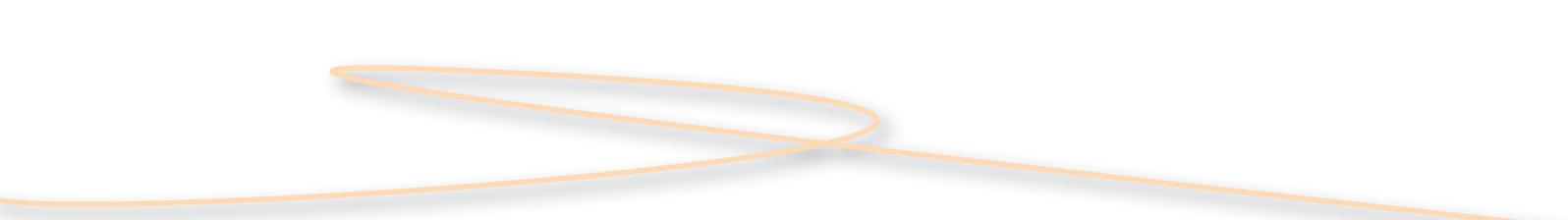


# Kidney Dialysis - developing costs to deliver an equitable and high quality service

Final Report  
June 2009



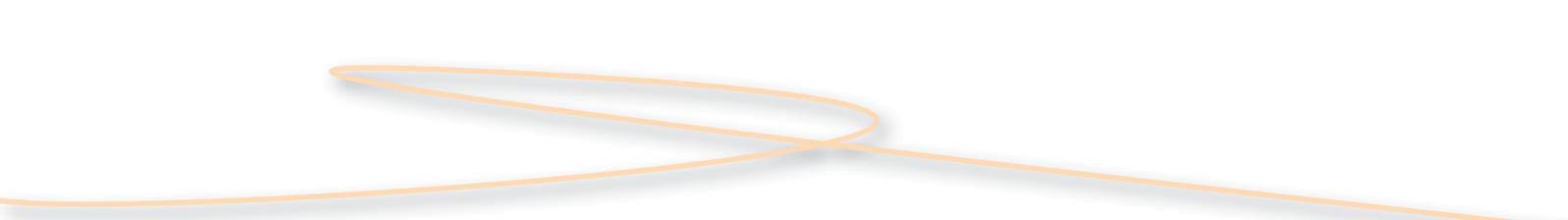




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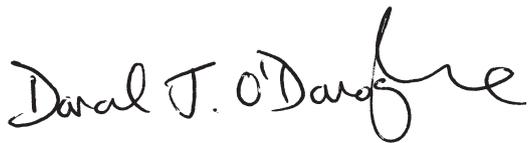
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## Foreword

Since this project began the concept of a Best Practice Tariff has been developed and endorsed. This report provides a financial basis for considering this approach to commissioning of kidney dialysis, offering an opportunity to both introduce the service into the scope of PbR and improve the quality of service through incentivising best clinical practice.



**Donal O'Donoghue**

National Clinical Director for Kidney Care

## Executive Summary

The Department of Health (DH) is committed to introducing a tariff system as a means of paying for healthcare services in the NHS. Several initiatives over the past few years have shown considerable variability in the costs of kidney dialysis in different units. As a result, the kidney community was keen to develop more robust reference costs for dialysis. There was additional impetus for ensuring consistency and accuracy of costs for renal dialysis therapy due to the significant financial implications that the introduction of a national tariff will have on individual providers and commissioners.

A Payment by Results (PbR) for Kidney Dialysis Project Group was established in November 2007 to conduct a study designed to increase

understanding of the key issues in the quality of costing and the development of national tariffs for renal dialysis. The Group included representatives from the Department of Health and clinical, operational and finance leads from 16 NHS Trusts.

The first stage of the project was an intensive review of cost variations in the national reference cost returns for adult kidney dialysis with the aim of understanding what different units were including in their costings for dialysis, and whether this was being approached in a consistent manner. Results showed wide variation in the costs submitted by different Trusts which, in the view of the Project Group, made them unacceptable for tariff calculation.

Going through the costing exercise enabled Trusts to recognise gaps in information and identify improvements in their costing systems. The Group also recommended that it would be useful to further develop HRG4 service definitions in relation to dialysis to reflect the complexities associated with different patient groups through the Renal Expert Working Group.

The project group considered that there was a need to reinforce a number of key areas to improve the quality of both financial and activity data collection from 2008 onwards and to increase the robustness of costing models. In phase two of the project, Trusts shared their provisional 2008 reference cost returns before final submission. They used the checklist developed by the project to increase the consistency of the figures reported. Results showed a reduction in the variations in costs, with the final figures providing a more robust basis on which to consider further tariff development.

This report provides an account of the process used in the project and the key results and recommendations arising from the findings, with the aim of enabling this information to be shared nationally. It provides useful insight into the variation in costs for dialysis between

different Trusts and shows the value of developing national consistency by the development of a costing template and checklist. Finally, the project has provided more information on the costs of dialysis that can be used as a more accurate basis for setting a national tariff. It has also enabled Kidney Dialysis to be part of the work underway to develop Best Practice Tariffs.

## **Acknowledgement**

*Grateful thanks to all the members of the PbR for Kidney Dialysis Project Group (Appendix A) who gave willingly of their time to contribute to the development of the project and to the staff in participating Trusts who collected and analysed the data on renal dialysis costs. Particular thanks to Dr Donal O'Donoghue, National Clinical Director for Kidney Care for spearheading this work, to Paul Jennings, Chief Executive, NHS Warwickshire for Chairing the Project Group; to Beverley Matthews, Director, NHS Kidney Care for providing the project management required to keep the project on course; to Chris Newton, Senior Divisional Finance Manager, University Hospitals Birmingham, for providing financial leadership and co-ordinating the data analysis; and to the PbR Clinical Advisory Panel (CAP) and RAG for supporting the project.*

# Chapter one: Introduction and context

## 1.1 The context

- 1.11 The Department of Health (DH) reiterated the commitment to a tariff system as a means of paying for healthcare services in the NHS in the consultation document *Options for the Future of Payment by Results: 2008/09 to 2010/11*, published in March 2007.
- 1.12 In the consultation document, the DH asked if there were any organisations interested in becoming development sites, to develop new currencies for services outside the scope of the national tariff or alternative currencies or funding models for services within the scope of the national tariff. Their purpose was to help make improvements to local funding mechanisms and to inform national development of payment by results. The ultimate aim was to create more transparent local and national funding mechanisms, which help ensure high quality, efficient, sustainable and accessible services.
- 1.13 In response, the renal community, working through the Renal Advisory Group (RAG), highlighted a number of concerns from clinicians and managers

and made suggestions for a work programme that would support the development of a tariff for kidney services, specifically for kidney dialysis.

## 1.2 Scoping: Why develop an indicative tariff for kidney dialysis?

- 1.21 At the time that the project was initiated, the PbR Team had indicated that it was aiming towards an indicative tariff for 2009/10, with a view to being mandatory for renal services, including kidney dialysis, in 2010/11. Several initiatives had been undertaken over the last few years to examine and compare the cost of renal dialysis in different units. These had shown considerable variability in provider costs. As a result, the kidney community was keen to develop more robust reference costs to inform tariffs.
- 1.22 There was additional impetus for ensuring consistency and accuracy of costs for renal replacement therapy due to the significant financial implications that the introduction of a national tariff would have on individual providers and commissioners.

# Chapter 2: The aims of the project

2.1 The objective of the project was to understand better the key issues influencing the quality of costing and inform the development of national tariffs for kidney dialysis.

## 2.2 Why was this service area chosen?

2.21 Dialysis was chosen as the focus of the project because:

- It is a major area of clinical activity and service delivery for most renal units and often provides the majority of renal unit income
- The renal community considered there was a need to ensure consistency and accuracy of renal replacement therapy costs because of the significant financial implications that a national tariff would have on individual providers
- There was concern that the tariff should be in line with implementing the aims of the National Service Framework for Renal Services, allowing choice of dialysis to suit individual patients' needs and with no financial incentives in favour of certain dialysis modalities or for a particular frequency of dialysis
- There was limited reference cost collection guidance for these services

- Some units were aware of overall spending on dialysis (their quantum of costs) but had little information about costs allocated to the different elements included in the total
- Several initiatives over the last few years had shown variability in provider costs for renal dialysis in different units
- There had previously been relatively little interaction between clinical staff and finance teams in some renal units, resulting in a low level of shared understanding.

**Donal O'Donoghue, National Clinical Director for Kidney Care, Department of Health**

"Dialysis should be customised around the needs of the individual to improve experience and outcomes. We need both accurate costs and measures of quality to ensure our current service builds on best practice and does not fossilise the past"

**Chris Newton, Senior Divisional Finance Manager, University Hospital Birmingham**

"Renal dialysis is a major component of kidney services in many Trusts. The introduction of tariffs could have a very marked financial effect so it is essential that reference costs underpinning tariffs are calculated on an accurate basis."

### **Beverley Matthews**

**Director, NHS Kidney Care**

“The key aim of the project was to get motivated Trusts together who were prepared to work collaboratively to gain a better shared understanding of the costs of renal dialysis.”

### **Dr Hugh Cairns, Consultant**

**Nephrologist, King’s College Hospital  
NHS Foundation Trust, London**

“Ensuring that the costs are correct for dialysis is important because it constitutes a large proportion of a renal unit’s activity. Failing to get the costs correct could potentially destabilise a renal unit.”

**Dr John Bradley, consultant physician  
and nephrologist, Addenbrooke’s  
Hospital and Director of Research and  
Development, Cambridge University  
Hospitals NHS Foundation Trust**

“It was important that an indicative tariff was set for dialysis that was going to enable the service to be deliverable and sustainable.”

“We needed to look at the issue systematically, so we met with the PbR team and it was decided that a more rigorous costing analysis was needed. Trusts needed to provide detailed costs for dialysis to see why there were such broad differences.”

## **2.3 Governance: who was involved in the project?**

2.31 The project was run by the PbR for Kidney Dialysis Project Group, which was established in November 2007 (See Appendix A). This included representatives from the Department of Health and clinical, operational and finance leads from 16 NHS Trusts. The project was sponsored by the PbR Clinical Advisory Panel (CAP) and RAG.

