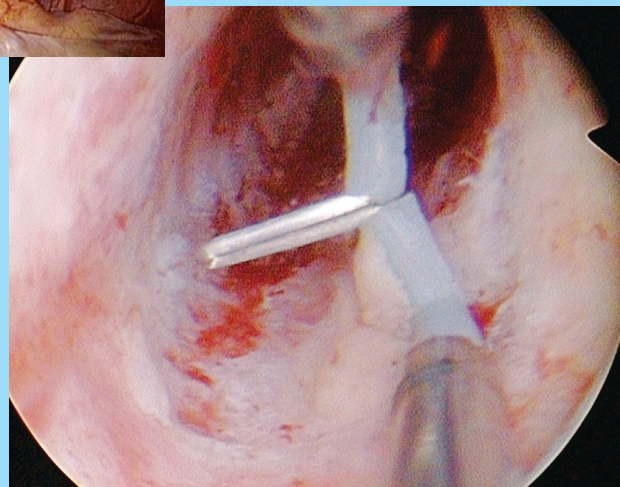
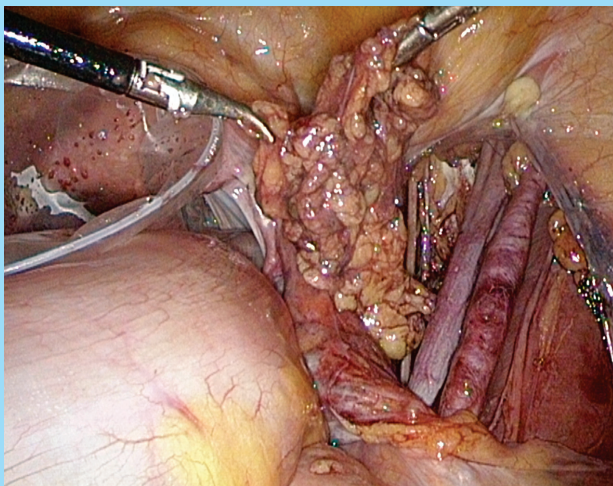


Gynaecological Endoscopic Surgery

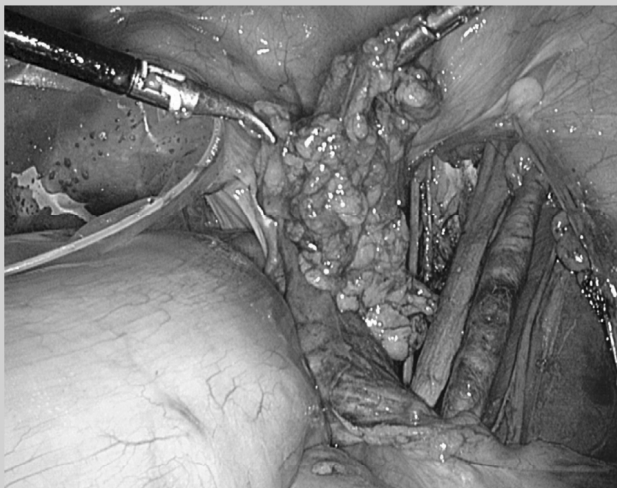
Territory Wide Audit 2007



The Hong Kong College of Obstetricians & Gynaecologists

Gynaecological Endoscopic Surgery

Territory Wide Audit 2007



The Hong Kong College of Obstetricians & Gynaecologists

MESSAGE FROM THE PRESIDENT

I would like to congratulate all members who had taken part in the territory wide audit on gynaecological endoscopy surgery. Without knowing how one is performing, we lost the overall direction on how to further develop and excel. The Audit has showed and confirmed the changing trend in surgical management of gynaecological diseases. With the increasing number of laparoscopic surgery especially in hysterectomy, it is time for us to rethink the training of our future generation.

I must thank Dr. PM Yuen and his team in producing this audit again for the College. I hope you will find reading this both informative and interesting.

Prof. Hextan Y.S. Ngan
President
Hong Kong College of Obstetricians and Gynaecologists

May 2011

AN OVERVIEW OF THE REPORT

Gynaecological endoscopic surgery was introduced in Hong Kong since late 1980s and early 1990s. In view of the rapid development and employment of these new surgical approaches, the Hong Kong College of Obstetricians and Gynaecologists conducted the first territory-wide audit on gynaecological endoscopic surgery in 1997. All hospitals providing in-patient gynaecological care in Hong Kong participated in that audit exercise. A simple audit form was designed for both laparoscopic and hysteroscopic surgery to capture information on the qualification of the surgeon and assistant, the operative diagnoses and procedures, the surgical time and complications. At that time, 18 hospitals provided data on laparoscopic surgery and 14 on hysteroscopic surgery.

In 2002, five years after the first audit, the College repeated the same audit with some modification of the data set in conjunction with the Hong Kong Gynaecological Endoscopy Society (HKGES). At that time, all gynaecological laparoscopy and hysteroscopy, including diagnostic procedures, were included to give a more comprehensive information on the practice and safety of gynaecological endoscopy in Hong Kong. A web-based database program was developed to allow online data entry and continuous audit in endoscopic surgery became possible. In that year, 22 hospitals provided data on laparoscopy and hysteroscopy.

In 2007, 10 years after the first audit, the College conducted the third audit exercise. Unlike 2002, level 1 procedures were excluded again to reduce the workload. The data set was further modified to allow a better assessment of the development and progress of gynaecological endoscopy, and a more comprehensive comparison of the operative morbidity of different commonly performed procedures. In the current exercise, 23 hospitals provided data on laparoscopic surgery and 22 on hysteroscopic surgery. Over this past 10 years, the number of operative laparoscopies increased by 2.5 fold from 2,200 in 1997 to 4,174 in 2002 and 5,576 in 2007, while that of operative hysteroscopy increased by 5 fold from 199 in 1997 to 1,076 in 2002 and remained at 1,029 in 2007.

Laparoscopic Surgery

As mentioned previously, the reduction in the number of procedures audited was because of the exclusion of the level 1 procedures. The number of level 2 and level 3 procedures were similar but the level 4 procedures almost doubled and the level 5 procedures increased by ten folds. We observed an increase in the complexity of the procedures performed over these 5 years period.

Similar to 1997 and 2002, operative laparoscopy was mainly performed for the removal of adnexal mass (about 50%). Whilst the number of procedures for the management of ectopic pregnancy was similar to the previous audit, the number of hysterectomy doubled and became the second most common procedure. Level 5 procedures were still uncommonly performed (2.8%). Laparoscopic procedures were more commonly done for malignancy and related conditions. The numbers of patients diagnosed to have carcinoma of corpus increased from 19 in 2002 to 106 in 2007. Similarly, the number of patients diagnosed to have endometrial hyperplasia increased from 5 to 90. The increase in the proportion of procedures with longer operating time reflected the change in complexity of the procedures.

Overall, 70% of the procedures were performed by specialists, 12.9% by doctors with MRCOG and 14.4% by pre-MRCOG doctors. Only 27% of the procedures were performed by surgeons not accredited by the College (53% in 2002), 24.2% were accredited with intermediate level and 48.3% advanced level. The percentages for the latter two were 26.6% and 20% respectively.

The change in the practice of primary trocar entry observed in the last audit seemed to have persisted. Although closed method was still the most common method used, its use continued to drop over the past 10 years from 83.9% in 1997 to 63.4% in 2002 and 55.8% in 2007. There was a dramatic increase in the use of open method in 2002 (from 0.4% in 2007 to 31.8% in 2002) but its use remained unchanged at 34.4% in 2007. Direct trocar entry, which was reported the first time in the current audit, emerged and was used in 8.2% while the use of visual-guided trocar continued to drop from 15% in 1997 to 5% in 2002 and 1.6% in 2007. Electrosurgery remained the most commonly used energy source. There was a significant increase in the use of sutures (16.3% in 2007 versus 0.6% in 2002) while the use of laser continued to drop.

Conversion was required in 1.9% of operative laparoscopies, similar to that in 2002 (1.8%). Surgical difficulty remained the main reason for conversion, of which dense adhesions accounted for over 50% of the cases. Major complication occurred in 1.9% and minor complication in 1.6%. Compared to 2002, major complication rate was almost doubled in 2007. This was probably related to the performance of more advanced and complex procedures as the complication rates were reduced in all except level 5 procedures. There was 1 death in 2007 and the overall mortality rate was 0.02% . The cause of death was necrotizing fasciitis.

Hysteroscopic Surgery

As diagnostic procedures were not audited in 2007, the number of procedures audited was much reduced compared with 2002. Over the past 10 years, the number of operative hysteroscopic procedures increased by 5 fold from 199 in 1997 to 1076 in 2002, however there was no further increase with the number remained at 1029 in 2007. While the number of level 2 procedures remained unchanged over the past 5 years, the number of level 3 procedures actually decreased by 30%. This was mainly due to the continuous decrease in the performance of endometrial ablation/resection.

Hysteroscopic polypectomy remained the most common procedure and accounted for over 60% of the procedures, compared to 60% in 2002 and 40% in 1997. Over 40% of the procedures were performed in 3 hospitals. Although there was an increase in the procedures being performed under anaesthesia, there was an increase in the use of non-electrical tools for the polyp removal (36.6% in 2007 versus 26.7% in 2002). While the incidence of resection of fibroid remained unchanged (~ 25%), that of endometrial ablation/resection reduced from 41.2% in 1997 to 18.3% in 2002 and 14.2% in 2007. Over 50% of the endometrial ablations/resections were performed in one single unit, the same unit also performed the most number of fibroid resections (17.6%).

As in 2002, glycine was the distending medium used in about 60-70%, compared to 90% in 1997. Normal saline remained the second most common distending medium and was used in 31.4%, similar to that in 2002 (36%). Endometrial preparation was carried out in only 15.6% (21% in 2002) of all operative hysteroscopies and 50% (45% in 2002) of those undergoing endometrial ablation/resection. Cervical priming was practiced much more commonly and carried out in 44.2%, compared to only 10% in 2002. About 80% of the procedures were performed under general anaesthesia and 13.3% under no anaesthesia. About 70% of the procedures were performed by specialists while only 13% were performed by doctors with MRCOG and 15% by pre-MRCOG doctors. The overall complication rate decreased over the past 10 years from 8.5% in 1997 to 2.8% in 2002 and 2.0% in 2007. Excessive fluid absorption decreased from 3.0% in 1997 and 1.3% in 2002 to 0.1% in 2007. Resection of fibroid was associated with the highest complication rate and its rate continued to decrease from 12.8% in 1997 to 6.4% in 2002 and 3.9% in 2007.

