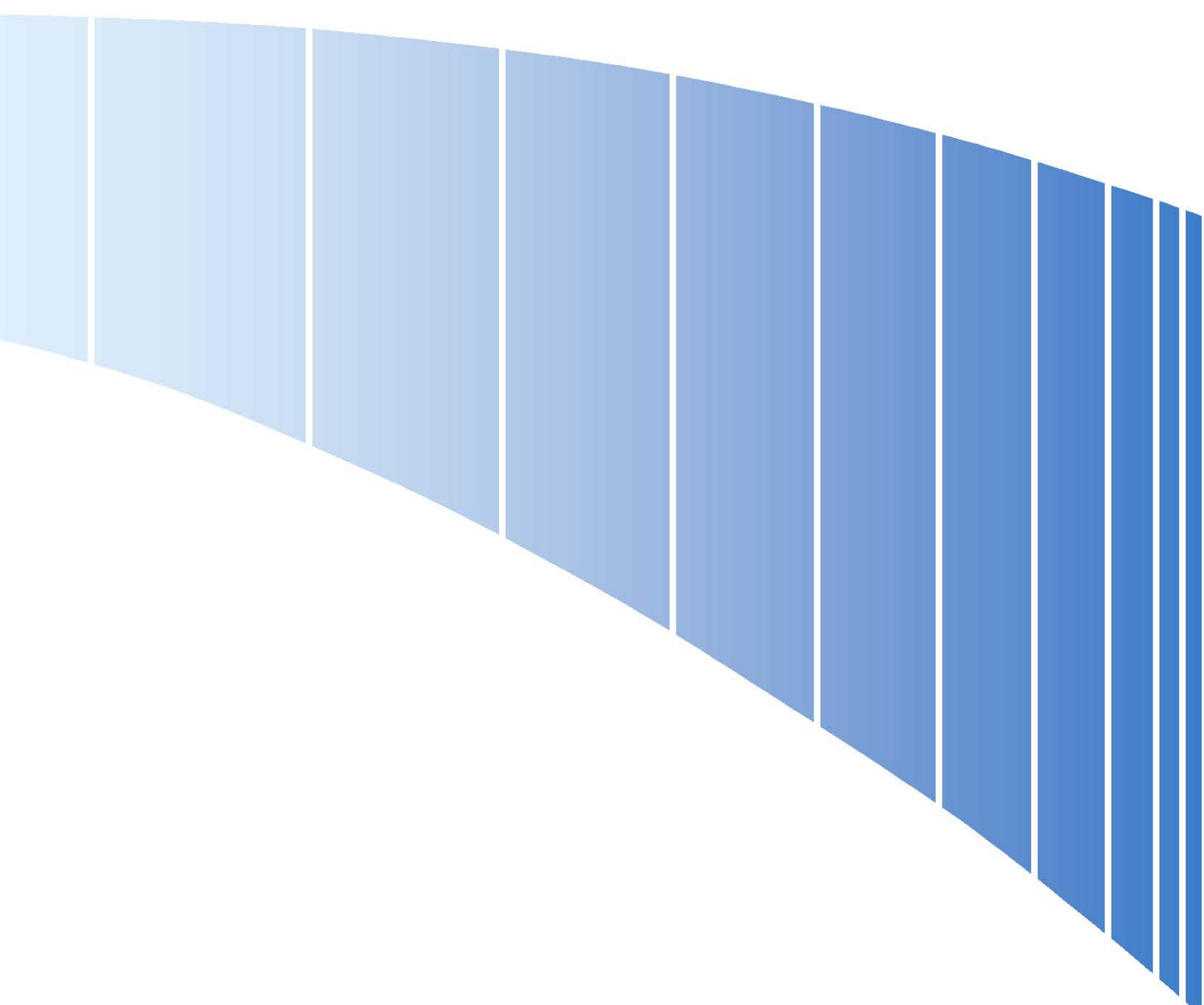


Payment by Results

Step-by-Step Guide: Calculating the 2012-13 National Tariff



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Section 1: Introduction

1.1 The Department is committed to publishing a step-by-step guide to calculating the Payment by Results (PbR) national tariff each year¹. This guide meets that commitment by describing the stages involved in calculating the 2012-13 tariffs for the following admission or attendance types:

- *Elective Inpatient (EL)*
 - *Daycase (DC)*
 - *Non-Elective Inpatient (NE)*
 - *Outpatient Procedure (OPROC)*
 - *Outpatient Attendances (OPATT)*
 - *Accident & Emergency (A&E)*
- } *Admitted Patient Care (APC)*

These were all based on full-year 2009-10 reference costs (RC0910) and 2009-10 Hospital Episode Statistics (HES0910).

- 1.2 The purpose of this guide is to describe the iterations of the tariff calculation lifecycle, i.e. how the Department has calculated the 2012-13 mandatory national tariffs. These are summarised in the diagram at Annex E. It should not be confused with the "Payment by Results Guidance for 2012-13", which covers the operation of PbR by the NHS.
- 1.3 Section two summarises the structural changes to the tariff in 2012-13 which have affected its calculation.
- 1.4 Section three lists the general principles which apply to tariff calculation and price adjustments.
- 1.5 Sections four to seven explain the key stages in the calculation models, which output an initial set of prices for each of the points of delivery. These sections also summarise the adjustments that applied to the prices generated by each model. These were undertaken outside of the tariff calculation models in response to feedback from the sense check and road test exercises.
- 1.6 Section eight explains the calculation of best practice tariffs.
- 1.7 This guide contains a number of examples to demonstrate specific calculations or adjustments. Any figures quoted are for illustrative purposes only and should not be considered true representations of actual data. In many cases, the HRG and treatment function codes used are fictitious.

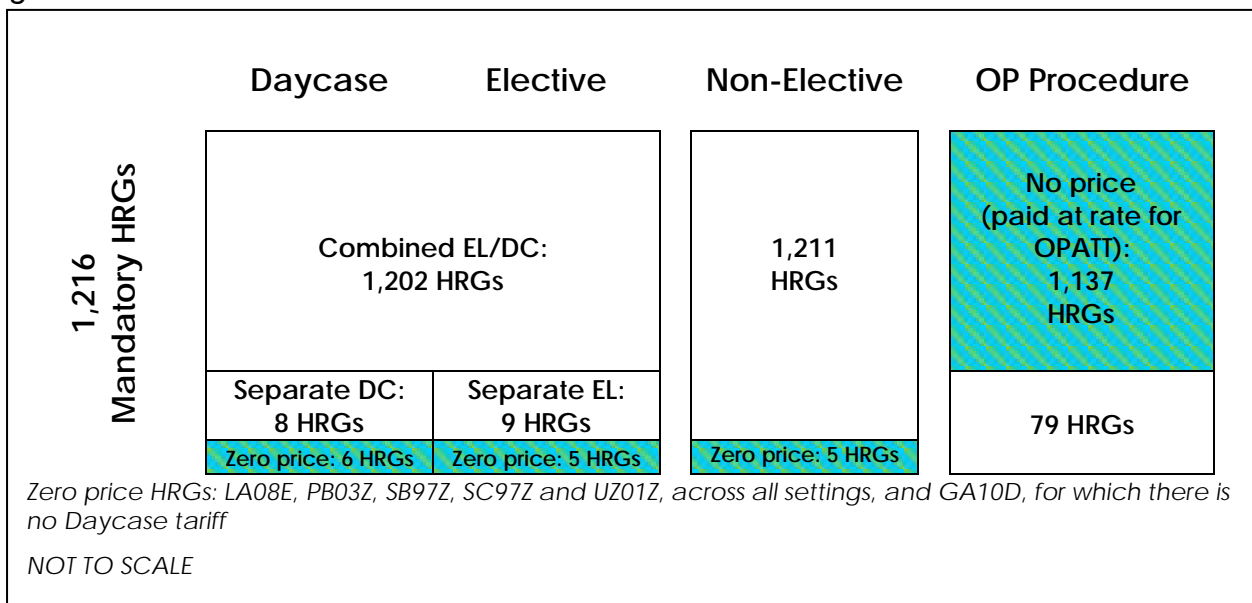
¹ Code of Conduct for Payment by Results, paragraph 3.1.4

Section 2: Overview of major structural changes

Admitted patient care (APC) and outpatient procedure (OPROC) tariff

- 2.1 In 2012-13, the scope of the APC tariff was expanded slightly by introducing tariffs for some, typically low volume, HRGs which did not have a tariff in 2011-12.
- 2.2 The number of HRGs assigned a price in the OPROC tariff rose to 79 from 52 in 2011-12. This was the result of HRG design changes and not an expansion in scope.
- 2.3 It is worth noting some structural/policy changes to tariffs – which occurred in 2011/12 – that still remain in place:
 - Long stay payments – which are applied to all spells whose length of stay exceeds the trim point set for the HRG – are standardised across each HRG chapter. Therefore, all excess bed days for HRGs falling within a particular chapter receive the same per-day long stay payment.
 - A minimum floor of five days is applied to all trim points, as part of the general policy to embed efficiency within the tariff.
- 2.4 Figure 2.1 below illustrates the 2012-13 APC & OPROC tariff structure:

Figure 2.1: 2012-13 APC and OPROC tariff structure



Accident & emergency tariff

- 2.5 The 2012-13 A&E tariff was calculated on HRG4. This is consistent with the 2011-12 A&E tariff. In years previous to this, tariffs were based on HRG3.2.

Section 3: Principles of tariff calculation and price adjustments

- 3.1 There are some general principles which underpin the calculation of the tariffs and have been developed over a number of years. These provide the starting point for both tariff calculation and price adjustments in each year.

