

**THE BRITISH ASSOCIATION OF
UROLOGICAL SURGEONS**

SECTION of ONCOLOGY

**BAUS Cancer Registry
Analyses of Complex Operations
January 1st – 31st December 2007**

May 2008

MEMBERS OF THE EXECUTIVE COMMITTEE

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PRODUCED FOR BAUS SECTION OF ONCOLOGY

by

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Introduction

I take pleasure in writing this introduction, on behalf of the Executive Committee of the BAUS Section of Oncology, to the analysis of the data for Complex Operations for 2007 our fourth year of collecting such data. It is gratifying to report a greater number of procedures being submitted this year and, of worthy of note, a greater number of cystectomies than in 2004. In comparison to the latest available Hospital Episode Statistic data, our database is recording approximately 50% of each of the procedures. Follow-up data entry is poor, and deteriorating, with only 15% of nephrectomy patients having any follow-up recorded. Prostatectomy patients fare slightly better at 24%.

In comparison with 2004 data, the number of operating surgeons has increased for both nephrectomy and prostatectomy but decreased for cystectomy. There has been a slight reduction in the number of centres reporting carrying out cystectomy, 42 versus 50 in 2004.

Some of the highlights from this year's analysis are:

- There remain a large number of surgeons operating on very small number of cases for all three procedures with the median figures being 4 – 6, just at the threshold suggested as the minimum in the Improving Outcome Guidance for Urological Cancers published by NICE in 2002.
- The use of neoadjuvant chemotherapy for cystectomy patients has increased again, now being used in 30% of patients – a remarkable increase from 8% in 2004. It will be interesting to observe any improved outcome as a result.
- Extended lymph node dissection above the common iliac artery bifurcation is still not extensively practised (11% of cases in 2007 data), but a substantial increase over the 4.5% rate in 2004.
- The 30 day mortality rate for each of the procedures remains low being 2.6% for the most complex, the cystectomy patients; with 12 patients suffering intra- or post-operative complications directly attributable to the patient's death.
- The submission of follow-up data has been extremely poor especially from some of high volume individuals or centres with only one of the top six cystectomy surgeons performing twenty or more procedures per year entering any data. Similarly only four of the eleven centres reporting an annual rate of forty radical prostatectomies submitted any data.

In the near future the BAUS Cancer Registry, incorporating the Complex Operations Audit, will be entering a new phase becoming web-based with live data entry available on line. This major change is as a result of substantial generous funding from BAUS Council to help individual members with the rigours of relicensure and recertification as proposed by the General Medical Council.

As ever our thanks should go to Sarah Fowler, the BCR database manager who has produced this analysis and helped many individuals with their data queries over the year.

Gregor McIntosh
Salisbury,
May 2008

Audit Results Summary

BAUS Complex Operations Datasets – January 1st – December 31st 2007

- **482 cystectomies reported by 67 consultants from 42 centres**
- **72% males (331/462 recorded)**

- **80% (388/482) of the cystectomy data was returned electronically**

- **1309 prostatectomies reported by 105 consultants from 54 centres**

- **87% (1139/1309) of the prostatectomy data was returned electronically**

- **1407 nephrectomies reported by 154 consultants from 68 centres**
- **63% males (861/1364 recorded)**

- **85% (1191/1407) of the nephrectomy data was returned electronically**

Private patients accounted for 1.2% (6/482) of the cystectomies; 2.8% (37/1309) of the radical prostatectomies and 0% (0/1407) of the nephrectomies.

How were the data analysed?

Information obtained from consultants was entered into the computer database using unique identifying numbers for individual consultants or, if they preferred, a centre number. Five centres returned data under a centre number only (15 consultants in total).

Data could be returned either by completion of pro formas for each patient (537 – 17% of returns) or in electronic format using either an Access (Microsoft) database or “in-house” database (2661 – 83% of returns) designed for the purpose. The pro formas were entered directly into an Access database, at which time validation comprising mainly of checks for duplicate entries and on dates could be carried out. There are separate pro formas for the operation and follow-up information.

The data presented here are a summary of the data received up to 1st May 2008 and relate to operations performed during the whole of 2007. Follow-up information was returned on 17.6% (85/482) of the cystectomies; 24.7% (323/1309) of the radical prostatectomies and 15.5% (219/1407) of the nephrectomies.

For the ranked charts (1, 2, 21, 22, 25, 26, 47, 48, 51, 52, 69 & 70) 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 for each of the three procedures was issued individually to go with this chart book.

Sarah Fowler
BAUS Cancer Registry (BCR) Manager
May 2008

A. Cystectomies for malignant disease

Chart 1

Total Number of Cystectomies Reported per Consultant
Median: 4 (Interquartile Range 2 - 8)

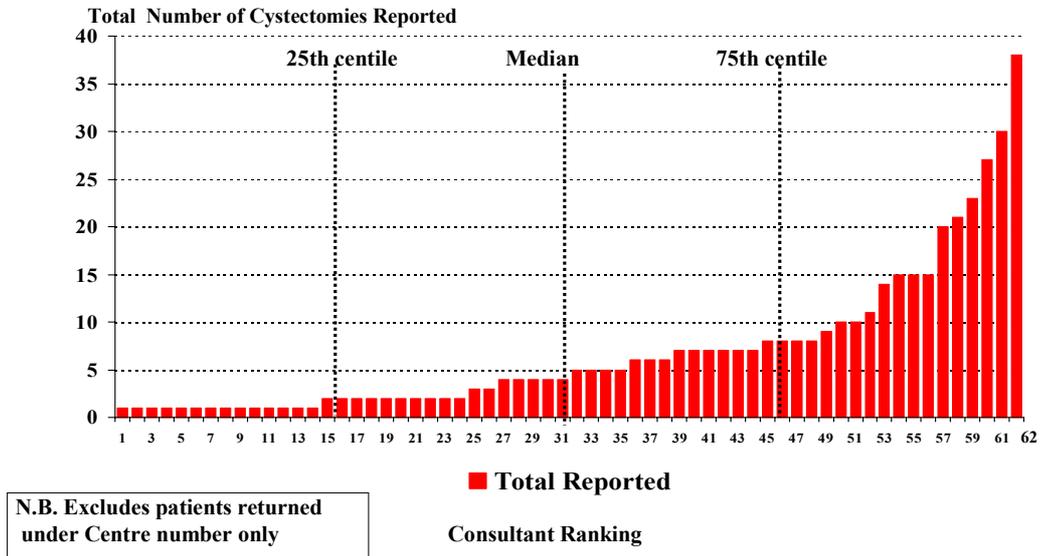


Chart 2

Total Number of Cystectomies Reported per Centre
Median: 6 (Interquartile Range 2 - 14)

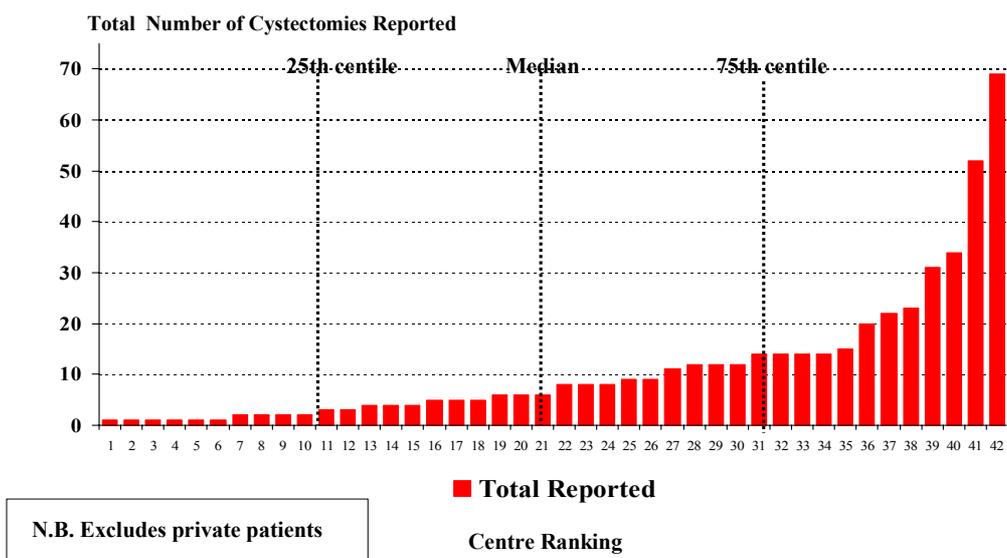


Chart 3

Indication for Cystectomy

Indication	Number & percentage of total (482)	
	N	%
Muscle invasive TCC	261	54.1
Salvage after Radiotherapy	19	3.9
Uncontrolled superficial disease	68	14.1
Squamous cell ca	17	3.5
Primary CIS	18	3.7
Sarcoma	1	0.2
Gynaecological ca	6	1.2
Primary Adenocarcinoma	3	0.6
Secondary Adenocarcinoma	1	0.2
Other	22	4.6
Not recorded	66	13.7