MEMBERSHIP OF CLINICAL AUDIT SUBCOMMITTEE

Year 2007 - 2009

Dr. YUEN, Pong Mo (Chairman)
Dr. LEUNG, Wing Cheong
Dr. NG, Pui Shan Doris
Dr. PUN, Ting Chung
Dr. SUM, Tak Keung
Dr. TO, Wing Kei William

Year 2010

Dr. YUEN, Pong Mo (Chairman)
Dr. FAN, Tak Chung
Dr. NG, Pui Shan Doris
Dr. PUN, Ting Chung
Dr. TO, Wing Kei William

Year 2011

Dr. YUEN, Pong Mo (Chairman)
Dr. FAN, Tak Chung
Dr. NG, Pui Shan Doris
Dr. LAW, Lai Wah
Dr. PUN, Ting Chung
Dr. TO, Wing Kei William

HOSPITAL COORDINATORS

Hospital	Co-ordinator
Alice Ho Miu Ling Nethersole Hospital	Dr. NG, Pui Shan
Canossa Hospital	Dr. LEE, Tat Choi Eric
Caritas Medical Centre	Dr. CHOW, Kam Ming
Evangel Hospital	Dr. KWOK, Chi Yeung Peter
Hong Kong Adventist Hospital	Dr. CHAN, Yik Ming
Hong Kong Central Hospital	Dr. LEE, Kai Cheung Stephen
Hong Kong Baptist Hospital	Dr. LI, Chiu Fai
Hong Kong Sanatorium & Hospital Ltd	Dr. CHAN, Woon Tong Joseph
Kwong Wah Hospital	Dr. LAM, Siu Keung
Matilda Hospital	Dr. SCHRADER, Hans
North District Hospital	Dr. NG, Pui Shan
Our Lady of Maryknoll Hospital	Dr. LAM, Siu Keung
Pamela Youde Nethersole Eastern Hospital	Dr. LAU, Nga Ting Winnie
Prince of Wales Hospital	Dr. NG, Pui Shan
Princess Margaret Hospital	Dr. CHOW, Kam Ming
Queen Elizabeth Hospital	Dr. CHAN, Chung Sum
Queen Mary Hospital	Dr. PUN, Ting Chung
St Paul's Hospital	Dr. CHAN, Kuen Ting
St Teresa's Hospital	Dr. LAU, Woon Chung
Tseung Kwan O Hospital	Dr. TSANG, Sing Wing
Tsuen Wan Adventist Hospital	Ms. FUNG, Lo Ping
Tuen Mun Hospital	Dr. PANG, Chung Pui
Union Hospital	Dr. SIN, Sai Yuen
United Christian Hospital	Dr. FUNG, Suk Yee

PARTICIPATING HOSPITALS IN LAPAROSCOPIC SURGERY AUDIT

Participating hospitals	No. Returned	No. Audited	Percentage audited
Canossa Hospital	355	345	(6.8%)
Caritas Medical Centre	55	55	(1.1%)
Evangel Hospital	72	71	(1.4%)
Hong Kong Adventist Hospital	8	8	(0.2%)
Hong Kong Baptist Hospital	253	253	(5.0%)
Hong Kong Central Hospital	12	10	(0.2%)
Hong Kong Sanatorium & Hospital	552	536	(10.6%)
Kwong Wah Hospital	223	208	(4.1%)
Matilda International Hospital	24	22	(0.4%)
North District Hospital	342	290	(5.7%)
Pamela Youde Nethersole Eastern Hospital	233	198	(3.9%)
Prince of Wales Hospital	684	1	(0.02%)
Princess Margaret Hospital	269	603	(11.9%)
Queen Elizabeth Hospital	387	205	(4.0%)
Queen Mary Hospital	519	322	(6.3%)
St Paul's Hospital	507	459	(9.0%)
St Teresa's Hospital	237	505	(9.9%)
Tseung Kwan O Hospital	52	232	(4.6%)
Tsuen Wan Adventist Hospital	10	43	(0.8%)
Tuen Mun Hospital	224	10	(0.2%)
Union Hospital	196	209	(4.1%)
United Christian Hospital	362	179	(3.5%)
Total	5576	5077	

PARTICIPATING HOSPITALS IN HYSTEROSCOPIC SURGERY AUDIT

Participating hospitals	No. Returned	No. Audited	Percentage Audited
Canossa Hospital	230	98	(9.5%)
Caritas Medical Centre	8	8	(0.8%)
Hong Kong Adventist Hospital	1	1	(0.1%)
Hong Kong Baptist Hospital	4	11	(1.1%)
Hong Kong Sanatorium & Hospital	18	59	(5.7%)
Kwong Wah Hospital	90	22	(2.1%)
Matilda International Hospital	22	3	(0.3%)
North District Hospital	10	176	(17.1%)
Pamela Youde Nethersole Eastern Hospital	190	57	(5.5%)
Pok Oi Hospital	63	21	(2.0%)
Prince of Wales Hospital	21	50	(4.9%)
Princess Margaret Hospital	55	26	(2.5%)
Queen Elizabeth Hospital	26	10	(1.0%)
Queen Mary Hospital	10	62	(6.0%)
St Paul's Hospital	62	56	(5.4%)
St Teresa's Hospital	106	45	(4.4%)
Tseung Kwan O Hospital	69	54	(5.2%)
Tuen Mun Hospital	54	140	(13.6%)
Union Hospital	301	63	(6.1%)
United Christian Hospital	84	67	(6.5%)
Total	1612	1029	

Contents

Message from The President	i
An Overview of The Report	iii
Membership of Clinical Audit Subcommittee	vi
Hospital Coordinators	vii
Participating Hospitals in Laparoscopic Surgery Audit	viii
Participating Hospitals in Hysteroscopic Surgery Audit	ix
1 Laparoscopic Surgery - Overall Data	3
Background Information on Laparoscopic Surgery Data	3
Case Distribution by Individual Hospitals	4
Age Distribution of Patients	4
Qualifications of Surgeon and Assistant	5
Level of Procedures	6
Type of Procedures	7
Operative Diagnosis	9
Detailed Breakdown of Individual Diagnosis	9
Operative Techniques	12
Operative Procedures	14
Operating Time	17
Post-operative Hospital Stay	18
Complications	20
Conversion	22
Re-admission	23
Re-operation	24
2 Laparoscopic Surgery - Level 2 Procedures	25
Case Distribution by Individual Hospitals	25
Age Distribution of Patients	25
Qualifications of Surgeon and Assistant	26
Operative Diagnosis	27
Operative Techniques	27
Operative Procedures	29
Operating Time	30
Post-operative Hospital Stay	31
Conversion	31
Complications	32
Re-operation	32
Re-admission	32
Comparison Between Elective and Emergency Operations	33
3 Laparoscopic Surgery - Level 3 Procedures	34
Case Distribution by Individual Hospitals	34
Age Distribution of Patients	34
Qualifications of Surgeon and Assistant	35
Operative Diagnosis	36
Operative Techniques	36
Operative Procedures	38

	Operating Time	39
	Post-operative Hospital Stay	40
	Conversion	41
	Complications	41
	Re-operation	42
	Re-admission	42
	Comparison Between Elective and Emergency Operations	43
4	Laparoscopic Surgery – Level 4 Procedures	44
	Case Distribution by Individual Hospitals	44
	Age Distribution of Patients	44
	Qualifications of Surgeon and Assistant	45
	Operative Diagnosis	46
	Operative Techniques	46
	Operative Procedures	48
	Operating Time	49
	Post-operative Hospital Stay	50
	Complications	51
	Conversion	51
	Re-operation	52
	Re-admission	52
	Comparison Between Elective and Emergency Operations	53
5	Laparoscopic Surgery - Level 5 Procedures	54
	Case Distribution by Individual Hospitals	54
	Age Distribution of Patients	54
	Qualifications of Surgeon and Assistant	55
	Operative Diagnosis	56
	Operative Techniques	56
	Operative Procedures	58
	Operating Time	59
	Post-operative Hospital Stay	60
	Complications	61
	Conversion	62
	Re-operation	62
	Re-admission	62
6	Laparoscopic Hysterectomy	63
	Case Distribution by Individual Hospitals	63
	Age Distribution of Patients	64
	Qualifications of Surgeon and Assistant	64
	Operative Diagnosis	65
	Operative Techniques	66
	Types of Hysterectomy	68
	Concurrent Operation	69
	Operating Time	70
	Post-operative Hospital Stay	71
	Conversion	72
	Complications	72
	Re-operation	73

	Re-admission	73
	Comparison Between Total and Subtotal Hysterectomy	74
	Operative Outcome For Fibroids and Adenomyosis	74
7	Laparoscopic Myomectomy	77
	Case Distribution by Individual Hospitals	77
	Age Distribution of Patients	78
	Qualifications of Surgeon and Assistant	78
	Operative Diagnosis	79
	Concurrent Pathology	81
	Operative Techniques	81
	Concurrent Operation	83
	Operating Time	84
	Post-operative Hospital Stay	85
	Conversion	86
	Complications	86
	Re-operation and Re-Admission	86
	Operative Outcome By Uterine and Fibroid Size	87
8	Laparoscopic Management of Ectopic Pregnancy	89
	Case Distribution by Individual Hospitals	89
	Age Distribution of Patients	90
	Qualifications of Surgeon and Assistant	91
	Operative Techniques	92
	Types of Ectopic Pregnancy	94
	Operative Procedures	95
	Concurrent Operative Procedures	95
	Comparison Between Salpingectomy and Salpingostomy	95
	Operating Time	96
	Post-operative Hospital Stay	97
	Conversion	98
	Complications	98
	Re-admission	99
	Re-operation	99
9	Laparoscopic Management of Adnexal Masses	100
	Case Distribution by Individual Hospitals	100
	Age Distribution of Patients	101
	Qualifications of Surgeon and Assistant	102
	Types of Adnexal Masses	103
	Level of Procedures	104
	Operative Techniques	104
	Operative Procedures	106
	Concurrent Operative Procedures	106
	Pathology in Those Cases Labelled as Diagnostic Procedure	107
	Risk of Cyst Rupture During Operation	107
	Frozen Section	109
	Operating Time	109
	Post-operative Hospital Stay	111

Conversion	112
Complications	113
Re-admission	114
Re-operation	114
10 Laparoscopic Management of Genital Malignancy	115
Case Distribution by Individual Hospitals	115
Age Distribution of Patients	116
Qualifications of Surgeon and Assistant	116
Operative Diagnosis	117
Operative Techniques	118
Operative Procedures	120
Operating Time	121
Post-operative Hospital Stay	122
Conversion	123
Complications	123
Re-operation	123
Re-admission	124
Comparison Between Simple and Radical Hysterectomy	124
Carcinoma of Corpus	125
Carcinoma of Cervix	127
Carcinoma of Ovary	128
11 Hysteroscopic Surgery Overall Data	131
Background Information on Hysteroscopic Surgery Data	131
Case Distribution by Individual Hospitals	132
Age Distribution of Patients	132
Operative Diagnosis	133
Qualifications of Surgeon and Assistant	133
Operative Techniques	134
Operative Procedures	136
Operating Time	137
Post-operative Hospital Stay	138
Complications	139
12 Hysteroscopic Surgery – Level 2 Procedures	140
Case Distribution by Individual Hospitals	140
Age Distribution of Patients	140
Operative Diagnosis	141
Qualifications of Surgeon and Assistant	141
Operative Techniques	142
Operative Procedures	143
Operating Time	144
Post-operative Hospital Stay	145
Complications	146
13 Hysteroscopic Surgery – Level 3 Procedures	147
Case Distribution by Individual Hospitals	147
Age Distribution of Patients	147

Operative Diagnosis	148
Qualifications of Surgeon and Assistant	148
Operative Techniques	149
Operative Procedures	150
Operating Time	151
Post-operative Hospital Stay	152
Complications	153
14 Endometrial Ablation / Resection	154
Case Distribution by Individual Hospitals	154
Age Distribution of Patients	154
Operative Diagnosis	155
Qualifications of Surgeon and Assistant	155
Operative Techniques	156
Operative Procedures	158
Operating Time	159
Post-operative Hospital Stay	160
Complications	161
15 Hysteroscopic Resection of Fibroid	162
Case Distribution by Individual Hospitals	162
Age Distribution of Patients	162
Operative Diagnoses	163
Qualifications of Surgeon and Assistant	163
Operative Techniques	164
Operative Procedures	165
Operating Time	166
Post-operative Hospital Stay	167
Complications	168
16 Hysteroscopic Resection of Endometrial Polyp	169
Case Distribution by Individual Hospitals	169
Age Distribution of Patients	169
Operative Diagnoses	170
Qualifications of Surgeon and Assistant	170
Operative Techniques	171
Operative Procedures	172
Operating Time	172
Post-operative Hospital Stay	173
Complications	174
Appendix I Guidelines for Training in Gynaecological Endoscopic Surgery	175
Appendix IIA HKCOG Laparoscopic Surgery Data Form 2007	177
Appendix IIB HKCOG Hysteroscopic Surgery Data Form 2007	179

Laparoscopic Surgery

Territory Wide Audit 2007



1

LAPAROSCOPIC SURGERY - OVERALL DATA

BACKGROUND INFORMATION ON LAPAROSCOPIC SURGERY DATA

A total of 24 hospitals agreed to participate in the audit exercise and 22 returned the audit forms on laparoscopic surgery in year 2007.

Unlike 2002 but same as in 1997, all except Level 1 laparoscopic procedures were included in this audit exercise. The total number of cases reported in 2007 were 5,576, of which 499 (8.9%) were reported as Level 1 and 18 were not stated (0.3%). Excluding those Level 1 procedures, the number of cases included for analysis was 5,077.

Compared to previous audits, the total number of operative laparoscopy increased from 2,200 in 1997 to 4,174 in 2002 to 5,077 in 2007. As most of the units did not provide the total number of cases undergoing laparoscopic surgery in their units, the percentage of cases audited in 2007 was unknown.

