost implications of the model for each area of work – vascular services, cardiac surgery and cardiology – have been evaluated. The evaluation involved a detailed analysis based on the recommendations proposed in each model.

This paper sets out the analysis and conclusions of the financial assessment. The financial analysis took into consideration the potential cost implications for both commissioners and providers.

The cost implications are different for providers and commissioners because of the payment currency for patients admitted to hospital. Commissioners pay for elective and non-elective admissions as part of a Health Resource Group (HRG) spell cost – this cost includes a pre-determined number of bed days, known as a trimpoint. The cost to commissioners is the same even if the patient stays in hospital for a shorter length of time than the trimpoint. If patients stay in hospital longer than the trimpoint there is an additional cost to commissioners for excess bed days.

When service redesign reduces length of stay within the trimpoint this does not affect the tariff payable by commissioners, however the provider will be able to avoid costs associated with an occupied bed. When the redesign reduces the amount of bed days occurred beyond the trimpoint there is a saving for commissioners.

The overall analysis demonstrates that implementing the models will be at worst cost neutral with probable savings for both commissioners and providers. Savings and cost pressures are found at different points of the models of care, with some element of co-dependency.

1. Vascular surgery

Arterial surgery encompasses surgery on abdominal aortic aneurysms and surgery on other arteries in the body. This includes procedures such as abdominal aortic aneurysm repair, carotid endarterectomy surgery, lower extremity arterial bypass and limb angioplasty.

The vascular services model of care proposes that all elective and emergency arterial surgery in London should be centralised and delivered at five central vascular units. This means the delivery of all arterial procedures will be relocated and will only take place at the designated five units (see appendix 1 of the model of care).

1.1 Economic impacts of centralising vascular surgery

Market forces factor

The market forces factor is an index that factors geographical variations in the costs of providing health services. This means a cost percentage is added to the national tariff price for areas that have higher unavoidable costs such as land values and staffing costs.

The financial implications of relocating all arterial surgery to five central units in London were assessed. For the purposes of this financial modelling, the assessment was based on having one central unit per London sector. North east inner and north east outer London sectors were considered together due to the low volumes of arterial procedures performed in these sectors. The model was based on relocating arterial surgery to the current highest volume unit in each of the five sectors.

Based on this modelling there would be an overall projected cost to commissioners due to changes in market force factors of the providers (in most cases high volume units occupy central London locations, which incur a higher market force factor cost relative to those units in outer London).

Table 2 shows whether there would be a cost saving or cost incurred for the relocations used in the current modelling. For example, if arterial surgery were relocated to the highest volume unit in each sector.

Table 2: Financial impact on commissioners, HES 2007/08

Sector	Change in costs £000
North West London	(50)
North Central London	(10)
North East London	(38)
South East London	13
South West London	(7)
TOTAL	(92)



Economic impact on some providers losing arterial activity

Centralisation will result in some providers' activity being relocated to central units. The impact of this was analysed based on arterial surgery moving to the current highest volume unit in each London sector. North east inner and north east outer London sectors were considered together for the purposes of this financial modelling, due to the low numbers of procedures carried out in both of these sectors. Table 3 shows the impact for individual sector's income.

Table 3: Financial impact on providers losing arterial activity – gain/(loss), HES 2007/08

Sector	Activity	Bed days	Income £'000
North West London			
Trust 1	(115)	(1,995)	(764)
Trust 2	(58)	(785)	(354)
Trust 3	(26)	(180)	(152)
Trust 4	(12)	(136)	(76)
Trust 5	(2)	(14)	(16)
Trust 6	0	0	0
North Central London			
Trust 7	(88)	(828)	(535)
Trust 8	(60)	(921)	(387)
Trust 9	(28)	(344)	(203)
North East London			
Trust 10	(124)	(1,586)	(730)
Trust 11	(36)	(421)	(234)
Trust 12	0	0	0
South East London			
Trust 13	(192)	(2,500)	(1,339)



Trust 14	(64)	(906)	(361)
Trust 15	(1)	0	(5)
South West London			
Trust 16	(81)	(829)	(518)
Trust 17	(15)	(237)	(90)
Trust 18	(6)	(82)	(48)

Economic impact on some providers gaining activity

Increased demand at the central units has been considered insignificant to capacity, as overall volumes are low. Table 4 shows increases in episodes and beds required at each central unit.