Tariff calculation

- 3.2 Tariffs are based on underlying reference costs, with a three year time lag. Therefore, the 2012-13 tariff was based on 2009-10 reference costs. This time lag is necessary to ensure the submitted reference costs are of an appropriate quality and that the generated tariffs have had sufficient input from all relevant stakeholders.
- 3.3 HES data are used as a basis for activity for APC tariffs, including mapping of costs from FCEs to spells. The HES data used are from the same financial year as the reference costs data.
- 3.4 The aggregation of costs to a HRG or TFC level is done as early as possible in the tariff calculation process.

Price adjustments

- 3.5 Once tariffs have been calculated using the base reference costs data, they are then subject to both manual and automatic price adjustments to remove anomalies and reflect stakeholder feedback. These adjustments are also based on some general principles.
- 3.6 Adjustments to the prices generated by the tariff calculation models are only made for good reasons. These are done to avoid pricing anomalies or perverse incentives and are mainly in response to feedback from clinicians and stakeholders.
- 3.7 Price adjustments do not generally move away from using the underlying costs used in calculation. In the rare instances where this occurs, it is only done with good reason such as strong clinical feedback.
- 3.8 Where the scope of the tariff does not change, adjustments should not alter the tariff quantum. Where this does occur, it is the result of specific policies such as the implementation of embedded efficiency savings (which are described in subsequent sections).
- 3.9 Adjustments may result in amended prices that do not comply with rules applied during the initial calculation process. An example of this would be the separate, published EL and NE prices for a HRG with low volume activity, despite the PbR rules stating it should receive a combined price
- 3.10 A breakdown of adjustments are detailed in subsequent sections. They cover adjustments made at two stages in the tariff calculation process:
- **Pro-active pricing adjustments** – adjustments made by the PbR team prior to the formal sense check exercise. The aim of this stage was to adjust prices

and relativities between HRGs where there were clear anomalies or perversities. The principles underpinning these adjustments were based on clinical feedback received in previous years.

- ***Adjustments in response to consultation*** – adjustments implemented in response to stakeholder feedback from the sense-check and road test exercises.

Section 4: Admitted patient care tariff

Tariff calculation

- 4.1 RC0910 data covering daycase (DC), elective inpatient (EL) and non-elective inpatient (NE) formed the basis of the tariff calculation.
- 4.2 All data relating to services supplied by non-NHS organisations and PMS+ providers were excluded. These providers operate under different cost bases and it would not have been appropriate to include their data when calculating the national averages.
- 4.3 Total inlier and excess bed day (EBD) costs were obtained for each provider/HRG/admission type combination as:

$$\text{Total Cost} = \text{Unit Cost} * \text{Finished Consultant Episode (FCE) Volumes}$$

- 4.4 NE data, split between short¹ and non-short stay episodes in RC0910, were combined for the tariff calculation.
- 4.5 RC0910 data were collected at HRG level and reported using the relevant treatment function code (TFC). However, for the tariff calculation the RC0910 data was aggregated to remove the TFC.

Inclusion of Coronary Care Unit (CCU) data

- 4.6 The unit costs of CCU admissions (separately reported in RC0910) were multiplied by volumes to obtain the total CCU cost by provider. Each provider's total CCU costs were then apportioned across its inpatient costs through the six HRGs covering coronary care (EA31Z, EA35Z, EA36A, EA36B, EA49Z and EB10Z) and by admission. The amount given to each HRG (by admission method) was dependent on its relative cost for that provider. Figure 4.1 below illustrates this calculation:

Figure 4.1: Example of rebundling CCU costs into EA31Z

(A)	Total Provider Costs (All CCU HRGs)		£ 60m
(B)	Provider Costs for EA31Z		£ 6m
(C)	Provider CCU Costs		£ 1m
(D)	EA31Z Costs as % of Total Provider Costs	(B / A)	10%
(E)	CCU Costs to rebundle into EA31Z	(C * D)	£ 0.1m
(F)	Total EA31Z Costs	(B + E)	£ 6.1m

Removal of costs relating to Market Forces Factor (MFF)

- 4.7 The costs submitted by each provider were divided by their MFF to remove unavoidable location-specific differences in the costs of providing services. For example, activity performed in Central London would typically be more expensive than the same activity carried out in Devon. It would be inappropriate for the tariff to

¹ In the reference costs data collection, short stay is defined as a length of stay less than or equal to one day.

reflect these differences, as organisations with high MFFs would report higher costs. Provider MFF is then re-applied at the payment stage (paragraph 4.9). More detail on calculation of provider level MFFs can be found in the *PbR and the market forces factor in 2012-13*. Figure 4.2 illustrates how the MFF was removed.

Figure 4.2: Example of MFF removal

(A)	Provider YY01Y Costs		£ 50m
(B)	Provider MFF (min = 1)		1.2500
(C)	Provider YY01Y Costs (Exc. MFF)	(A / B)	£ 40m

4.8 MFF figures for payment are set to a minimum of one.

4.9 As provider MFFs have been removed from costs in tariff calculation, these differences need to be re-applied at the payment stage. Again, it would be inappropriate to pay all organisations the same prices when unavoidable location-specific differences exist. As such, provider's MFF is applied to the prices they receive, i.e. provider income = activity * tariff * MFF.

4.10 A further adjustment ensured the cost neutrality of removing MFF (paragraph 4.40).

Data cleaning

4.11 Cleaning was done conservatively to uphold the principle that the tariff reflects full reported costs, as much as possible. However, there may be examples of organisations with reported costs so low that they were clearly erroneous and other costs so different from the mean that they were clearly unique cases, unrelated to the package of care that the HRG was intended to cover and the tariff was planned to fund.

4.12 For each HRG across the five categories (DC, EL, NE, EL EBDs and NE EBDs), provider level costs less than one twentieth of, or greater than twenty times, the national average were removed (illustrated in Figure 4.3).

Figure 4.3: Example of data cleaning

(A)	National Average Unit Cost		£ 800
(B)	Provider Unit Cost		£ 10
(C)	Provider UC as a % of National Average UC	(B / A)	1.25%
(D)	Is Provider UC < 1/20 th or > 20 Times National Average?	(C) < 5% OR (C) > 2000%	1.25% < 5% So Remove

4.13 Further data cleaning was also performed on EBD activity data. The RC0910 data used for tariff calculation only covered activity within that financial year, i.e. between 1 April 2009 and 31 March 2010. In certain instances, the number of EBDs reported was greater than the maximum possible in a single year, i.e. greater than 365 days. These bed days and their associated costs were removed.

4.14 From this point onwards, the costs and activity were aggregated solely by HRG and admission (removing provider) and all adjustments made at HRG level.

Inclusion of costs in A&E leading to admission

4.15 Patients admitted via A&E will generate both an A&E and non-elective payment. The A&E tariff is funded through all A&E attendances. Where attendances lead to an admission, the costs associated solely with admitting the patient were removed from the A&E cost and added to the non-elective payment tariff.

4.16 RC0910 separately identified those attendances leading to admission from those that do not. Therefore, it was possible to calculate the total cost of admitting (in those attendances that lead to an admission) over and above those not leading to an admission and add it to the NE tariff. This figure was £47m (in 2009-10 prices), excluding MFF.

4.17 This cost was apportioned across NE HRGs in proportion to both:

- the total NE cost of that HRG (excluding EBDs), and;
- the proportion of NE FCEs admitted via A&E (from HES0910)

Figure 4.4: Example of apportioning A&E costs (leading to admission)

(A)	Total Cost of A&E Leading to Admissions		£ 100m
(B)	Proportion of NE Admissions from A&E		
	YY01Y		24%
	YY02Y		15%
	YY03Y		20%
(C)	Total NE Costs:		
	YY01Y		£ 500m
	YY02Y		£ 400m
	<u>YY03Y</u>		<u>£ 100m</u>
	TOTAL		£ 1,000m
(D)	Costs of NE FCEs Admitted from A&E:		
	YY01Y		£ 120m (£ 500m* 24%)
	YY02Y		£ 60m (£ 400m* 15%)
	<u>YY03Y</u>		<u>£ 20m (£ 100m* 20%)</u>
	TOTAL	(C * B)	£ 200m
(E)	Adjusted NE Costs (inc. A&E Leading to Admission):		
	YY01Y	(C) + (A * D)	£ 560m
	YY02Y		£ 430m
	<u>YY03Y</u>	$\Sigma(D)$	<u>£ 110m</u>
	TOTAL		£ 1,100m
(F)	Check: Total Cost of A&E Leading to Admission + NE Cost	$\Sigma(C) + (A)$	£ 1,100

NICE technology appraisals

4.17 NICE technology appraisals between the year of costs (2009/10) and payment (2012/13) are taken into account. However, for the 2012/13 tariff no adjustment was required.

FCE to spell cost conversion

- 4.18 A full explanation and illustration of the methodology for generating spell-based costs can be found at Annex A.
- 4.19 Costs for any non-mandatory HRGs (out of scope of the 2012-13 tariff) were removed at this stage.

Combining daycase and elective admissions

- 4.20 At this stage, data associated with DC and EL admissions were combined.

Calculation of excess bed days and long stay payment

- 4.21 Combined EBD average costs (covering EL and NE admissions) were calculated at a chapter level:

$$\frac{\Sigma (\text{EL FCE EBD Total Cost}) + \Sigma (\text{NE FCE EBD Total Cost})}{\Sigma (\text{EL FCE EBD Activity}) + \Sigma (\text{NE FCE EBD Activity})}$$

These averages represented the basic 'hotel' cost of keeping a patient in hospital and formed the basis of the long stay payment.

