

**THE BRITISH ASSOCIATION OF  
UROLOGICAL SURGEONS**

**SECTION of ONCOLOGY**

**BAUS Cancer Registry**

**Analyses of Nephrectomy Operations**

**(Including procedures for both malignancies and non-malignancies)**

**January 1<sup>st</sup> – 31<sup>st</sup> December 2009**

**August 2010**

**MEMBERS OF THE EXECUTIVE COMMITTEE**

M Aitchison	G Boustead	J Crew	D R Greene
R C Kocklebergh	R A Persad	S Prescott	
V Srinivasin	K S Swami		

**Copyright**

It is important to remind you that, under the Copyright Designs and Patents Act 1988 (CDPA) copyright of this Report, including the charts produced in it, is owned by The British Association of Urological Surgeons Limited (BAUS). Copying or reproducing any part of this material in any other publication without seeking the prior permission of BAUS is a breach of copyright.

Please contact Mrs Sarah Fowler (E-mail: [sarah@sarahfowler.org](mailto:sarah@sarahfowler.org)) if you wish to seek the prior consent or licence of BAUS in respect of the above or wish to seek further advice.

**PRODUCED FOR BAUS SECTION OF ONCOLOGY**

**by**

**Mrs Sarah Fowler**

**BAUS Cancer Registry & Audits Manager**

## **CONTENTS**

	<b>Page Number</b>
<b>Introduction, Results Summary &amp; Methods of analysis</b>	<b>1</b>
<b>Nephrectomies for malignant &amp; non-malignant disease Charts 1 – 25</b>	<b>2</b>
<b>Participating Hospital Centres</b>	<b>15</b>

## **Introduction, Results Summary and Methods of Analysis**

The analysis produced in May 2010 of the complex operations datasets for 2009 extracted from the web-based database developed by Nuvola mistakenly did not include nephrectomies performed for non-malignant disease. In addition we received a number of comments about the varying complexity of the different procedures and techniques used. It was decided, therefore, to re-extract and re-analyse the data taking these factors into account.

The data presented here are a summary of the data extracted from the web-based database on 2nd August 2010 and relate to all (1903) nephrectomy operations performed, regardless of reason, during 2009. Follow-up information has been returned on 14.0% (267/1903) of these cases. This data was returned by 143 consultants from 82 centres. Data from two centres was returned using the centre number only. 1% (20/1903) were the private patients of 8 consultants.

Until January 1<sup>st</sup> 2010 data could be returned either by completion of pro formas for each patient or in electronic format using either an Access (Microsoft) database or "in-house" database. The pro formas were entered directly into an Access database, at which time validation comprising mainly of checks for duplicate entries and dates could be carried out. There are separate pro formas for the operation and follow-up information. All of this data was transferred to the web-based system and has been included in the analyses.

For the ranked charts (1, 2, 22 & 23) the individual consultant or centre identification numbers were removed and replaced with rank numbers starting at 1. A unique, confidential "Ranking Sheet" was prepared for each surgeon to enable them to identify their rank in every chart. For those charts where overall figures for the entire database are shown the ranking sheet displays the consultant's individual figures. No one else can identify the results of an individual consultant. The ranked charts comprise single bars ranked from left to right in the ascending order of the data item being measured with, in addition, the 25, 50, and 75 percentiles. Where percentages are included figures have been rounded up to one decimal point.

A personal ranking sheet for each consultant was issued individually to go with this chart book.