Table 4: Increases in episodes and beds required for each central unit

	Activity					
	AAA	CEA	LEAB	TOTAL	Bed days	Beds
Trust 19	66	54	93	213	2,822	8
Trust 20	61	47	68	176	2,242	6
Trust 21	68	39	53	160	1,953	5
Trust 22	66	60	131	257	2,640	7
Trust 23	23	20	59	102	1,331	4

Financial impact for commissioners

The financial impact on commissioners would be an increase in cost of £92k.

There are also likely to be differences in prices for critical care, which do not form part of the national tariff but are negotiated locally. While market force factors only impact on national tariff prices there can be a similar theme in pricing for non-tariff activity. There is insufficient robust data available for critical care to inform this paper and this must be considered at a local level.

Financial implications for providers

For some providers, centralising arterial services will result in a loss of income. The largest loss of income to any one provider is estimated at £1.4m – the impact of which would be less than one percent of trust turnover.



Although some providers will lose some income as a result of activity being relocated, there will be a reduced bed requirement; opportunity to redistribute workforce salaries; and reduced equipment costs. There are provider savings that would be realised as a result.

1.2 Increase uptake of endovascular aneurysm repair

The model predicts an increased uptake of endovascular aneurysm repair procedures rather than open repair techniques for abdominal aortic aneurysm surgery, as a result of centralisation of arterial services.

Predicted increase in endovascular aneurysm repair rates

The impact of increasing endovascular aneurysm repair procedures to 70% was calculated and is shown in Table 5. This was assessed based on arterial surgery moving to the current highest volume units in each sector (with north east inner and outer London being considered together for the purposes of this modelling). Each sites' latest available endovascular aneurysm repair rates were taken into consideration in the analysis.

The payment by result (PbR) spell price for endovascular aneurysm repair is the same as for open surgery. Endovascular aneurysm repair requires less critical care compared with open surgery but incurs costs for non-tariff devices (stents). The cost of the stent needed for endovascular aneurysm repair surgery is estimated at £6k per stent device. Critical care costs are negotiated separately by each provider and are estimated at £1,500 per day. It is estimated that high volume units with a dedicated high dependency unit (circa £600 per day) will use one day in an intensive treatment unit and two days in the high dependency unit for open surgery, and lower volume units without the high dependency unit facility will use three days in an intensive treatment unit. In comparison, endovascular aneurysm repair requires one day in a high dependency unit before transfer to the ward. This was taken into account when assessing the financial impact of increasing uptake of endovascular aneurysm repair to 70%.

Table 5: Increased cost to commissioners of increasing endovascular aneurysm repair (EVAR), HES 2007/08

	Procedures				Costs associated with EVAR £000		
	EVAR	Open	TOTAL	% of EVAR	Critical care	Device (stent)	TOTAL
North West London							
Trust 19							
Current activity	65	56	121	54%	(41)	118	77
Activity that would be gained by centralisation	23	43	66	35%	(64)	144	80

Consolidated activity level	88	99	187	47%	(105)	262	157
North Central London							
Trust 20							
Current activity	35	14	49	71%	0	0	0
Activity that would be gained by centralisation	39	22	61	64%	(26)	74	48
Consolidated activity level	74	36	110	67%	(26)	74	48
North East London							
Trust 21							
Current activity	29	21	50	58%	(13)	36	23
Activity that would be gained by centralisation	18	50	68	26%	(62)	178	115
Consolidated activity level	47	71	118	40%	(75)	214	139
South East London							
Trust 22							
Current activity	86	74	160	54%	(55)	156	101
Activity that would be gained by centralisation	30	36	66	45%	(34)	97	63
Consolidated activity level	116	110	226	51%	(89)	253	165
South West London							
Trust 23							
Current activity	166	19	185	90%	0	0	0
Activity that would be gained by centralisation	17	6	23	74%	0	0	0
Consolidated activity level	183	25	208	88%	0	0	0
LONDON TOTAL	508	341	849	60%	(295)	803	509



Reduced aortic aneurysm repair length of stay due to increased uptake of endovascular aneurysm repairs

Endovascular aneurysm repair is associated with a lower length of stay compared with open repair techniques. The impact on length of stay as a result of increased uptake of endovascular aneurysm repair to 70% was assessed.