## **2.4 Trusts providing data**

2.41 The 16 Trusts that took part in the project provided a nationally representative sample of kidney service delivery in England in terms of:

- Pool size
- Transplant centres and non-transplant centres
- Number of satellite units
- Size of home haemodialysis programmes.

## Participating Trusts



Cambridge University Hospitals NHS Foundation Trust  
East Kent Hospitals University NHS Foundation Trust  
East & North Hertfordshire NHS Trust  
Epsom & St Helier University Hospitals NHS Trust  
Guys and St Thomas's NHS Foundation Trust  
King's College Hospital NHS Foundation Trust  
Royal Berkshire NHS Foundation Trust  
Royal Cornwall Hospitals NHS Trust

Royal Free Hampstead NHS Trust  
Royal Wolverhampton Hospitals NHS Trust  
Salford Royal Hospitals NHS Foundation Trust  
South Tees Hospitals NHS Foundation Trust  
University Hospitals Birmingham NHS Foundation Trust  
University Hospitals Coventry & Warwickshire NHS Trust  
University Hospitals of Leicester NHS Trust  
York Hospitals NHS Foundation Trust

# Chapter 3: Methodology and process

## 3.1 Initial Workshop

3.11 An initial workshop was held for participating organisations setting out the context of the project and to agree the data to be collected. The meeting was well attended, with at least one representative from all 16 Trusts. The key focus was to agree the project scope and identify the key components of the costing template.

3.12 In order to gain an understanding of cost variations part of the workshop focused on a review of the most recently available national reference cost returns (2006) for adult kidney dialysis. This showed that there was significant variation in reference costs and, in particular, for peritoneal dialysis.

## 3.2 Stage one: comparison of baseline cost data

### 3.21 Template development

3.211 Following the first workshop, a template was developed to identify cost components and categories for dialysis (see Appendix B) based on the four Healthcare Resource Groups version 4 (HRG4) definitions together with further disaggregations into:

- Haemodialysis/Hospital
- Haemodialysis/Satellite

- Haemodialysis/Home
- Continuous Ambulatory Peritoneal Dialysis/Automatic Peritoneal Dialysis.

### 3.22 Data collection and analysis

3.221 The template was circulated to all participating Trusts for completion and subsequent analysis based on their 2006/07 reference cost submissions.

3.222 The data were then analysed and presented back to the Project Group at a second workshop. The team shared the 'lessons learned' and identified reasons for the variations in costs identified.

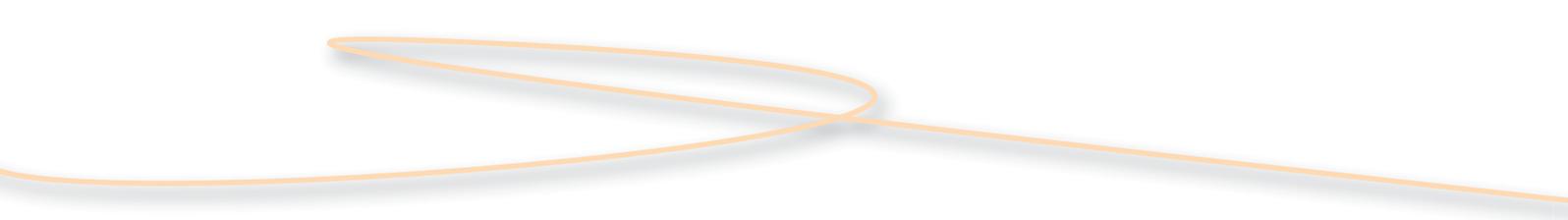
## 3.3 Stage Two: comparison of baseline cost data

### 3.31 Development of Checklist

3.311 A Checklist of the 'Lessons Learned' from Stage One was generated and shared with all 52 Trusts with a kidney service across England to improve all reference cost submissions for 2008 returns.

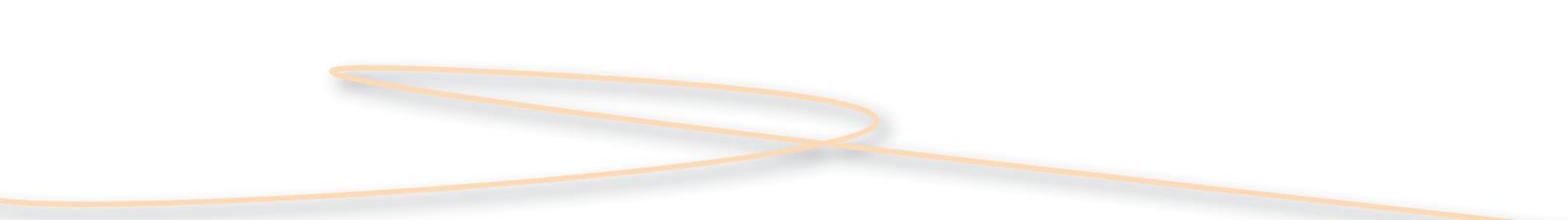
### 3.32 Data Analysis for 2008 Returns

3.321 All 16 Trusts shared their provisional 2008 submissions prior to formal submissions to enable validation of the impact of the project aim of increasing the consistency of the figures reported.



### 3.4 Timeline of the project process

<b>October 2007</b>	<b>November 2007</b>	<b>December 2007</b>	<b>January 2008</b>	<b>February 2008</b>
Project outline plan drawn up	PbR for Kidney Dialysis Project Group established	Initial workshop for participating organisations to agree on data collection	Reference cost analysis template developed based on the 4 HRG4 definitions and further disaggregations	Data analysis workshop for 2006/07 reference costs into key categories
Representative sample of Trusts invited to take part Each Trust set up a multidisciplinary team	Trust projects teams asked to secure Chief Executive sign-up to project membership	Trusts completed the template based on 2006-07 reference costs submissions		



**March  
2008**

Reference cost  
checklist introduced

**May  
2008**

Interim report and  
recommendations  
published

**September  
2008**

Provisional 2007/2008  
costs analysed at final  
workshop

**Jan/Feb  
2009**

Analysis of actual  
2007/08 reference  
costs

**May  
2009**

PbR project group  
make final recommendations

Trusts collected data on provisional 2007/2008 costs using the checklist

# Chapter 4: Results from phase one

4.1 The Project Group analysed data from all 16 participating Trusts, reconciling their individual submissions from the 2006/07 reference costs collection exercise with the actual data received by the PbR Team.

4.2 The intention was to compare the cost components of each dialysis modality using actual reference cost quantum and activity levels as control figures. However, as a result of breaking down costs into the project template and a multidisciplinary review of local data, all but one Trust identified weaknesses in their original 2007 submissions (see page 18/para 4.151).

4.3 As a result, the first stage of the project analysis focused on data validation, reasonableness checking and data cleansing. This culminated in a second cut dataset incorporating several amendments. This resulted in a move away from the initial 2007 control figures, but the project group considered this second cut provided a much more meaningful basis on which to make comparisons.

## 4.4 Key findings by HRG

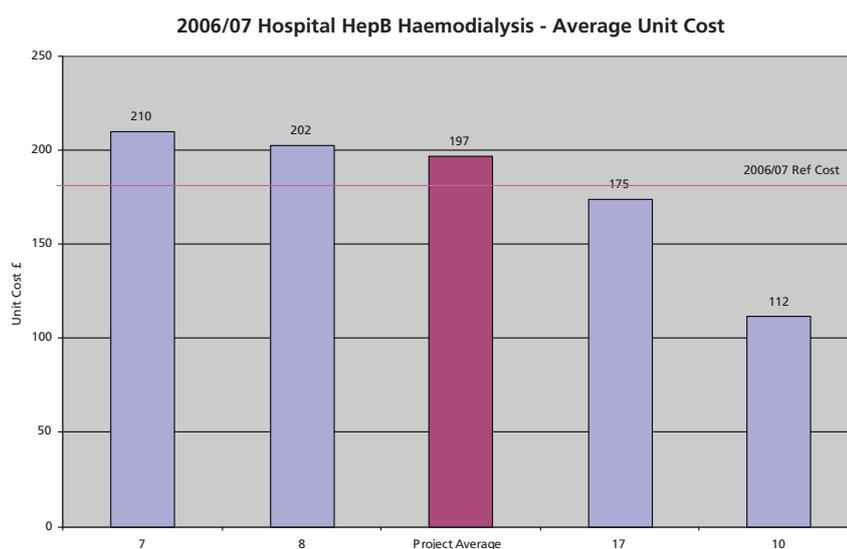
### 4.5 LC01A: Haemodialysis/filtration in patients with Hepatitis B aged 19 years and over

4.51 Seven Trusts made a submission for haemodialysis (HD) for patients with Hepatitis B, although only four of these had a significant number of dialysis sessions (the other 3 Trusts combined comprised less than 1% of the total). There were only 5,452 sessions in people with Hepatitis B submitted by the participating Trusts, which represented 3% of the national total.

## 4.6 Key finding

4.61 The average unit cost for these Trusts was £197, which was higher than the National Schedule of Reference Costs (NSRC) national average of £175 (see Figure 1).

**Figure 1: Average unit cost for Hospital Haemodialysis for patients with Hepatitis B**



#### 4.7 Variations

4.71 One Trust submitted a large number of sessions but noted that this included Hepatitis C and HIV patients. In two Trusts, the unit costs were the same as for Haemodialysis without Hepatitis B and there were minimal differences in the other two submissions.

#### 4.8 Learning points

4.81 Where separate costs for patients with Hepatitis B receiving haemodialysis are identified (LC01A), these should include the cost differential arising from the need to provide isolation dialysis if its delivery reduces staffing flexibility and increases the capital costs by requiring use of patient-specific dialysis machines.

4.82 At a national level, only 21 out of 52 Trusts (40%) submitted data under this definition [DH PbR team, taken from 2006/7 national schedule of reference costs], although it is understood that all Trusts manage some patients with Hepatitis B. As a result of further consultation with the Expert Working Group this HRG has been amended to LC01A Haemodialysis/Filtration on patient with Blood Borne Viruses 19 years and over, to include Hepatitis B, C and HIV in the 2008/09 Reference Cost Grouper, and is designed to reflect the additional resource to dialyse patients with these conditions.