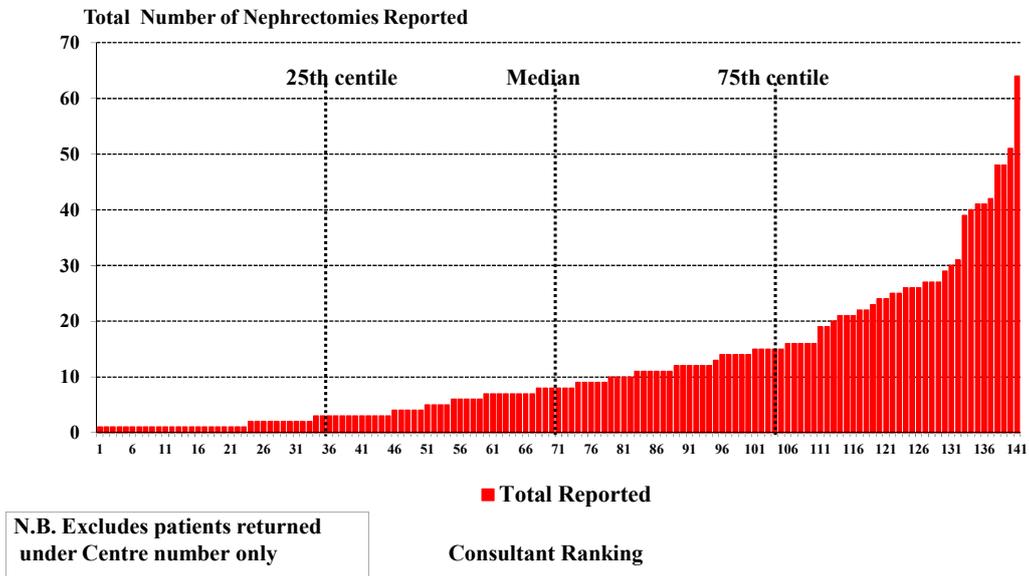
Sarah Fowler

BAUS Cancer Registry (BCR) Manager

August 2010

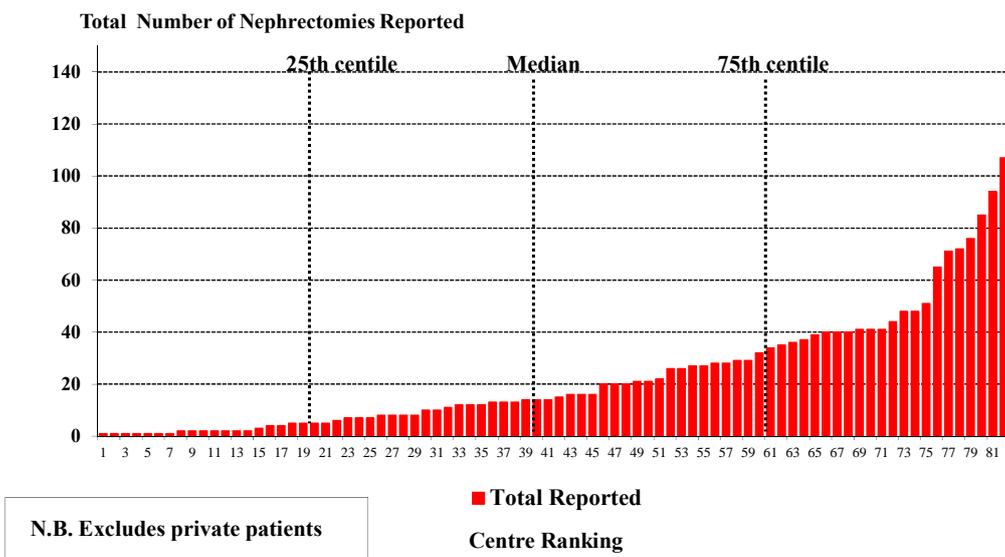
## Chart 1

**Total Number of Nephrectomies Reported per Consultant**  
**Median: 8 (Interquartile Range 3 - 15)**



## Chart 2

**Total Number of Nephrectomies Reported per Centre**  
**Median: 14 (Interquartile Range 5 - 34)**



### Chart 3

#### Nephrectomy - Pre-operative presentation

	N	% of total (1903)
<b>Incidental finding with no symptoms</b>	<b>498</b>	<b>26.2</b>
<b>Haematuria</b>	<b>388</b>	<b>20.4</b>
<b>Other:</b>	<b>645</b>	<b>33.9</b>
<b>Weight Loss</b>	<b>28</b>	<b>1.5</b>
<b>Other Ca</b>	<b>10</b>	<b>0.5</b>
<b>Pain</b>	<b>103</b>	<b>5.4</b>
<b>UTI</b>	<b>26</b>	<b>1.4</b>
<b>Other/Not recorded</b>	<b>478</b>	<b>25.1</b>
<b>Not recorded</b>	<b>372</b>	<b>19.5</b>