Patients receiving abdominal aortic aneurysm repair surgery using endovascular surgery have a lower length of stay compared to those receiving open surgery. Table 6 compares the average length of stay for both types of technique (HES 2007/08 – includes critical care).

Table 6: Average length of stay for aortic aneurysm repair patients, bed days

Average length of stay	Elective	Emergency
Endovascular aneurysm repair	7.6	15.7
Open	12.0	25.5
Difference	4.4	9.8

Increasing usage of endovascular aneurysm repair to 70% will give providers a saving in bed days and costs related to those bed days.

Financial implications for commissioners

Based on HES 2007/08 data, increased uptake of endovascular aneurysm repair to 70% would result in an increase in cost of around £509k to commissioners, due to the additional device but with reduced critical care costs. The larger volume providers have submitted their individual endovascular aneurysm repair rates for 2009. Using this newer data reveals that Imperial, North West London and Kings College already meet the 70% target meaning an overall cost pressure of £372k.

Financial implications for providers

The number of bed days saved across London as a result of reduced length of stay is estimated at 1,267. The average cost for a bed day to a provider can be estimated as 60% (marginal rate) of the excess bed day tariff. For endovascular aneurysm repair the excess bed day tariff (excluding market force factors) is £245, giving a marginal rate of £147 per day. Using this excess bed day tariff it is estimated that £186k is available to London providers as a result of the bed day savings due to the increased uptake of endovascular aneurysm repair to 70%.

Additionally, there will be a reduced usage of intensive treatment unit beds as a result of increased uptake of endovascular aneurysm repair. Assuming costs are equal to income this will be the same £295k benefit to providers and cost neutral overall.

1.3 Reduce length of stay following carotid endarterectomy surgery

Average lengths of stay for carotid endarterectomy are higher in London than the rest of the UK, which also compares unfavourably to other countries in Europe. Centralising services will enable providers to reduce the gap.



The average length of stay in London providers for carotid endarterectomy ranges from two to 14 days with a London average of seven days. Reducing the average length of stay for London providers to the best quartile (five days) would release 1,023 bed days (circa three beds).

Financial implications for providers

Using a 60% marginal excess bed day rate (£245) of £147 this would realise a saving of £150k for carotid endarterectomy.

1.4 Reduce length of stay following lower extremity arterial bypass

The length of stay for patients following vascular surgery varies hugely across the capital. The NHS in London can improve patient experience and reduce the length of stay by performing lower extremity arterial bypass surgery at centralised units.

The average length of stay in London following lower extremity arterial bypass ranges from 10 to 23 days with a London average of 16 days. Reducing the average length of stay for London providers down to the best quartile (12.5 days) would release 2,950 bed days (c. eight beds).

Financial implications for providers

Using a 60% marginal excess bed day rate (£245) of £147 this would realise a saving of £430k for lower extremity arterial bypass.

2. Cardiac surgery

The cardiac surgery model of care makes a number of recommendations around reducing the length of the patient pathway for elective and non-elective patients.

Currently, many patients with heart disease are admitted to a hospital that does not undertake cardiac surgery. This hospital refers and transfers the patient to another hospital for treatment. The waiting time for referral and transfer has the largest effect on prolonging the overall pathway length.

Some patients are admitted to a hospital that can perform the surgery. For these patients it is the time between having the procedure and discharge (for example, the post-operative length of stay) that has the largest effect on prolonging the overall pathway.

The model of care makes a number of recommendations to address this by reducing transfer waiting times and post-operative length of stay. Reducing transfer waiting times and post-operative length of stay will result in cost savings for providers and commissioners.

Additionally, recommendations to improve the delivery of cardiac surgery are made. The implications of all these changes are presented below.

2.1 Reduce cardiac valve excess bed days

At present, PCTs are only being charged excess bed days for 0.9% of patients undergoing valve procedures. However, more efficient working practices in trusts should mean that these figures could be reduced further.