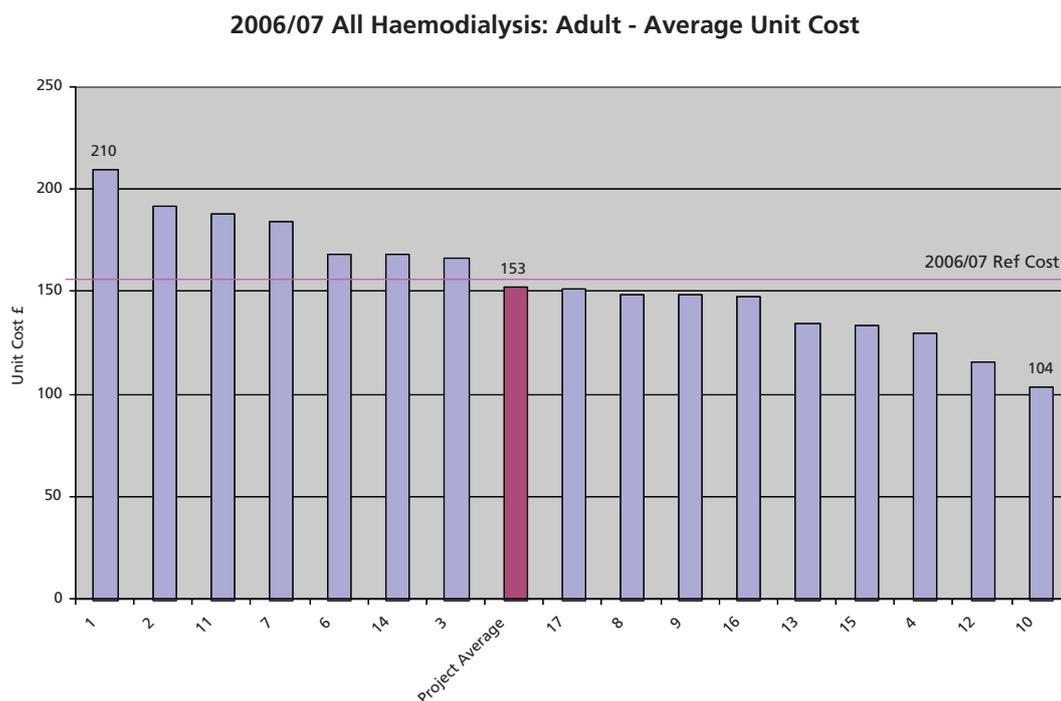
## 4.9 LC02A: Haemodialysis/filtration for patients aged 19 years and over

4.91 All 16 participating Trusts submitted project data for this definition, which collectively represented 41% of national activity.

## 4.10 Key finding

4.101 The project gave an average unit cost of £153, which compared to £158 for the national average (see Figure 2). The range in costs was £104 to £210, with part of the variation explained by local market factors for Trusts in London and the South East.

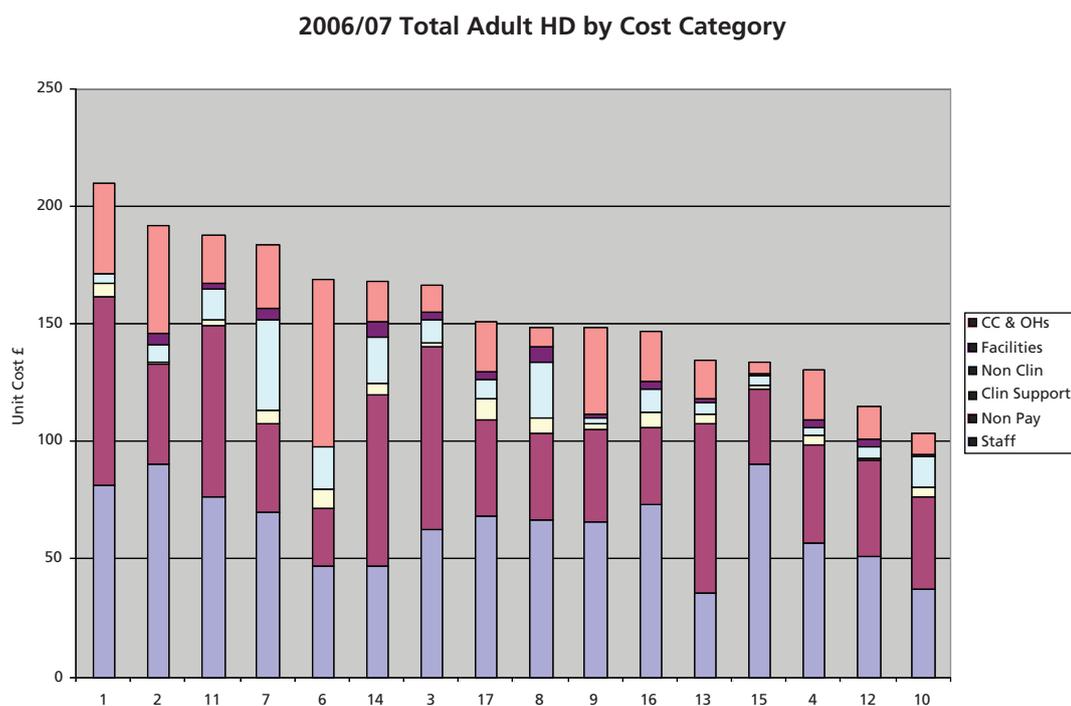
**Figure 2: 2006/07 All haemodialysis for adults – average unit costs**



## 4.11 Cost variations

4.111 Further analysis showed significant variation in individual cost components and particularly in capital charges and overheads (see Figure 3).

**Figure 3: 2006/07 Total adult haemodialysis by cost category**



4.112 Examining this further, non-pay costs were broadly consistent at approximately £40 per session and an arithmetic mean of £49 (See Appendix D, Graph 4). Although variation should be least significant for this cost category, outliers were explained, in part, by independent sector unit cost allocation assumptions as well as other variables in cost allocation models.

4.113 Staff pay costs averaged £64 per session but showed a high degree of variation that was not readily

explainable (See Appendix D, Graph 5). Capital charges and overheads showed an average of £24, but with a range of £5-£71 (Appendix D, Graph 6). Variation was due to cost allocation in costing models but these costs were also generally higher in London and the South East.

• **Hospital Haemodialysis**

The project average cost for hospital haemodialysis was £185, with a range of £104 - £288. As expected, unit costs were

higher in London and the South East but it should be noted that this excludes any adjustment for market forces factors (Appendix D, Graph 7).

- **Satellite Haemodialysis**

Project satellite haemodialysis costs show a more consistent cost distribution, with an average of £142. This unit cost was 23% less than that for Hospital HD (Appendix D, Graph 8).

- **Home Haemodialysis**

Home haemodialysis costs showed major variation, ranging from £28 - £133 per dialysis, which reflects the significant differences in the estimated number of dialysis sessions undertaken each week (Appendix D, Graph 9). The average unit cost was £83 per session.

#### **4.12 LC03A: Peritoneal Dialysis (PD) in patients with Hepatitis B aged 19 years and over**

4.121 There were no project submissions for this definition. Participating Trusts did not identify differences in treatment or costs for patients with blood borne viruses receiving PD therapies. As a result of further consultation with the Expert Working Group this HRG has

been removed from the Reference Cost 2008/09 Grouper design as it was considered that there was no significant resource difference in patients receiving PD with or without blood borne viruses.

#### **4.13 LC04A: Peritoneal Dialysis in patients aged 19 years and over**

4.131 There were 15 peritoneal dialysis returns, including 15 for continuous ambulatory peritoneal dialysis (CAPD) and 13 for automated peritoneal dialysis (APD), covering 35% of national activity. Activity measures proved an issue that resulted in both very high and low unit costs which is discussed further on page 19. The project average was £57, compared to a national average of £52 (Appendix D, Graph 10).

- **CAPD and APD**

Participating Trusts went beyond the HRG4 definitions by examining the individual costs of both CAPD and APD. The project average unit cost for CAPD was £52 and £60 for APD, representing an annual therapy cost of £19.0k and £21.9k, respectively (Appendix D, Graphs 11 and 12).

As a result of further consultation with the Expert Working Group in the Reference Cost 2008/09 Grouper design the HRGs above have been replaced with:

- LC04A** Continuous Ambulatory Peritoneal Dialysis 19 years and over
- LC05A** Automated Peritoneal Dialysis 19 years and over

These new HRGs separating CAPD and APD better reflect the cost differences seen in the project submissions.

#### 4.14 Therapy cost summary

4.141 The average actual costs, not adjusted for market forces factors, from the 2007 reference cost submissions for the 16 participating Trusts at 2006/07 price levels were:

#### 2006/07 Project Reference Cost Comparisons

	Cost per Session £	Annual Sessions	Annual Cost £
<b>All Haemodialysis LC02A</b>	<b>153</b>	<b>156</b>	<b>23,868</b>
Hospital Haemodialysis	185	156	28,860
Satellite Unit Haemodialysis	142	156	22,152
Home Haemodialysis*	83	208	17,264

	Cost per Therapy Day £	Annual Days	Annual Cost £
<b>All Peritoneal Dialysis LC04A</b>	<b>57</b>	<b>365</b>	<b>20,805</b>
Continuous Ambulatory PD	52	365	18,980
Automatic PD	60	365	21,900

Note - Home Haemodialysis annual sessions based on 4x weekly therapy

## 4.15 Analysis of weaknesses in the data

4.151 All but one of the 16 Trusts taking part in the project identified weaknesses in their original 2007 submissions as a result of breaking down costs into the project template and reviewing data locally. Most of these variances were identified by the Trusts and discussed with the project team as part of the open approach to the project.

4.152 One of the major contributors to these weaknesses was lack of continuity in the finance staff contributing to reference costs models. This was compounded in some cases by inadequate audit trails. Another problem was that the costing template sent to participating Trusts may have been too complex and some Trusts had difficulty in differentiating between cost details.

4.153 The main areas of weakness arose in:

- The recording of activity against HRG4 'service label' headings
- Activity measures for each of the dialysis modalities
- The calculation of trust reference quantum.

## 4.16 HRG4 Service labels

4.161 The majority of Trusts submitted returns using HRG4 service labels LC02A for adult haemodialysis/filtration (HD) and LC04A for adult peritoneal dialysis (PD), which are correct. Two Trusts made errors in service labelling within their 2007 data submissions, with one Trust submitting all PD data (LC04A) under PD for patients with Hep B (LC03A), and another Trust submitting Haemodialysis activity (LC02A) under PD (LC04A). One Trust also included cost and activity data for all patients with a blood borne virus under LC01A rather than including only those patients with Hepatitis B.