### Chart 4

#### Nephrectomy - Diagnosis

		N	% of total (1903)
<b>Malignant</b>	<b>Renal Cell Cancer</b>	<b>914</b>	<b>48.0</b>
	<b>TCC</b>	<b>225</b>	<b>11.8</b>
	<b>Other Cancer / Not recorded</b>	<b>342</b>	<b>18.0</b>
<b>Non-Malignant</b>	<b>Non-functioning kidney</b>	<b>76</b>	<b>4.0</b>
	<b>Stone disease</b>	<b>46</b>	<b>2.4</b>
	<b>Other / Not recorded</b>	<b>256</b>	<b>13.5</b>
<b>Not recorded</b>		<b>44</b>	<b>2.3</b>

## Chart 5

### Nephrectomies – Haematology at Presentation

	N	Median	Range
Hb (g/L)	1078	13	7 – 167
Total WBC ( $\times 10^9$ / L)	980	8	2 – 514
Neutrophils ( $\times 10^9$ / L)	846	4	2 – 412
Lymphocytes ( $\times 10^9$ / L)	817	1.8	0.4 – 114
Platelets ( $\times 10^9$ / L)	948	266	2 - 3337

## Chart 6

### Nephrectomy - Pre-operative Serum Creatinine

Serum Creatinine Level $\mu\text{mols/l}$	N	% of total (1903)
0 – 120 $\mu\text{mols/l}$	1479	77.7
121 - 200 $\mu\text{mols/l}$	186	9.8
> 200 $\mu\text{mols/l}$	27	1.4
Not recorded	211	11.1

## Chart 7

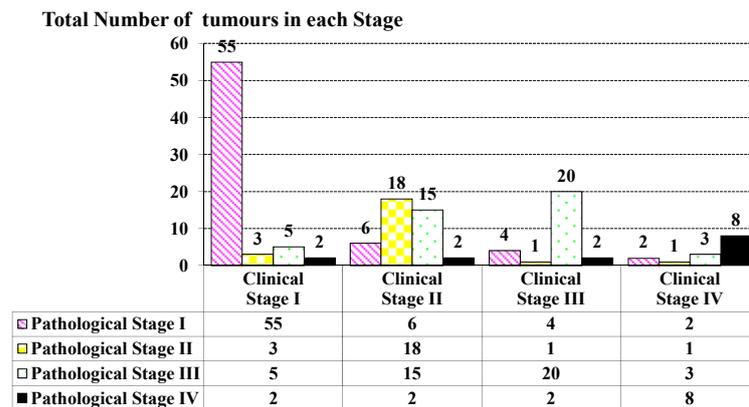
### Nephrectomy Pre-operative Clinical Staging Staging could be estimated in 66% (977/1481\*) cases

Known Staging	Total Known	
	N	%
Stage I (T1 N0 M0)	468	47.9
Stage II (T2 N0 M0)	191	19.5
Stage III (T1, T2, T3 N0, N1 M0)	212	21.7
Stage IV (T4 N0, N1 M0 Any T N2 M0 Any T any N M1)	106 including 71 with metastases	10.8 8.0

\* Malignancies only

## Chart 8

### Nephrectomies Comparison of clinical & pathological staging



## Chart 9

### Nephrectomy Grade of Main Operating Surgeon with numbers & percentage reported as being a supervised training operation

	Total Number	% of total (1903)	Supervised training operation	%
Consultant	1188	62.4	230/1058	21.7
Specialist Registrar	225	11.8	206/222	92.8
Other / Not recorded	490	25.7	-	-

## Chart 10

### Nephrectomy – Procedure

	Malignancies		Non-Malignancies	
	N	% of total (1481)	N	% of total (378)
Radical Nephrectomy	983	66.4	124	32.8
Partial Nephrectomy	145	9.8	31	8.2
Simple Nephrectomy	66	4.5	153	40.5
Nephroureterectomy	252	17.0	37	9.8
Heminephrectomy	1	0.1	1	0.3
Other	30	2.0	14	3.7
Not Recorded	4	0.3	18	4.8

The vena cava was reported as being explored in 54 cases:

- 8 – level 1; 10 – level 2; 5 – level 3; 6 – level 4 and 25 not recorded
- 12 – liver mobilisation; 2 cardiopulmonary bypass; 2 circulatory arrest; 11 complete excision from IVC

## Chart 11

### Nephrectomies – Known Surgical Approach Known Laparoscopic Conversion rate = 5.8% (59/1018)\*

Approach	Malignancies		Non-Malignancies	
	N	% of total (1163)	N	% of total (261)
Open	382	32.8	24	9.2
Laparoscopic	781	67.2	237	90.8

\* Conversion reasons

- 19 due to bleeding
- 18 due to failure to progress
- 22 other / not recorded

## Chart 12

### Nephrectomy Approach by Pre-operative Clinical Staging Staging could be estimated in 66% (977/1481\*) cases

Known Staging	Total	Open	%	Laparoscopic	%
	N	N		N	
Stage I (T1 N0 M0)	439	106	35.3	333	56.2
Stage II (T2 N0 M0)	170	63	21.0	107	18.0
Stage III (T1, T2, T3 N0, N1 M0)	192	77	25.7	115	19.4
Stage IV (T4 N0, N1 M0 Any T N2 M0 Any T any N M1)	92	54	18.0	38	6.4

\* Malignancies only

## Chart 13

### Nephrectomies – Procedure 9.3% (130/1392) had Lymph Node dissection\*

	Procedure	N	Median	Range
Duration of Operation (mins)	Open Radical Nephrectomy	215	150	40 – 510
	Lap Radical Nephrectomy	508	150	17 – 575
	Open Nephroureterectomy	49	180	65 – 300
	Lap Nephroureterectomy	145	200	60 – 540
	Open Partial/Simple Nephrectomy	78	140	40 – 465
	Lap Partial/Simple Nephrectomy	153	160	40 – 465
Post –op Length of Stay (days)	Open Radical Nephrectomy	176	7	0 – 78
	Lap Radical Nephrectomy	461	4	0 – 192
	Open Nephroureterectomy	36	8	4 – 59
	Lap Nephroureterectomy	134	7	0 – 40
	Open Partial/Simple Nephrectomy	86	6	0 – 25
	Lap Partial/Simple Nephrectomy	156	3	0 – 66

\* 9.4% malignancies (119/1261; 8.3% non-malignancies (11/132) Non-Sig difference

## Chart 14

### Nephrectomies – Procedure Measured Blood Loss and Transfusion

	Procedure	N	Median	Range
Units of Blood Transfused	Open Radical Nephrectomy	213	0	0 – 20
	Lap Radical Nephrectomy	526	0	0 – 12
	Open Nephroureterectomy	41	0	0 – 7
	Lap Nephroureterectomy	156	0	0 – 7
	Open Partial/Simple Nephrectomy	89	0	0 – 32
	Lap Partial/Simple Nephrectomy	151	0	0 – 4
Measured Blood Loss (mls)	Open Radical Nephrectomy	222	360	0 – 10,000
	Lap Radical Nephrectomy	534	30	0 – 3,000
	Open Nephroureterectomy	42	200	0 – 2,200
	Lap Nephroureterectomy	158	50	0 – 2,500
	Open Partial/Simple Nephrectomy	82	200	0 – 4,000
	Lap Partial/Simple Nephrectomy	129	5	0 – 4,000

## Chart 15

### Nephrectomies Complications by Procedure and Severity\*

	Total complication rate % (N)	Known Intra-operative rate %	Known Post-operative rate %
<b>Radical Nephrectomy:</b>			
Open	22.9 (63/275)	6.9 (5 major, 1 minor)	14.5 (11 major, 24 minor)
Laparoscopic	12.9 (79/613)	3.6 (2 major, 3 minor)	8.6 (7 major, 40 minor)
<b>Nephroureterectomy:</b>			
Open	17.6 (9/51)	2.0 (0 major, 1 minor)	13.7 (3 major, 4 minor)
Laparoscopic	21.1(38/180)	2.8 (not recorded)	8.6 (11 major, 13 minor)
<b>Simple/Partial Nephrectomy:</b>			
Open	22.8 (23/101)	1.0 (0 major, 1 minor)	13.9 (4 major, 9 minor)
Laparoscopic	10.3(19/185)	4.9 (2 major, 1 minor)	3.8 (1 major, 6 minor)