Table 7: Total number and proportion of excess bed days following cardiac valve surgery charged to PCTs in 2007/8 by cardiac surgery units in London

Provider	Total number of bed days	Number of excess bed days	% of excess bed days
Trust 22	6,671	66	1.0%
Trust 19a	1,424	16	1.1%
Trust 23	3,358	53	1.6%
Trust 13	2,489	13	0.5%
Trust 21	7,114	39	0.5%
Trust 19b	2,364	64	2.7%
Trust 7	4,730	4	0.1%
Trust 4	9,092	88	1.0%
TOTAL	37,242	343	0.9% (average)



Table 8 shows the savings resulting from reducing the excess bed days in line with the best performing units, at which only 0.5% of patients stay in hospital over the HRG trim point.

Table 8: Potential excess bed days and cost savings if all trusts reduced their average length of stay to that of the lowest performing trust in London

Cardiac valve procedures	
Total number of excess bed days if all trusts achieved lowest average length of stay	202
Number of excess bed days saved	141
Cost per excess bed day (£)	332
TOTAL SAVING (£)	46,812

Financial implications for commissioners

Reducing the number of excess bed days by cardiac valve surgery patients to that of the best performing units would realise a saving of £47k.

2.2 Reduce coronary bypass excess bed days

PCTs are currently only being charged excess bed days for 3.5% of patients undergoing a CABG procedure but there is opportunity to further reduce this figure.

Table 9: Total number and proportion of excess bed days charged to PCTs in 2007/8 by cardiac surgery units in London

Provider	Total bed days	Number of excess bed days	% of excess bed days
Trust 22	8,436	451	5.3%
Trust 19a	2,471	-	0.0%
Trust 23	5,233	80	1.5%
Trust 13	2,650	45	1.7%
Trust 21	10,195	208	2.0%
Trust 19b	3,904	169	4.3%
Trust 7	5,293	121	2.3%
Trust 4	11,676	647	5.5%
TOTAL	49,858	1,721	3.5% (average)

Table 10 shows the potential that could be achieved by reducing the excess bed days in line with the best performing units, at which only 1.7% of patients stay in hospital over the HRG trim point for coronary bypass episodes.



Table 10: Potential excess bed days and cost savings if all trusts reduced their average length of stay to that of the lowest performing trust in London

Coronary bypass	
Total number of excess bed days if all trusts achieved lowest average length of stay	826
Number of excess bed days saved	895
Cost per excess bed day (£)	318
Total saving (£)	284,610

Financial implications for commissioners

Reducing the number of excess bed days by cardiac valve surgery patients to that of the best performing units would realise a saving of £285k.

2.3 Increase uptake of mitral valve surgery

The model projects an increased uptake of mitral valve repair procedures from the current average of 34% up to 85% as shown in Table 11.

Table 11: Relative mitral valve repair and replacement

HRG	Description	Current		Future	
EA17Z	Repair	303	34%	757	85%
EA25Z	Replacement	588	66%	134	15%
	TOTAL	891		891	

Based on 2007/08 HES data, increased uptake of mitral valve repair to the minimum 85% would result in the following savings.

Table 12: Reduced cost to commissioners due to uptake of mitral valve repair procedures (HES 2007/08)

HRG	Description	Elective	Current	Future	Difference
		£	£'000	£'000	£'000
EA17Z	Repair	9,304	2,819	7,043	
EA25Z	Replacement	9,942	5,846	1,332	
	TOTAL		8,665	8,375	290

Mitral valve repair is associated with a lower length of stay as shown in Table 13.

Table 13: Reduced length of stay from increasing to mitral valve repair to 85%

HRG	Description	Average length of stay	Current	Future	Difference
EA17Z	Repair	15.2	4,599	11,490	
EA25Z	Replacement	16.9	9,958	2,269	
	TOTAL		14,557	13,759	798



Financial implications for commissioners

Increasing uptake of mitral valve repair procedures to 85% would result in a cost saving of £290k for commissioners, due to the reduced HRG cost and reduced length of stay for delivering mitral valve repair over replacement.

Financial implications for providers

Reducing the total average episode length due uptake of mitral valve repair to 85% would result in bed day savings of 798 bed days for providers across London based on HES 2007/08 data. Using 60% marginal rate of the excess bed day cost (excluding market force factors) this can be translated as a saving of £129k to offset the reduction in income.