Chart 4

Cystectomy Pre-operative Clinical Staging Staging could be estimated in 77.4% (373/482) cases

Known Staging	Total Known	
	N	%
Stage 0a (T _a N ₀ M ₀)	10	2.7
Stage 0is (T _{is} N ₀ M ₀)	18	4.8
Stage I (T ₁ N ₀ M ₀)	64	17.2
Stage II (T _{2a} , 2b N ₀ M ₀)	158	42.4
Stage III (T _{3a} , 3b, 4a N ₀ M ₀)	105	28.2
Stage IV (T _{4b} N ₀ M ₀)	18	4.8
Any T N ₁ , N ₂ , N ₃ M ₀ Any T any N M ₁)	including 1 with metastases	0.3

Chart 5

Cystectomy - Comparison of Pre-operative clinical & pathological Categories

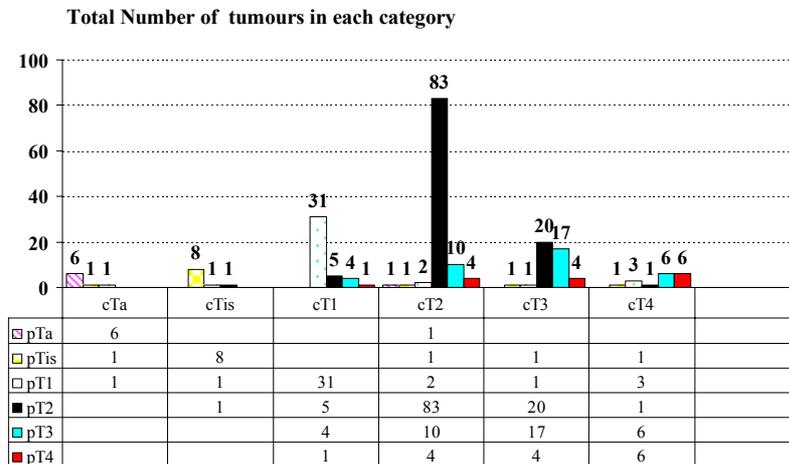


Chart 6

Cystectomy - Comparison of Pre-operative clinical & Post-operative pathological staging

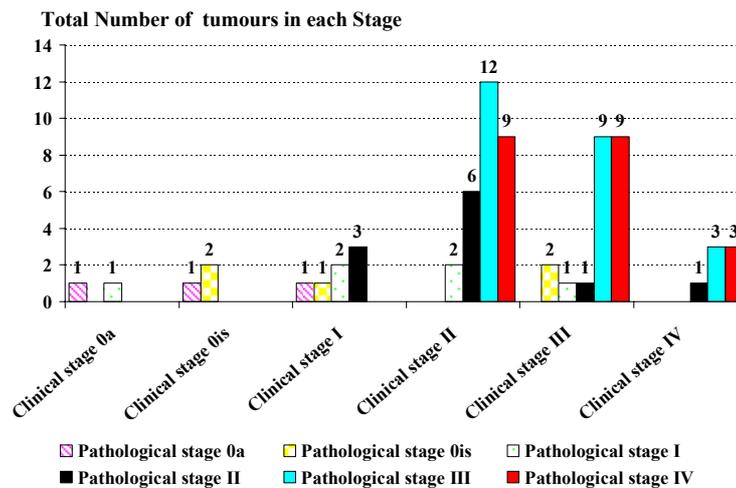


Chart 7

Cystectomy - Pre-operative Imaging Total Numbers Reported with those as only Imaging method in () Information recorded in 92% cases (444/482)

Imaging Method	N
CT Scan	360 (181)
MRI	93 (27)
Bone Scan	93 (2)
IVU	67 (2)
Others	63 (5)
None	30 (30)

Chart 8

Cystectomy - Pre-operative Serum Creatinine

Serum Creatinine Level $\mu\text{mols/l}$	N	% of total (482)
0 – 120 $\mu\text{mols/l}$	288	59.8
121 - 200 $\mu\text{mols/l}$	73	15.1
> 200 $\mu\text{mols/l}$	7	1.5
Not recorded	114	23.7

Chart 9

Cystectomy - Other Pre-operative findings

	N	% of total reporting
Pre operative Radiotherapy	25/364	6.9
Pre operative Neoadjuvant Chemotherapy	114/370	30.8
Synchronous Upper tract disease	18/428	4.2

Chart 10

Cystectomy - Status Upper Tracts

Status	Number & percentage of total reported (482)	
	N	%
Normal	288	59.8
Tumour	5	1.0
Hydronephrosis – left	43	8.9
Hydronephrosis – right	39	8.1
Hydronephrosis – bilateral	24	5.0
Non – functioning kidney	6	1.2
Other	16	3.3
Not recorded	61	12.7

Chart 11

Cystectomy Pre-operative Potency

	N	% of total (482)
Impotent	78	16.2
Partially potent	56	11.6
Fully potent	124	25.7
Potency not recorded	224	46.5

Chart 12

Cystectomy Pre-operative Continence

	N	% of total (482)
Complete	315	65.4
Minor stress leakage	36	7.5
1 pad per day	4	0.8
> 1 pad per day	10	2.1
Appliance	15	3.1
Continence not recorded	102	21.2

Chart 13

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

	Total Number	% of total (482)	Supervised training operation	%
Consultant	416	86.3	122/255	47.8
Specialist Registrar	41	8.5	39/41	95.1
Other	20	4.1	0/20	0
Surgeon not recorded	5	1.0	-	-

Chart 14

Cystectomy - Diversion procedure 20 laparoscopic procedures were reported 63 combined synchronous urethrectomies 18 combined synchronous nephroureterctomies

	N	% of total (482)
Ileal conduit	377	78.2
Orthotopic	35	7.3
Rectal diversion	0	-
Continent cutaneous diversion	0	-
Other	3	0.6
Not recorded	67	13.9

54% (19/35) of the orthotopics were Studer

Chart 15

Cystectomy Lymph Node Dissection

	N	% of total (482)
None	116	24.1
Palpable only	32	6.6
Below bifurcation of common iliac	212	44.0
Extended above bifurcation of common iliac	55	11.4
Not recorded	67	13.9

Chart 16

Cystectomies

- **Median duration of operation:**
- All patients = 280 mins; Range: 90 – 755; (333 patients)
- Patients having LND = 275 mins; Range: 140 – 640; (253 patients)
- Patients with no LND = 255 mins; Range: 90 – 501; (57 patients)
- **Median number of units of blood transfused = 1**
Range: 0 - 16
(reported in 62% (299) patients)
- **Median measured blood loss = 1,000 mls**
Range: 0 – 11,100
(reported in 63% (304) patients)
- **Median post-operative stay = 14 days (excluding deaths)**
Range: 0 - 107
(reported in 71% (343) patients)

Chart 17

Cystectomies Complications

		N	%
Intra-operative complications:		34/435	7.8
	Bleeding	10/435	2.3
	Other / NR	24/435	5.5
Post-operative complications:		106/404	26.2
	Infections/ Septicaemia	35/404	8.7
	Prolonged Ileus	15/404	3.7
	Leaks	8/404	2.0
	Other / NR	48/404	11.9