\* N.B. Neither the severity nor timing of the complication (intra or post-operative) was recorded in all cases

## Chart 16

### Radical Nephrectomies - Significance of Complications

Overall morbidity Rate: Open = 27.4%(75/273); Laparoscopic = 13.9% (85/611)  
 30 day mortality Rate: Open = 1.5% (4/273); Laparoscopic = 1.0% (6 / 611)

	Open		Laparoscopic	
	N	%	N	%
No action required	6	8.0	8	9.4
Contributed to death	1	1.3	0	0.0
Delayed discharge	13	17.3	23	27.1
Required medical treatment	22	29.3	22	25.9
Required surgery	13	17.3	8	9.4
Not recorded	20	26.7	24	28.2

## Chart 17

**Nephroureterectomies - Significance of Complications**  
**Overall morbidity Rate: Open = 22.4%(11/49); Laparoscopic = 23.3% (42/180)**  
**30 day mortality Rate: Open = 2.0% (1/49); Laparoscopic = 0.6% (1 / 180)**

	Open		Laparoscopic	
	N	%	N	%
No action required	1	9.1	4	9.5
Contributed to death	0	0.0	0	0.0
Delayed discharge	0	0.0	6	14.3
Required medical treatment	5	45.5	14	33.3
Required surgery	3	27.3	8	19.0
Not recorded	2	18.2	10	23.8

## Chart 18

**Partial / Simple Nephrectomies - Significance of Complications**  
**Overall morbidity Rate: Open = 23.7%(24/101); Laparoscopic = 12.0% (22/184)**  
**30 day mortality Rate: Open = 0% (0/101); Laparoscopic = 0.5% (1/184)**

	Open		Laparoscopic	
	N	%	N	%
No action required	5	20.8	1	4.5
Contributed to death	0	0.0	0	0.0
Delayed discharge	3	12.5	3	13.6
Required medical treatment	6	25.0	6	27.3
Required surgery	4	16.7	2	9.1
Not recorded	6	25.0	10	45.5

## Chart 19

### Nephrectomies – Parenchymal Tumours Predominant cell type Reported in 97% parenchymal tumours (166/171)

Predominant Cell Type	N	% of total reported (171)
Clear Cell	127	76.5
Papillary	15	9.0
Oncocytoma	10	6.0
Chromophobe	8	4.8
Collecting duct	0	0.0
Other	6	3.6

## Chart 20

### Nephrectomies – Urothelial Tumours Site of Tumour Reported in 100% urothelial tumours (38)

Site of Tumour	N	% of total reported (38)
Calyx	5	13.2
Pelvis	15	39.5
PUJ	1	2.6
Ureter	12	31.6
Multiple sites	5	13.2

## Chart 21

### Nephrectomy Follow ups

Follow up recorded in 14.0% (267 / 1903) patients

Median time to latest Follow-up = 95 days; range 0 – 530 days

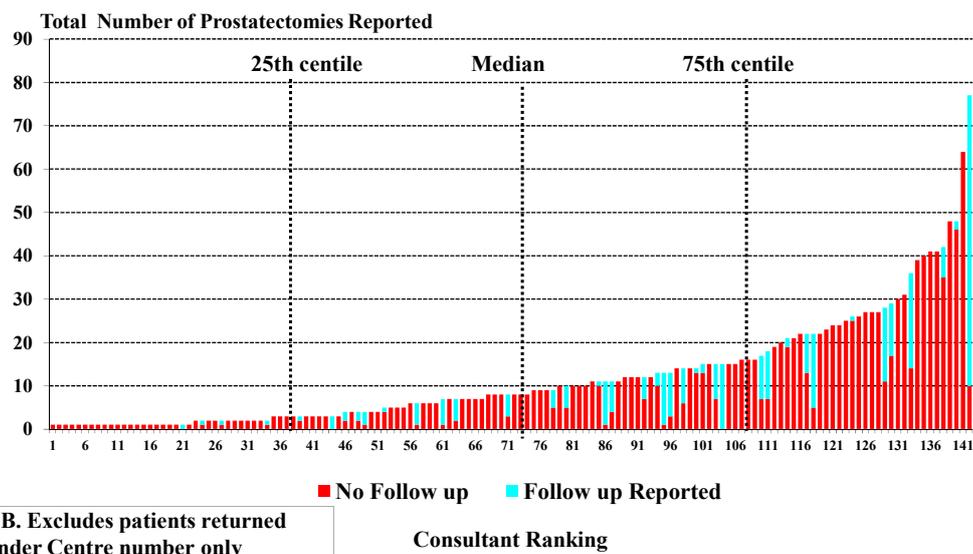
Median number of Follow-ups = 0; Range: 0 - 6