2.4 Reduce pre-transfer delays for non-elective cardiac surgery

The current average length of stay for patients waiting to be referred and transferred to surgical centre for treatment is 14.3 days, as shown in Table 14.

Table 14: Average length of stay before transfer for cardiac surgery procedures in 2007/08 (source, HES)

Cardiac surgery in London	Cardiac valve procedures	Coronary bypass surgery	Total
Finished consultant episodes (FCEs)	486	1,257	1,757
Total bed days	8,323	16,793	25,115
Average length of stay (bed days)	17.1	13.2	14.3

The model recommends that patients identified as high risk and in need of urgent treatment must be transferred by the referring unit within five days of identifying the need for surgery. Using 2007/08 HES data, if all patients requiring urgent cardiac surgery were referred and transferred to a surgical centre within five days the following bed day savings could be realised.

Table 15: Reduced pre-transfer bed days for maximum five day length of stay (HES, 2007/08)

Cardiac surgery in London	Cardiac valve procedures	Coronary bypass	Total
Current total bed days	8,323	16,793	25,115
Bed days at maximum five days wait	2,416	6,347	8,763
Bed days saved	5,906	10,446	16,352

Financial implications for providers

By reducing pre-transfer bed days, units referring cardiac surgery have the opportunity to save around 16,300 bed days. Using a 60% marginal rate per excess bed day of £172, it is estimated that the 16,300 beds days saved represent approximately £2.8m.



2.5 Reduce post-operative length of stay

The average length of stay following elective and non-elective cardiac surgery in London hospitals is variable, along with the associated average bed days currently being utilised.

Table 16: Average length of stay following common cardiac procedures in 2007/08 by London trust (HES, 2007/08)

Provider	Cardiac valve procedures			Coronary bypass		
	Total bed days	FCEs	Average length of stay (days)	Total bed days	FCEs	Average length of stay (days)
Trust 22	6,671	574	11.62	8,436	860	9.81
Trust 19a	1,424	115	12.38	2,471	314	7.87
Trust 23	3,358	263	12.77	5,233	565	9.26
Trust 13	2,489	234	10.64	2,650	308	8.60
Trust 21	7,114	550	12.93	10,195	1,073	9.50
Trust 19b	2,364	179	13.21	3,904	352	11.09
Trust 7	4,730	391	12.10	5,293	540	9.80
Trust 4	9,092	792	11.48	11,676	1,157	10.09
TOTAL	37,854	3,131	12.09 (average)	50,327	5,200	9.68 (average)

The model of care recommends that individual London trusts and units should aim to reduce their average post-operative length of stay for cardiac surgery to that of the best performing. If this were achieved, the following savings could be realised.

Table 17: Resulting bed day saving if all cardiac surgery units reduced their average length of stay to equal the best performing unit

	Cardiac valve procedures	Coronary bypass
Current total bed days	37,854	50,327
Total bed days if all units performed equal to the lowest average length of stay	33,304	40,921
Bed days saved	4,550	9,406
Beds saved	12	25

If trusts were to reduce the number of excess bed days, in line with the best



performing trust, this could save commissioners around £330,000 per year.

Financial implications for commissioners

The HRG trim points for valve surgery and coronary bypass are both considerably greater than the vast majority of patient episodes, including those with the longest length of stay. This means that currently, there are very few excess bed days charged to PCTs and therefore minimal savings for commissioners.

Financial implications for providers

Using a 60% marginal rate of the excess bed day cost (excluding market force factors) for valves (£269) and CABG (£286), this translates to a provider cost saving of £2.3m.

Providers of cardiac surgery in London have the opportunity to save almost 14,000 bed days across London if units improve their performance to match the best performing.

3. Cardiology

When acute coronary syndrome is suspected an electrocardiogram (ECG) is performed. If this shows ST-elevation, it is normally diagnosed as an ST-elevation myocardial infarction (STEMI) heart attack. When acute coronary syndrome is present but ST-elevation is not seen on the ECG, a non-ST elevation acute coronary syndrome (NSTEMACS) is diagnosed.