4.162 Overall, the impact of labelling errors at a national level is likely to be small and appropriate rules excluding outliers would address this issue.

## 4.17 Activity recording

### • Peritoneal Dialysis

4.171 The most common error was the activity levels submitted for PD therapies, with six of the 16 participating Trusts (38%) amending PD therapy days compared to their

2007 submissions as the unit cost denominator. The majority of these reflected costing models that had historically contained estimates of the number of bags or exchanges before the revised technical guidance issued for 2007 required the number of therapy days. As a result of this error it is likely that national reference costs returns considerably understate PD therapy day costs. This helps to explain the very wide variation in PD unit costs seen in the returns for different Trusts.

- **Haemodialysis**

4.172 Haemodialysis activity was generally well understood in terms of data submission, with few changes from the original NSRC returns. There was material understatement in one Trust taking part in the project.

4.173 Not all Trusts were able to identify accurately the disaggregated split of activity between hospital, satellite and home dialysis sessions. This highlighted the fact that many Trusts used measures employed locally for contracting purposes, rather than actual activity.

4.174 At the project review workshop, only one Trust stated that it had recorded all its HD activity on a PAS system, with the majority of Trusts using various local proxy measures for contracting purposes based on patient numbers or dialysis stations.

4.175 Home haemodialysis activity was particularly poorly recorded, with estimates of the average weekly frequency of dialysis sessions varying from 3-7 times weekly. This is clearly an important issue that requires attention before a move to tariffs in the future.

#### **4.18 Changes implemented as a result of taking part in the project**

4.181 Six of the 16 Trusts amended their overall dialysis quantum as a result of reviewing costs for the project. These changes fell into the following categories:

- reference cost exclusions
- costs incorrectly excluded
- cost allocation within the quantum.

- **Dialysis reference cost exclusions**

4.182 The 2006/07 reference cost guidance contained a number of significant changes to accommodate the costing of HRG4. Two of these changes that impact on renal dialysis are the exclusion of patient transport services and high cost drugs including erythropoietin stimulating agents (ESAs), or erythropoietin [EPO]).

4.183 One Trust had included the cost of ESAs (EPO) and six Trusts had included the costs of patient transport, which accounted for significant variation in costs.

- **Cost completeness**

4.184 Many Trusts commented that the review of cost components had enabled them to identify omissions in their cost models. These included items such as pay costs for medical staff, specialist nursing, medical engineering costs (technical support) and imaging requests.

- **Costing models – cost allocation**

4.185 All of the Trusts participating in the project found it challenging to allocate

their reference cost totals into the cost components listed in the project comparison template.

4.186 The complexity of Trust costing models often limits the ability for originating direct costs to be mapped back to the unit costs generated as they pass through a number of cost pools picking up further Trust costs as part of the full absorption algorithms in the software. Secondly, the way data are collected in Trust general ledger systems does not always facilitate simple allocation between modalities. Thirdly, where Independent Sector (IS) satellite units are operated, cost allocation is problematic and somewhat arbitrary allocations to cost headings are often followed. These factors limited the opportunities for cost comparisons in a number of areas.

- **Future Costing Development**

4.187 On a positive note, Trusts stated that the review of their costing models, including much greater clinical input, had been a useful exercise and many improvements were made to cost models as a result.

# Chapter 5: Next steps arising from phase one

## 5.1 Key findings from stage one requiring action

- The variations in 2006/07 unit costs made these reference costs unacceptable for tariff calculation
- Tariff definitions required greater granularity
- Tariff flexibilities
- Tariff design issues
- Activity recording was inconsistent.

## 5.2 Costing and tariff calculation

5.21 As a result of the high number of data inaccuracies found in stage one, the project group considered that the validity of a tariff calculated using 2006/07 reference cost returns would be questionable. It was considered likely that similar problems would apply to Trusts not taking part in the project so, overall, the group considered that the variation in unit costs revealed by the project made them unacceptable for tariff calculation.

5.22 A number of factors contributed to the variation in costs, including:

1. 2006/07 was the first year that reference costs were collected using HRG4.
2. Guidance and the grouper software were published at a late stage.
3. Some Trusts were introducing new costing models to implement patient level costing systems, which caused an element of inconsistency.

5.23 Renal dialysis has historically been subject to local payment mechanisms, so it is likely that it has not been given the same level of costing attention as tariff funded services. Similarly, the engagement of finance staff in this clinical area may have been limited in the past when reviewing costing models and their outputs.

5.24 The project group considered that there was a need to reinforce a number of key areas to improve the quality of both financial and activity data collection from 2007/08 onwards and to increase the robustness of costing models. To

help achieve this, the project team developed a Reference Cost Data Collection checklist (see Appendix B) at an early stage in order to share its learning more widely within the NHS. This was sent, together with the service costing template (Appendix C), to all 53 Trusts providing kidney services to help inform and improve the preparation of 2007/2008 reference costs.

5.25 In relation to activity figures, it is apparent that Trusts use a range of methods to arrive at the total activity denominator. This raises questions about best practice to ensure fair reimbursement and a level playing field as we move towards a tariff.

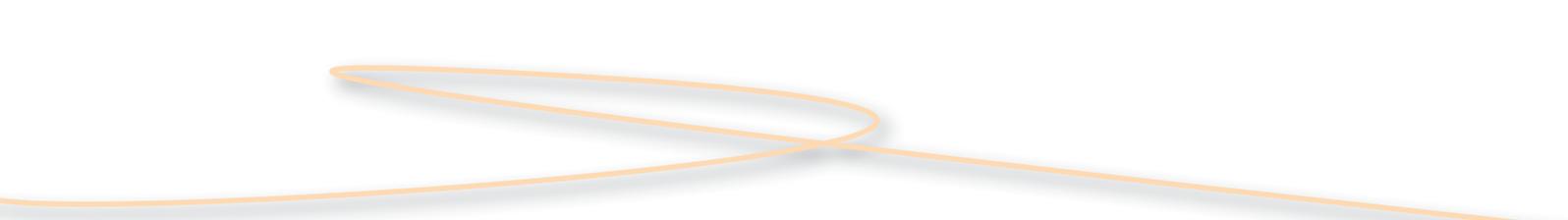
### **5.3 Tariff definitions: improving granularity**

5.31 The difference in average unit costs for Hospital, Satellite and Home HD is significant and raised the risk of perverse incentives. Some commissioners have expressed the view that they would be reluctant to pay for an expansion in satellite unit capacity, largely situated in non-hospital settings, skewed by the higher cost elements for more acute hospital-based services.

5.32 With regard to the differences in PD therapy costs, the variation between CAPD and APD of 15% was less marked, but raises similar issues to those for haemodialysis. It is important that the use of a combined PD tariff does not constrain the uptake of APD where this is indicated clinically. Conversely, from a local commissioning perspective, a combined tariff might also raise concerns where the majority of patients receive CAPD.

### **5.4 Tariff flexibilities**

5.41 For Home HD, the large majority of patients have dialysis three times weekly but some patients will dialyse more often (up to six times weekly). As they have a dedicated machine at home, the cost of additional dialysis sessions does not increase linearly with dialysis frequency i.e. the cost of six sessions does not cost twice as much as three sessions. Therefore, a payment per session basis might be resisted by commissioners for patients requiring more frequent therapy, and this could stifle innovation in this area.



## 5.5 Tariff design issues

5.51 The project group believes that there is an inconsistency of approach in restricting the HRG4 tariff definition for patients with blood borne viruses to Hepatitis B (LC01A) for haemodialysis, as the additional resource implications apply for patients with Hepatitis C and HIV. It also considered that the HRG definition of PD for patients with Hepatitis B (LC03A) is not necessary from a tariff design perspective. The project group is pleased that the 2008/09 Reference Cost Grouper design takes into account these issues, and that the new HRGs are more appropriately aligned from a tariff design perspective.

## 5.6 Activity recording

5.61 The project showed clear evidence that methods for activity recording across all modalities were inconsistent and require further data quality refinement.

# Chapter 6: Results of phase two

## 6.1 Process

6.11 Trusts participating in the project shared their provisional 2008 reference cost submissions in September 2008, before formal submission. They used the checklist (ref 5.24 and Appendix B) developed by the project to increase the consistency of the figures reported. These costs were compared with the previous data and, as a result, further recommendations were made on tariff development.

## 6.2 Results

### 6.3 Analysis of 2007/08 reference cost submissions from participating Trusts

6.31 Returns were received in September 2008 from the 16 participating Trusts in order to provide an early indication of what progress had been made in the preparation of reference costs following the stage one of the project.

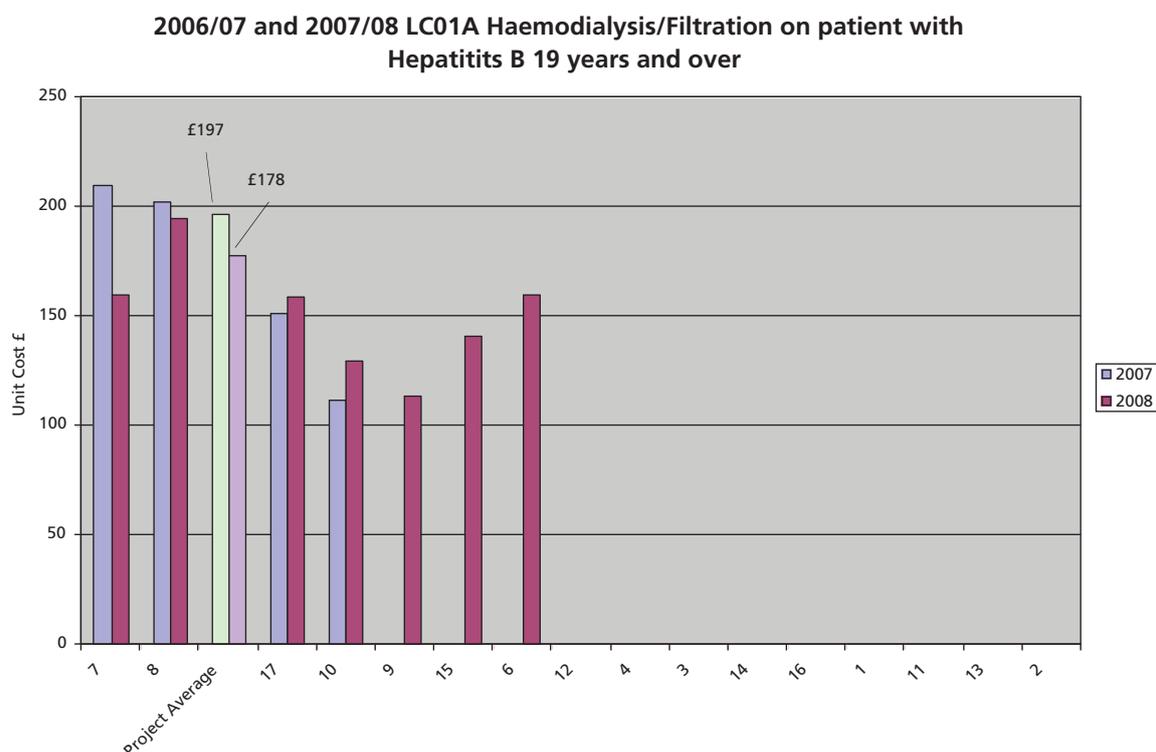
Comparisons with national averages from the full 2007/08 dataset suggested that the participating Trusts are representative of other renal units.