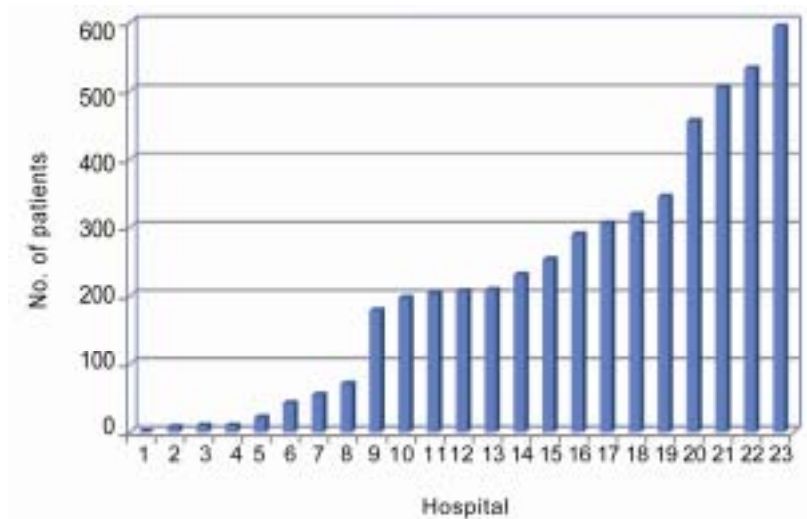
Total number of patients

5,077

Compared to previous audits, the number of operative laparoscopic procedures increased from 2,200 in 1997 to 4,174 in 2002 and plateau at 5,077 in 2007.

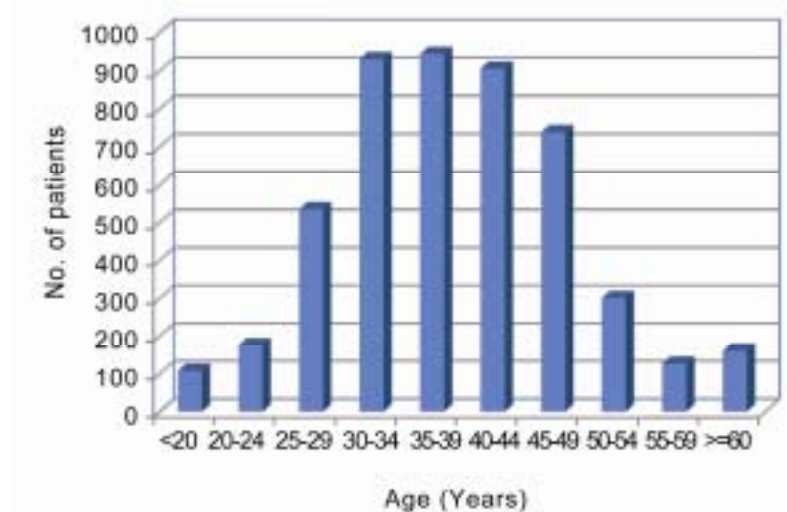
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Most of the units performed 200 to 400 cases a year with 3 performed over 500 cases a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 38.9 (SD 10.2), compared to 36.3 (SD 8.6) in 2002 and 35.4 (SD 9.1) in 1997. The age distribution was similar to that in 2002 and 1997 except that more patients aged 45 or above 50.



Number of missing data: 150 (3.0%)

Distribution of age

	1997	2002	2007
< 20 years	51 (2.3%)	81 (1.4%)	108 (2.2%)
20 - 24 years	151 (6.9%)	307 (5.2%)	175 (3.6%)
25-29 years	330 (15.1%)	709 (12.0%)	535 (10.9%)
30 – 34 years	537 (24.5%)	1456 (24.6%)	931 (18.9%)
35 – 39 years	517 (23.6%)	1578 (26.7%)	944 (19.2%)
40 – 44 years	336 (15.3%)	987 (16.7%)	906 (18.4%)
45 – 49 years	162 (7.4%)	464 (7.8%)	739 (15.0%)
≥ 50 years	108 (4.9%)	333 (5.6%)	589 (12.0%)
Total	2192	5915	4927

Number of missing data: 8 (0.4%) in 1997, 150 (2.5%) in 2002 and 150 (3.0%) in 2007

Data in 2002 included cases with level 1 procedures as well

QUALIFICATIONS OF SURGEON AND ASSISTANT

Over 70% of the operations were performed by specialists, compared to about 60% in 2002 and 1997. The operations were performed by doctors with MRCOG in 12.9% (25% in 2002 and 30% in 1997). Pre-MRCOG doctors performed 14.4% (17% in 2002 and 5% in 1997) of the procedures, of which 82.8% (70% in 2002) were assisted by specialists. The operation was assisted by specialists in 37.7% (48.8% in 2002 and 33.6% in 1997) and by nurses in 33.4% (21.4% in 2002 and 22.2% in 1997) of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	Specialist	Nurse	
MBBS	48	64	549	2	663
MRCOG	236	14	327	18	595
Specialist	780	192	862	1520	3354
Total	1064	270	1738	1540	4612

Number of missing data: 465 (9.2%)

Only 27% (53% in 2002) of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 24.9% (18.5% in 2002) were assisted by doctors without accreditation and 8.6% (25.0% in 2002) were assisted by nurses. Similar to 2002, the procedures were performed by doctors with intermediate accreditation in 24.2% (26.6% in 2002), almost half of which were assisted by doctors without accreditation. For those procedures performed by doctors with advanced accreditation, 20.2% (27.4% in 2002) were assisted by doctors without accreditation and 57.4% (40.0% in 2002) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	296	441	350	102	1189
Intermediate	525	194	262	72	1053
Advanced	423	185	283	1203	2094
Total	1244	820	895	1377	4336

Number of missing data: 741 (14.6%)

LEVEL OF PROCEDURES

The level of procedures was defined according to the Guidelines on Laparoscopic Surgery of the HKCOG (see Appendix I). There was one change in the classification. In 2007, laparoscopic hysterectomy performed for uterine prolapse was considered as Level 3 procedure rather than Level 4 procedure.

The proportion of level 2 procedures remained around 16-19%, while that of level 3 procedures decreased to 44.3% (63.5% in 1997 and 57.5% in 2002). The number of advanced procedures increased dramatically in 2007 with Level 4 procedures increased to 36.9% (19.1% in 1997 and 23.5% in 2002) and Level 5 procedures increased to 2.6% (0.3% in 1997 & 2002).

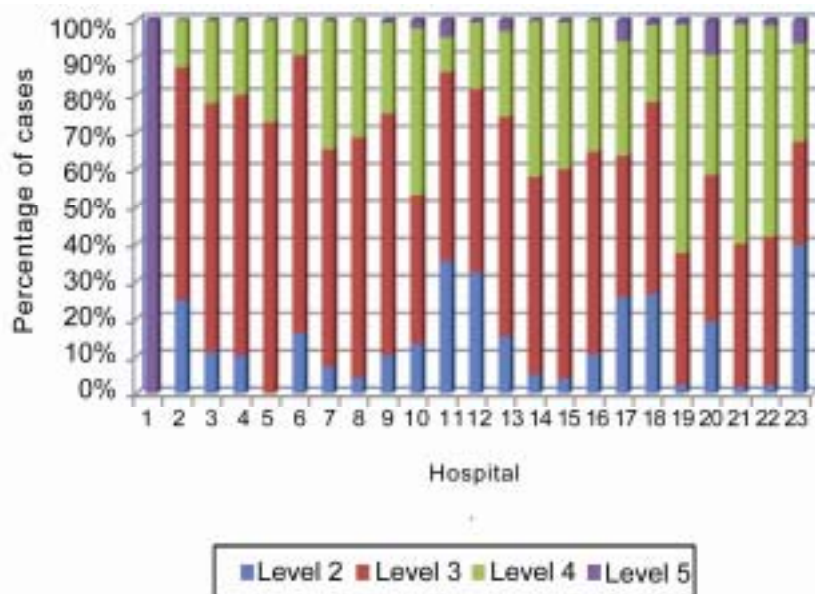
	1997	2002	2007
Level 2	374 (17.1%)	779 (18.7%)	804 (16.0%)
Level 3	1385 (63.5%)	2399 (57.5%)	2230 (44.3%)
Level 4	417 (19.1%)	982 (23.5%)	1857 (36.9%)
Level 5	6 (0.3%)	14 (0.3%)	139 (2.8%)
Total	2182	4174	5030

Number of missing data: 18 (0.8%) in 1997, 257 out of 5808 (4.2%) in 2002 and 18 (0.3%) in 2007

Distribution of level of procedures in each hospital

Hospital	Level 2	Level 3	Level 4	Level 5	Total
1	12	211	299	8	530
2	9	193	296	5	503
3	237	164	157	36	594
4	88	178	147	42	455
5	8	120	208	4	340
6	85	164	66	4	319
7	31	157	102	0	290
8	79	116	94	17	306
9	10	142	100	1	253
10	12	122	97	0	231
11	32	123	48	6	209
12	67	102	37	1	207
13	72	103	19	9	203
14	26	78	88	4	196
15	18	114	43	1	176
16	3	45	22	0	70
17	4	32	19	0	55
18	7	32	4	0	43
19	0	16	6	0	22
20	1	7	2	0	10
21	1	6	2	0	9
22	2	5	1	0	8
23	0	0	0	1	1
Total	804	2230	1857	139	5030

Number of missing data: 18 (0.3%)



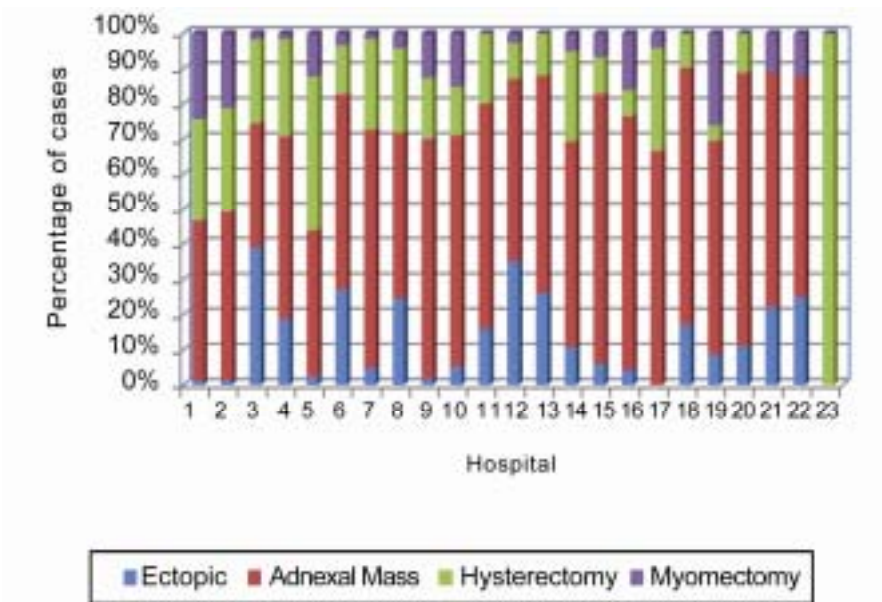
TYPE OF PROCEDURES

Removal of adnexal mass remained the most common laparoscopic procedure and was performed in 48.3% of the cases, which was lower than that in previous audits (56.3% in 2002 and 53.6% in 1997). Hysterectomy outweighed management of ectopic pregnancy and became the second most common procedure. It accounted for 20.9%, which was higher than that in previous audits (11.1% in 2002 and 9.5% in 1997). Laparoscopic management of ectopic pregnancy became the third most common procedure and accounted for 12.2% which was lower than that in previous audits (14.5% in 2002 and 18.5% in 1997).

	1997	2002	2007
Surgery for adnexal mass	1193	2485	2442
Hysterectomy	209	492	1057
Surgery for ectopic pregnancy	406	643	619
Myomectomy	86	193	422
Miscellaneous	331	595	515
Total	2225	4408	5055

Distribution of types of procedure in each hospital

Hospital	Ectopic pregnancy	Adnexal Mass	Hysterectomy	Myomectomy
1	7	232	148	124
2	7	245	151	108
3	167	152	102	7
4	68	189	100	6
5	8	136	143	40
6	80	164	41	10
7	13	179	68	4
8	64	123	62	11
9	5	173	44	32
10	12	148	31	34
11	31	125	39	0
12	65	96	19	5
13	46	109	21	0
14	19	103	45	9
15	10	125	17	11
16	3	49	5	11
17	0	32	14	2
18	7	30	4	0
19	2	14	1	6
20	1	7	1	0
21	2	6	0	1
22	2	5	0	1
23	0	0	1	0
Total	619	2442	1057	422



OPERATIVE DIAGNOSIS

Primary indication for the surgery was not specified in the audit. The diagnosis reflected the types of pathology encountered during the operation, but it might not be the indications for surgery. Some patients could have more than one diagnosis under the same or different categories. *Data in 2002 included cases with level 1 procedures (513 diagnostic laparoscopy, 1121 laparoscopic tubal sterilisation), while data in 2007 and 1997 excluded those cases.*

The distribution and ranking of the pathologies encountered was similar to that in previous audits, except that the incidence of disease of the uterus, disease of the cervix and genital displacement/urinary disorder increased. Though compared to 2002, the incidence of pregnancy related problems seemed to have decreased, the difference was mainly due to the inclusion of level 1 procedures in that year.