Chart 18

Cystectomy - Significance of Complications

Overall morbidity Rate = 26.6% (128/482)

30 day mortality Rate = 2.6% (11/482)

	Intra-operative		Post-operative	
	N	%	N	%
No action required	2	5.9	10	9.4
Contributed to death	3	8.8	9	8.5
Delayed discharge	2	5.9	27	25.5
Required medical treatment	2	5.9	30	28.3
Required surgery	7	20.6	22	20.8
Not recorded	18	52.9	8	7.5

Chart 19

Cystectomy - Operative Histology reported in 19.7% (95/482) cases

Histology	Number & percentage of total known (95)	
	N	%
No cancer	11	11.6
Muscle invasive TCC	58	61.1
SCC	6	6.3
Primary CIS	8	8.4
Sarcoma	1	1.1
Gynaecological ca	0	-
Primary adenocarcinoma	0	-
Secondary adenocarcinoma	0	-
Other	11	11.6

Chart 20

Cystectomy Follow ups

Follow up recorded in 17.6% (85 / 482) patients

Median time to latest Follow-up = 69 days; range 9 – 369 days

Median number of Follow-ups = 0; Range: 0 - 4

Time to latest follow-up:

Time from Operation to follow-up	N	% of total (85)
0 – 90 days	48	56.5
91 – 180 days	25	29.4
181 – 360 days	11	12.9
>=361 days	1	1.2

Chart 21

**Total Number of Cystectomies Reported per Consultant
Including number with follow-ups
Follow up recorded in 17.6% (85 / 482) patients**

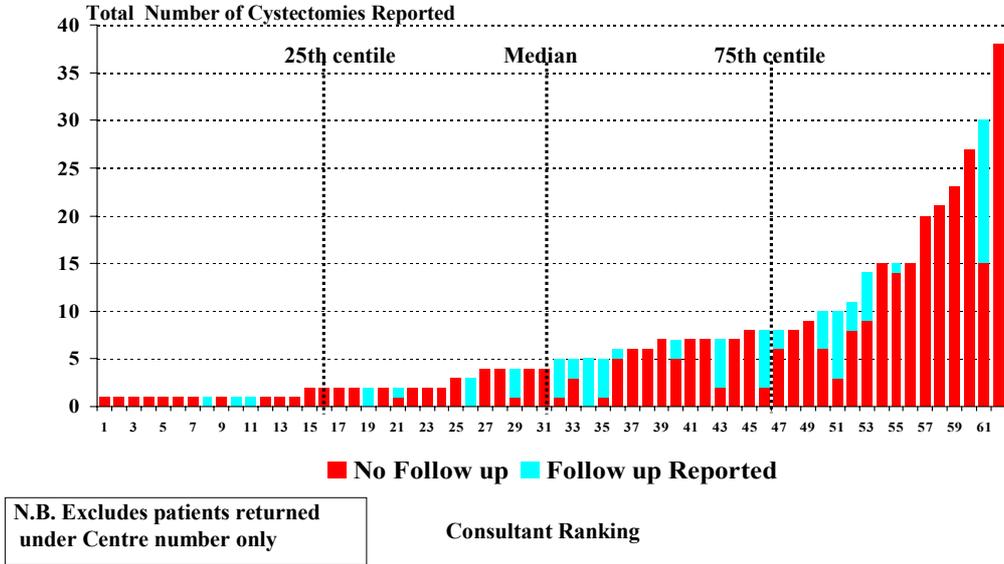


Chart 22

**Total Number of Cystectomies Reported per Centre
Including number with follow-ups
Follow up recorded in 17.6% (85 / 482) patients**

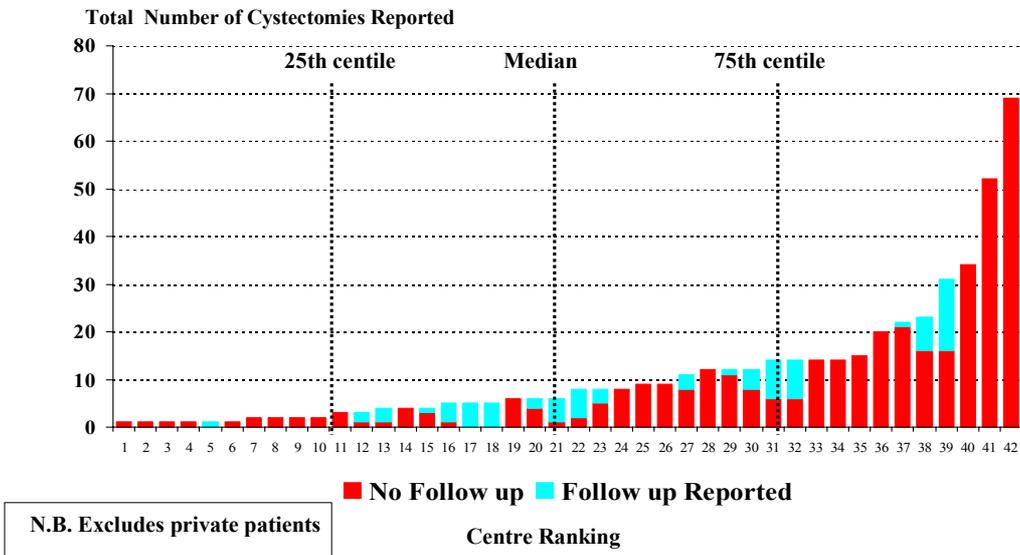


Chart 23

Cystectomy - Current Status
Follow up recorded in 17.6% (85 / 482) patients
Median time to latest Follow-up = 69 days; range 9 – 369 days

	N	% of total (85)
Alive with no evidence of bladder cancer	64	75.3
Alive with local recurrence of bladder cancer	1	1.2
Alive with lymph node involvement	1	1.2
Alive with metastatic disease	3	3.5
Dead	8	9.4
Not recorded	8	9.4

Late complications were reported in 14/85 (16.5%) patients

Chart 24

Cystectomy - Current Status
Follow up recorded in 17.6% (85 / 482) patients
Median time to latest Follow-up = 69 days; range 9 – 369 days

Time to follow up	N	% of total (100)	0 – 90 days		91-180 days		181 – 360 days		≥361 days	
			N	%	N	%	N	%	N	%
Alive with no evidence of bladder cancer	64	75.3	39	83.0	17	65.4	7	63.6	1	100.0
Alive with local recurrence of bladder cancer	1	1.2	1	2.1	0	-	0	0.0	-	-
Alive with lymph node involvement by bladder ca	1	1.2	1	2.1	0	-	0	0.0	-	-
Alive with metastatic disease	3	3.5	2	4.3	0	-	1	9.1	-	-
Dead	8	9.4	3	6.4	4	15.4	1	9.1	-	-
Not recorded	8	9.4	1	2.1	5	19.2	2	18.2	-	-

B. Radical prostatectomies

Chart 25

Total Number of Prostatectomies Reported per Consultant
Median: 6 (Interquartile Range 2 - 15)

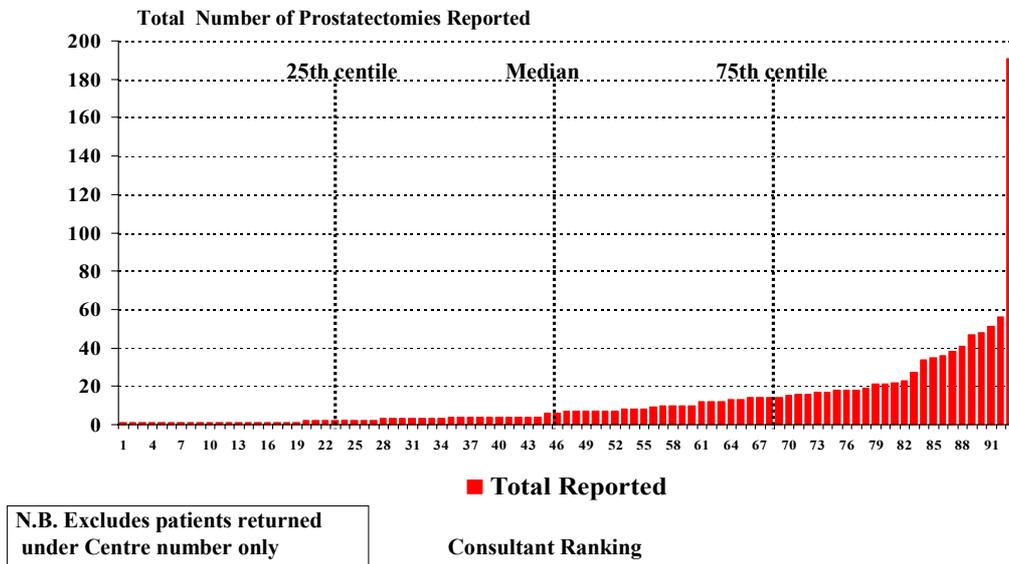


Chart 26

Total Number of Prostatectomies Reported per Centre
Median: 15 (Interquartile Range 6 - 25)