### 6.4 Key findings by service code

6.41 LC01A: Haemodialysis/Filtration in patients with Hepatitis B aged 19 years and over

6.412 Data were provided by seven of the Trusts participating in the project, compared to four in 2007. They showed that the average cost had fallen noticeably, from £197 to £178, which was close to the cost of haemodialysis for patients without Hepatitis B (LC02A) (see Figure 4).

**Figure 4:**



*(2007 average costs shown in green and 2008 average costs in purple)*

6.413 Given that most units manage some patients with hepatitis B, the small number of returns suggests that there are still issues with recording this activity and/or identifying the cost differential in delivering dialysis to these patients.

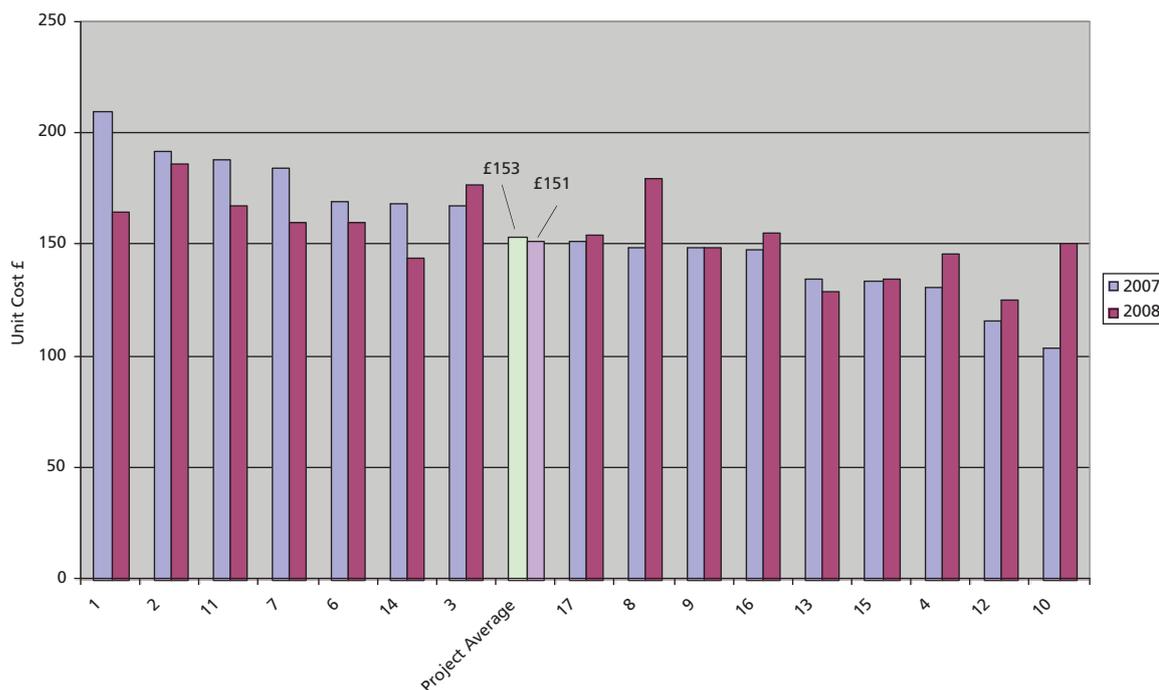
6.414 The national weighted mean in 2008 was £162, reflecting the fact that the group represented only 7% of national activity for this service code.

6.42 LC02A: Haemodialysis/Filtration in patients aged 19 years and over

6.421 There was a small change in the average HD session cost compared to 2006/07 at £151, representing a reduction in real terms (see Figure 5). Although the project group sample of 16 Trusts is relatively small, there appeared to be some further convergence around the mean, with a reduced range indicating some progress in costing this measure. The national mean including participating Trusts was £152. The participating Trusts represented 37% of all national activity.

**Figure 5:**

**2006/07 and 2007/08 LC02A Haemodialysis/Filtration 19 years and over**



6.43 LC03A: Peritoneal Dialysis in patients with Hepatitis B aged 19 years and over

6.431 As before, there were no project submissions for this definition. Participating Trusts did not identify differences in treatment or costs for patients receiving PD therapies with blood borne viruses.

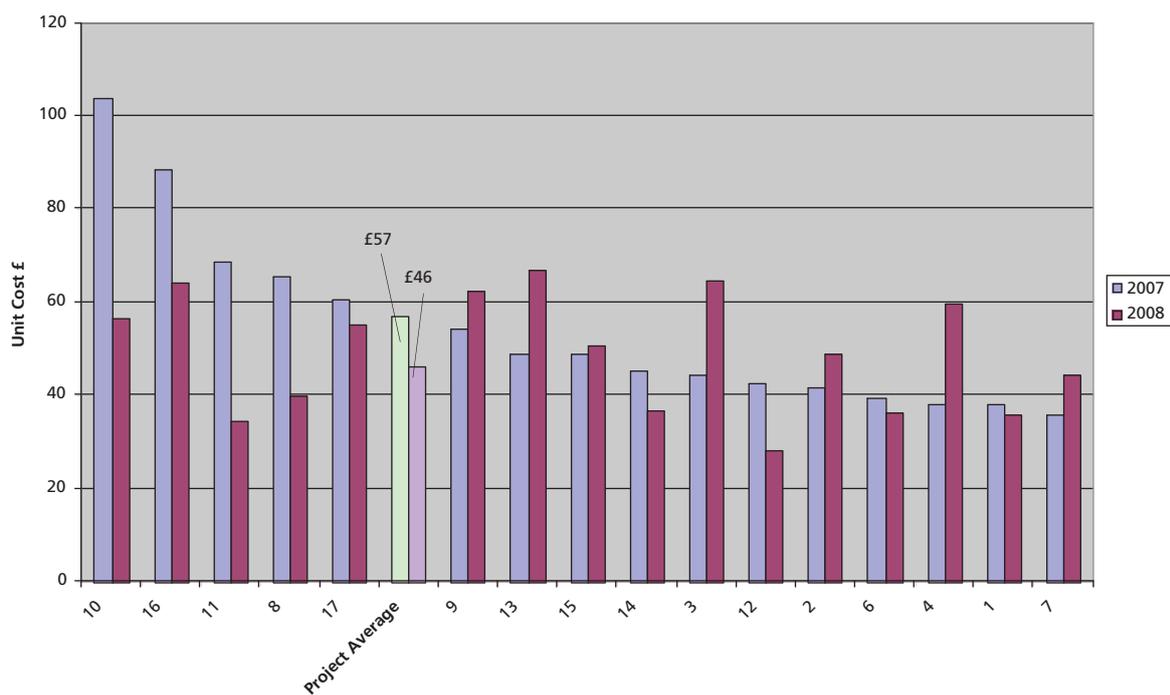
6.44 LC04A – Peritoneal Dialysis in patients aged 19 years and over.

6.441 The average PD cost per therapy day had fallen from £57 for the figures submitted for 2006/07 to £46 for 2007/08 (equivalent to £16.8k per therapy year). There was a marked reduction in costs for those Trusts that reported higher costs in 2007 (see Figure 6).

6.442 Although the sample size is small, there appeared to be some progress on reference costs. The group represented 35% of all national activity in this area.

Figure 6:

2006/07 and 2007/08 LC04A Peritoneal Dialysis 19 years and over



6.443 The national average for this service code at £49 was close to the average figure of £46 for the participating Trusts.

# Chapter 7: Conclusions and recommendations

## 7.1 Conclusions

7.11 The first phase of this project demonstrated wide variations in reference costs for dialysis, as had been predicted from previous work in this area. Going through the costing exercise enabled Trusts to recognise gaps in information and problems with local cost coding systems.

7.12 The variations in costs were reduced somewhat in the second phase of the project by use of a template that specified individual elements for costing. The final figures provide a more informed basis on which to set tariffs for dialysis.

7.13 Encouraging renal clinicians to work with finance staff in providing costs proved an effective way of sharing understanding of key issues. The project was a good example of clinical engagement, which demonstrated the value of including clinicians in costing issues. For some of the Trusts, this project was the first time that staff from finance departments had met their clinical colleagues. Their meeting proved

to be very beneficial in improving their shared understanding of PbR issues at both national and local levels. Finance teams found it helpful for clinicians to be involved in reference cost work.

**Dr Donal O'Donoghue, National Clinical Director for Kidney Care, Department of Health**

"It was a pleasure to work with clinicians and finance colleagues on this project, which has demonstrated the importance of that dialogue. This project has provided improved understanding for developing a Best Practice Tariff for dialysis and addresses other areas of work now needed in kidney care"

**Chris Newton, Senior Divisional Finance Manager, University Hospital Birmingham**

"The project has achieved its aim, and provided more transparency to the calculation of renal dialysis costs."

"Working with the project team was very satisfying, with input from very knowledgeable and engaged clinicians and enthusiastic finance staff."

**Dr Hugh Cairns, Consultant Nephrologist, King's College Hospital NHS Foundation Trust, London**

"This was a time-consuming exercise for those taking part but was very educational. The findings will improve – both locally and nationally – the financial robustness of decisions about costings for dialysis."

"A key lesson from the project is that when planning PbR both clinicians and finance staff are involved so that decisions are taken that are both clinically and financially appropriate. It was also important that information collected was sufficiently granular to provide fine detail so that we can separate out the different elements, including high cost and low cost items."