- 4.22 Long stay payments have been calculated at chapter level since 2011-12. Prior to this, they were calculated for individual HRGs.

Removal of costs associated with excess bed days

- 4.23 The costs of EBDs i.e. number of days in the length of stay above the long stay trim point, were then removed from the total cost for each spell HRG (by admission method). The number of spell-based EBDs by HRG was calculated using HES0910 data based on trim points calculated using the same data source (calculation of trim points is described in Annex B).
- 4.24 The number of spell-based EBDs for a given HRG/admission method was multiplied by the HRG EBD unit cost (calculated at paragraph 4.21) to give a total EBD cost. This total EBD cost by HRG/admission method was then subtracted from the total spell cost for the combination.

Figure 4.5: Example of removing EBD costs

(A)	Total Cost of Spells for YY01Y		£ 10,000
(B)	Number of Spell-Based EBDs for YY01Y		10
(C)	Adjusted HRG EBD Average Cost		£ 100
(D)	EBD Total Cost	(B * C)	£ 1,000
(E)	Spell-Based Costs (Exc. EBD)	(A – D)	£ 9,000

Removal of costs associated with drugs and devices (D&D)

- 4.25 Costs associated with specific drugs and devices (outside of the scope of the 2012-13 tariff) were then removed. These costs were differentially apportioned across specific HRGs. As with RC0910, the MFF was removed from the exclusions at this stage. This was done using a national MFF to deflate the figures, in order to improve the transparency of the calculation. The national MFF was calculated as 8.4% for admitted patient care.
- 4.26 Some of the costs for drugs and devices could not be targeted to specific HRGs. Therefore, an amount that could not be targeted was removed from all HRGs as a top-slice at a later stage (see paragraphs 4.34 - 4.37).

Limiting cost removal of EBD and D&D

- 4.27 A general rule was applied that no more than 50% of the total cost of each spell-based HRG within the separate admission settings could be removed for both EBDs and D&D exclusions. This was to ensure that no HRG, particularly those with low activity, would be disproportionately affected by the exclusions. For HRGs where more than 50% was removed, any amount above 50% was not removed from the HRG but applied across all HRGs as a top-slice at a later stage (see paragraphs 4.34 - 4.37).

Short Stay Emergency tariff (SSEM)

- 4.28 Certain HRGs attracted a reduced short stay emergency (SSEM) tariff for adult emergency spells with a length of stay less than 2 days. The level of the SSEM tariff was based on the average NE length of stay of the HRG (from HES0910).
- 4.29 The percentage reductions for each SSEM banding are shown in figure 4.6 below:

Figure 4.6: SSEM Bandings

Average length of stay of HRG (days)	Band	% of full NE tariff price
0-1	1	100%
2	2	70%
3-4	3	45%
>5	4	25%

- 4.30 Prior to this stage in the process, the tariff calculation had assumed that all NE spells attracted full tariff. From this point on, however, it differentiated between SSEM and SSEM NE spells. As the SSEM tariff is a percentage of the main tariff, treating the short stay spells separately caused a reduction in the overall cost quantum of the tariff.

4.31 To counteract this, the NE tariff prices were inflated based on:

- the proportion of non-elective spells that attract the short stay adjustments, and;
- the short stay banding of the HRG.

Figure 4.7: Example of SSEM adjustments to NE prices

(A)	Non-Elective Tariff Price of YY01Y (prior to SSEM)		£ 5,000
(B)	Total Non-Elective Spells for YY01Y		100
(C)	Total SSEM Spells		10
(D)	SSEM tariff (band 2)		70%
(E)	Total Costs (prior to SSEM)	(A * B)	£ 500,000
(F)	Revised Costs (spells not attracting SSEM)	(A) * (B - C)	£ 450,000
(G)	Revised Costs (spells attracting SSEM)	(C) * (A * D)	£ 35,000
(H)	Total Revised Costs	(F + G)	£ 485,000
(I)	Revised Costs as % of Total Costs Prior to SSEM	(H / E)	97%
(J)	Adjusted Non-Elective Price (inc. SSEM)	(A / I)	£ 5,155

Clinical Negligence Scheme for Trusts (CNST) adjustments

4.32 The increase in premiums between the cost year (2009-10) and payment year (2012-13) was calculated at chapter or sub-chapter level (dependant on the specialty) and apportioned across all relevant HRGs as a percentage uplift:

$$\frac{\text{Total Costs for (Sub-)Chapter + CNST Premiums}}{\text{Total Costs for (Sub-)Chapter}}$$

4.33 The (sub-)chapter specific uplift was then applied to each HRG. Figure 4.8 below illustrates this:

Figure 4.8: Example of calculating CNST uplift

(A)	Total Costs Associated with HRG Chapter X		£ 15m
(B)	Total CNST Premium Associated with HRG Chapter X		£ 1.5m
(C)	Total Costs for Chapter X (inc. CNST)	(A + B)	£ 16.5m
(D)	CNST Uplift (applied to all Chapter X HRGs)	(C / A) - 1	10%

Top-slices

4.34 Next, a number of top-slices were collated and applied. A top-slice is a national level adjustment across all or a subset of HRGs for which the same amount of funds are removed proportional to the total cost of the service.

4.35 The top-slices were calculated as percentage adjustments to adjust the inlier unit costs accordingly, as:

$$\frac{\text{Total Costs} - \text{Top-sliced Income}}{\text{Total Costs}}$$

4.36 Top-slices were calculated for:

- **Specialised services** – in order to fund the additional payments for specialist top-ups, an estimate was made of the costs to commissioners for this and removed from DC/EL and NE;
- **Injury Cost Recovery (ICR) Scheme** – estimated from NHS accounts, because these costs are paid separately through the ICR scheme they were removed (from NE only), and;
- **D&D exclusions** – (from paragraph 4.25 - 4.26) applied to NE and DC/EL separately.

4.37 The top-slices were then multiplied together to attain a single adjustment for DC/EL and NE prices. These adjustments were applied to total DC/EL and NE costs. Using these costs, a unit cost for every HRG/admission type combination was calculated as:

$$\frac{\text{Total Costs (adjusted for top-slices)}}{\text{Total Activity}}$$

Low volume activity weighted prices

4.38 Any HRGs with low levels of activity had their EL/NE costs and activity combined and a single unit cost calculated across both admission types. Low volume activity was defined as:

- DC/EL Activity < 50 spells, or;
- NE Activity < 50 spells, or;
- Total Activity (i.e. DC/EL + NE) < 150 spells.

Affordability

4.39 All prices were then decreased by an affordability adjustment of 0.95%.

Tariff adjuster

4.40 To take account of differences between a provider's underlying MFF and that used for payment in 2011-12, all prices were adjusted by -0.02% (see paragraph 4.7 - 4.10).

4.41 In addition, unit costs were uplifted into 2012-13 prices, using the following the tariff adjusters net of relevant embedded efficiencies:

- 2010-11: 0.0%
- 2011-12: -1.1%²
- 2012-13: -1.5%³

² 0.4% of 2011-12 uplift relates to embedded efficiency from best practice tariffs and the introduction of the 5-day trimpoint floor. This policy continued for 2012-13 and so this was removed from the uplift used for 2011-12.

Price adjustments

Change to HRG pricing structure

- 4.42 Following feedback and comparisons with the 2011-12 published tariff, several prices were either (a) combined, (b) uncombined across admission types or (c) set at a level agreed by the relevant stakeholders.
- 4.43 Where prices were uncombined, relativities from tariff calculation (prior to combination) were applied, whilst maintaining the overall quantum of cost within each HRG.

Price differences between related HRGs (relativities)

- 4.44 Percentage differences between the prices of related HRGs should reflect the cost differential between treatments of, for example, different complexities and co-morbidities. In some cases, the tariff calculation generated prices with counter-intuitive differentials.
- 4.45 The relativities were adjusted in one of the following ways:
- *applying the relativities from the 2011-12 tariff;*
 - *applying the relativities of similar HRGs in the 2012-13 tariff, or;*
 - *calculation of a combined (weighted) price (see below).*

Weighted (combined) prices

- 4.46 In cases where it was not feasible or practical to apply existing relativities, perversities were removed by combining the costs and activity to calculate a single weighted cost for the affected HRGs, as illustrated in figure 4.9 below.

Figure 4.9: Example of combined cost calculation

(A)	Original Prices for HRGs to be Combined:		
	AB05Z (Intermediate Pain Procedures)		£ 100
	AB06Z (Minor Pain Procedures)		£ 300
(B)	Activity for HRGs to be Combined:		
	AB05Z (Intermediate Pain Procedures)		1,500
	AB06Z (Minor Pain Procedures)		1,000
(C)	Total Cost of All HRGs	$\Sigma(A * B)$	£ 450,000
(D)	Total Activity of All HRGs	$\Sigma(B)$	2,500
(E)	Combined Price	(C / D)	£ 180

³ The overall uplift for 2012-13 is -1.8%, including a national efficiency requirement of 4%. However, 0.3% of the efficiency requirement was already "embedded" within the tariff in the form of best practice tariff pricing.

4.47 The combined prices were calculated by dividing the total costs for the relevant tariffs by the total activity for those tariffs. This ensured the cost neutrality of the adjustment.