	1997	2002	2007
Disease of the uterus	310 (8.8%)	812 (10.0%)	1612 (22.5%)
Disease of the cervix	23 (0.7%)	9 (0.1%)	111 (1.5%)
Disease of the Fallopian tubes	138 (3.9%)	309 (3.8%)	419 (5.8%)
Disease of the ovaries	1260 (35.6%)	2583 (31.7%)	2629 (36.7%)
Disease of the pelvic peritoneum	1321 (37.3%)	2608 (32.0%)	1483 (20.7%)
Genital displacement/urinary dis.	23 (0.7%)	26 (0.3%)	80 (1.1%)
Menstrual disorders	21 (0.6%)	26 (0.3%)	49 (0.7%)
Pregnancy related problems	442 (12.5%)	1779 (21.8%)	786 (11.0%)
Total	3538	8152	7169

Data in 2002 included cases with level 1 procedures as well

DETAILED BREAKDOWN OF INDIVIDUAL DIAGNOSIS

Disease of the uterus

This became the third most common category and constituted 22.5% of all diagnoses, compared to 10% in 2002 and 8.7% in 1997. Fibromyoma remained the most common diagnosis and accounted for over 70% of the cases, which was lower than that in 2002 and 1997. Adenomyosis was the second most common diagnosis with the incidence increased from 7.1% in 1997 and 13.7% in 2002 to 15.0% in 2007. The number of carcinoma of corpus and endometrial hyperplasia increased significantly, and accounted for 6.6% (2.3% in 2002 and 1.9% in 1997) and 5.6% (0.6% in 2002 and 1.9% in 1997) and of cases respectively.

	1997	2002	2007
Fibromyoma	259 (83.5%)	672 (82.8%)	1147 (71.2%)
Adenomyosis	22 (7.1%)	111 (13.7%)	242 (15.0%)
Carcinoma of corpus	6 (1.9%)	19 (2.3%)	106 (6.6%)
Endometrial hyperplasia	6 (1.9%)	5 (0.6%)	90 (5.6%)
Endometrial polyps	8 (2.6%)	0 (0.0%)	14 (0.9%)
Sarcoma	0 (0.0%)	0 (0.0%)	5 (0.3%)
Trauma	5 (1.6%)	3 (0.4%)	2 (0.1%)
Miscellaneous	4 (1.3%)	2 (0.2%)	6 (0.4%)
Total	310	812	1612

Data in 2002 included cases with level 1 procedures as well

Disease of the cervix

The incidence in 2007 was 1.5% which was much higher than the 0.1% in 2002 and half of than in (0.7%) in 1997. Cervical intraepithelial neoplasia was still the most common diagnosis in this category and accounted for 54.1%, compared to 66.7% in 2002 and 65.2% in 1997. Carcinoma of cervix became the second most common diagnosis in this category.

	1997	2002	2007
Cervical intraepithelial neoplasia	15 (65.2%)	6 (66.7%)	60 (54.1%)
Carcinoma of cervix	3 (13.0%)	3 (33.3%)	40 (36.0%)
Micro-invasive carcinoma of cervix	5 (21.7%)	0 (0.0%)	6 (5.4%)
Adenocarcinoma in-situ	0 (0.0%)	0 (0.0%)	5 (4.5%)
Total	23	9	111

Data in 2002 included cases with level I procedures as well

Disease of the ovaries

This became the most common category (second in previous audits) and constituted 36.7% of all the diagnoses, compared to 31.7% in 2002 and 35.5% in 1997. Over 99% of the diseases were benign in nature. Ovarian malignancy occurred in 0.7%, compared to 0.1% in 2002 and 0.2% in 1997. There was also an increased in borderline ovarian tumour being managed laparoscopically (0.5% compared to 0% in 2002 and 1997).

	1997	2002	2007
Endometriotic cysts	585 (46.4%)	1126 (43.6%)	1299 (49.4%)
Benign tumours/cysts	492 (39.0%)	1116 (43.2%)	830 (31.6%)
Dermoid cysts	158 (12.5%)	315 (12.2%)	437 (16.6%)
Polycystic ovarian diseases	14 (1.1%)	22 (0.9%)	20 (0.8%)
Carcinoma of ovary	2 (0.2%)	2 (0.1%)	13 (0.5%)
Borderline tumour	0 (0.0%)	0 (0.0%)	13 (0.5%)
Bleeding corpus luteum	8 (0.6%)	2 (0.1%)	12 (0.5%)
Ovarian malignancy	0 (0.0%)	0 (0.0%)	5 (0.2%)
Mosaic Turners	1 (0.1%)	0 (0.0%)	0 (0.0%)
Total	1260	2583	2629

Data in 2002 included cases with level I procedures as well

Disease of the Fallopian tubes

This constituted 5.8% of all diagnoses, compared to 3.8% in 2002 and 3.9% in 1997. Hydrosalpinx remained the most common diagnosis in this category.

	1997	2002	2007
Hydrosalpinx	93 (67.4%)	238 (77.0%)	247 (58.9%)
Fimbrial cysts	21 (15.2%)	0 (0.0%)	66 (15.8%)
Tubo-ovarian abscess	13 (9.4%)	36 (11.7%)	50 (11.9%)
Pyosalpinx	7 (5.1%)	29 (9.4%)	34 (8.1%)
Acute pelvic infection	0 (0.0%)	3 (1.0%)	7 (1.7%)
Chronic pelvic infection	0 (0.0%)	1 (0.3%)	6 (1.4%)
Miscellaneous	4 (2.9%)	2 (0.6%)	9 (2.1%)
Total	138	309	419

Data in 2002 included cases with level 1 procedures as well

Disease of the pelvic peritoneum

This became the second most common category (first in previous audits) and constituted 20.7% of all diagnoses, compared to 32.0% in 2002 and 37.2% in 1997. Pelvic adhesions and endometriosis remained the two most common diagnoses in this category.

	1997	2002	2007
Endometriosis	534 (40.4%)	991 (38.0%)	774 (52.2%)
Adhesions	738 (55.9%)	1469 (56.3%)	565 (38.1%)
Paraovarian cysts	45 (3.4%)	143 (5.5%)	135 (9.1%)
Miscellaneous	4 (0.3%)	5 (0.2%)	9 (06)
Total	1321	2608	1483

Data in 2002 included cases with level 1 procedures as well

Genital displacement/urinary disorders

The incidence increased to 1.1% in 2007, compared to 0.3% in 2002 and 0.6% in 1997. The incidence of genital prolapse increased back to almost 70% as in 1997 while that of genuine stress incontinence decreased down to the 20 % in 1997.

	1997	2002	2007
Genital prolapse	17 (73.9%)	4 (15.4%)	55 (68.7%)
Genuine stress incontinence	5 (21.7%)	22 (84.6%)	15 (18.8%)
Vault prolapse	1 (4.3%)	0 (0.0%)	10 (12.5%)
Total	23	26	80

Data in 2002 included cases with level 1 procedures as well

Menstrual disorders

This constituted only 0.7% (0.3% in 2002 and 0.6% in 1997) of all diagnoses.

	1997	2002	2007
Dysfunctional uterine bleeding	16 (76.2%)	21 (80.8%)	22 (44.9%)
Post-menopausal bleeding	5 (23.8%)	5 (19.2%)	27 (45.1%)
Total	21	26	49

Data in 2002 included cases with level 1 procedures as well

Pregnancy related problems

This became the fourth most common category (third in 2002 and 1997) and accounted for 11.0%, compared to 21.8% in 2002 and 12.5% in 1997. Ectopic pregnancy remained the most common diagnosis in this category and accounted for almost 80% of the diagnoses. The high number of the diagnosis "condition leading to sterilisation" in 2002 was related to the inclusion of level 1 procedures in that year.

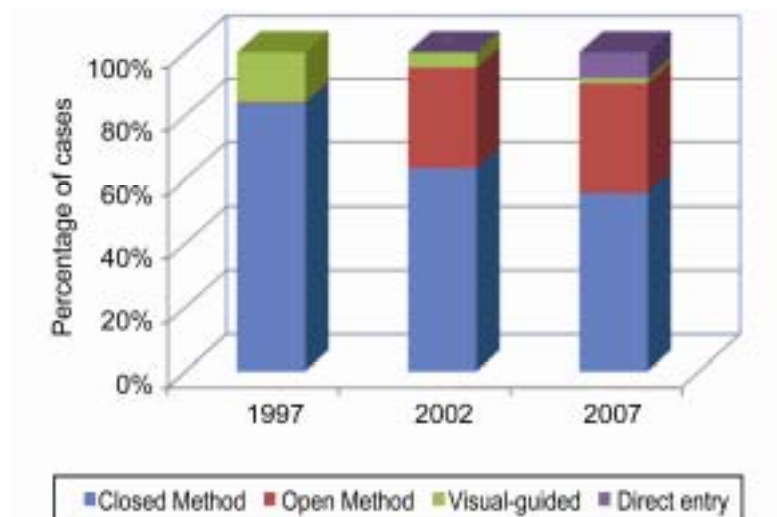
	1997	2002	2007
Ectopic pregnancy	422 (95.5%)	634 (34.8%)	619 (78.8%)
Infertility	11 (2.5%)	24 (1.3%)	13 (1.7%)
Condition leading to sterilisation	4 (0.9%)	1164 (63.9%)	149 (19.0%)
Failed sterilization	3 (0.7%)	0 (0.0%)	4 (0.5%)
Persistent ectopic pregnancy	2 (0.5%)	0 (0.0%)	0 (0.0%)
Gestational trophoblastic disease	0 (0.0%)	0 (0.0%)	1 (0.1%)
Total	442	1822	786

Data in 2002 included cases with level 1 procedures as well

OPERATIVE TECHNIQUES

Primary trocar entry technique

Although closed method remained the most common technique for primary trocar entry, its incidence reduced from 83.9% in 1997 to 63.4% in 2002 and 55.8% in 2007. There was a substantial increase in the use of the open method from 0.4% in 1997 to 31.8% in 2002 and plateaued off at 34.4% in 2007. The use of visually guided trocar dropped significantly from 15.7% in 1997 to 4.8% in 2002 and 1.6% in 2007. Direct trocar entry was not reported in previous audits but was used in 8.2% in 2007, over 90% were from a single unit. In that unit, direct trocar was used in 82.0%, closed technique in 15.6%, open technique in 2.0% and visual guided in 0.4%



Number of missing data: 84 (1.7%)

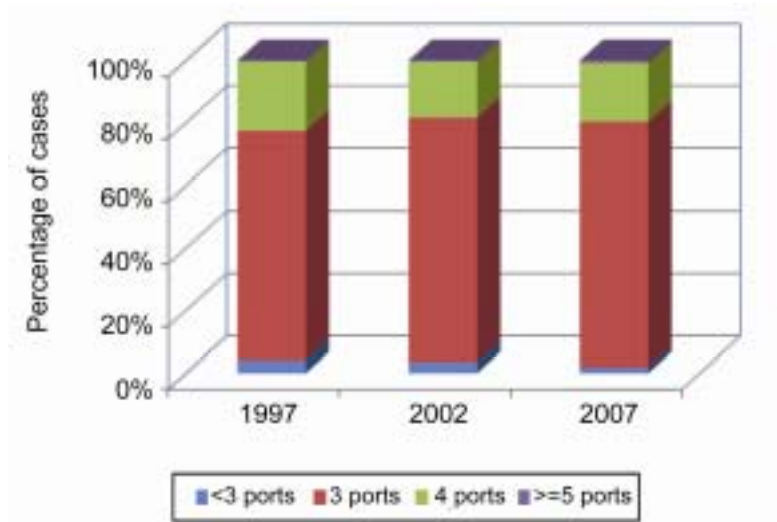
The primary trocar was inserted through the umbilical incision in 96.9% of cases. The supraumbilical and left upper quadrant was used for primary trocar insertion in 2.4% and 0.7% respectively. These data were not captured in 1997.