"To do this type of project in other areas, you need buy-in from interested clinicians and finance staff. Clinicians don't always get involved in this type of project but it is important that they do."

**Dr John Bradley, consultant physician and nephrologist, Addenbrooke's Hospital and Director of Research and Development, Cambridge University Hospitals NHS Foundation Trust**

"For Trusts taking part in the project, it got the Trust and finance teams together, in some cases meeting for the first time. For each meeting, a finance representative and a clinical representative for Trust attended and sat round a table together. I hope it allowed a similar process in Trusts not taking part, by sending the template out and contacting chief executives, clinical and finance directors."

"The success of the project is illustrated by the fact that people are now keen to use a similar approach in other areas of renal medicine. It provides more informed data for the tariff system. It also enabled clinicians and finance to learn about each other's work."

## 7.2 Recommendations

7.21 The recommendations below follow from the Project, and the Project Group seeks the support of the PbR Team in relation to the tariff development path and HRG4 design issues.

### 7.3 The path to dialysis tariff introduction

7.31 In view of the weaknesses in the 2007 NSRC returns, the group suggested that a mandatory tariff should not be introduced in April 2009. It proposed that local funding arrangements continue for 2009/10 informed by the average costs coming out of this project subject to adjustment for local market forces factors and consideration of the cost of ESAs and patient transport services.

7.32 As an alternative approach, it was also suggested that some commissioners and providers might wish to continue to use an uplifted 2008/09 indicative tariff (which includes ESAs and patient transport services) in 2009/10. This required some caution; however, as 2008/09 indicative tariff was based on 2004/05 data collection and was likely

to contain the same inherent weaknesses as those found in the project submissions.

7.33 It was recommended that a checklist should be incorporated into 2007/08 costing guidance to address the most common themes identified in the work of the Group. This was communicated to all 53 organisations with a kidney service and is published on the Payment by Results website.

### 7.4 Tariff granularity

7.41 For haemodialysis, the Project Group returns demonstrate very different costs for dialysis delivered in hospital, satellite and home settings. The Project Group recommends that the HRG4 definitions are developed to provide a greater degree of granularity in relation to a patient's condition and clinical needs to better reflect these differences.

7.42 Without this approach, there is a risk of a perverse incentive whereby patients with higher clinical needs, and hence costs, are directed predominantly towards NHS delivered services and those with lower needs towards independent sector providers at the same level of tariff.

7.43 It is also recognised that there is currently a low level of home haemodialysis in many parts of England. A single Haemodialysis tariff would undoubtedly stimulate some growth in areas where access is limited. The Project Team acknowledges that PbR cannot, in itself, resolve this issue and that the difference in cost is not so great that it is likely to lead to sudden shifts in service provision.

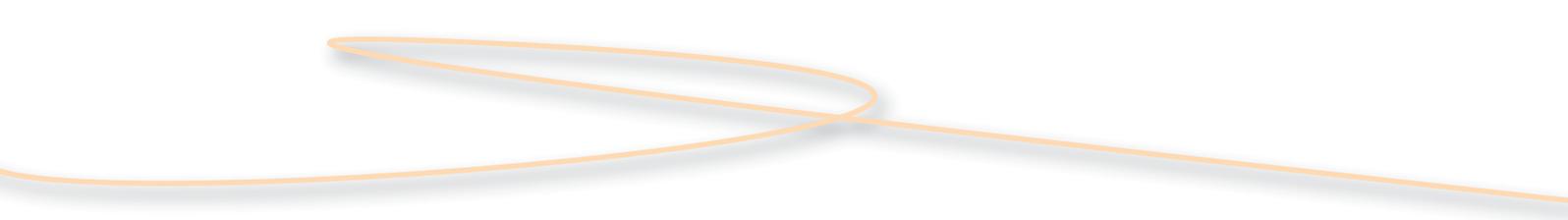
## 7.5 Tariff flexibilities

7.51 The Project Group recommends that tariffs should be reviewed on a frequent basis to ensure that new developments and innovations in best practice are incorporated. This is particularly pertinent to Home Haemodialysis where there is an increasing evidence base that more frequent dialysis improves outcomes.

## 7.6 Other tariff design issues

7.61 HRG4 distinguishes between patients with and without hepatitis B and it is proposed that these definitions should be amended to include other patients with transmissible viral infections (Hepatitis C and HIV) as they share the same differences in service costs. These changes have been implemented in the 2008/09 Reference Cost Grouper design.

7.62 The current HRG4 definitions for peritoneal dialysis make the same distinction for patients with hepatitis B but this is not considered necessary from a tariff perspective as there is no material difference in the cost of service delivery. In the 2008/09 Reference Cost Grouper design this split has been removed to reflect that there is no significant difference in the resource of a patient with Hepatitis B. The HRG design has also been amended to separate out CAPD and APD to more appropriately reflect the resource difference.



## **7.7 Activity recording – data quality**

7.71 Providers should progressively move towards recording actual activity for all modalities to supersede the use of estimates or other proxy measures. This will help ensure that the accuracy of successive tariffs is improved and that departmental data are collected and coded, particularly for unbundled components of care.

# APPENDICES

## APPENDIX A

The project team was:

Peter Donnelly	DH Head of Costing and Classification
Liz Eccles	DH Director of Financial Reform
Richard Kelly	DH Policy Development Manager
Chris Watson	DH Deputy Director - Head of Development (PbR)
Gerard Hetherington	DH Director of Clinical Programmes
Donal O'Donoghue	DH National Clinical Director of Kidney Care
Paul Jennings	CEO, Walsall tPCT & RAG member
Juliette Kingcombe	DH Renal Policy lead
Nicky Coffey	Associate Director, South East Coast SCG
Chris Newton	University Hospitals Birmingham NHS Foundation Trust
Helen Strain	Cambridge University Hospitals NHS Foundation Trust
John Bradley	Cambridge University Hospitals NHS Foundation Trust
Hugh Cairns	Kings College NHS Foundation Trust
Kevin Harris	University Hospitals of Leicester NHS Trust
Bev Matthews	NHS Kidney Care

## APPENDIX B

### Dialysis Services Reference Cost Collection Guidance 2008

Accurate cost data collection for renal dialysis in 2008 is more important than ever as mandatory tariffs for dialysis are expected to be introduced in 2010. Inconsistent approaches to activity recording, in particular, represent a significant risk to the development of robust tariffs. HRG Version 4 unbundles dialysis from admitted patient care. This represents a key change in data requirements as well as the need to significantly improve the reliability and consistency of Trust returns.

### Data Collection Checklist

#### 1 - Service Labels

The majority of Trusts submit returns using service labels LC02A for adult haemodialysis/filtration (HD) and LC04A for adult peritoneal dialysis (PD). Care should be taken not to use the associated service labels for dialysis for patients with Hepatitis B, LC01A and LC03A respectively except for this defined patient group.

Where separate costs for patients with Hepatitis B receiving haemodialysis are identified (LC01A) these should include the cost differential arising from the need to provide isolation dialysis if its delivery reduces staffing flexibility and increases the capital costs through patient specific dialysis machine usage.

#### 2 - Haemodialysis Activity

Identifying the actual number of haemodialysis sessions can be problematic if Trusts do not currently use their PAS for activity recording (particularly for home haemodialysis patients). Local reporting data (often reflecting commissioning arrangements) should be used. Home HD should reflect the average frequency of individual patients and may be 4 times (or more) rather than 3 times per week.

Under version 4 HRGs, each individual inpatient dialysis session should be clinically coded generating an additional Renal Dialysis HRG. This ensures that all occurrences of renal dialysis, even when carried out with another unrelated procedure, will generate an additional Renal Dialysis HRG in addition to the core HRG. The costs associated with these inpatient dialysis sessions, should be included in the relevant HRG4 dialysis category.

#### 3 - Peritoneal Dialysis Activity

As costs "per session" are not readily comparable patient days should be used as the unit of activity as a proxy for sessions as for 2006/07 i.e. the number of bags or exchanges should NOT be used.

#### **4 - Cost Allocation**

Outpatient activities associated with each dialysis modality should be separately recorded and linked to the outpatient point of delivery e.g. pathology testing or drug prescriptions issued in clinics.

Similarly Renal Medicine admitted patient care costs should be mapped accordingly to inpatient cost pools and not to renal dialysis except where these costs are directly related to inpatient dialysis.

Care should be taken to ensure that all costs are appropriately allocated between haemodialysis and peritoneal dialysis. Costs should also include the revenue costs of buying and maintaining buildings and equipment, allocated appropriately between the different types of dialysis.

#### **5 - Dialysis Reference Costs Exclusions – ESAs (formerly known as EPO)**

The costs of erythropoietin alfa and beta (and any other defined high cost drugs) must be excluded from dialysis reference costs and included on the high cost drugs return.

#### **6 - Dialysis Reference Cost Exclusions - Patient Transport Services**

It is recognised that patient transport is a significant cost component of haemodialysis services but all PTS (including taxis and private ambulances) must be excluded from renal dialysis submissions and included under the separate Trust PTS cost return.

#### **7 - Intravenous Iron and Blood Transfusions**

Where these are administered as part of the haemodialysis session they must be included in the dialysis session costs. For patients receiving peritoneal dialysis and who attend hospital on an outpatient basis these costs should be included under the outpatient POD.

#### **8 - Staffing**

The full range of staffing inputs should be allocated to all dialysis modalities including Medical and Nursing staff (including ESA management), Nutrition & Dietetic staff, Social Work, Pharmacy and Medical Engineering/Technical staff. Costing models must allocate these appropriately to PD therapies.

As for all areas of reference cost data collection the quality of submissions will be significantly improved by the active engagement of clinical teams. To support these discussions a typical costing template is attached overleaf for guidance.