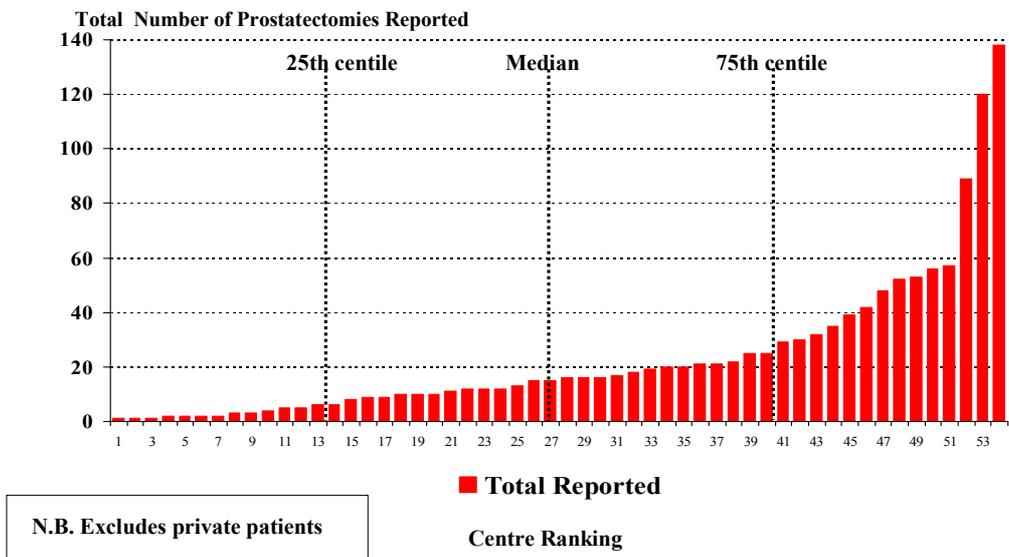
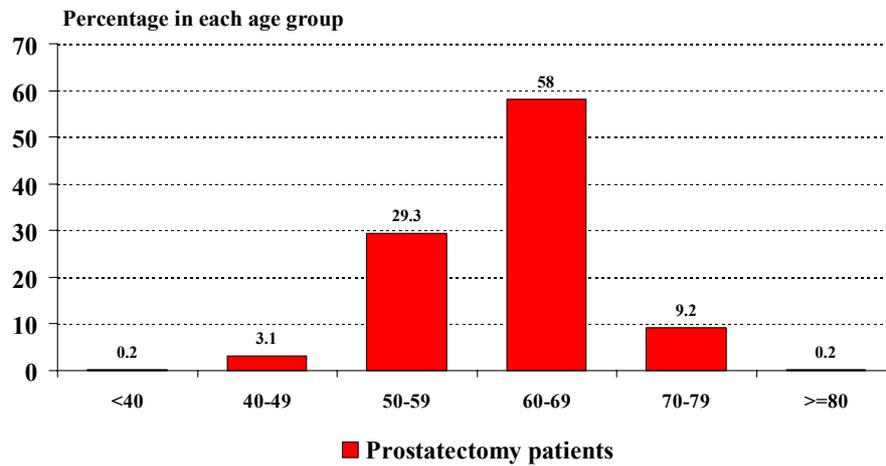


Chart 27

Percentage Age Distribution - Prostatectomies Median : 62 Years; Range 37 -87 (n= 1244*)



Age could be calculated when both date of birth and operation date were recorded = 1244/1309 (95%)

Chart 28

Prostatectomy Presentation

Presentation	N	% of total (1309)
Via Screening or Case Finding	770	58.8
LUTS	227	17.3
Other	170	13.0
Not recorded	142	10.8

Other presentation was only recorded in 16% (28/170) cases:

0.2% (3/1309) Referred for surgery from another hospital

0.2% (3/1309) Haematuria

0.2% (2/1309) TURP

3.7% (41/1105) were reported as having had a previous TURP

Chart 29

Prostatectomy Pre-operative Clinical Staging Staging could be estimated in 85% (1111/1309) cases

Known Staging	Total Known	
	N	%
Stage I (T1a N0 M0)	2	0.2
Stage II (T1b, 1c, 1, 2 N0 M0)	T1 - 110	9.9
	T1a - 2	0.2
	T1b - 7	0.6
	T1c - 421	37.9
	T2 - 531	47.8
Stage III (T3 N0 M0)	38	3.4
Stage IV (T4 N0 M0 Any T N1 M0 Any T any N M1)	0	-

Chart 30

Prostatectomies Comparison of clinical & pathological staging

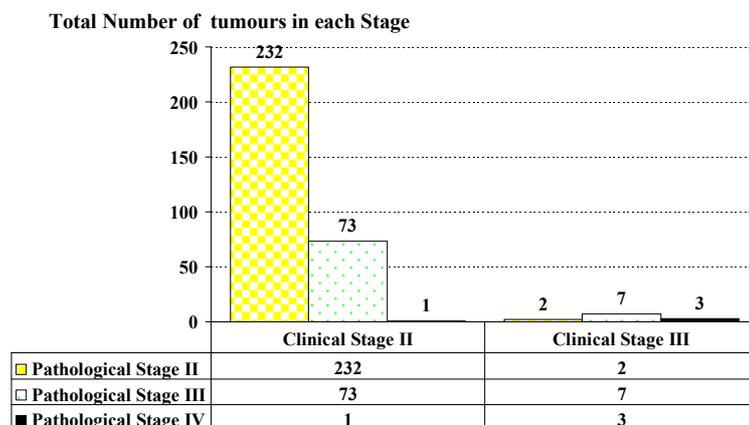


Chart 31

Staging of Prostate Tumours by PSA

Numbers falling in each category
Pre-operative PSA was recorded in 88.5% patients (1159/1309)
Staging could be estimated in 85% (1111/1309) cases

Known Clinical Staging	Total Patients	PSA 0-5		PSA 6-10		PSA 11-20		PSA 21-50		PSA > 50	
		N	%	N	%	N	%	N	%	N	%
Stage I T1a N0 M0	2	1	0.4	1	0.2	0	-	0	-	0	-
Stage II T1b, 1c, 1, 2, N0 M0	1038	227	97.0	586	98.0	202	93.1	23	85.2	0	
Stage III T3 N0 M0	37	6	2.6	11	1.8	15	6.9	4	14.8	1	100
Stage IV (T4 N0 M0 Any T N1 M0 Any T any N M1)	0										
Totals	1077	234		598		217		27		1	

Chart 32

Gleason Sum Scores by Age Group - Prostatectomies

Number falling into each category
Gleason scores were recorded in 86.6% (1133/1309)
Age could be recorded in 95% (1075/1133) of these

Age Group	Total Patients	Gleason sum 2 – 4		Gleason sum 5 – 6		Gleason sum 7		Gleason sum 8 – 10	
		N	%	N	%	N	%	N	%
< 60	346	0	0.4	217	62.7	112	32.4	17	4.9
60 – 64	343	0	0.4	207	60.3	122	35.6	14	4.1
65 – 69	285	0	-	148	51.9	109	38.2	28	9.8
70 – 74	93	0	-	50	53.8	35	37.6	8	8.6
75 – 79	7	0	-	4	57.1	2	28.6	1	14.3
>=80	1	0		1	100	0	-	0	-
Totals	1075	0	-	627	58.3	380	35.3	68	6.3