	2002	2007
Umbilical	4049 (97.9%)	4668 (96.9%)
Supraumbilical	49 (1.2%)	115 (2.4%)
Left upper quadrant	36 (0.9%)	33 (0.7%)
Total	4134	4816

Number of missing data: 297 (6.7%) in 2002 and 261 (5.1%) in 2007 respectively

Number of ports used

Majority of the procedures were performed using 3 ports and the rate remained about 80% over the past 10 years. The use of 4 or more ports decreased from 22.6% in 1997 to 18.3% in 2002 and 19.7% in 2007.



Number of missing data: 163 (3.2%)

Surgical modalities

Electrocautery was the most common energy source used and the overall rate was 91.3% in 2007 which was similar to that in 1997 and 2002. Bipolar energy alone was used in 2372 (51.1%), monopolar alone in 328 (7.1%) and both in 1937(41.8%). Ligature and Plasmakinetic were used in 3.3% and 4.6% respectively in 2007. These data were not captured in previous audits. Ultracision, which was not reported in 1997, was used in 3.8% in 2002 and 5.0% in 2007. There was a significant increase in the use of sutures from 3.4% in 1997 and 0.6% in 2002 to 16.3 in 2007. The use of laser continued to drop from 3.8% in 1997 and 1.6% in 2002 to only 0.2% in 2007.

	1997	2002	2007
Electrocautery	2018 (91.7%)	3748 (89.8%)	4637 (91.3%)
Ligature	-	-	167 (3.3%)
Plasmakinetic	-	-	234 (4.6%)
Ultracision	0 (0.0%)	157 (3.8%)	253 (5.0%)
Suture	74 (3.4%)	24 (0.6%)	827 (16.3%)
Endoloop	133 (6.0%)	339 (8.1%)	39 (0.8%)
Laser	83 (3.8%)	65 (1.6%)	11 (0.2%)
Clips/Staples	36 (1.6%)	17 (0.4%)	23 (0.5%)
Use of drain	149 (6.8%)	398 (9.5%)	504 (9.9%)

*Number of missing data: 116 (5.3%) in 1997, 333 (8.0%) in 2002 and 259 (5.1%) in 2009 respectively
Data are presented as number and percentage of total number of patients*

OPERATIVE PROCEDURES

The operative procedures were categorized into ovarian, tubal, uterine and other pelvic surgery. Some patients could have more than one operative procedure performed. The top 5 most common operative procedures remained unchanged, however their ranking changed. Cystectomy remained the most common procedure but the incidence was decreased 44.1% in 1997 and 46.8% in 2002 to 38.9% in 2007. Hysterectomy became the second most common procedure and its incidence increased from 9.5% in 1997 and 11.8% in 2002 to 20.8% in 2007. Salpingo-oophorectomy (16.5%) was the third most common procedure, probably related to the increase in the number of hysterectomies. Salpingectomy (13.3%) was the 4th followed by adhesiolysis (11.3%).

Ovarian surgery

Cystectomy was the most common procedure in this category, followed by salpingo-oophorectomy. The incidence of ovarian drilling increased from 0.5% in 1997 to 1.3% 2002 and decreased to 0.7% in 2007.

	1997	2002	2007
Cystectomy	970 (44.1%)	1952 (46.8%)	1976 (38.9%)
Salpingo-oophorectomy	252 (11.5%)	548 (13.1%)	839 (16.5%)
Oophorectomy	41 (1.9%)	94 (2.3%)	77 (1.5%)
Ovarian drilling	11 (0.5%)	53 (1.3%)	37 (0.7%)
Ovarian biopsy	4 (0.2%)	3 (0.07%)	10 (0.2%)
Fenestration of cyst	10 (0.5%)	0 (0.0%)	0 (0.0%)
Aspiration of cyst	8 (0.4%)	0 (0.0%)	0 (0.0%)
Ablation of cyst wall	3 (0.1%)	0 (0.0%)	0 (0.0%)

Tubal surgery

Salpingectomy was the most common procedure in this category though the incidence was slightly decreased. The incidence of salpingostomy continued to dropped from 7.5% in 1997 to 4.3% in 2002 and 3.3% in 2007.

	1997	2002	2007
Salpingectomy	346 (15.7%)	692 (16.6%)	674 (13.3%)
Salpingostomy	164 (7.5%)	181 (4.3%)	168 (3.3%)
Tubal occlusion/sterilization	0 (0.0%)	43 (1.0%)	55 (1.1%)
Cornual resection	2 (0.09%)	2 (0.05%)	10 (0.2%)
Segmental resection	1 (0.05%)	0 (0.0%)	4 (0.08%)
Tubal re-anastomosis	0 (0.0%)	0 (0.0%)	4 (0.08%)
Removal of tubal stump	1 (0.05%)	0 (0.0%)	0 (0.0%)
Glucose injection	1 (0.05%)	0 (0.0%)	0 (0.0%)

Uterine surgery

Hysterectomy was the most common procedure performed in this category and the incidence increased from 9.5% in 1997 and 11.8% in 2002 to 20.8% in 2007. The incidence of myomectomy also increased from 3.9% in 1997 and 4.6% in 2002 to 8.3% in 2007. Radical hysterectomy was performed in 26 patients while it was not being reported in previous audits.

	1997	2002	2007
Hysterectomy	209 (9.5%)	492 (11.8%)	1057 (20.8%)
Myomectomy	86 (3.9%)	193 (4.6%)	422 (8.3%)
Radical hysterectomy	0 (0.0%)	0 (0.0%)	26 (0.5%)
Adenomyomectomy	0 (0.0%)	0 (0.0%)	6 (0.1%)
Excision of rudimentary horn	1 (0.05%)	0 (0.0%)	2 (0.04%)
Myolysis	15 (0.7%)	0 (0.0%)	0 (0.0%)
Repair of uterine perforation	2 (0.09%)	1 (0.02%)	0 (0.0%)

Other Pelvic Surgery

Adhesiolysis was reported to have been performed in 11.3% of cases, which was lower than that in 2002 and 1997. However, as in previous audits, it was not possible to differentiate whether the adhesiolysis was performed as a primary operation or as part of an operative procedure. Ablation or resection of endometriosis was performed in about 6%, similar to the 7.9% in 1997 and 8.7% in 2002.

The number of pelvic lymphadenectomy increased significantly from 4 in 1997 and 13 in 2002 to 103 in 2007. Para-aortic lymphadenectomy was reported in 11 patients in 2007 and the procedure was not reported in 1997 and 2002. Laparoscopic repair of prolapse also increased dramatically from 2 in 1997 and 1 in 2002 to 23 in 2007.

	1997	2002	2007
Adhesiolysis	413 (18.8%)	816 (19.5%)	573 (11.3%)
Ablation/resection of endometriosis	174 (7.9%)	362 (8.7%)	312 (6.1%)
Pelvic lymphadenectomy	4 (0.2%)	13 (0.3%)	103 (2.0%)
Chromotubation	0 (0.0%)	5 (0.1%)	79 (1.6%)
Lap repair of prolapse	2 ^a (0.09%)	1 ^b (0.1%)	23 (0.5%)
Drainage of abscess	5 (0.2%)	20 (0.5%)	22 (0.4%)
Colposuspension	5 (0.2%)	22 (0.5%)	14 (0.3%)
Control of bleeding	12 (0.5%)	5 (0.6%)	16 (0.3%)
Para-aortic LN dissection	0 (0.0%)	0 (0.0%)	11 (0.2%)
Staging laparoscopy	1 (0.05%)	0 (0.0%)	11 (0.2%)
Appendicectomy	2 (0.09%)	4 (0.1%)	11 (0.2%)
Extraction of POG	9 (0.4%)	1 (0.1%)	5 (0.1%)
LUNA	6 (0.3%)	10 (0.2%)	1 (0.02%)
Cholecystectomy	2 (0.09%)	0 (0.0%)	0 (0.0%)
Removal of translocated IUCD	1 (0.05%)	0 (0.0%)	0 (0.0%)

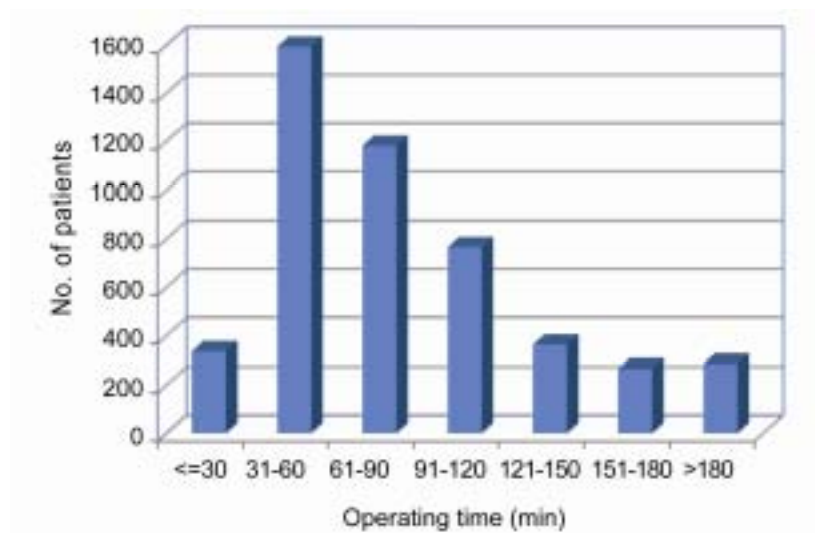
LUNA- Laparoscopic utero-sacral nerve ablation

Lap repair of prolapse included 17 sacrocolpopexy, 1 hysteropexy, 1 rectocele repair, 1 cystocele repair, 1 pelvic floor suspension, 2 paravaginal repair

a : High McCall vault suspension and Moschowitz culdoplasty; b: High McCall vault suspension

OPERATING TIME

The mean operating time was 91.9 (SD 118.8) minutes, compared to 75.5 (SD 45.5) in 2002 and 75.4 (SD 40.8) in 1997. The operation was completed within 60 minutes in 40.2% (51.2% in 2002 and 51.9% in 1997) and lasted longer than 120 minutes in 19.1% (11.2% in 2002 and 8.9% in 1997).



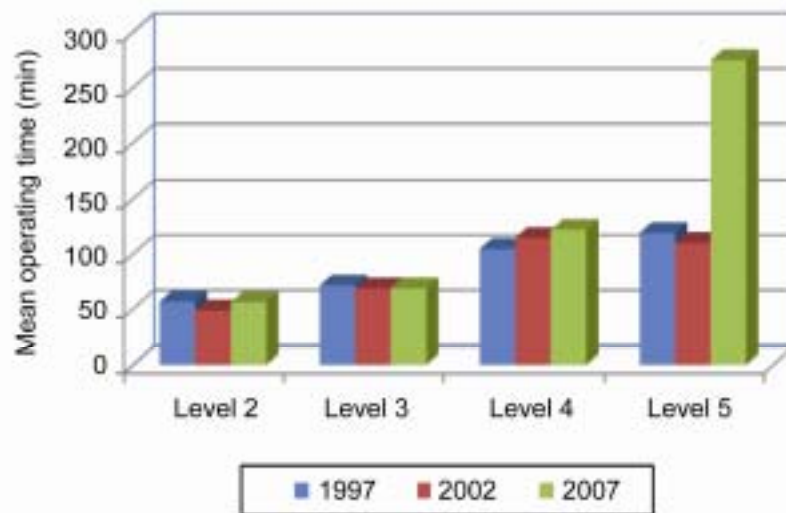
Number of missing data: 278 (5.5%)

Distribution of operating time

	1997	2002	2007
≤ 30 minutes	220 (10.2%)	497 (12.1%)	337 (7.0%)
31 - 60 minutes	899 (41.7%)	1608 (39.1%)	1594 (33.2%)
61 - 90 minutes	547 (25.4%)	988 (24.0%)	1182 (24.6%)
91 - 120 minutes	296 (13.7%)	561 (13.6%)	767 (16.0%)
121 - 150 minutes	84 (3.9%)	218 (5.3%)	364 (7.6%)
151 - 180 minutes	63 (2.9%)	122 (3.0%)	268 (5.6%)
> 180 minutes	45 (2.1%)	120 (2.9%)	287 (6.0%)
Total	2154	4114	4799