Further information on renal dialysis reference cost production can be seen in *Section 8 of Reference Costs 2007/08 Collection Guidance* (February 2008) via the following link:

[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_082746](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_082746)

## APPENDIX C

### Reference Cost Guidance Template

	Therapy	Activity Measure
Activity Measures	Haemodialysis for patients with/ out HepB	Dialysis Sessions - includes hospital/satellite/home haemodialysis
	Peritoneal Dialysis for patients with/ out HepB	Therapy Days - NOT exchanges or bags

Category	Subject	Data Collection Notes
Staff	Dialysis Nursing	"Including Qualified Nurses, Health Care Assistants and nurse management"
	Non Dialysis Nursing	Other specialist nursing input e.g. Anaemia Management
	Medical Staffing	"Consultant plus other grades - sessions including dialysis ward rounds, Quality Assurance meetings"
	Technical Staff	Renal Technicians/Medical Engineers
	Dietetic support	
	Pharmacy	
	Social Work and Counselling	
	Administrative and Managerial	
	Other	
Non Pay - Clinical	Clinical Consumables	All dialysis/PD consumables inclusive of delivery charges
	Drugs – Erythropoietin	High Cost Drug Exclusion - do NOT include
	Drugs – intravenous iron	
	Drugs – Standard	"Heparin, lignocaine, IV saline etc."
	Drugs – Non Dialysis	Any other drugs issued at the point of delivery
	Blood	Blood products for transfusion
	Holiday Dialysis charges	Charges from other Trusts/Independent Sector providers
	Other	
Clinical Support	Pathology – routine	"Renal blood scan, FBC, liver function tests, iron studies, urea kinetics, cholesterol, HBA1C, Hep B&C, Parathyroid hormone"
Services	Pathology – other	
	Imaging	"Including annual chest x-ray, ECG"

continued...

Category	Subject	Data Collection Notes
Non Clinical Support	Patient Transport Service	Dialysis reference cost exclusion (PTS costs must be submitted separately from dialysis services within the RC return)
	Equipment maintenance	Maintenance contract or technical staff non pay spending Building & plant maintenance Including water plant and water testing
	Hotel Services - Catering	Snacks & beverages
	Hotel Services - Cleaning	Including infection control
	Hotel Services - Portering	
	Hotel Services - Linen/Laundry	
	Clinical Waste disposal	
	IT Services	"Including cost of IT, data collection and analysis"
Facilities	Energy and Utilities	"Includes water, heat and light, telephone, and associated administration costs"
	Security	
	Rates	
Overheads	Capital charges/lease costs – Building	Inclusive of water treatment plant
	Capital charges/lease costs – Equipment	"Machines, chairs, other"
	All other Overheads	"Includes administration, finance, human resources, payroll etc."

## APPENDIX D

Figure 4

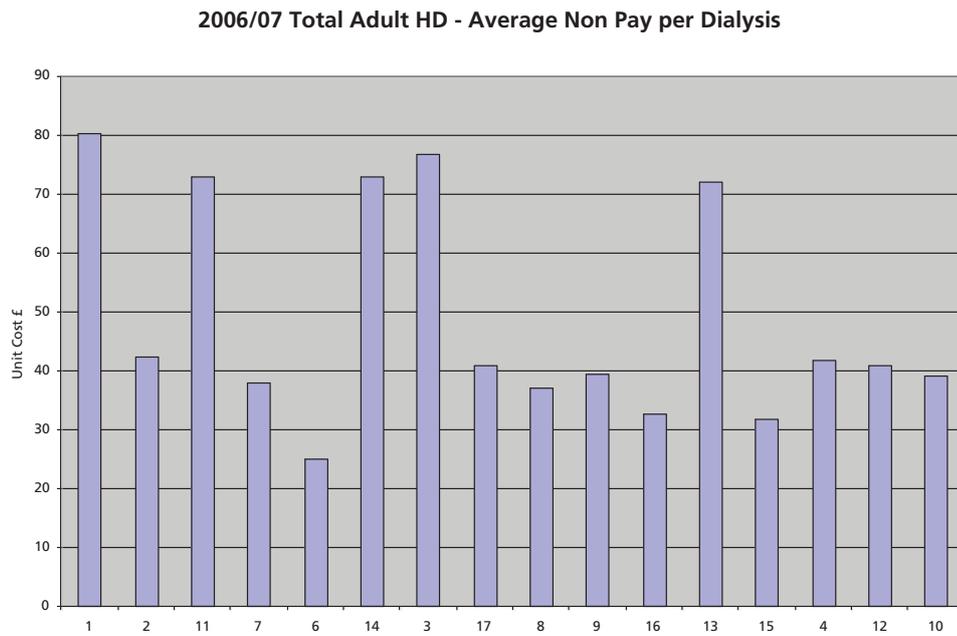
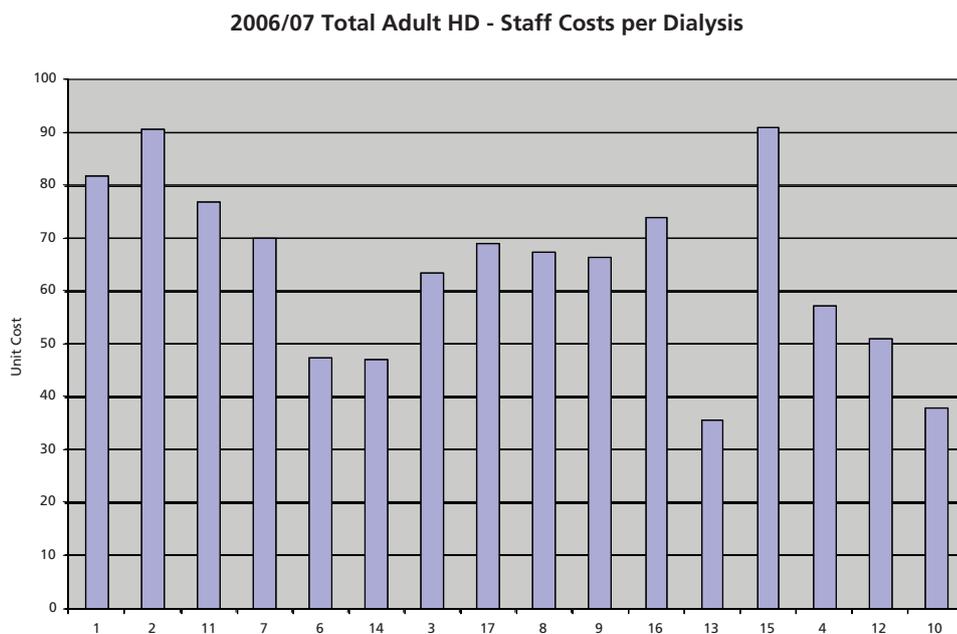
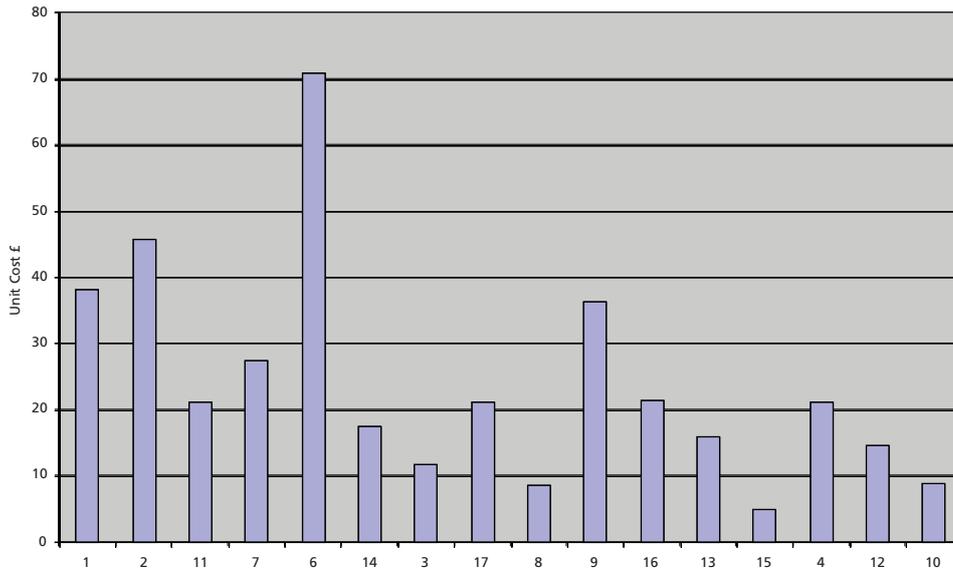