4.48 The adjustment was applied to:

- *single HRGs across admission methods, and;*
- *a range of HRGs across a single admission method.*

Fixed price adjustments

4.49 In some instances following clinical advice, the calculated price was replaced with a preferred alternative.

4.50 Prices were either:

- *a reversion to 2011-12 tariff prices;*
- *manually re-calculated e.g. to take into account 2010/11 reference costs data, or;*
- *set at a level agreed by the relevant stakeholders.*

Chapter-specific price adjustments

4.51 Following clinical feedback, including ongoing work with Expert Working Groups (EWGs), changes were made to tariffs in the following chapters:

- *chapter D (Respiratory System) - these included a number of HRGs which were set at the same level as an outpatient attendance*
- *chapter F (Digestive System) – these included fixed pricing adjustments and combination of prices across admission methods for HRGs which were newly implemented in the 2012-13 tariff.*
- *chapter H prices (Musculoskeletal System) – these adjustments reflected outcomes of ongoing work with clinicians and specialised providers as well as to take account of changes between the RC0910 grouper and that for payment in 2012-13.*
- *chapter N (Obstetrics) - prices were amended to move money from non-delivery HRGs into delivery HRGs.*
- *chapter R (Radiology and Nuclear Medicine) – reverted to 2011-12 prices*
- *chapter V (Multiple Trauma) – owing to the time lag between reference costs and tariff these prices were based on 2011-12 costs, but adjusted to reflect ongoing work with the major trauma re-design.*

Trim point floor

4.52 A minimum trim point - first introduced for the 2011-12 tariff - has remained in place. The trim point floor is set at five days, so any HRGs with a trim point of less than five is set to this minimum level (excluding some maternity HRGs – paragraph 4.53).

Maternity trim point adjustment

4.53 One maternity HRG (NZ11B) had its trim point floor effectively set at a minimum of two days. This was due to the re-design of the HRG which meant it would have been disproportionately affected by the standard five day minimum level.

Audit Commission findings on 2009/10 reference costs

4.54 As part of the 2010/11 PbR data assurance programme, the Audit Commission (AC) undertook an audit of all acute trust's 2009/10 reference costs.

4.55 The Audit Commission provided a list of organisations (see Annex C: Organisations highlighted by the Audit Commission) where auditors were unable to offer assurance that their reference costs were wholly accurate, along with a summary of their issues. These organisations and the associated issues were reviewed and appropriate data were removed from the tariff calculation.

4.56 Given that the audit results had not been finalised when we initially processed the tariff data, it was not possible to remove directly (i.e. by removing from reference costs and rerunning the entire calculation model). Instead a proxy approach was used that achieved the same aims, whilst being simpler to implement.

4.57 Where organisations' data for a specific area was removed, this was done by comparing the reference costs including / excluding the relevant data, and observing the % change in average unit cost. This differential was applied to the calculated tariff price. We pragmatically made a decision to only adjust tariff prices where the average costs changed by >2%, to avoid changing a high number of tariffs by very small amounts.

4.58 Where an organisation had a specific issue with their total quantum in reference costs, we adjusted the overall quantum of the tariff accordingly to reflect this. This is to reflect the fact that it is not possible for us to identify whether the over / understatement of the reference costs quantum affects all costs or not, as it depends on the costing approach used and how costs are allocated.

4.59 To reflect the fact that not all of this quantum will be covered by the scope of the tariff, we identified the proportion of the reference costs for these organisations covered by the tariff. This has led to the overall tariff quantum being top-sliced by around 0.1%.

Section 5: Outpatient procedure tariff

Tariff calculation

- 5.1 The RC0910 data covering OPROC formed the basis of the tariff calculation.
- 5.2 Prices were calculated by applying the following adjustments (consistent with the APC tariff)
- **Removal of non-NHS and PMS+ providers** (paragraph 4.2)
 - **Removal of costs relating to Market Forces Factor (MFF)** (paragraph 4.7 - 4.10)
 - **Data cleaning** (paragraph 4.11)
 - **CNST** (paragraph 4.32 - 4.33)
 - **Tariff adjuster** (paragraph 4.40 - 4.41)
- 5.3 In addition to these adjustments the costs of **non-direct access diagnostic imaging** were rebundled into outpatient procedure HRGs. This was done in a similar manner to the adjustment described for outpatient attendances (paragraph 6.12).

Price adjustments

Comparison to outpatient attendance price

- 5.4 To ensure outpatient procedures are not disincentivised, prices were set no lower than that of the equivalent outpatient attendance (with a small number of exceptions).

Audit Commission findings on 2009/10 reference costs

- 5.5 The findings of the audit commission's audit of 2009/10 reference costs were taken into account as set out in paragraph 4.54 - 4.59.

Section 6: Outpatient attendance tariff

Tariff calculation

- 6.1 The starting point for the tariff calculation was the outpatient attendance (OPATT) data from RC0910. As with the APC & OPROC tariff, data for PMS+ and non-NHS providers were excluded.
- 6.2 The RC0910 categories were mapped to the appropriate outpatient treatment. For each of the treatment functions codes (TFCs) with mandatory tariffs, four attendance tariffs were generated, covering consultant-led (CL), face-to-face (F2F) attendances:
- *First Attendance, Single Professional (FAS)*
 - *First Attendance, Multi-Professional (FAM)*
 - *Follow-Up Attendance, Single Professional (FUS)*
 - *Follow-Up Attendance, Multi-Professional (FUM)*
- 6.3 The exception to this was TFCs 501 (Obstetrics) and 560 (Midwife Episodes), for which combined consultant-led (CL) / non-consultant-led (NCL) tariffs were calculated.

Group to Treatment Function Code (TFC)

- 6.4 RC0910 collected some data at sub TFC level e.g. TFC 110 (Trauma and Orthopaedics) was collected split by Trauma and Non-Trauma (110T and 110N respectively). In all such cases, the data were grouped together to TFC level.

Removal of costs relating to Market Forces Factor (MFF)

- 6.5 Each provider's costs were divided by their MFF to remove any unavoidable location-specific costs (as per paragraphs 4.7 - 4.10).

Data cleaning

- 6.6 Further data cleaning was then performed to remove any obviously erroneous or inappropriate outliers (as per paragraph 4.11).
- 6.7 At this point, the costs and activity were aggregated solely by TFC (removing provider).

Recoding of NCL Maternity and Obstetrics

- 6.8 As TFCs 501 and 560 have combined CL / NCL tariffs, the NCL activity and costs for these TFCs were recoded as CL.

Removal of costs associated with drugs and devices (D&D)

- 6.9 Next, costs associated with certain high cost drugs and devices were removed from the tariff (as performed in paragraphs 4.25 - 4.26). As with the APC tariff, an amount that could not be targeted to specific TFCs was removed as a top-slice.

Limiting cost removal of drugs and devices

- 6.10 At the next stage, an upper threshold of 50% was set for the proportion of cost that could be removed from the total cost of an individual category by the effect of the drugs and devices exclusions (as performed in paragraph 4.27). The resulting tariffs affected by the threshold were then reviewed to check that this was appropriate.
- 6.11 As with the APC tariff, the exclusions were deflated by the national MFF. For outpatients this was calculated as 9.1%. This figure was different from that used in the APC tariff as it was derived solely from the data within the OPATT tariff.

Rebundling of non-direct access diagnostic imaging costs

- 6.12 The costs for non-direct access diagnostic imaging (DI) for outpatient procedures and attendances were unbundled in RC0910 data. A policy decision was made to rebundle the non-direct access DI costs into TFCs (and procedure HRGs). Firstly, similar DI HRGs were grouped together to give a more robust mapping e.g. similar MRI HRGs were grouped together. A mapping table, split by TFC and attendance types, was used to assign non-direct access DI costs to attendances. The process is illustrated in figure 6.1 below.
- 6.13 As with the 2011-12 National Tariff, the rebundling of diagnostic imaging was based on 2008-09 data provided by NHS Healthcare Commission Services. This ensured that the tariff prices are not overly volatile between the two years.

Figure 6.1: Example of rebundling diagnostic imaging costs

(A)	Unbundled RC0809 Group: MRI1 <u>TOM1</u> TOTAL	£ 10,000 £ 15,000 £ 25,000	
(B)	Unbundled Group to TFC Mappings: MRI1 – AAA <u>MRI1 – BBB</u> TOTAL <u>TOM1 – AAA</u> TOTAL	40% 60% 100% 100% 100%	
(C)	TFC to attendance core HRG mapping MRI1 AAA – WF01A MRI1 AAA – WF01B MRI1 AAA – WF02A <u>MRI1 AAA – WF02B</u> TOTAL MRI1 BBB – WF01A MRI1 BBB – WF01B MRI1 BBB – WF02A <u>MRI1 BBB – WF02B</u> TOTAL TOM1 AAA – WF01A TOM1 AAA – WF01B TOM1 AAA – WF02A <u>TOM1 AAA – WF02B</u> TOTAL	10% 20% 30% 40% 100% 40% 30% 20% 10% 100% 25% 25% 25% 25% 100%	
(D)	Map Unbundled Costs to TFCs and HRGs: MRI1 AAA WF01A MRI1 AAA WF01B MRI1 AAA WF02A MRI1 AAA WF02B MRI1 BBB WF01A MRI1 BBB WF01B MRI1 BBB WF02A <u>MRI1 BBB WF02B</u> TOTAL TOM1 AAA WF01A TOM1 AAA WF01B TOM1 AAA WF02A <u>TOM1 AAA WF02B</u> TOTAL	(A * B*C)	£ 400 £ 800 £ 1,200 £ 1,600 £ 2,400 £ 1,800 £ 1,200 <u>£ 600</u> £ 10,000 £3,750 £3,750 £3,750 <u>£3,750</u> £15,000
(E)	TFCs – Total Rebundled Costs: AAA WF01A AAA WF01B AAA WF02A AAA WF02B BBB WF01A BBB WF01A BBB WF01A <u>BBB WF01A</u> TOTAL	GROUP(D)	£ 4,150 £ 4,550 £ 4,950 £ 5,350 £ 2,400 £ 1,800 £ 1,200 <u>£ 600</u> £ 25,000