Number of missing data: 46 (2.1%) in 1997, 60 (1.4%) in 2002 and 278 (5.6%) in 2007 respectively

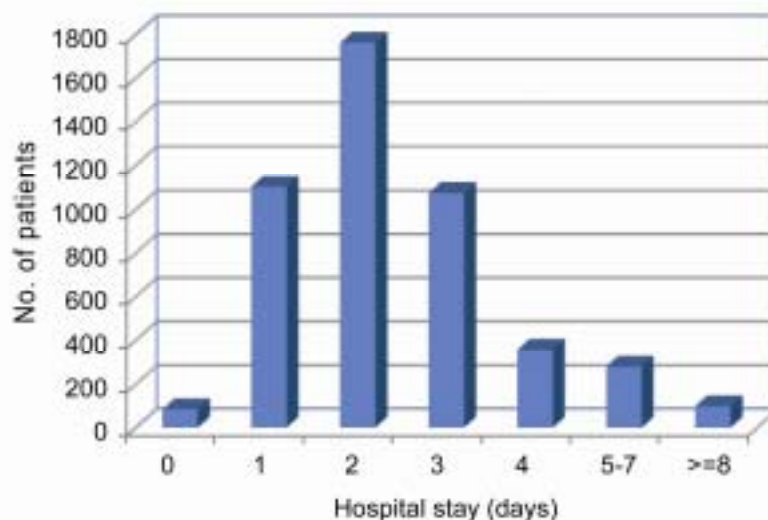
Level 4 and 5 procedures (121.8 and 274.7 min respectively in 2007 (114.6 and 110.0 min respectively in 2002) required significantly longer operating time than level 2 and 3 procedures (56.2 and 69.0 min respectively, compared to 48.9 and 68.8 min respectively in 2002). Compared to 2002, the mean operating time for level 5 procedures was almost 2.5 times longer while that of the other level remained the same.



Number of missing data: 278 (5.5%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.6 (SD 2.6) days, compared to 2.5 (SD 1.9) in 2002 and 2.5 (SD 2.4) in 1997. Over 80% of the patients were discharged within the first 3 days. Almost 30% of patients were discharged within one day. The incidence of prolonged hospital stay (> 7 days) remained around 2%.



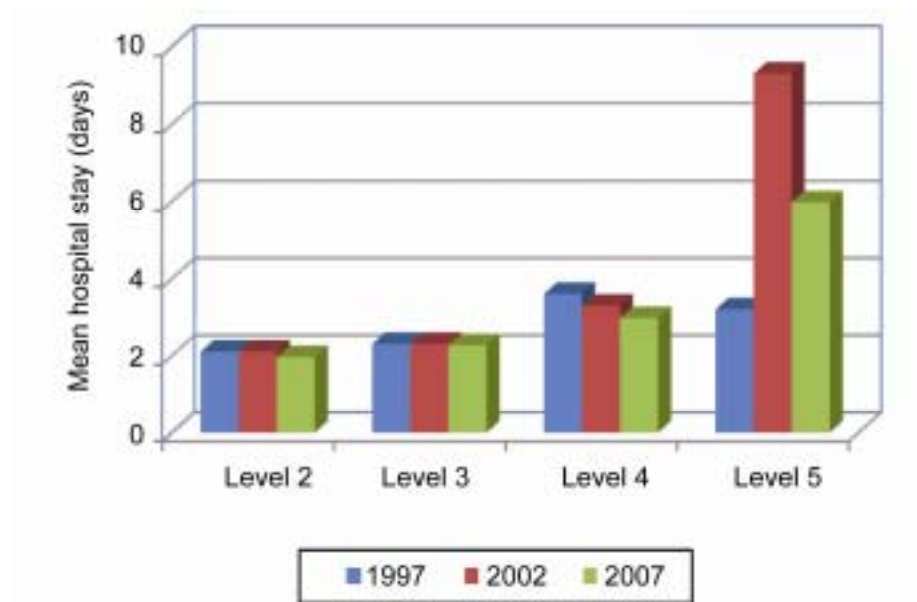
Number of missing data: 310 (6.1)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	40 (1.8%)	90 (2.2%)	85 (1.8%)
1 day	575 (26.5%)	956 (23.1%)	1105 (23.2%)
2 days	749 (34.5%)	1501 (36.3%)	1762 (37.0%)
3 days	485 (22.4%)	932 (22.5%)	1076 (22.6%)
4 days	137(6.3%)	307 (7.4%)	357 (7.5%)
5 – 7 days	142 (6.5%)	270 (6.5%)	283 (5.9%)
8 – 14 days	30 (1.4%)	66 (1.6%)	69 (1.4%)
≥ 15 days	10 (0.5%)	12 (0.3%)	29 (0.6%)
Total	2170	4134	4767

Number of missing data: 30 (1.4%) in 1997, 40 (1.0%) in 2002 and 310 (6.1%) in 2007 respectively

The mean post-operative hospital stay for level 2, 3 and 4 procedures were similar to that in 2002 and 1007, but that for level 5 procedures was almost halved that of 2002.



COMPLICATIONS

Major complications

Major complication rate was 1.9% which was higher than that in 2002 and similar to that in 1997. As in previous audits, organ injury accounted for about half of the major complications (47.3% in 2007 versus 54.8% in 2002 and 50.0% in 1997). There were more visceral injuries than vascular injuries. The incidence of visceral injury almost doubled (0.8% in 2007 versus 0.4% in 2002 and 0.5% in 1997), mainly contributed by the increase bowel injury (0.4% in 2007 versus 0.2% in 2002 and 1997). In contrast, the incidence of vascular injury significantly decreased from 0.4% in 1997 to 0.1% in 2002 and 0.02% in 2007.

There was 1 death reported. The patient was 28 years old and underwent emergency laparoscopy for suspected torsion of ovarian cyst by a specialist with intermediate accreditation. During the operation, a 3 cm left corpus luteal cyst and a 6 cm right ovarian fibroma were noted. There was no evidence of torsion of both ovarian lesions. The rest of the abdomen was normal. Both ovarian lesions were removed. Part of the fibroma was retrieved with the use of a laparoscopic morcellator. The remaining ovarian fibroma which was around 3cm in diameter was too calcified for further morcellation and was removed vaginally. The operating time was 167 minutes and estimated blood loss was 100 ml. Histological examination confirmed the diagnoses of corpus luteal cyst and ovarian fibroma. The patient was discharged on the second post-operative day but was admitted to another hospital the day after because of abdominal pain. On admission, the patient was afebrile. She developed septic shock the next day after admission. Stale blood was found coming out from the previous trocar site in the right lower abdomen with surrounding erythema. Laparotomy was performed for intraperitoneal sepsis. Foul smelling brownish fluid was found in the pelvis but no bowel perforation was found. The patient's condition deteriorated and finally succumbed the next day after the laparotomy. The clinical feature was compatible with necrotizing fasciitis.

	1997	2002	2007
Bladder injury	5 (0.2%)	5 (0.1%)	16 (0.3%)
Ureteric injury	2 (0.09%)	4 (0.1%)	6 (0.1%)
Bowel injury	4 (0.2%)	8 (0.2%)	22 (0.4%)
Major vascular injury	1 (0.05%)	2 (0.05%)	0 (0.0%)
Inferior epigastric artery injury	7 (0.3%)	4 (0.1%)	1 (0.02%)
Haemorrhage with transfusion	15 (0.7%)	16 (0.4%)	47 (0.9%)
Deep vein thrombosis	1 (0.05%)	3 (0.07%)	3 (0.1%)
Pneumomediastinum	1 (0.05%)	0 (0.0%)	0 (0.0%)
Incisional hernia	2 (0.09%)	0 (0.0%)	1 (0.02%)
Death	1 (0.05%)	0 (0.0%)	1 (0.02%)
Total	38 (1.7%)	42 (1.0%)	95 (1.9%)

Data are presented as number and percentage of total number of patients

Minor complications

The incidence of minor complications for operative laparoscopy reduced from 5.7% in 1997 and 2.6% in 2002 to 1.6% in 2007. Febrile morbidity remained the most common minor complication and its incidence continued to drop from 2.3% in 1997 and 0.9% in 2002 to 0.6% in 2007.

	1997	2002	2007
Febrile morbidity	50 (2.3%)	36 (0.9%)	28 (0.6%)
Urinary tract infection	22 (1.0%)	15 (0.4%)	19 (0.4%)
Vault/Pelvic haematoma	4 (0.4%)	20 (0.5%)	16 (0.3%)
Retention of urine	21 (1.0%)	12 (0.3%)	11 (0.2%)
Wound complication	15 (0.7%)	10 (0.2%)	5 (0.1%)
Pelvic infection	5 (0.2%)	0 (0.0%)	2 (0.04%)
Uterine/ Vaginal perforation	3 (1.0%)	0 (0.0%)	1 (0.02%)
Others	5 (0.2%)	16 (0.4%)	8 (0.2%)
Total	125 (5.7%)	109 (2.6%)	83 (1.6%)

Data are presented as number and percentage of total number of patients

Trocar related complications

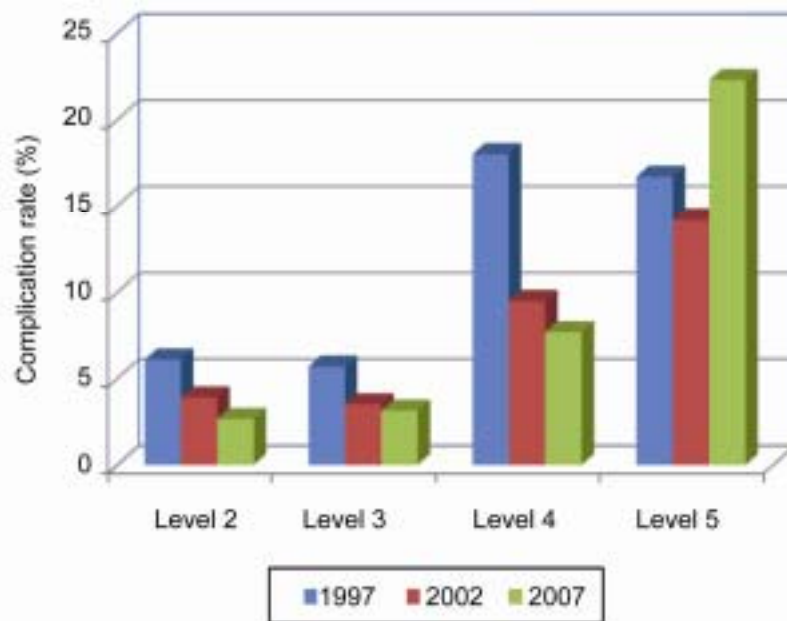
The incidence of trocar related complications was 0.4% of all operative laparoscopies, which was much lower than that of 0.8% in 2002 and 1.4% in 1997. None of the 22 bowel injuries was reported to be trocar-related, in contrast to 0.02% in 2002 and 0.05% in 1997. There was no major vascular injury and inferior epigastric artery injury occurred in only 0.02%.

	1997	2002	2007
Bowel injury	1 (0.05%)	1 (0.02%)	0 (0.0%)
Major vascular injury	1 (0.05%)	0 (0.0%)	0 (0.0%)
Inferior epigastric artery injury	7 (0.3%)	4 (0.1%)	1 (0.02%)
Surgical emphysema	3 (0.1%)	12 (0.3%)	13 (0.2%)
Trocar site haematoma/infection	19 (0.9%)	14 (0.3%)	5 (0.1%)
Trocar site hernia	2 (0.1%)	1 (0.02%)	1 (0.04%)
Total	33 (1.5%)	32 (0.8%)	20 (0.4%)

Data are presented as number and percentage of total number of patients

Breakdown of complication rates

Compared to previous audits, there was a reduction of the complication rate across all except level 5 procedures. The reduction was largest for level 4 procedures (from 18.0% in 1997 and 9.5% in 2002 to 7.7% in 2007). For level 5 procedures, the complication rate increased from 16.6% in 1997 and 14.2% in 2002 to 22.3% in 2007. This was likely related to the increase in number and variety of the procedures in 2007. Overall the complication rate of operative laparoscopy decreased from 7.5% in 1997 to 5.0% in 2002 and 5.3% in 2007.