Chart 33

Gleason Sum Score Related to Age

Gleason scores were recorded in 86.6% (1133/1309)

Age could be recorded in 95% (1075/1133) of these

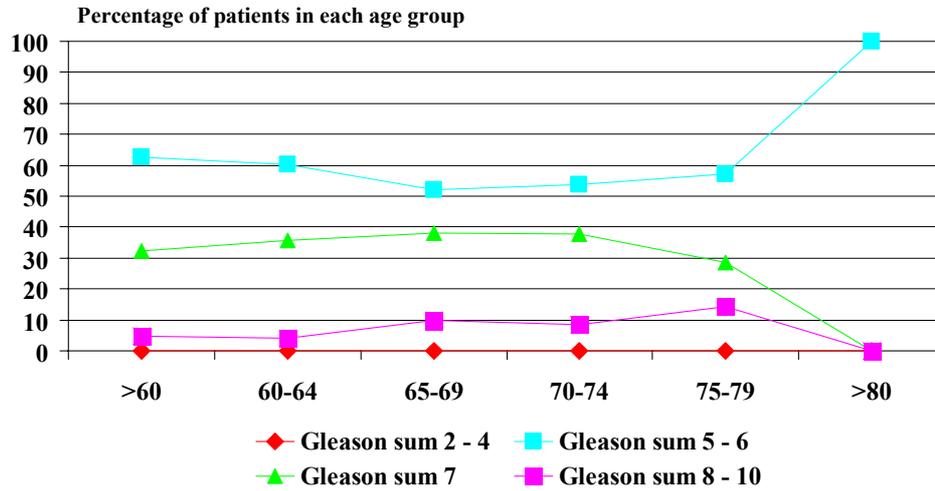


Chart 34

Prostatectomy Pre-operative Potency

	N	% of total (1309)
Impotent	109	8.3
Partially potent	241	18.4
Fully potent	633	48.4
Potency not recorded	326	24.9

Chart 35

Prostatectomy Pre-operative Continence

	N	% of total (1309)
Complete	1067	81.5
Minor stress leakage	12	0.9
1 pad per day	2	0.2
> 1 pad per day	3	0.2
Appliance	5	0.4
Continence not recorded	220	16.8

Chart 36

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

	Total Number	% of total (1309)	Supervised training operation	%
Consultant	1196	91.4	260/718	36.2
Specialist Registrar	52	4.0	49/50	98.0
Other	40	3.1	9/39	23.1
Surgeon not recorded	21	1.6	-	-

Chart 37

Prostatectomy - Procedure Nerve sparing

Nerve Sparing	N	% of total (1309)
Bilateral	547	41.8
Unilateral	186	14.2
None	408	31.2
Not recorded	168	12.8

Chart 38

Prostatectomy Procedure - Approach

	N	% of total (1309)
Retropubic	847	64.7
Perineal	3	0.2
Other	9	0.7
Not recorded	450	34.4

Chart 39

Prostatectomy Procedure – Laparoscopic Conversion rate = 7.8% (36/463)*

Laparoscopic	N	% of total (1309)
Yes	463	35.4
No	550	42.0
Not recorded	296	22.6

*Conversion reasons were only included in 7/36 and included 2 peritoneal breaches , 1 peritoneal tear and 1 heavy bleeding

Chart 40

Prostatectomies

- 33.25% had Lymph Node dissection (383/1153 patients)
- Median duration of operation:
 - All patients = 165 mins; Range: 62 - 480; (997 patients)
 - Patients having LND = 172 mins; Range: 70 - 480; (172 patients)
 - Patients with no LND = 160 mins; Range: 62 – 480; (600 patients)
- Median number of units of blood transfused = 0
Range: 0 - 15
(reported in 74% (798) patients)
- Median measured blood loss = 500 mls
Range: 0 – 5,000
(reported in 78% (820) patients)
- Median post-operative stay = 3 days (excluding deaths)
Range: 0 - 290
(reported in 83% (1080) patients)

Chart 41

Prostatectomies - Procedure

	Procedure	N	Median	Range
Duration of Operation (mins)	Total patients	997	165	62 – 480
	Retropubic	725	160	62 – 480
	Perineal	2	185	160 – 210
	Laparoscopic	422	180	90 - 480
Units of Blood Transfused	Total patients	975	0	0 – 15
	Retropubic	717	0	0 – 15
	Perineal	2	1	0 – 2
	Laparoscopic	405	0	0 – 6
Measured Blood Loss (mls)	Total patients	1017	500	0 – 5,000
	Retropubic	761	500	0 – 5,000
	Perineal	2	1750	400 – 3100
	Laparoscopic	419	200	0 - 2500
Post –op Length of Stay (days)	Total patients	1080	3	0 – 290
	Retropubic	747	3	0 – 290
	Perineal	3	3	2 – 6
	Laparoscopic	417	3	0 – 33

Chart 42

Prostatectomies Complications

		N	%
Intra-operative complications:		65/1039	5.0
	Bleeding	15/1039	1.1
	Rectal Injury	9/1039	0.7
	Other / NR	41/1039	3.1
Post-operative complications:		106/1039	8.1
	Wound Infections	9/1039	0.9
	Ileus	4/1039	0.4
	Leaks	10/1039	1.0
	Stenosis	4/1039	0.4
	Other / NR	79/1039	7.6

Chart 43

Prostatectomy - Significance of Complications

Overall morbidity Rate = 11.2% (147/1309)

30 day mortality Rate = 0.2% (3/1309)

	Intra-operative		Post-operative	
	N	%	N	%
No action required	18	27.7	18	17.0
Contributed to death	0	-	1	0.9
Delayed discharge	8	12.3	32	30.2
Required medical treatment	3	4.6	32	30.2
Required surgery	3	4.6	16	15.1
Not recorded	33	50.8	7	6.6

Chart 44

Prostatectomies Comparison of Pre-operative Biopsy and Operative Surgical Gleason Sum Scores

Total Number of tumours in each Group

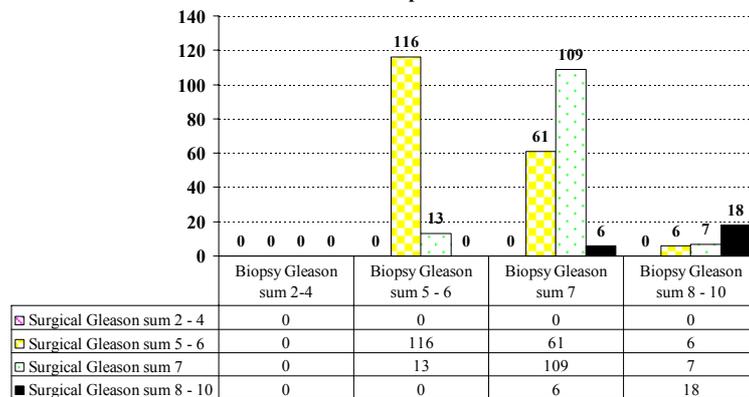


Chart 45

Prostatectomy Pathology

	N	% of total known
Known Positive Lymph Nodes	5/120	4.2
Known Seminal Vesical Involvement	20/352	5.7

Chart 46

Prostatectomy Follow ups

Follow up recorded in 24.6% (323 / 1309) patients

Median time to Follow-up = 86 days; range 6 – 407 days

Median number of Follow-ups = 0; Range: 0 - 5

Time to latest follow-up:

Time from Operation to follow-up	N	% of total (323)
0 – 90 days	166	51.4
91 – 180 days	85	26.3
181 – 360 days	61	18.9
>=361 days	11	3.4

Chart 47

**Total Number of Prostatectomies Reported per Consultant
Including number with follow-ups
Follow up recorded in 24.6% (323 / 1309) patients**