Rebundling of non-mandatory OPROC HRGs

6.14 For any HRGs not receiving a mandatory OPROC tariff, the associated costs and activity were rebundled into OPATT TFCs using a mapping to assign HRG activity and costs to first and follow-up TFCs. This process is illustrated in figure 6.2:

Figure 6.2: Example of rebundling non-mandatory OPROC HRGs

(A)	Total Costs to be Rebundled from Non-Mandatory OPROC HRG (YY01Z)		£ 10,000
(B)	Total Cost of TFCs (prior to rebundling)		
	AAA (First, Single)		£ 6,000
	AAA (First, Multi)		£ 5,000
	AAA (Follow-Up, Single)		£ 4,000
	AAA (Follow-Up, Multi)		£ 5,000
	BBB (First, Single)		£ 6,000
	BBB (First, Multi)		£ 4,000
	BBB (Follow-Up, Single)		£ 15,000
	<u>BBB (Follow-Up, Multi)</u>		<u>£ 5,000</u>
	TOTAL		£ 50,000
	YY01Z – TFC Mapping		
	AAA (First, Single)		15%
	AAA (First, Multi)		5%
(C)	AAA (Follow-Up, Single)		10%
	AAA (Follow-Up, Multi)		15%
	BBB (First, Single)		25%
	BBB (First, Multi)		10%
	BBB (Follow-Up, Single)		10%
	<u>BBB (Follow-Up, Multi)</u>		<u>10%</u>
	TOTAL		100%
(D)	Apportioned Costs by (First & Follow-Up)	(A * C)	
	AAA (First, Single)		£ 1,500 (10k * 15%)
	AAA (First, Multi)		£ 500 (£10k * 5%)
	AAA (Follow-Up, Single)		£ 1,000 (£10k * 10%)
	AAA (Follow-Up, Multi)		£ 1,500 (£10k * 15%)
	BBB (First, Single)		£ 2,500 (£10k * 25%)
	BBB (First, Multi)		£ 1,000 (£10k * 10%)
	BBB (Follow-Up, Single)		£ 1,000 (£10k * 10%)
	<u>BBB (Follow-Up, Multi)</u>		<u>£ 1,000 (£10k * 10%)</u>
	TOTAL		£ 10,000
(E)	Rebundle Apportioned Costs into FCE Costs	(B + D)	
	AAA (First, Single)		£ 7,500
	AAA (First, Multi)		£ 5,500
	AAA (Follow-Up, Single)		£ 5,000
	AAA (Follow-Up, Multi)		£ 6,500
	BBB (First, Single)		£ 8,500
	BBB (First, Multi)		£ 5,000
	BBB (Follow-Up, Single)		£ 16,000
	<u>BBB (Follow-Up, Multi)</u>		<u>£ 6,000</u>
	TOTAL		£ 60,000

Grouping of TFCs with a combined price

6.15 TFCs 501 & 560 were set to have a combined price. Their costs and activity were combined.

Front-loading of first attendance costs

6.16 Front-loading of the first attendances was performed at this stage. For each TFC, 10% of all follow-up costs were moved into the corresponding first attendance costs (with the exceptions of infectious diseases and nephrology). This policy decision was taken to discourage unnecessary follow-up attendances.

Figure 6.3: Example of front-loading

(A)	Total First Attendance Costs for AAA		£ 1,000
(B)	Total Follow-Up Attendance Costs for AAA		£ 500
(C)	Adjusted First Attendance Costs for AAA	$(A) + (B / 10)$	£ 1,050
(D)	Adjusted Follow-Up Attendance Costs for AAA	$(B) - (B / 10)$	£ 450
(E)	Check	$(A + B) = (C + D)$	£ 1,500 = £ 1,500

Disproportionate and inappropriate front-loading

6.17 Front-loading involved redistributing 10% of follow-up costs to first attendances (see paragraph 6.16).

6.18 Disproportionate front-loading was deemed to occur where the adjustment resulted in an increase of more than 50% of the first attendance total price.

6.19 Additionally, a policy decision was made that front-loading was not appropriate for infectious diseases (350) and nephrology (361) as given the nature of these TFCs, follow-up attendances should not be dis-incentivised.

6.20 In such cases, the adjustment was undone and both first and follow-up prices were reverted to their original values.

Affordability

6.21 All prices were then decreased by an affordability adjustment of 0.95%.

Tariff adjuster

6.22 All prices were then uplifted into 2012-13 prices (as performed in paragraph 4.40-4.41)

Price adjustments

Low volume combinations

- 6.23 Any TFC with first or follow-up activity of less than 50 or being generated by less than five providers had its prices combined across the two activity settings.

First and follow-up adjustments

- 6.24 Follow-up attendance prices must not be greater than the equivalent first attendance price. Where this occurred, the combined prices were calculated.

Multi-professional adjustments

- 6.25 A rule was applied that a multi-professional TFC should not be more than double the price of its single professional counterpart. Should this have occurred, the price would have been limited to twice that of the single professional price. For the 2012/13 tariff, the rule was not breached and so no price limitation was required.
- 6.26 Similarly, a multi-professional price should never be less than the price of its single-professional counterpart. In instances where the multi-professional price was the lower of the two, a combined price was calculated for both attendance types.

Paediatric-Adult relativities

- 6.27 This next stage involved comparing each paediatric TFC with its adult counterpart. Where the paediatric TFC price was less than the adult, combined weighted prices were calculated.

Audit Commission findings on 2009/10 reference costs

- 6.28 The findings of the audit commission's audit of 2009/10 reference costs were taken into account as set out in paragraph 4.54 - 4.59.

Section 7: Accident & emergency tariff

Tariff calculation

- 7.1 For 2012-13, the A&E tariff was calculated on HRG4.
- 7.2 The starting point for the tariff calculation was the A&E data from RC0910. As with the other tariffs, data for PMS+ and non-NHS providers were excluded, along with that covering NHS walk-in centres.

Removal of costs relating to Market Forces Factor (MFF)

- 7.3 Each provider's costs were divided by their MFF to remove any unavoidable location-specific differences (as per paragraphs 4.7 - 4.10).

Data cleaning

- 7.4 Further data cleaning was then performed to remove any obviously erroneous or inappropriate outliers (as per paragraph 4.11).
- 7.5 At this point, the costs and activity were aggregated solely by HRG (removing provider).

Data re-coding

- 7.6 Attendance data recorded as "dead on arrival" (VBDOA) in RC0910, were re-coded as VB09Z. Data reported by PCTs, or as non-24hr A&E services or minor injury services were recoded as VB11Z.

Removing costs of attendances leading to admissions

- 7.7 The A&E tariff is funded at the rate for an attendance that does not lead to an admission, with the cost of admitting the patient funded within the non-elective payment. RC0910 separately identified those attendances leading to admission from those that do not.
- 7.8 For patients admitted from an A&E setting, the costs of the *admission* were added into the APC tariff (see paragraph 4.15) with the costs of the *attendance* remaining in the A&E tariff. These costs were calculated as:

$$\frac{\text{HRG Unit Cost of Attendance * Number of Attendances}}{\text{Not Leading to Admission} \quad \text{Leading to Admission}}$$

- 7.9 This was added to the total cost of attendances not leading to admission, which created the initial quantum of the A&E tariff (as per paragraph 7.7).

Grouping of A&E HRGs

- 7.10 The A&E HRGs were placed into the A&E payment groups as illustrated in figure 7.1 below, and each group's total costs and activity were totalled to calculate the unit costs.

Figure 7.1: A&E groupings and costing example

GROUP	HRG	HRG COSTS	HRG ACTIVITY	GROUP COST	GROUP ACTIVITY	UNIT COST
1	VB01Z	£ 1,000	20	£ 4,000	40	£100
	VB02Z	£ 3,000	20			
2	VB03Z	£ 3,000	30	£ 12,000	60	£200
	VB04Z	£ 5,000	20			
	VB05Z	£ 4,000	10			
3	VB06Z	£ 3,000	20	£ 8,000	40	£200
	VB09Z	£ 5,000	20			
4	VB07Z	£ 1,000	40	£ 3,000	50	£60
	VB08Z	£ 2,000	10			
5	VB10Z	£ 2,000	30	£ 5,000	50	£100
	VB11Z	£ 3,000	20			

CNST increase

7.11 The prices were uplifted to take account of the 2012-13 increases in CNST premiums (as performed in paragraph 4.32). This only applied to groups 1 - 4.

Affordability

7.12 All prices were then decreased by an affordability adjustment of 6.6%.

Tariff adjuster

7.13 All prices were then 'uplifted' into 2012-13 prices (as performed in paragraph 4.40 - 4.41).

Price adjustments

Audit Commission findings on 2009/10 reference costs

7.14 The findings of the audit commission's audit of 2009/10 reference costs were taken into account as set out in paragraph 4.54 - 4.59.

Section 8: Best practice tariffs

8.1 The best practice tariff (BPT) package for 2012-13 is shown in the table below. This provides a summary of the new BPTs and the revisions to those introduced since 2010-11.