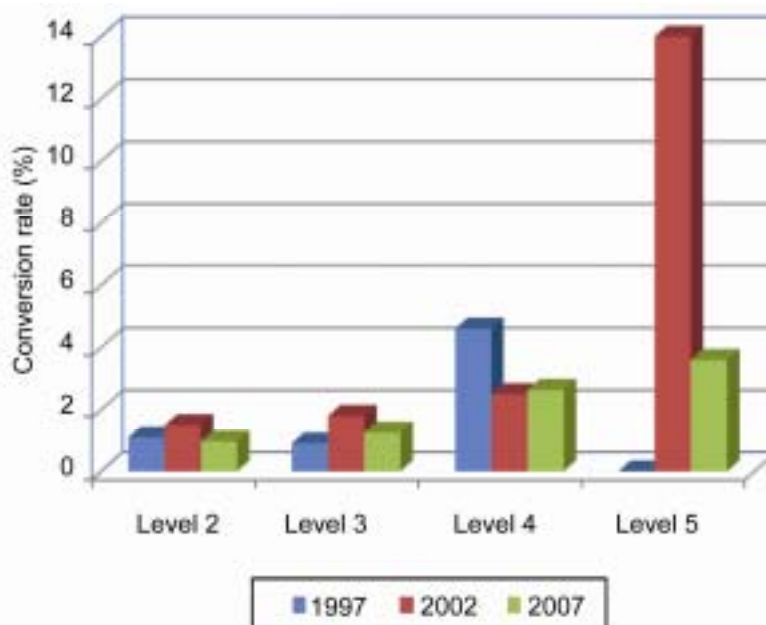
CONVERSION

Conversion was required in 1.9%, compared to 1.8% in 2002 and 5.7% in 1997. Surgical difficulty remained the main reason for conversion, of which dense adhesions accounted for 54.8%, compared to over 70% in previous audits. Conversion as a result of organ injury occurred in 0.3%, majority of them (76.9%) were due to bowel injury.

	1997	2002	2007
Surgical difficulty	29 (1.3%)	54 (1.3%)	73 (1.4%)
<i>Dense adhesions</i>	20 (0.9%)	38 (0.9%)	40 (0.8%)
<i>Uncontrolled haemorrhage</i>	8 (0.4%)	6 (0.1%)	13 (0.3%)
<i>Large pelvic mass</i>	0 (0.0%)	8 (0.2%)	8 (0.2%)
<i>Poor pelvic access</i>	1 (0.05%)	2 (0.05%)	6 (0.1%)
<i>Emphysema</i>	0 (0.0%)	0 (0.0%)	3 (0.06%)
<i>Cornual/interstitial pregnancy</i>	0 (0.0%)	0 (0.0%)	1 (0.02%)
<i>Miscellaneous</i>	4 (0.2%)	0 (0.0%)	2 (0.04%)
Inadvertent organ injury	4 (0.2%)	5 (0.1%)	13 (0.3%)
<i>Bowel injury</i>	1 (0.05%)	2 (0.04%)	10 (0.2%)
<i>Bladder injury</i>	2 (0.1%)	2 (0.04%)	2 (0.04%)
<i>Ureteric injury</i>	1 (0.05%)	1 (0.02%)	1 (0.02%)
Instrument problems	1 (0.05%)	1 (0.02%)	2 (0.04%)
<i>Broken needle</i>	0 (0.0%)	1 (0.02%)	0 (0.0%)
<i>Failed pneumoperitoneum</i>	1 (0.05%)	0 (0.0%)	1 (0.02%)
<i>Failed to remove specimen</i>	0 (0.0%)	0 (0.0%)	1 (0.02%)
Unexpected malignancy	1 (0.05%)	1 (0.02%)	3 (0.06%)
Unspecified	0 (0.0%)	22 (0.5%)	4 (0.08%)
Total	125 (5.7%)	83 (1.8%)	94 (1.9%)

Data are presented as number and percentage of total number of patients

Conversion rate was highest for level 5 procedures (3.6%) but it was 3.5 fold lower than that in 2002 (14%). The conversion rate for the levels remained low and less than 2.5%.



RE-ADMISSION

The incidence of unplanned re-admission to hospital after laparoscopic surgery was 0.7%, similar to that in 2002 and 1997. Secondary haemorrhage remained the most common reason for unplanned re-admission.

Among the 8 secondary bleeding, 5 were after hysterectomy, 1 after paravaginal repair, 1 after neovagina reconstruction and excision of müllerian hypoplastic uterus for Rokitansky syndrome and 1 after salpingectomy for tubal pregnancy. The case of bowel obstruction occurred after laparoscopic myomectomy for subserosal fibroid > 6 cm. The case of uretero-vaginal fistula occurred after laparoscopic hysterectomy for submucosal fibroid with uterus 10-12 weeks size.

	1997	2002	2007
Secondary haemorrhage	2 (0.09%)	5 (0.1%)	8 (0.2%)
Pelvic infection	3 (0.1%)	3 (0.07%)	3 (0.06%)
Persistent ectopic pregnancy	3 (0.1%)	2 (0.05%)	2 (0.04%)
Wound infection	0 (0.0%)	2 (0.05%)	4 (0.08%)
Wound pain	1 (0.05%)	1 (0.02%)	0 (0.0%)
Pelvic haematoma	0 (0.0%)	1 (0.02%)	2 (0.04%)
Surgery of ureteric fistula	0 (0.0%)	1 (0.02%)	1 (0.02%)
Bowel obstruction	0 (0.0%)	0 (0.0%)	1 (0.02%)
Miscellaneous	0 (0.0%)	0 (0.0%)	6 (0.1%)
Unrelated problems	4 (0.2%)	3 (0.07%)	5 (0.1%)
Unspecified	0 (0.0%)	7 (0.2%)	1 (0.02%)
Total	13 (0.6%)	25 (0.6%)	33 (0.7%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

Six patients had undergone subsequent laparotomy and the incidence of re-operation was 0.1%, compared to 0.07% in 2002 and 0.5% in 1997. One patient had laparotomy for intraperitoneal sepsis 3 days after laparoscopic ovarian surgery and subsequently died. One patient, who had a previous right salpingo-oophorectomy for borderline ovarian tumour, had an injury to sigmoid colon after a total laparoscopic hysterectomy and left salpingo-oophorectomy with primary trocar inserted by direct method. One patient had an unexpected borderline ovarian malignancy after a laparoscopic right salpingo-oophorectomy for a 5-8 cm ovarian cyst and underwent staging laparotomy and pelvic lymph node dissection. One patient with a fimbrial ectopic pregnancy and reported to have "immediate" re-operation as no expertise was available. One patient underwent laparoscopic oophorectomy for a dermoid cyst of >8 cm and reoperation was reported to be due to "adhesion and large size pregnancy". One patient had drainage of tubo-ovarian abscess and was complicated by bowel injury. She underwent another laparoscopy on the second post-operative day and was commented to have limited visualization due to dilated bowels with no other information reported.

	1997	2002	2007
Bowel injury	2 (0.09%)	0 (0.0%)	1 (0.02%)
Ureteric injury	0 (0.0%)	1 (0.02%)	0 (0.0%)
Haemorrhage	3 (0.14%)	0 (0.0%)	0 (0.0%)
Persistent ectopic pregnancy	2 (0.09%)	0 (0.0%)	0 (0.0%)
Peritonitis	1 (0.05%)	0 (0.0%)	1 (0.02%)
Persistent pelvic abscess	1 (0.05%)	0 (0.0%)	0 (0.0%)
Unexpected malignancy	2 (0.09%)	0 (0.0%)	1 (0.02%)
Expertise not available	0 (0.0%)	0 (0.0%)	1 (0.02%)
Unspecified	0 (0.0%)	2 (0.05%)	2 (0.04%)
Total	11 (0.5%)	3 (0.07%)	6 (0.1%)

Data are presented as number and percentage of total number of patients

2

LAPAROSCOPIC SURGERY - LEVEL 2 PROCEDURES

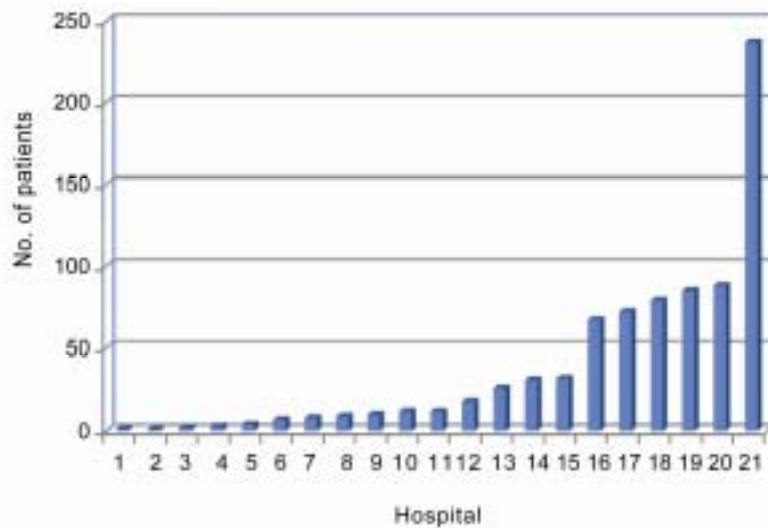
Total number of patients

804

Compared to previous audits, the number of level 2 procedures increased from 374 in 1997 to 779 in 2002 and plateau at 804 in 2007.

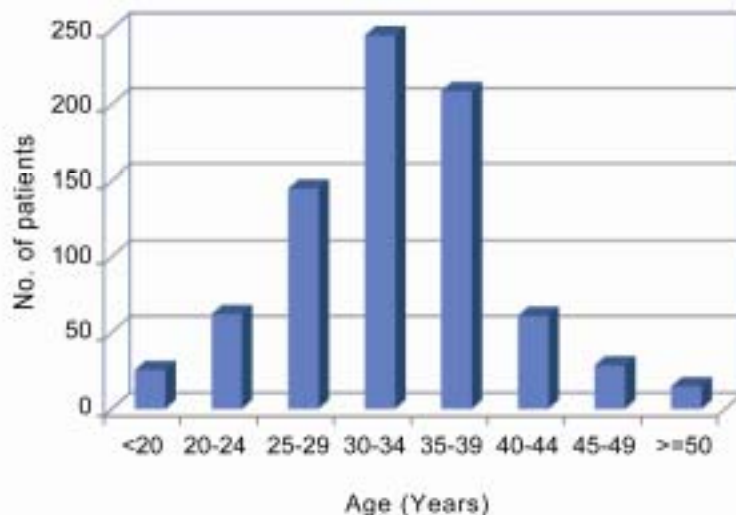
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Most units performed less than 40 cases a years, in contrast to 2002 when half of the units performed more than 40 cases a year. One unit performed over 200 cases a year, which was more than double than the rest of the units.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 33.0 (SD 7.2) years, similar to that in 2002 (32.5, SD 6.6) and 1997 (mean 32.2, SD 6.7). The age distribution was also similar to previous audits with peak age between 30 and 34. About 3% of patients were younger than 20 and 13.2% aged 40 or above.



Number of missing data: 11 (1.4%)

Distribution of age

	1997	2002	2007
< 20 years	15 (4.0%)	14 (1.8%)	26 (3.3%)
20 - 24 years	42 (11.2%)	64 (8.4%)	62 (7.8%)
25-29 years	76 (20.3%)	170 (22.3%)	145 (18.3%)
30 – 34 years	117 (31.3%)	235 (30.8%)	246 (30.6%)
35 – 39 years	85 (22.7%)	180 (23.6%)	209 (26.4%)
40 – 44 years	37 (9.9%)	73 (9.6%)	61 (7.7%)
45 – 49 years	8 (2.1%)	19 (2.5%)	29 (3.7%)
≥ 50 years	2 (0.5%)	9 (1.2%)	15 (2.0%)
Total	374	764	793

Number of missing data was 15 (1.9%) in 2002 and 11 (1.4%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

Compared to previous audits, the proportion of operations performed by pre-MRCOG doctors increased from 6.9% in 1997 to 23.8% in 2002 and 33.6% in 2007, of which over 70% were assisted by specialists. The proportion of operation performed by doctors with MRCOG decreased from 45.4% in 1997 to 36.4% in 2002 and 24.0% in 2007. Those performed by specialists decreased from 47.6% in 1997 to 39.8% in 2002 and 42.4% in 2007. The operations were assisted by specialists in 38.4 (51.8% in 2002 and 25.9% in 1997) and by nurses in 6.7% (8.1% in 2002 and 17.0% in 1997).