Time to latest follow-up:

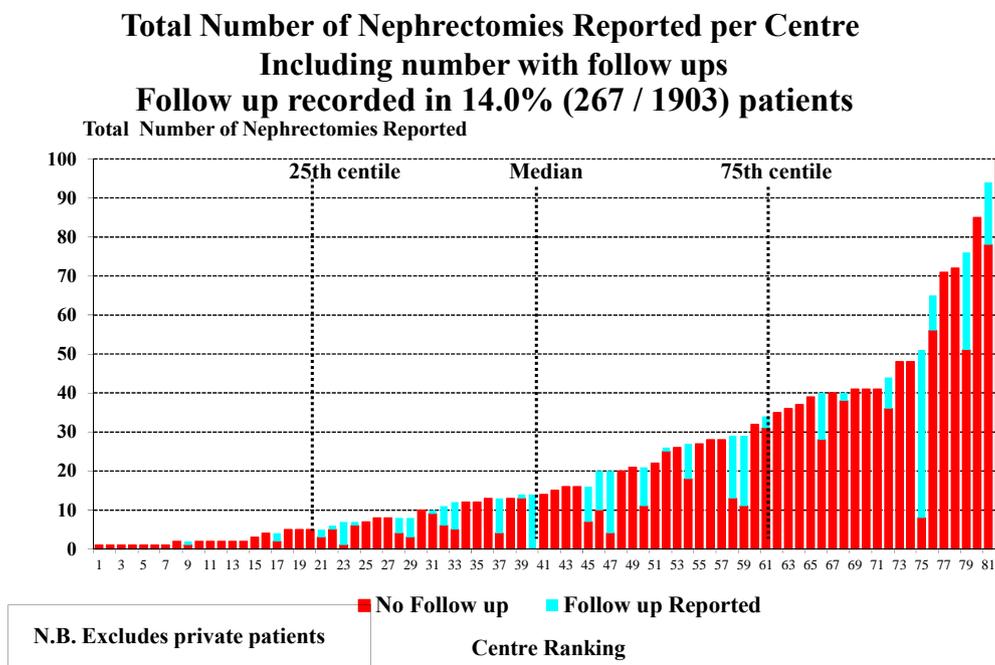
Time from Operation to follow-up	N	% of total known (267)
0 – 90 days	131	49.1
91 – 180 days	58	21.7
181 – 360 days	54	20.2
>=361 days	24	9.0

## Chart 22

### Total Number of Nephrectomies Reported per Consultant Including number with follow-ups Follow up recorded in 14.0% (267 / 1903) patients



## Chart 23



## Chart 24

**Nephrectomy - Current Status**  
**Follow up recorded in 14.0% (267 / 1903) patients**  
**Median time to latest Follow-up = 95 days; range 0 – 530 days**

	N	% of total (267)
Alive with no evidence of renal cancer	191	71.5
Alive with local recurrence of renal cancer	1	0.4
Alive with lymph node involvement	4	1.5
Alive with metastatic disease	16	6.0
Dead	4	1.5
Not recorded	51	19.1

Late complications were reported in 47/266 (17.7%) patients:

- 7 wound infection
- 3 wound hernia
- 12 renal
- 9 wound pain
- 21 other

## Chart 25

**Nephrectomy - Current Status**  
**Follow up recorded in 14.0% (267 / 1903) patients**  
**Median time to latest Follow-up = 95 days; range 0 – 530 days**