Figure 5



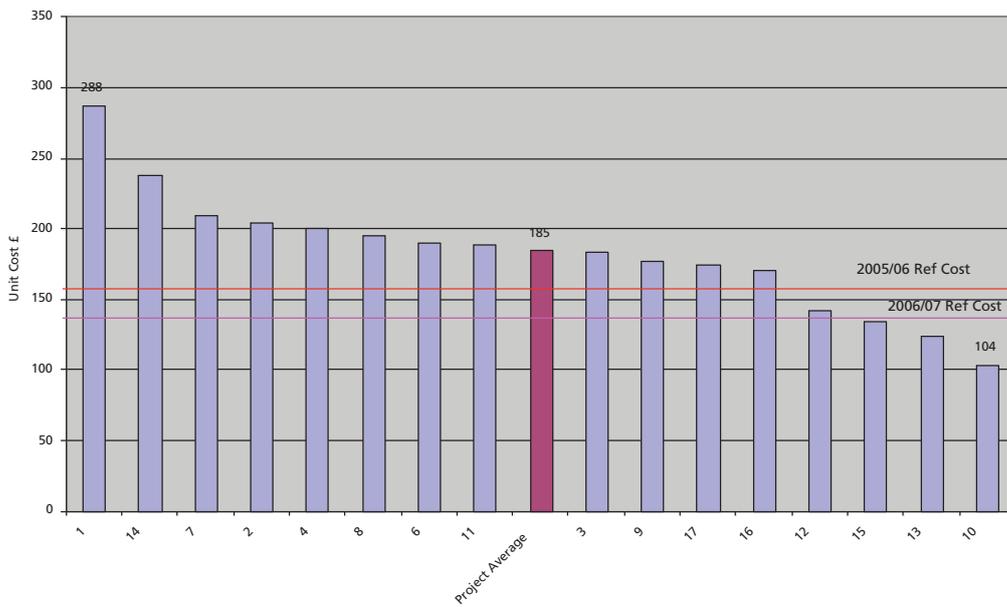
**Figure 6**

**2006/07 Total Adult HD - Capital Charges & Overheads per Dialysis**

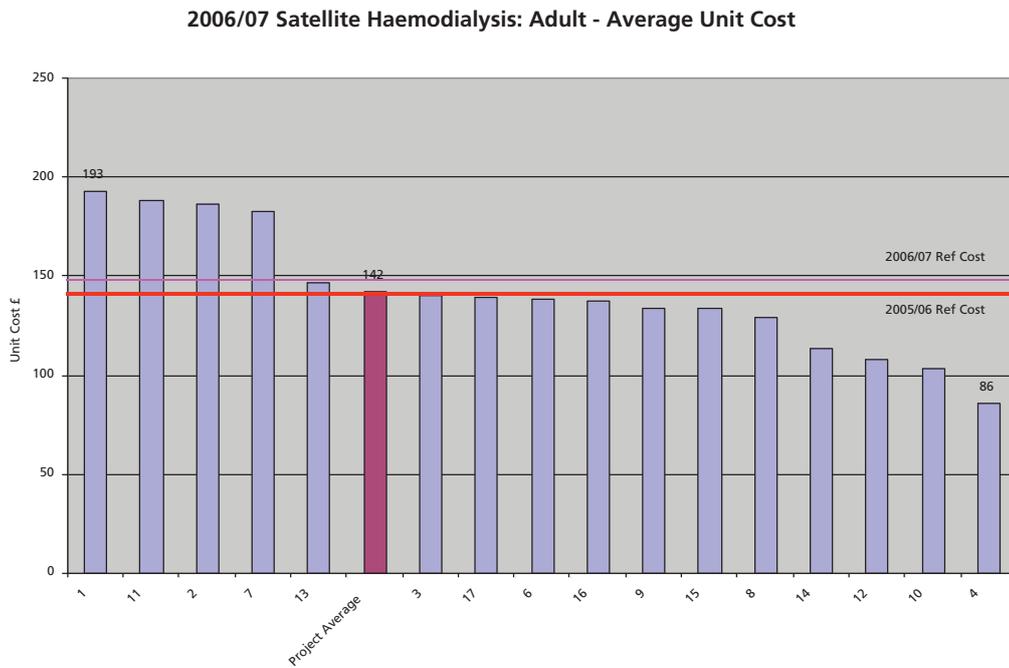


**Figure 7**

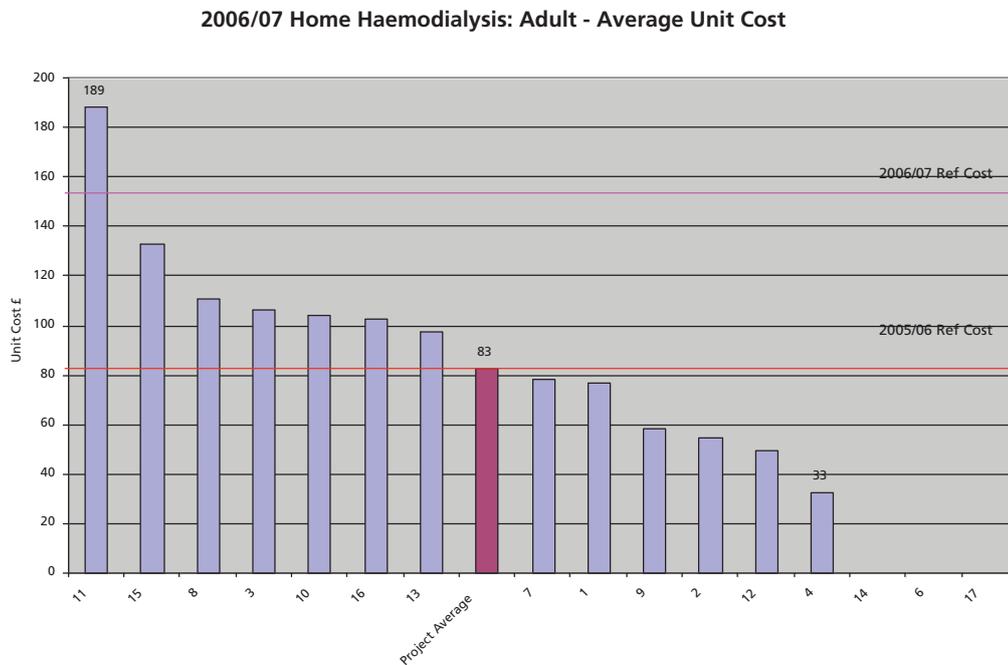
**2006/07 Hospital Haemodialysis: Adult - Average Unit Cost**



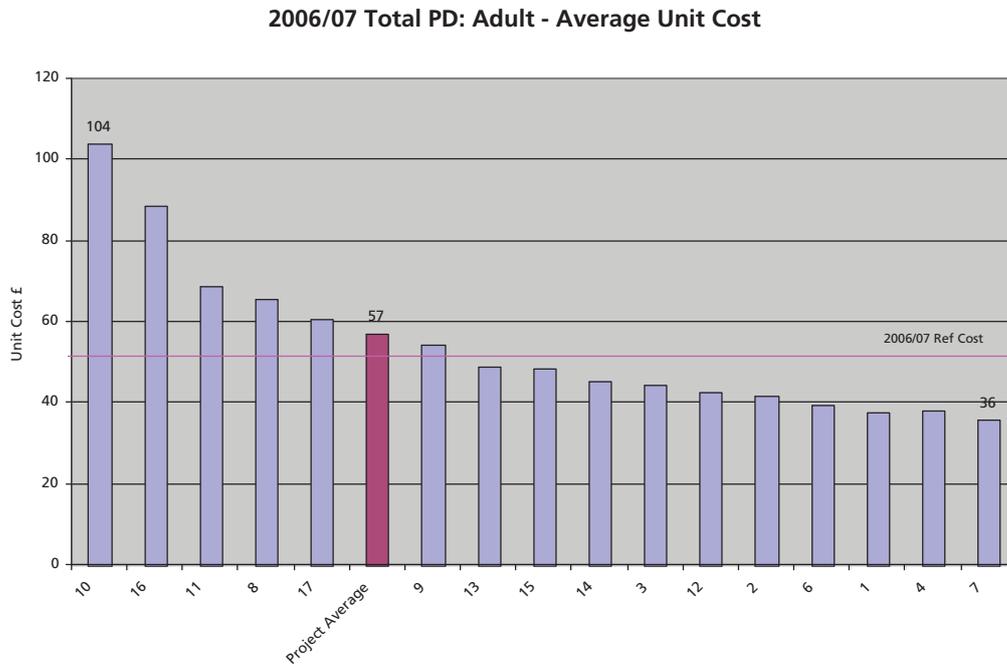
**Figure 8**



**Figure 9**



**Figure 10**



**Figure 11**

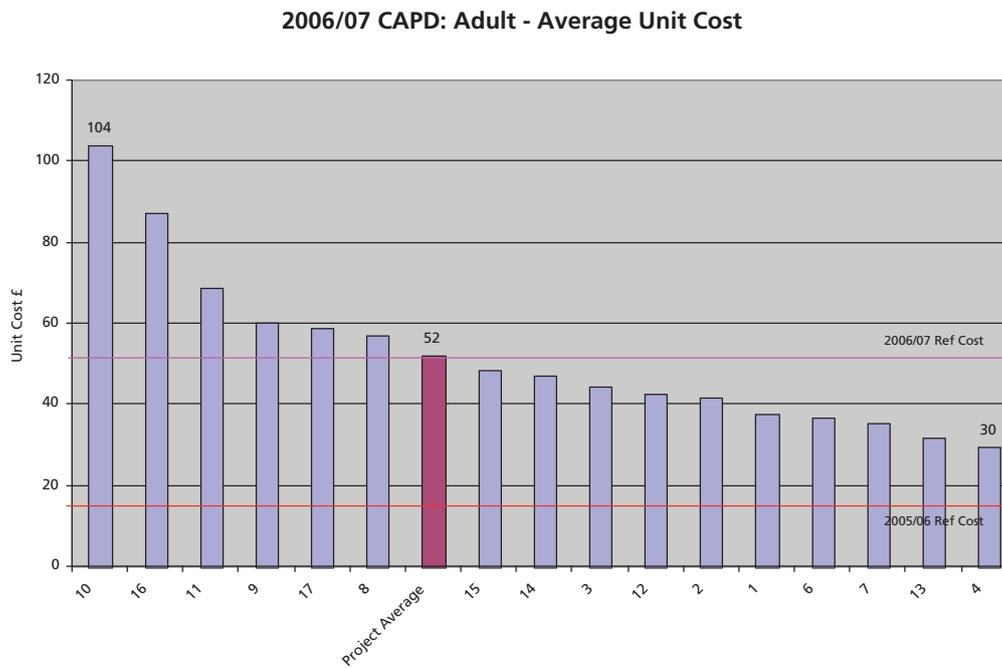
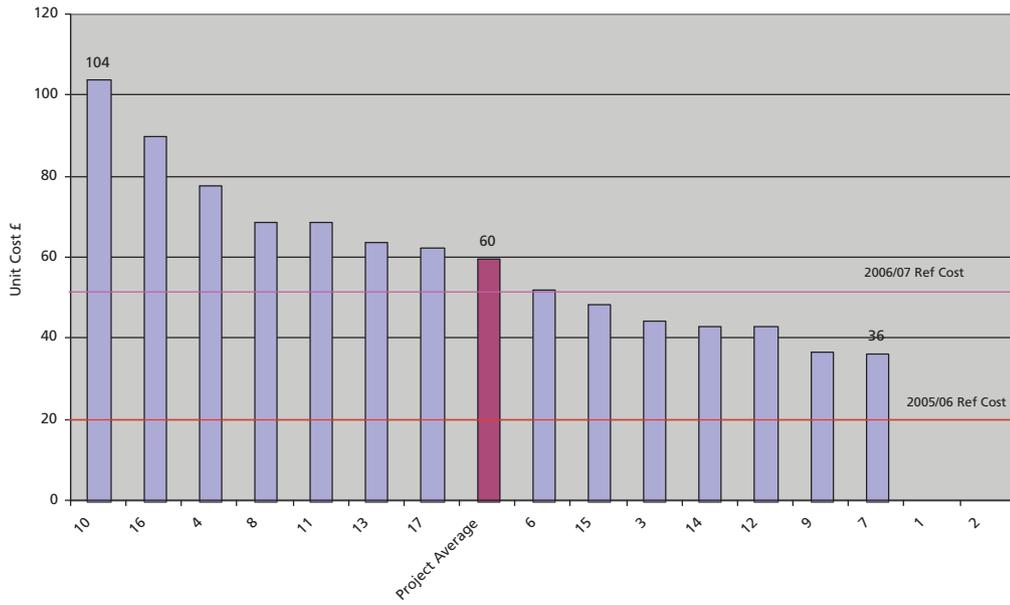


Figure 12

2006/07 APD: Adult - Average Unit Cost











## **Kidney Care**

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