Figure 8.1: Summary of best practice tariffs

BPT	2010-11	2011-12	2012-13
Acute stroke	Introduced	Increased price differential	Further increase in price differential
Cataracts	Introduced and maintained		
Fragility hip fracture	Introduced	Increased price differential	Further increase in price differential and expansion of best practice characteristics
Day case procedures	Gall bladder removal	12 further procedures added	2 further procedures added; breast surgery procedures amended and revision to some daycase rates
Adult renal dialysis		Vascular access for haemodialysis	Home therapies incentivised
Paediatric diabetes		Activity based structure (non-mandatory)	Year of care structure (mandatory)
Transient ischaemic attack		Introduced and maintained	
Primary total hip and knee replacements		Introduced and maintained	
Interventional radiology		2 procedures introduced	5 further procedures added
Procedures in outpatients			3 procedures introduced
Same day emergency care			12 clinical scenarios introduced
Major trauma care			Introduced

8.2 The methodology behind the calculation of the 2012-13 BPTs was broadly consistent with that used in 2011-12 (and 2010-11). Where a BPT is based on reference costs, the price was updated to reflect the RC0910 data.

8.3 Any alterations or different methods of calculating the tariffs are explained below under the relevant BPT headings.

Existing best practice tariffs

Acute stroke

8.4 The acute stroke care BPT continued in the same form in 2012-13 with the following revisions:

- a greater differential between the base tariff and the best practice tariff
- Inclusion of the alteplase adjustment¹

8.5 The differential between the base tariff and best practice tariff has increased each year since the introduction in 2010-11. Initially the differential was £475 to pay for the additional costs associated with best practice care.

8.6 In subsequent years the differential has increased to further incentivise best practice. This was achieved by lowering the base tariff by the increased additional payment. The differentials are as follows:

Figure 8.2: Acute stroke differential between base tariff and best practice tariff

Financial year	Differential
2010-11	£475
2011-12	£950
2012-13	£1,425

Cataracts

8.7 There was no change to the calculation of the BPT for cataracts in 2012-13.

8.8 The BPT was calculated by summing the tariff prices, excluding MFF, for each of the APC and OPATT events along the recommended pathway.

Fragility hip fracture

8.9 The fragility hip fracture BPT continued in the same form in 2012-13, but with a greater differential between the base and best practice tariff.

8.10 The differential between the base and best practice tariff has increased each year since the introduction in 2010-11. Initially the differential was £445 to pay for the additional costs associated with best practice care.

8.11 In subsequent years the differential has increased to further incentivise best practice. This was achieved by lowering the base tariff by the increased additional payment. The differentials are as follows:

Figure 8.3: Fragility hip fracture differential between base tariff and best practice tariff

Financial year	Differential
2010-11	£445
2011-12	£890
2012-13	£1,335

¹ For further information on the inclusion of the alteplase adjustment, please see the PbR guidance 2011/12.
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_124356

Daycase procedures

8.12 In 2012-13, a number of BPTs were introduced to further incentivise daycase procedures. We have expanded the list of procedures covered by the BPT model for incentivising higher day case rates, where clinically appropriate.

8.13 Tariff prices for new and existing procedures were calculated using spell-level unit costs from RC0910 and activity data from HES0910. The calculation was a two-staged process.

8.14 The first stage was to calculate the total cost quantum across DC and EL admissions assuming a shift to the best practice level of DC rates. The second stage was to set separate prices for DC and EL admissions to meet the following constraints:

- Total cost quantum equals that in the first stage;
- DC are higher than EL prices by a given differential, and;
- DC prices are less than or equal to the combined DC/EL tariff price based on actual DC rates.

8.15 The best practice DC rates used for tariff calculation were as follows:

Figure 8.4: New or amended day case BPTs for 2012-13

Procedure	BADS ² rate	Tariff calculation rate	Current rates	Comment
Breast surgery				
Excision of breast - quadrantectomy - partial excision - any other excision	15% 15% 95%	75% (for all procedures)	52% (average)	Differs from BADS rates based on expert clinical advice, higher current rates than BADS target, and procedures being grouped with any other excision for BPT purposes
Excision of breast with sentinel lymph node biopsy or axillary sample	n/a	75%	21%	
Simple mastectomy +/- axillary surgery	n/a	15%	2%	The target rate is to be reviewed each year, with a move to an 80% target rate over three years if deemed clinically appropriate.
Sentinel lymph node biopsy or axillary sample	n/a	80%	48%	
Axillary clearance	n/a	40%	7%	The target rate is to be reviewed each year, with a move to an 80% target rate over three years if deemed clinically appropriate
Ear, nose and throat				
Tonsillectomy 18 years and under (without CC)	70%	80%	29%	
19 years and over	80%	70%	32%	
Septoplasty	60%	60%	43%	

² British Association of Day Surgery (BADS)

Figure 8.5: Existing day case BPT areas

Procedure	BADS rate	Tariff calculation rate	Current rates	Comments
Gynaecology				
Operations to manage female incontinence	80%	45%	31%	Differs from BADS rate based on clinical advice and reduced from 2011-12 rate of 80% to 45% in 2012-13
Urology				
Endoscopic resection of prostate (TUR)	15%	15%	1%	
Resection of prostate by laser	90%	60%	16%	Phased increase to BADS rate over 3 years in 30 percentage point increments.
General surgery				
Cholecystectomy	60%	60%	28%	
Repair of umbilical hernia	85%	85%	66%	
Repair of inguinal hernia	95%	95%	61%	
Repair of recurrent inguinal hernia	70%	70%	49%	
Repair of femoral hernia	90%	90%	62%	
Orthopaedic surgery				
Arthroscopic subacromial decompression	80% (75%)	n/a	51%	The BADS rates in parentheses are the 75 th percentile day case rates from HES 2009-10. We are in consultation with BADS and British Orthopaedic Association to agree these as the target rates for tariff calculation for 2012-13.

Adult renal dialysis

- 8.16 For the haemodialysis HRGs (LD01A – LD08A) the tariff prices were calculated based on RC0910.
- 8.17 The weekly tariffs for *home* haemodialysis HRGs (LD09A – LD10A) were also calculated using RC0910, with support through feedback received as part of a recent NHS Kidneycare survey and information offered specifically by renal units.
- 8.18 There was no reference costs data available to support the calculation of a tariff for automated assisted peritoneal dialysis (LD13A), therefore this was set based on information from a number of organisations and reflects a mix of service delivery models.

Paediatric diabetes

- 8.19 The BPT for paediatric diabetes was calculated using information provided by several NHS provider organisations and also NHS Diabetes.

Transient ischaemic attacks (TIA)

- 8.20 There was no change to the calculation of the BPT for TIA.

- 8.21 The base tariff price for non-admitted services for patients with suspected TIA was based on the national average cost of services from RC0910 adjusted to remove MFF.
- 8.22 It consisted of the Geriatric Medicine single professional outpatient first attendance plus:
- Additional tests and imaging to reflect higher rate of imaging within the service
 - Geriatric Medicine single professional outpatient follow-up attendance
- 8.23 These additional costs were included based on an expected average casemix of patients attending the service e.g. only around 50% of all patients attending the service will be diagnosed with TIA, and therefore require specialist follow-up within one month – this was reflected in the pricing.
- 8.24 The additional payment for use of an MRI (rather than a CT scan) was based on the difference in the RC national averages for these services, with an additional increase of around 20%, to incentivise increased use of this modality.
- 8.25 The additional payment for diagnosis and treatment of patients within 24-hours was set at 20% of the base tariff, whilst ensuring it was not less than the payment for MRI.

Primary total hip and knee replacements

- 8.26 There was no change to the calculation of the BPT for primary total hip and knee replacements in 2012-13.
- 8.27 The BPT prices were calculated as the conventional tariff prices for the relevant HRGs less £232.

Interventional radiology

- 8.28 The list of interventional radiology procedures covered by the BPT programme was expanded to include a further five, bringing the total number of procedures to seven.
- 8.29 The BPT prices were produced in partnership with a number of providers and are based on a dedicated 'bottom up' costing exercise, adjusted / uplifted to 2012-13 prices.

New best practice tariffs for 2012-13

Procedures in outpatients

- 8.30 The calculation of the diagnostic procedures in outpatients was consistent with the methodology used in calculating daycases. For hysteroscopic sterilisation the tariff price was based on cost information from NHS providers benchmarked against RC0910.

8.31 The rate used for tariff calculation, the achievable rate and an estimate of the current rate are detailed in the table below.

Figure 8.6: Achievable and estimated outpatient rates for diagnostic hysteroscopy and cystoscopy

Procedure	Rate for 2012-13 tariff calculation	Achievable outpatient rate ³	Estimated ⁴ outpatient rate
Diagnostic Hysteroscopy	60% ⁵	80%	36%
Diagnostic Cystoscopy	50%	50%	11%

Same day emergency care

8.32 Calculation of the same day emergency tariff followed similar principles to those for incentivising day case procedures. Prices were calculated based on the following principles:

- The difference between the same day and non-same day BPT prices was the level of one excess bed day i.e. the long stay payment for that HRG, with the same day price being higher.
- Prices were based on the conventional non-elective prices (calculation of which is elsewhere described in this document). Where the short stay emergency adjustment had been applied to the HRGs, this was removed (and the impact of the adjustment reversed).
- Where possible, both same day and non-same day BPT prices were less than the conventional non-elective price.
- The target rate for shifting activity was set at the 75th percentile of current activity rates (based on HES0910). These are shown below:

³ Based on expert clinical advice to supplement evidence for diagnostic hysteroscopy available at Gulumser C, Narvekar N, Pathak M, Palmer E, Parker S, Saridogan E. See-and-treat outpatient hysteroscopy: an analysis of 1109 examinations. *Reprod Biomed Online*. 2010 Mar;20(3):423-9), and 09/10 HES data highlighting a number of providers achieving high OP rates.