STEMI patients need emergency treatment, usually percutaneous coronary intervention (PCI). Patients with NSTEMACS also require prompt treatment but are generally managed with medication in the first instance, though an angiogram is usually required during their hospital admission. Emerging evidence suggests this group of patients can also benefit from an early angiogram and possible PCI, where appropriate. Clinical guidelines recommend risk stratification and an early angiogram for these patients.

Currently, patients with a NSTEMACS episode, which finishes with a non-elective PCI, go down one of three possible pathways of care. These are set out below:

- Pathway 1: patients have the diagnostic angiography in a first hospital, before being transferred to a second hospital for PCI (undertaken as a second invasive procedure).
- Pathway 2: patients are admitted to a first hospital, before being transferred to a second hospital for both angiography and PCI (undertaken as a single invasive procedure).
- Pathway 3: patients have both angiography and PCI (undertaken as a single invasive procedure) in the same hospital to which they are initially admitted.

Additionally, a large number of patients are admitted to a hospital with undifferentiated chest pain stay for less than two nights, and are then discharged without intervention.

The model of care proposes changes to the patient pathway, which means patients following each of the current pathways would follow one of two pathways. This would involve patients being triaged and risk assessed at the nearest A&E department. Those identified as high risk would be admitted to a hospital, which is able to provide PCI within 24 hours of initial assessment (this may either be the hospital where they were risk assessed or involve transfer to another hospital).

A proportion of patients who currently go down pathway 1 or 2 will, under the new pathway, have a hospital admission prevented. Patients who currently go down pathway 3 have been excluded from the calculations as, under the new model, they will not have an admission prevented in their pathway. The reduction in extra hospital admissions will realise cost savings for commissioners.

Additionally, it is envisaged that a proportion of patients currently admitted to a hospital with undifferentiated chest pain and then discharged home without intervention would be triaged in A&E and discharged to their GP without being admitted. This will result in reduced hospital admissions and costs.

3.1 Reduce double admissions for high risk NSTEMI patients

Patients presenting with chest pain, but without STEMI on their ECG, will include many NSTEMI patients but also many more who will subsequently be diagnosed as having other causes of chest pain. In 2008/9 the London Ambulance Service took 67,000 people to hospital with acute chest pain¹.

Calculation of NSTEMI patient numbers

It was not possible to accurately obtain the number of patients in London who annually have an NSTEMI event. This is largely due to differences in coding practices at individual units and patchy use of databases. Therefore, to model the number of NSTEMI patients that would be affected by the changing pathways, the project had to make a number of assumptions namely:

- The UK national ratio of STEMI to NSTEMI events is around 1:3. The MINAP database has records for 2,500 STEMI events in London in 2008/09.
- The MINAP database recorded 3,836 NSTEMI diagnoses in 2008/09 but this number did not have submissions from several London trusts and other trusts had obviously low submissions.
- The MINAP database often does not include submissions from specialties other than cardiology. For example, if a patient is under a care of the elderly team it is likely that their record is not in the MINAP database.

Combining these issues with data from HES, the clinical expert panel for cardiology agreed on a figure of 7,500 patients in London annually have a diagnosis of NSTEMI. Once this figure was agreed, it was divided up in the same proportions as the data in the MINAP database. This gave us a feel as to where these patients are currently being treated and allowed analysis to be undertaken of what the impact of the changes to this pathway of care would be.

Of the estimated 7,500 diagnosed NSTEMI patients in London, it is envisaged a percentage will be assessed as high risk under the new pathway proposals and will require transfer for angiography. Based on the MINAP proportions, this figure is estimated as 3,754. It is envisaged that of these 3,754 patients a percentage will avoid two hospital admissions. The cost implication of this was assessed based on an average cost of the first admission taken from HES 2007/08 of £2,146 per spell.

As the number of these 3,754 patients who would be possible candidates for early transfer is unknown, the assessment for NSTEMI has been calculated for 12.5%, 25% and 50% to gauge a broad picture of the financial implications. As such, the financial implications for commissioners and providers are represented as a range of rather than a definitive figure.

Financial implications for commissioners

¹ Source: Mark Whitbread (personal communication) on behalf of the London Ambulance Service.