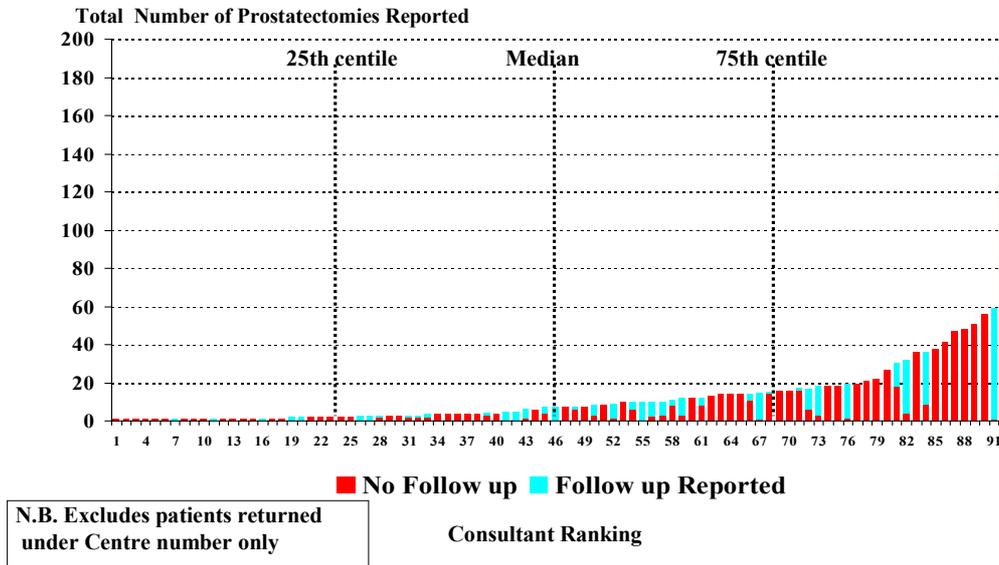


Chart 48

**Total Number of Prostatectomies Reported per Centre
Including number with follow-ups
Follow up recorded in 24.6% (323 / 1309) patients**

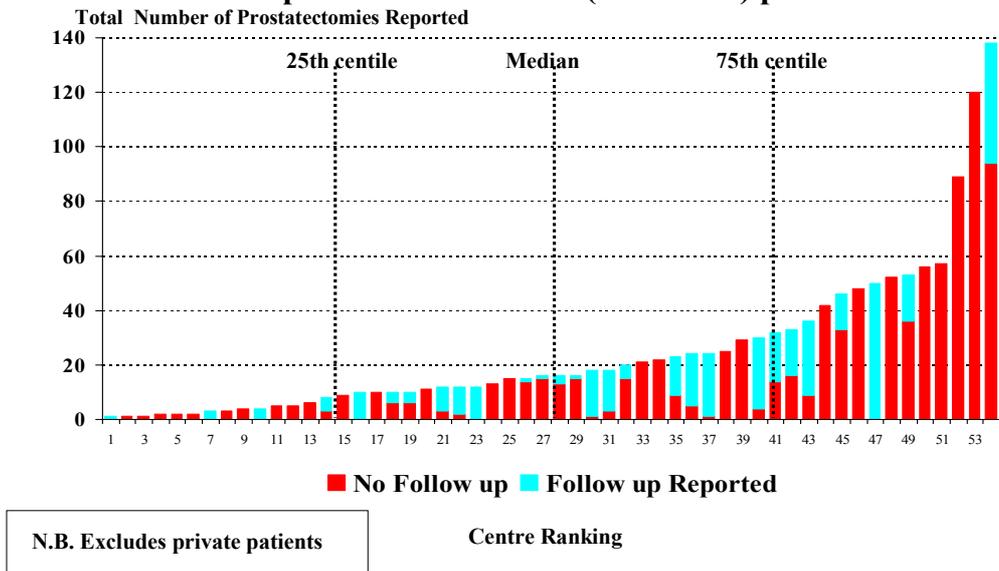


Chart 49

Prostatectomy - Current Status
Follow up recorded in 24.6% (323 / 1309) patients
Median time to Follow-up = 86 days; range 6 – 407 days

	N	% of total (323)
Alive with no evidence of prostate cancer	250	77.4
Alive with local recurrence of prostate cancer	7	2.2
Alive with lymph node involvement	1	0.3
Alive with metastatic disease	1	0.3
Dead	1	0.3
Not recorded	63	19.5

Late complications were reported in 14% (36/257) patients:

- 20 Anastamotic strictures
- 3 Urethral strictures
- 3 Recurrent UTI
- 1 Testicular pain
- 1 Hernia
- 10 Other complications

Chart 50

Prostatectomy - Current Status
Follow up recorded in 24.6% (323 / 1309) patients
Median time to Follow-up = 86 days; range 6 – 407 days

Time to follow up	N	% of total (323)	0 – 90 days		91-180 days		181 – 360 days		≥361 days	
			N	%	N	%	N	%	N	%
Alive with no evidence of prostate cancer	250	77.4	133	86.4	78	80.4	31	50.8	8	72.7
Alive with local recurrence of prostate cancer	7	2.2	2	1.3	2	2.1	3	4.9	0	
Alive with lymph node involvement	1	0.3	0		0		1	1.6	0	
Alive with metastatic disease	1	0.3	0		0		1	1.6	0	
Dead	1	0.3	0		1	1.0	0		0	
Not recorded	63	19.5	19	12.3	16	16.5	25	41.0	3	27.3

C. Nephrectomies

Chart 51

Total Number of Nephrectomies Reported per Consultant
Median: 5 (Interquartile Range 2 - 11)

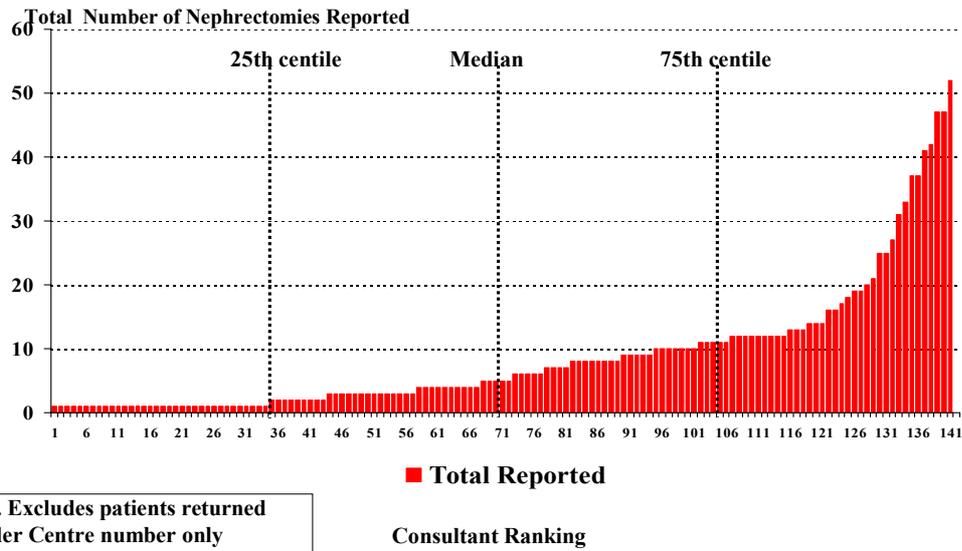


Chart 52

Total Number of Nephrectomies Reported per Centre
Median: 14 (Interquartile Range 6 - 24)