Time to follow up	N	% of total (267)	0 – 90 days		91-180 days		181 – 360 days		≥361 days	
			N	%	N	%	N	%	N	%
Alive with no evidence of renal cancer	191	71.5	82	63.1	39	69.6	48	84.2	22	22
Alive with local recurrence of renal cancer	1	0.4	0	-	0	-	1	1.8	0	-
Alive with lymph node involvement	4	1.5	1	0.8	0	-	3	5.3	0	-
Alive with metastatic disease	16	6.0	10	7.7	4	7.1	1	1.8	1	1
Dead	4	1.5	3	2.3	1	1.8	0	-	0	-
Not recorded	51	19.1	34	26.2	12	21.4	4	7.0	1	1

## Participating Hospital Centres

We are grateful to Consultants from the following Centres / Trusts who provided data for the analyses:

Aberdeen Royal Infirmary  
Alexandra Hospital; Kidderminster General Hospital;  
Worcester Royal Infirmary  
Altnagelvin Area Hospital  
Arrove Park Hospital  
Barnet & Chase Farm Hospital  
Bedford Hospital  
Bradford Royal Infirmary  
Broomfield Hospital  
Buckinghamshire Hospitals NHS Trust  
Castle Hill Hospital  
Causeway Hospital  
Churchill Hospital  
City Hospitals Sunderland NHS Foundation Trust  
Derby Hospitals NHS Foundation Trust  
Derriford Hospital  
Diana, Princess of Wales Hospital; Goole & District  
Hospital; Scunthorpe General Hospital  
Doncaster & Bassetlaw Hospitals NHS Trust  
Dorset County Hospital  
East Sussex Hospitals NHS Trust  
Freeman Hospital  
Gartnavel General Hospital  
Glan Clwyd Hospital  
Gloucestershire Royal Hospital  
Golden Jubilee National Hospital  
Great Western Hospital, Swindon  
Hairmyres Hospital  
Heart of England NHS FoundationTrust  
Hemel Hempstead General Hospital; Mount Vernon &  
Watford Hospitals  
Hereford Hospitals NHS Trust  
Huddersfield Royal Infirmary  
James Paget Hospital  
James Paget University Hospital  
Kettering General Hospital  
Leicester General Hospital  
Leighton Hospital  
Lincoln & Louth NHS Trust  
Lister Hospital; Queen Elizabeth II Hospital, Welwyn  
Manchester Royal Infirmary  
Mayday University Hospital  
Milton Keynes General Hospital  
New Cross Hospital  
Noble's Isle of Man Hospital  
Norfolk & Norwich Hospital  
North Bristol NHSTrust (Southmead)  
North Devon District Hospital  
North Hampshire Hospital  
Nottingham City Hospital  
Pinderfields Hospital  
Portsmouth Hospitals NHS Trust  
Queen Elizabeth Hospital, B'ham  
Royal Alexandra Hospital (Paisley)  
Royal Bournemouth Hospital  
Royal Devon And Exeter Hospital  
Royal Glamorgan Hospital  
Royal Infirmary of Edinburgh  
Royal Liverpool University Hospital  
Royal Preston Hospital  
Royal Shrewsbury Hospital  
Royal Surrey County Hospital; Frimley Park Hospital  
Royal Sussex County Hospital  
Royal United Hospital, Bath  
Royal West Sussex NHS Trust, St Richard's Hospital  
Salford RoyalNHS Foundation Trust  
Salisbury District Hospital  
Sandwell District General Hospital  
Southampton General Hospital  
Southend University Hospital NHS Foundation Trust  
Southern General Hospital  
Southport & Ormskirk NHS Trust  
St James's University Hospital  
St Mary's Hospital, IOW  
Stracathro Hospital; Perth Royal Infirmary; Ninewells  
Hospital  
Taunton And Somerset Hospital

Torbay Hospital  
University Hospital of North Stafford  
University Hospital Of Wales  
Walsall Manor Hospital N H S Trust  
Walsgrave Hospital  
Western General Hospital, Edinburgh  
Wrexham Maelor Hospital  
York District Hospital