⁴ Estimates based on 09/10 Reference cost activity data and HES 09/10 spell level data.

⁵ Based on clinical opinion, staged move starting with 60% moving to 80% in 2013-14. This will allow providers transition time to provide outpatient hysteroscopy services

Figure 8.7: Same day emergency target rates

Clinical scenario	75th percentile rate	Current national average rate
Deep vein thrombosis (DVT)	74%	56%
Cellulitis	33%	24%
Pulmonary embolism	13%	10%
Asthma	30%	23%
Acute headache	41%	35%
Chest pain	46%	41%
Lower respiratory tract infections without chronic obstructive pulmonary disease	45%	37%
Appendicular fractures not requiring immediate fixation	38%	28%
Renal/ureteric stones	43%	32%
Falls including syncope and collapse	41%	27%
Epileptic seizure	32%	27%
Deliberate self harm	55%	48%

Section 9: Annexes

Annex A: Converting FCE-level costs to spell-level

9.1 An inpatient spell consists of one or more FCEs. As with FCEs, a spell is defined by a single HRG.

Data preparation

9.2 A subset of FCEs covered by the tariff was obtained from the HES0910 data set. This tariff subset was obtained by taking the entire data set and excluding the following:

- *Treatment function codes:*
 - 318 (*Intermediate Care*)
 - 319 (*Respite Care*)
 - 424 (*Well Babies*)
 - 700 (*Learning Difficulties*)
 - 710 (*Adult Mental Illness*)
 - 711 (*Child and Adolescent Psychiatry*)
 - 712 (*Forensic Psychiatry*)
 - 713 (*Psychotherapy*)
 - 715 (*Old Age Psychiatry*)
 - 720 (*Eating Disorders*)
 - 721 (*Addiction Services*)
 - 722 (*Liaison Psychiatry*)
 - 723 (*Psychiatric Intensive Care*)
 - 724 (*Perinatal Psychiatry*)
- *Soft tissue sarcoma activity*
- *Intracranial telemetry activity*
- *Private Patients (Administrative Category 02)*
- *Episodes funded by National Specialist Commissioning Group (NSCG)*
- *Regular Day / Night Attenders*
- *Spells that started in 2009-10, but were not completed in 2009-10 (even if one or more of the contributing FCEs were concluded prior to 2010-11)*
- *Episodes flagged for exclusion by data providers (via "=" in the commissioning serial number)*

9.3 The data were then grouped at an FCE and spell-level using the appropriate reference cost groupers. FCE HRGs were generated using the RC0910 grouper, spell HRGs were generated using the RC1011 grouper as this was the basis of design for the LP1213 grouper used for tariff.

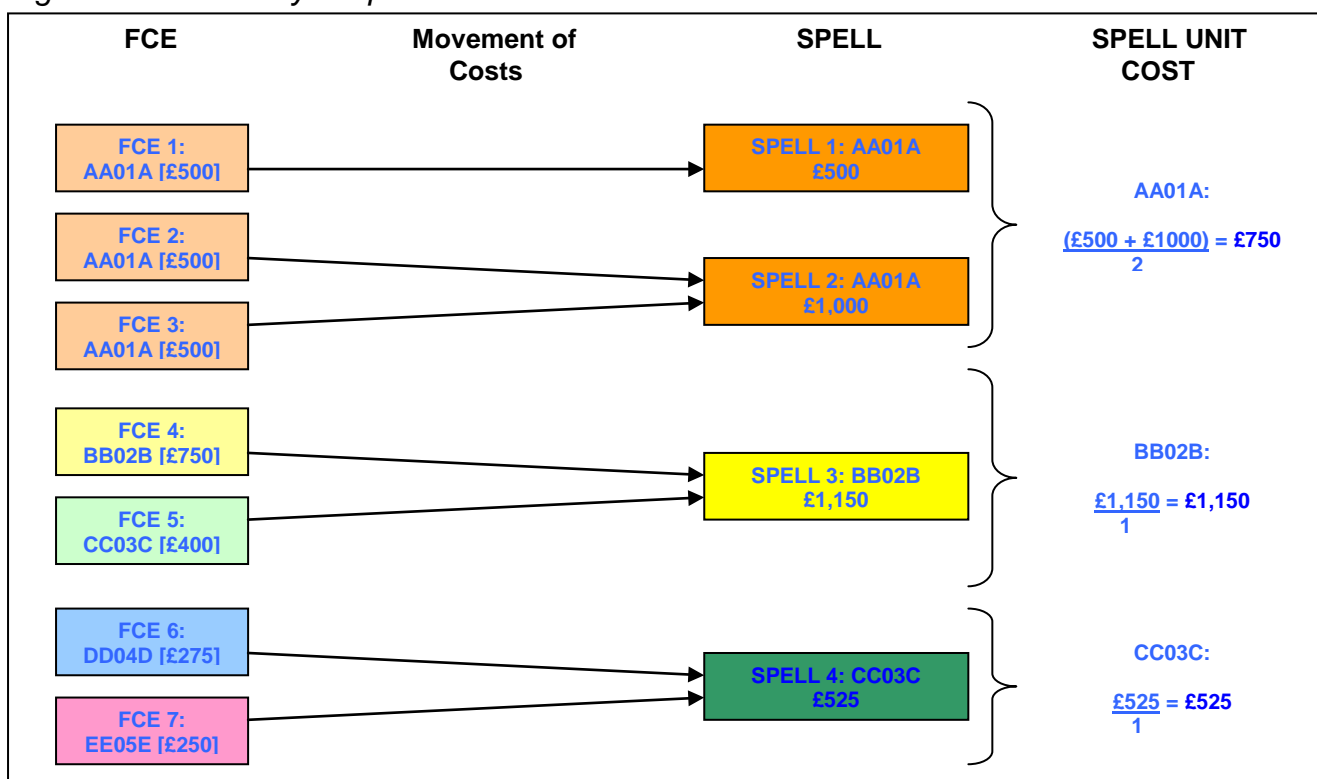
Conversion to spell level costs

9.4 The aim of “spell conversion” is to calculate total spell level costs (including EBD) by HRG and admission. The costs of spell-based EBD are then removed to create inlier spell unit costs.

9.5 Using HES0910 a matrix was produced which mapped FCE-based HRGs (by admission method) to the spell-based HRGs, i.e. each FCE to the spell in which it

occurred. A spell can be comprised of a single FCE of the same HRG or from multiple FCEs across different HRGs. In most cases, the spell HRG will be the same as one of the constituent FCE HRGs. In some instances, however, a FCE level HRG combination could map to a completely different spell HRG.

Figure 9.1: Summary of spell conversion



- 9.6 Total spell costs were produced by mapping (“spell converting”) FCE inlier and EBD costs separately.
- 9.7 For the conversion of inlier costs, adjusted RC0910 national averages were applied to the FCE to spell mapping and aggregated by spell HRG.
- 9.8 Conversion of FCE-based EBD costs was done by applying adjusted RC0910 national average EBD costs to the number of FCE EBDs for each FCE/spell combination within the mapping. FCE EBDs were derived from applying RC0910 trim points to HES0910. This ensures that consistent LoS activity is used when bundling FCE EBD costs and unbundling spell EBD costs, and takes into account any differences in activity and LoS between RC and HES.
- 9.9 The removal (or “unbundling”) of spell-based EBD was done by calculating the number of spell EBDs derived from applying tariff (spell) trim points to HES0910 (calculation of spell trim points in described in Annex B). The number of spell-based EBD were then multiplied by the long stay payment for the relevant spell-HRG chapter to calculate the total EBD costs to be removed from the spell.
- 9.10 Illustrated below is a simple worked example of the refined methodology.

Figure 9.2: Spell conversion methodologies example

Data	FCE/Spell	Source	AA01Z	YY01Z
Activity	FCE	HES	10	15
Activity	Spell	HES	5	10
Inlier Unit Cost	FCE	RC	£100	£50
EBD Unit Cost	FCE	RC	£10	£8
EBD (HES LoS)	FCE	-	20	60
EBD (HES LoS)	Spell	-	30	60

INLIER MATRIX (FCE Activity)			
SPELL HRG \ FCE HRG	AA01Z	YY01Z	TOTAL FCEs
AA01Z	8	2	10
YY01Z	5	10	15
FCE EBD MATRIX			
SPELL HRG \ FCE HRG	AA01Z	YY01Z	TOTAL (FCE EBDs)
AA01Z	16	4	20
YY01Z	20	40	60

METHODOLOGY USED

RC FCE-level Unit Costs:

AA01Z Inlier = £100

AA01Z EBD = £10

YY01Z Inlier = £50

YYA01Z EBD = £8

Calculate Total Cost of Inlier FCEs (using Inlier Matrix):

Inlier Mapping x Inlier Unit Cost

AA01Z to AA01Z = 8 x £100 = £800

YY01Z to AA01Z = 5 x £50 = £250

TOTAL AA01Z = £1,050

AA01Z to YY01Z = 2 x £100 = £200

YY01Z to YY01Z = 10 x £50 = £500

TOTAL YY01Z = £700

Calculate Total Cost of FCE EBDs (using EBD Matrix):

EBD Mapping x EBD Unit Cost

AA01Z to AA01Z = 16 x £10 = £160

YY01Z to AA01Z = 20 x £8 = £160

TOTAL AA01Z = £320

AA01Z to YY01Z = 4 x £10 = £40

YY01Z to YY01Z = 40 x £8 = £320

TOTAL YY01Z = £360

Calculate Spell Total Cost:

(Total Cost of Inlier) + (Total Cost of EBD)

AA01Z = £1,050 + £320 = £1,370

YY01Z = £700 + £360 = £1,060

Calculate Spell Inlier Total Cost:

Total Cost – (Spell EBDs x EBD Unit Cost)

AA01Z = £1,370 – (30 x £10) = £1,070

YY01Z = £1,060 – (60 x £8) = £580

Calculate Spell Inlier Unit Cost:

Inlier Total Cost / Spell Activity

AA01Z = £1,070 / 5 = £214

YY01Z = £580 / 10 = £58

Annex B: Calculation of trim points and excess bed days

- 9.11 The first stage was to calculate the long stay trim points, beyond which EBDs are counted. Lengths of stay (LoS) for all spells summed from the episode-based tariff subset were obtained from the HES0910.
- 9.12 Spell LoS were limited to a start date of 1st April 2008, so that spells with extreme LoS did not distort the calculation.
- 9.13 For each spell HRG / admission method combination, the distribution of spell durations was obtained. To be consistent with the tariff structure, separate upper trim points were calculated for EL and NE activity. DC were included in the calculation of the EL trim points.
- 9.14 The trim point for each combination is defined as:

$$\text{Upper Quartile} + (1.5 * \text{Inter Quartile Range})$$

- 9.15 The methodology used in calculating the location of quartiles for each spell HRG/admission method combination in tariff calculation was:

$$(x / 4) * (n+1)$$

where x was the quartile (i.e. 1 for the lower quartile, 3 for the upper), and n was the number of elements in the data set.

- 9.16 As outlined in the main tariff calculation guidance, HRGs with fewer than 150 spells in total or fewer than 50 DC/EL or NE spells were given the same tariff across both admissions to reduce the impact of volatility caused by small activity volumes. To ensure consistency, these HRGs were also given the same upper trim points for DC/EL and NE activity. These were calculated by pooling the DC/EL and NE LoS to produce a combined DC/EL/NE spell duration distribution for these HRGs.
- 9.17 Having generated the trim points, the number of EBDs for each HRG and admission method was calculated. This was derived in the same way as for the trim point calculation, however LoS were limited to 1st April 2009. This was done to ensure that the calculation of EBDs is consistent with the collection of RC0910 data.
- 9.18 Where the trim point was lower than the adjusted LoS, EBDs were calculated by subtracting the trim point from the adjusted LoS. The EBDs were then aggregated to obtain a total number of spell-based EBDs for each admission method / HRG combination.

Figure 9.3: Example of Excess Bed Days Calculation

(A)	Trim point for YY01Y		15 Days
(B)	Adjusted Spell Lengths of Stay:		
	Spell 1		20 Days
	Spell 2		13 Days
	Spell 3		18 Days
(C)	Number of EBDs:	(B - A)	
	Spell 1		5 Days
	Spell 2		-2 Days (thus 0)
	Spell 3		3 Days
(D)	Total EBDs	$\Sigma(C)$	8 Days

Annex C: Organisations highlighted by the Audit Commission

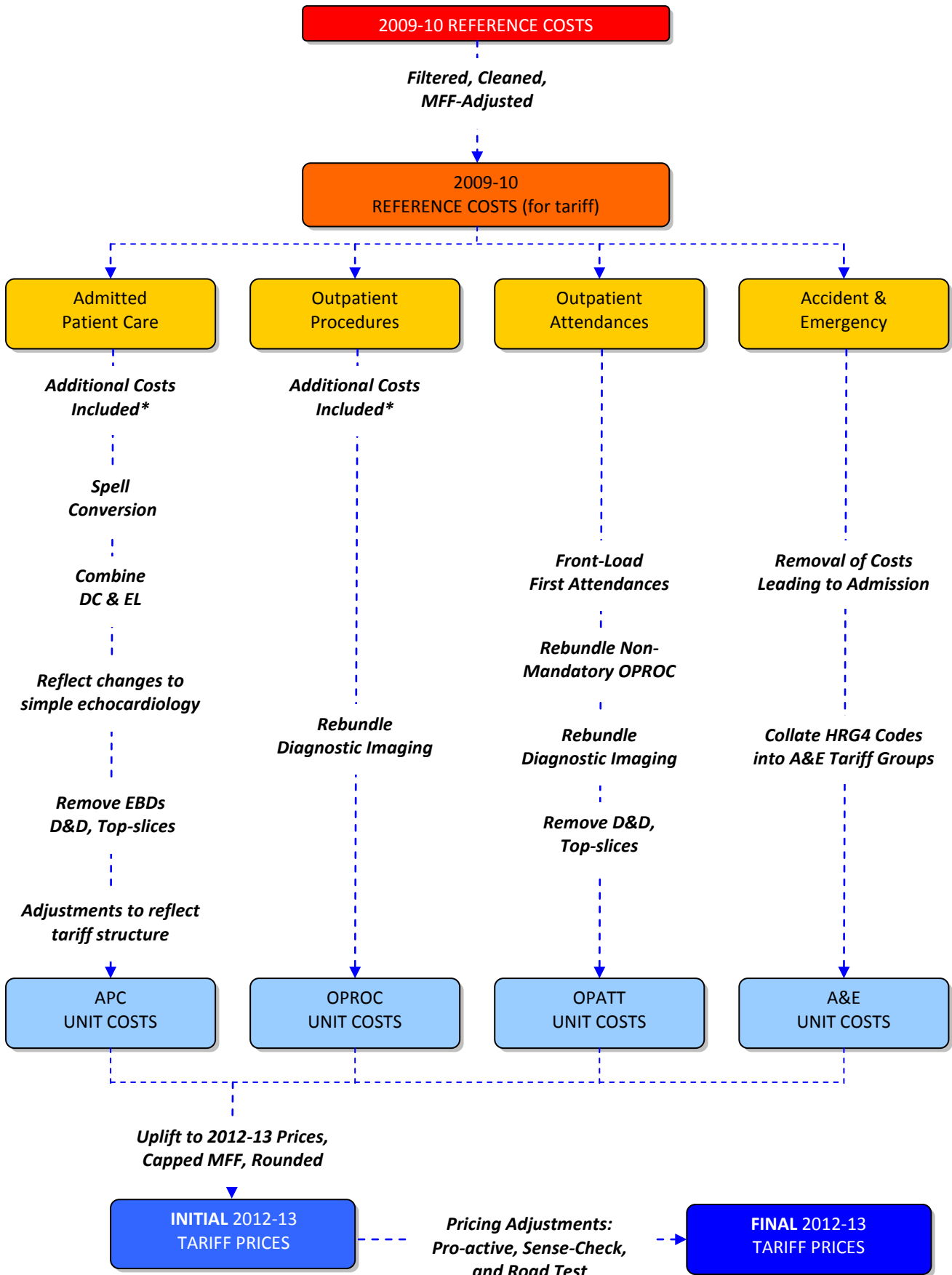
A list of organisations for whom the Audit Commission were unable to offer assurance that their 2009-10 reference costs were wholly accurate.

Organisation Name
Bedford Hospital NHS Trust
Blackpool Teaching Hospitals NHS Foundation Trust
East Cheshire NHS Trust
East Lancashire Hospitals NHS Trust
Heatherwood and Wexham Park Hospitals NHS Foundation Trust
Hull and East Yorkshire Hospitals NHS Trust
Isle of Wight NHS PCT
Leeds Teaching Hospitals NHS Trust
Medway NHS Foundation Trust
Newham University Hospital NHS Trust
Northern Devon Healthcare NHS Trust
Poole Hospital NHS Foundation Trust
Royal National Orthopaedic Hospital NHS Trust
Scarborough and North East Yorkshire Health Care NHS Trust
Sheffield Children's NHS Foundation Trust
Sherwood Forest Hospitals NHS Foundation Trust
South London Healthcare NHS Trust
Southend University Hospital NHS Foundation Trust
The Newcastle Upon Tyne Hospitals NHS Foundation Trust
The Princess Alexandra Hospital NHS Trust

Annex D: Glossary of Terms

A&E	Accident & Emergency
AC	Audit Commission
APC	Admitted Patient Care
BADS	British Association of Day Surgery
BPT	Best Practice Tariff
CC	Complications & Co-morbidities
CCU	Coronary Care Unit
CL	Consultant-led (Outpatient Attendance)
CNST	Clinical Negligence Scheme for Trusts
D&D	Drugs & Devices
DC	Daycase
DI	Diagnostic Imaging
EBD	Excess Bed Days
EL	Elective
FCE	Finished Consultant Episode
HES0910	Hospital Episode Statistics (2009-10)
HRG	Health Resource Group
ICR	Injury Cost Recovery (Scheme)
IP	Inpatient
LoS	Length of Stay
MFF	Market Forces Factor
NCL	Non-consultant-led (Outpatient Attendance)
NE	Non-Elective
NICE	National Institute for Health and Clinical Excellence
NSCG	National Specialist Commissioning Group
OPATT	Outpatient Attendance
OPROC	Outpatient Procedure
PbR	Payment by Results
PCT	Primary Care Trust
PMS+	Personal Medical Services Providers
RC0910	Reference Costs (2009-10 Return)
SSEM	Short Stay Emergency Tariff
TFC	Treatment Function Code
UC	Unit Cost

Annex E: Tariff Calculation Flow Chart



* including CCU and CNST

NOTE: this chart summarises the tariff calculation process and does not reflect each individual model, nor the order in which adjustments take place