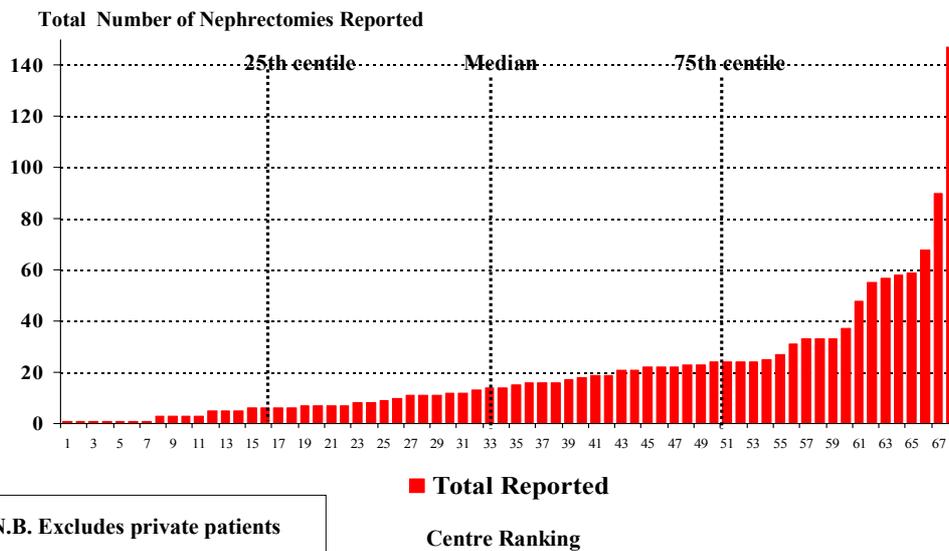


Chart 53

Nephrectomy - Pre-operative presentation

	N	% of total (1407)
Incidental finding with no symptoms	444	31.6
Haematuria	461	32.8
Other:	307	21.8
Pain	5	0.4
Other/Not recorded	291	20.7
Not recorded	195	13.9

Chart 54

Nephrectomies – Haematology at Presentation

	N	Median	Range
Hb (g/L)	1056	14	5.8 – 184
Total WBC (* 10⁹ / L)	1037	8	2 – 96
Neutrophils (* 10⁹ / L)	897	5	2 – 155
Lymphocytes (* 10⁹ / L)	613	2	0 – 532
Platelets (* 10⁹ / L)	1006	270	3 - 1127

Chart 55

Nephrectomy - Pre-operative Serum Creatinine

Serum Creatinine Level $\mu\text{mols/l}$	N	% of total (1407)
0 – 120 $\mu\text{mols/l}$	830	59.0
121 - 200 $\mu\text{mols/l}$	206	14.6
> 200 $\mu\text{mols/l}$	29	2.1
Not recorded	342	24.3

Chart 56

Nephrectomy Pre-operative Clinical Staging Staging could be estimated in 72% (1010/1407) cases

Known Staging	Total Known N	%
Stage I (T1 N0 M0)	513	50.8
Stage II (T2 N0 M0)	254	25.1
Stage III (T1, T2, T3 N0, N1 M0)	161	15.9
Stage IV (T4 N0, N1 M0 Any T N2 M0 Any T any N M1)	82 including 58 with metastases	8.1 5.7

7.6% (92/1210) patients were reported as having a pre-operative biopsy

Chart 57

Nephrectomies Comparison of clinical & pathological staging

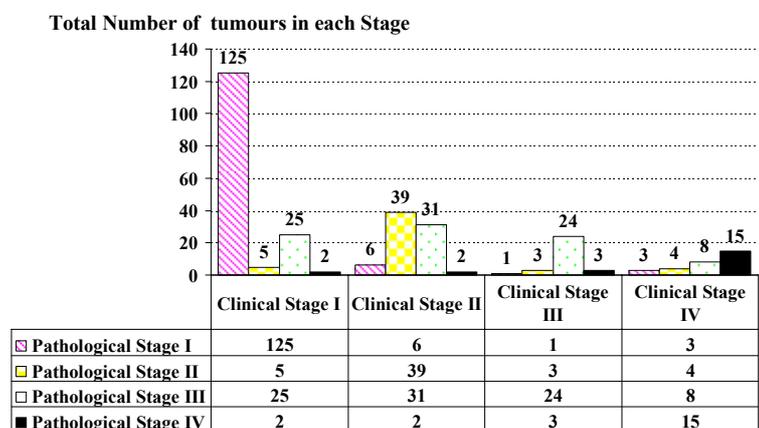


Chart 58

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

	Total Number	% of total (1407)	Supervised training operation	%
Consultant	1101	78.3	345/788	43.8
Specialist Registrar	148	10.5	124/126	98.4
Other / Not recorded	158	11.2	14/89	15.7

Chart 59

Nephrectomy – Procedure

The vena cava was reported as being explored in 6.5% (62/960) cases
87% (34/39) Infra-diaphragmatically; 13% (5/39) Supra-diaphragmatically

	N	% of total (1407)
Radical Nephrectomy	907	64.5
Bilateral Radical Nephrectomy	4	0.3
Partial Nephrectomy	150	10.7
Simple Nephrectomy	47	3.3
Nephroureterectomy	212	15.1
Other	18	1.3
Not Recorded	69	4.9

Chart 60

Nephrectomies – Surgical Approach

Known Laparoscopic Conversion rate = 10.8% (46/427)*

Approach	N	% of total (1407)
Open	948	67.4
Laparoscopic	459	32.6

* Conversion reasons

- 15 due to bleeding
- 5 due to adhesions
- 10 due to failure to progress
- 16 other / not recorded

Chart 61

Nephrectomy Approach by Pre-operative Clinical Staging Staging could be estimated in 72% (1010/1407) cases

Known Staging	Total	Open		Laparoscopic	
	N	N	%	N	%
Stage I (T1 N0 M0)	513	251	40.0	262	68.4
Stage II (T2 N0 M0)	254	170	27.1	84	21.9
Stage III (T1, T2, T3 N0, N1 M0)	161	143	22.8	18	4.7
Stage IV (T4 N0, N1 M0 Any T N2 M0 Any T any N M1)	82	63	10.0	19	5.0

Chart 62

Nephrectomies

- 11.3% had Lymph Node dissection (134/1185 patients)
- Median duration of operation = 160 minutes
Range: 30 - 600
(reported in 64.5% (907) patients)
- Median number of units of blood transfused = 0
Range: 0 - 28
(reported in 63% (883) patients)
- Median measured blood loss = 200 mls
Range: 0 - 10,000
(reported in 54.5% (767) patients)
- Median post-operative stay = 6 days (excluding deaths)
Range: 1 - 218
(reported in 82% (1153) patients)

Chart 63

Nephrectomies - Procedure

	Procedure	N	Median	Range
Duration of Operation (mins)	Total patients	907	160	30 - 600
	Open	541	150	30 - 600
	Laparoscopic	366	180	60 - 415
	LND	102	180	65 - 480
Units of Blood Transfused	Total patients	883	0	0 - 28
	Open	522	0	0 - 28
	Laparoscopic	361	0	0 - 6
Measured Blood Loss (mls)	Total patients	767	200	0 - 10,000
	Open	450	300	0 - 10,000
	Laparoscopic	317	140	0 - 5,000
Post -op Length of Stay (days)	Total patients	1153	6	0 - 218
	Open	733	7	0 - 218
	Laparoscopic	420	5	0 - 39

Chart 64

Nephrectomies Complications

		N	%
Intra-operative complications:		81/1194	6.8
	Bleeding	38/1194	3.2
	Required splenectomy	13/1194	1.1
	Other / NR	30/1194	2.5
Post-operative complications:		196/1097	17.9
	Wound Infection	20/1097	1.8
	Chest Infection	21/1097	1.9
	Bleeding	16/1097	1.5
	Pain	4/1097	0.4
	MI	4/707	0.4
	Other / NR	131/1097	11.9

Chart 65

Nephrectomy - Significance of Complications

Overall morbidity Rate = 17.9% (252/1407)

30 day mortality Rate = 1.4% (19/1407)

	Intra-operative		Post-operative	
	N	%	N	%
No action required	18	22.2	9	4.6
Contributed to death	4	4.9	11	5.6
Delayed discharge	5	6.2	52	26.5
Required medical treatment	11	13.6	70	35.7
Required surgery	13	16.0	19	9.7
Not recorded	30	37.0	35	17.9

Chart 66

Nephrectomies – Parenchymal Tumours

Predominant cell type

Reported in 98% parenchymal tumours (235/240)

Predominant Cell Type	N	% of total reported (235)
Clear Cell	188	80.0
Papillary	20	8.5
Oncocytoma	10	4.3
Chromophobe	5	2.1
Collecting duct	1	0.4
Other	11	4.7

Chart 67

Nephrectomies – Urothelial Tumours Site of Tumour Reported in 97% parenchymal tumours (72/75)