The savings associated with avoiding double admissions of high risk NSTEMI patients are highlighted in Table 18. Under the new pathway, triage will take place in a local A&E department for which the associated cost is likely to be minimal (assuming all patients come through local A&E anyway).

Table 18: Potential cost savings by avoiding double admissions of high risk NSTEMI patients

	% of 3,754	Number of patients	£'000
NSTEMI patients transferred for angiography (estimated at 3,754) and then diagnosed as high risk	12.5%	469	1,007
	25%	939	2,014
	50%	1,877	4,028

The range of cost savings based on this modelling is therefore is between £1m and £4m.

3.2 Reduce admissions for low risk NSTEMI patients

It is envisaged that early diagnosis in A&E will also avoid many unnecessary hospital admissions for patients diagnosed without NSTEMI. Currently many patients are admitted to hospital with undifferentiated chest pain and are discharged within two days, without intervention.

Table 19 displays all of the patients in London in 2007/08 who were admitted to hospital with a diagnosis that relates to chest pain, had a length of stay of less than two days and were then discharged home. All these patients did not attract the full tariff price due to their short length of stay. The codes for these patients have a letter 'S' added to the code in the label column.

Table 19: Chest pain patients with length of stay zero or one day (HES 2007/08)

Label	HRG description	FCEs	Non-elective tariff £	Value £000
E35S	Chest pain >69 or with cc	4,177	461	1,926
E36	Chest pain <70 without cc	12,404	394	4,887
TOTAL		16,581	411 (average)	6,813

Financial implications for commissioners

Patients who are admitted for less than two days are currently costing commissioners £6.8m. Risk assessing patients in A&E means that a proportion of these patients may be discharged to their GP directly from the A&E department without being admitted to the hospital, resulting in cost savings to commissioners

A range of 12.5%, 25% and 50% of these patients was used as examples to analysis



the potential cost savings of avoiding hospital admissions.

Table 20: Potential commissioner savings avoiding admission of low risk NSTEMI patients

Description	% of 16,581	Patients	£'000
NSTEMI patients transferred for angiography who are diagnosed low risk	12.5%	2,073	852
	25%	4,145	1,704
	50%	8,291	3,407

The range of cost savings therefore is between £850k and £3.4m.

Assumptions

The financial modelling for NSTEMI patients makes a series of assumptions. Where this is the case every effort has been made to be conservative in the estimate and give a worst case scenario.

The implied assumption throughout the paper is that the number of patients who currently end their pathway with a non-elective PCI will be the same number of patients who in future will be triaged as high risk. This assumption had to be made to allow for a comparison between what is happening currently and how the proposed new pathway will affect this.

3.3 Increase in electrophysiology uptake

The model of care proposes that hospitals delivering electrophysiology procedures should do so in organised networks. Specialist unit(s) would deliver complex electrophysiology procedures and would operate a 24-hour emergency service.

Networks would work together to devise plans to improve the identification, referral and treatment of patients in need of complex electrophysiology procedures.

This will help to increase the uptake of complex electrophysiology procedures and meet the current unmet need in London, as recommended by the case for change. Table 21 shows the increase for the next year.



Table 21: Estimated increase in electrophysiology

Procedure	Growth	Rate	Predicted number of procedures per year in London	
			2010	2011
Ablation	Low	5%	172	181
	Medium	10%	197	217
	High	15%	226	260
Pacemaker	Low	5%	3,048	3,200
	Medium	10%	3,505	3,856
ICD	Low	7.2%	384	412
	Medium	7.2%	384	412
CRT	Low	5%	372	391
	Medium	10%	372	409

Based on the model, electrophysiology uptake is predicted to rise between five and 15% year on year to 2020.

Table 22: Increased cost to commissioners for electrophysiology

Electrophysiology	Growth	Spend 2010 £'000	Spend 2011 £'000	Increase £'000
Commissioner cost	High	37,432	39,484	2,052
	Medium	41,925	45,906	3,981
	Low	42,095	46,221	4,126

Financial impact for commissioners

The expected annual increase in costs is estimated to be between £2m and £4.1m for commissioners as shown in Table 22. It is assumed that the tariff and device funding cover the costs making it neutral for providers.