Site of Tumour	N	% of total reported (73)
Calyx	9	12.3
Pelvis	28	38.4
PUJ	1	1.4
Ureter	23	31.5
Multiple sites	1	1.4
Other	11	15.1

Chart 68

Nephrectomy Follow ups

Follow up recorded in 15.6% (219 / 1407) patients

Median time to Follow-up = 72 days; range 3 – 390 days

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

Time to latest follow-up:

Time from Operation to follow-up	N	% of total (219)
0 – 90 days	122	55.7
91 – 180 days	50	22.8
181 – 360 days	46	21.0
>=361 days	1	0.5

Chart 69

**Total Number of Nephrectomies Reported per Consultant
Including number with follow-ups
Follow up recorded in 15.6% (219 / 1407) patients**

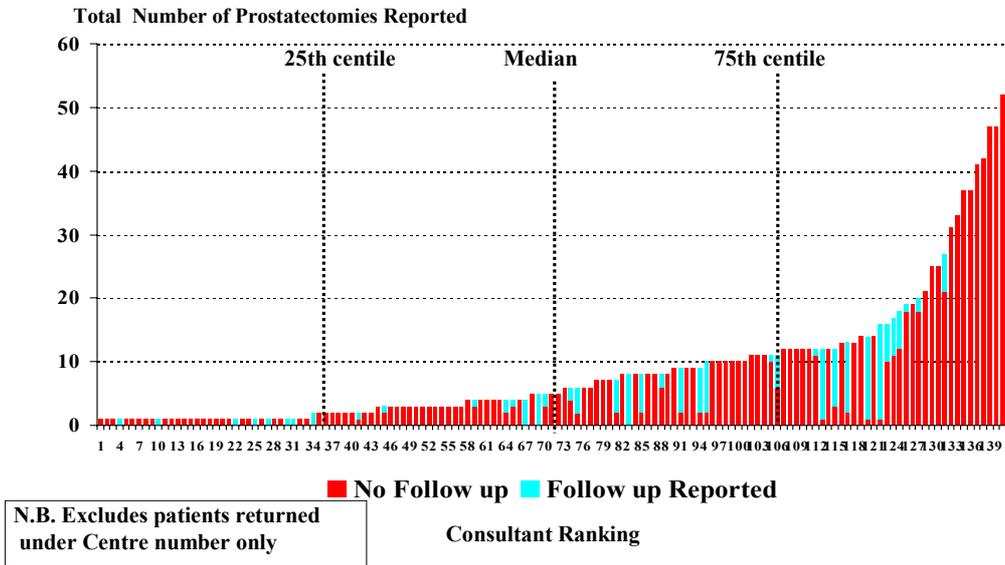


Chart 70

**Total Number of Nephrectomies Reported per Centre
Follow up recorded in 15.6% (219 / 1407) patients**

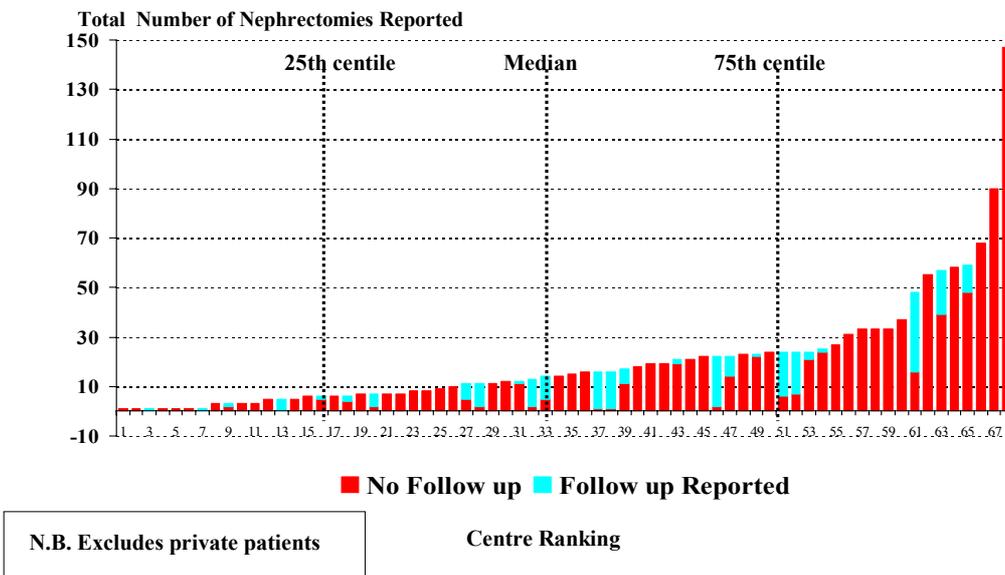


Chart 71

Nephrectomy - Current Status

Follow up recorded in 15.6% (219 / 1407) patients
Median time to Follow-up = 72 days; range 3 – 390 days

	N	% of total (219)
Alive with no evidence of renal cancer	196	89.5
Alive with local recurrence of renal cancer	1	0.5
Alive with lymph node involvement	0	
Alive with metastatic disease	13	5.9
Dead	4	1.8
Not recorded	5	2.3

Late complications were reported in 13/219 (6%) patients:

5 wound infection

1 wound hernia

1 renal

6 other

Chart 72

Nephrectomy - Current Status

Follow up recorded in 15.6% (219 / 1407) patients
Median time to Follow-up = 72 days; range 3 – 390 days

Time to follow up	N	% of total (219)	0 – 90 days		91-180 days		181 – 360 days		≥361 days	
			N	%	N	%	N	%	N	%
Alive with no evidence of renal cancer	196	89.5	106	87.6	45	88.2	44	95.7	1	100
Alive with local recurrence of renal cancer	1	0.5	0	-	0	-	1	2.2	0	-
Alive with lymph node involvement	0	-								
Alive with metastatic disease	13	5.9	10	8.3	2	3.9	1	2.2	0	-
Dead	4	1.8	2	1.7	2	3.9	0	0.0	0	-
Not recorded	5	2.3	3	2.5	2	3.9	0	0.0	0	-

D. Participating Hospital Centres

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

Alexandra Hospital Redditch	Ormskirk District General Hospital
Altnagelvin Area Hospital	Queen's Hospital Burton-on-Trent
Arrowe Park Hospital	Royal Bournemouth Hospital
Ayr Hospital	Royal Devon and Exeter Hospital
Barnet & Chase Farm Hospital	Royal Gwent Hospital
Bedford Hospital	Royal Hampshire County Hospital
Bradford Royal Infirmary	Royal Liverpool University Hospital
Broomfield Hospital	Royal Marsden Hospital
Castle Hill Hospital Hull	Royal Preston Hospital
Chesterfield & North Derbyshire Royal Hospital	Royal Surrey County Hospital
Christie Hospital	Royal West Sussex NHS Trust
Churchill Hospital	Salford Royal Hospital
Conquest Hospital	Salisbury District Hospital
Derby City General Hospital	Southampton General Hospital
Derriford Hospital	Southend Hospital
District General Hospital	Southern General Hospital Glasgow
Doncaster Royal Infirmary	Southmead Health Services Trust
Dorset County Hospital	St Mary's Hospital Portsmouth
Freeman Hospital	St Mary's Hospital Isle of Wight
Gartnavel General Hospital	Stirling Royal Infirmary
Glasgow Royal Infirmary	Stobhill Hospital Glasgow
Guy's Hospital	Stracathro Hospital Brechin
Hairmyres Hospital	Sunderland Royal Hospital
Harrogate District Hospital	The Ipswich Hospital
Hemel Hempstead General Hospital	Torbay Hospital
Hereford Hospitals NHS Trust	University Hospital of North Stafford
Hillingdon Hospital	University Hospital of Wales
Kettering General Hospital	Walsgrave Hospital
King George Hospital Essex	Whipps Cross Hospital
Leicester General Hospital	Whiston Hospital
Lister Hospital	Worcester Royal Infirmary
Monklands District General Hospital	Wrexham Maelor Hospital
New Cross Hospital Wolverhampton	
Noble's Isle of Man Hospital	
Nottingham City Hospital	