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	Specialist	Nurse	
MBBS	32	41	187	0	260
MRCOG	116	6	64	0	186
Specialist	209	21	46	52	328
Total	357	68	297	52	774

Number of missing data: 534 (9.6%)

About 54% (59.2% in 2002) of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 33.7% (29.0% in 2002) were assisted by doctors without accreditation and 2.6% (6.1% in 2002) were assisted by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	134	170	85	9	398
Intermediate	175	38	22	3	238
Advanced	69	7	2	28	106
Total	378	215	109	40	742

Number of missing data: 832 (14.9%)

OPERATIVE DIAGNOSIS

Ectopic pregnancy was the most common diagnosis and accounted for almost 60% of the cases.

	1997	2002	2007
Ectopic pregnancy	221 (59.1%)	456 (58.5%)	445 (55.3%)
Pelvic adhesions	120 (32.1%)	250 (32.1%)	94 (11.7%)
Endometriosis	62 (16.6%)	76 (9.8%)	83 (10.3%)
Hydrosalpinx	18 (4.8%)	50 (6.5%)	64 (8.5%)
Ovarian cyst	16 (4.3%)	21 (2.7%)	26 (3.2%)
Fibroids	15 (4.0%)	18 (2.3%)	10 (1.2%)
Polycystic ovarian disease	13 (3.5%)	20 (2.6%)	16 (2.0%)
Bleeding corpus luteum	8 (2.1%)	1 (0.1%)	4 (0.5%)
Paraovarian cyst	5 (1.3%)	4 (0.5%)	5 (0.6%)
Endometrioma	4 (1.1%)	5 (0.6%)	23 (2.9%)
Pyosalpinx	3 (0.8%)	5 (0.6%)	2 (0.2%)
Infertility	3 (0.8%)	4 (0.5%)	0 (0.0%)
Failed sterilization	3 (0.8%)	0 (0.0%)	3 (0.4%)
Sterilization	0 (0.0%)	49 (6.3%)	13 (1.6%)
Miscellaneous	13 (3.5%)	38 (4.9%)	40 (5.0%)

Data are presented as number and percentage of total number of patients

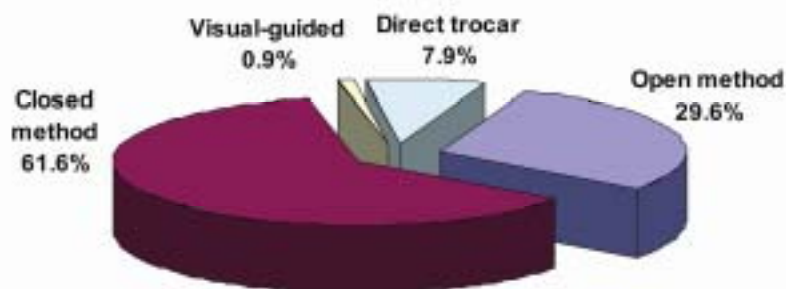
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 61.6% of cases, which was lower than that in 2002 (68.3%). Open method was used in 29.6% and was similar to that in 2002 (27.0%). Direct trocar entry was used in 7.9% and was not reported in 2002. The use of visually guided trocar dropped from 4.8% to 0.9%.

	2002	2007
Closed method	514 (68.3%)	490 (61.6%)
Open method	203 (27.0%)	236 (29.6%)
Visual guided	36 (4.8%)	7 (0.9%)
Direct trocar	0 (0.0%)	63 (7.9%)
Total	753	796

No. of missing data: 26 (3.3%) in 2002 and 8 (1.0%) in 2007



Number of missing data: 8 (1.0%)

The primary trocar was inserted through the umbilical incision in majority of the cases (98.2%). Supraumbilical and left upper quadrant insertion were used occasionally.

	2002	2007
Umbilical	732 (99.2%)	751 (98.2%)
Supraumbilical	4 (0.5%)	9 (1.2%)
Left upper quadrant	2 (0.3%)	5 (0.6%)
Total	738	765

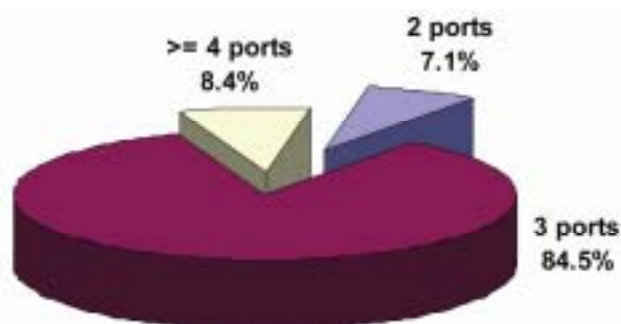
Number of missing data: 41 (5.3%) in 2002 and 39 (4.9%) in 2007 respectively

Number of ports used

Three ports were used in performing the surgery in 85% of cases, compared to 79.5% in 2002. Four ports were used in 8.4% (11.9% in 2002) while 2 ports were used in 7.1% (8.0% in 2002).

	2002	2007
2 ports	62 (8.5%)	56 (7.1%)
3 ports	582 (79.5%)	664 (85.4%)
4 ports	87 (11.9%)	66 (8.4%)
> 4 ports	1 (0.1%)	0 (0.0%)
Total	732	786

Number of missing data: 47 (6.0%) in 2002 and 18 (2.2%) in 2007



Number of missing data: 18 (2.2%)

Surgical Modalities

As in previous audits, electrocautery was used in 90.7% of cases, of which bipolar energy alone was used in 603 (82.7% versus 72.8% in 2002), unipolar alone in 26 (3.6% versus 8.8% in 2002) and both in 100 (13.7% versus 20.5% in 2002). Ultracision was used in 2.9% (0.4% in 2002 and 0% in 1997) and laser was used at all (0.5% in 2002 and 1.6% in 1997)

	1997	2002	2007
Electrocautery	343 (91.7%)	709 (91.0%)	729 (90.7%)
Ligature	-	-	2 (0.2%)
Plasmakinetic	-	-	1 (0.1%)
Suture	5 (1.3%)	12 (1.5%)	9 (1.1%)
Endoloop	31 (8.3%)	27 (3.5%)	5 (0.6%)
Laser	6 (1.6%)	4 (0.5%)	0 (0.0%)
Ultracision	0 (0.0%)	3 (0.4%)	23 (2.9%)
Clips/Staples	3 (0.8%)	4 (0.5%)	4 (0.5%)
Use of drain	14 (3.7%)	15 (1.9%)	32 (4.0%)

Data are presented as number and percentage of total number of patients

OPERATIVE PROCEDURES

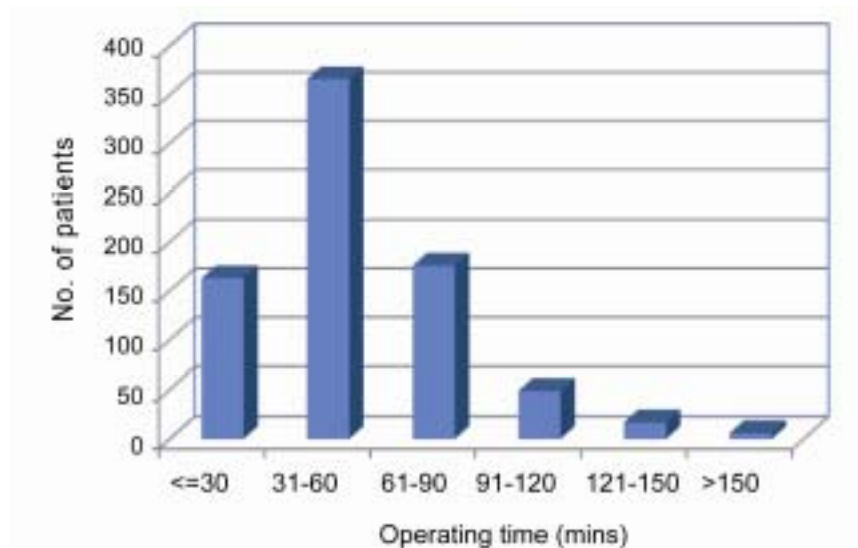
Salpingectomy was the commonest operative procedure performed and accounted for 63.1%, compared to 70.3% in 2002 and 62.6% in 1997.

	1997	2002	2007
Salpingectomy	234 (62.6%)	548 (70.3%)	508 (63.2%)
Adhesiolysis	63 (16.8%)	167 (21.4%)	123 (15.3%)
Ablation of endometriosis	34 (9.1%)	90 (11.6%)	67 (8.3%)
Ovarian drilling	11 (2.9%)	48 (6.2%)	28 (3.5%)
Control of bleeding	10 (2.7%)	5 (0.6%)	11 (1.4%)
Fenestration of cyst	7 (1.9%)	0 (0.0%)	2 (0.0%)
Myolysis	6 (1.6%)	0 (0.0%)	0 (0.0%)
Removal of POG	0 (0.0%)	0 (0.0%)	6 (0.7%)
Miscellaneous	25 (6.7%)	25 (3.2%)	40 (4.9%)

Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 56.3 (SD 38.5) minutes, compared to 48.9 (SD 24.9) in 2002 and 56.8 (SD 27.6) in 1997. The operating time was within 30 minutes in 21.0% (30.5% in 2002 and 20.9% in 1997) and exceeded 120 minutes in 3.0% (1.2% in 2002 and 2.0% in 1997) of patients.



Number of missing data: 27 (3.4%)

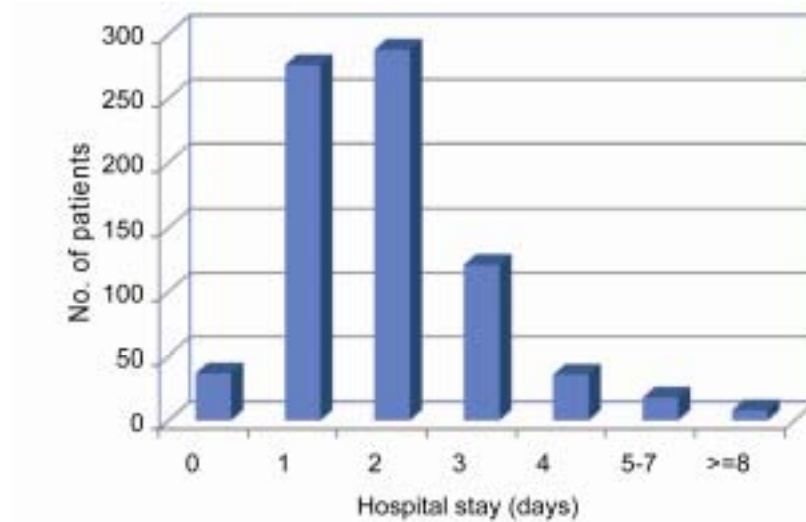
Distribution of operating time

	1997	2002	2007
≤ 30 minutes	75 (20.9%)	235 (30.5%)	163 (21.0%)
31 – 60 minutes	188 (52.5%)	372 (48.2%)	366 (47.1%)
61 – 90 minutes	61 (17.0%)	127 (16.5%)	176 (22.7%)
91 – 120 minutes	27 (7.5%)	28 (3.6%)	49 (6.3%)
121 – 150 minutes	6 (1.7%)	6 (0.8%)	17 (2.2%)
> 150 minutes	1 (0.3%)	3 (0.4%)	6 (0.8%)
Total	358	771	777

Number of missing data: 16 (4.3%) in 1997, 8 (1.0%) in 2002 and 27 (3.4%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.0 (SD 1.5) days, compared to 2.1 (SD 1.3) in 2002 and 2.1 (SD 2.0) in 1997. Thirty-seven (4.7%) were discharged on the day of operation (5.2% in 2002 and 4.1% in 1997) and 8 (1.0%) stayed longer than 7 days (0.6% in 2002 and 0.5% in 1997).



Number of missing data: 20 (2.5%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	15 (4.1%)	40 (5.2%)	37 (4.7%)
1 day	121 (32.8%)	254 (32.7%)	276 (35.2%)
2 days	121 (32.8%)	266 (34.3%)	288 (36.7%)
3 days	82 (22.2%)	152 (19.6%)	121 (15.4%)
4 days	17 (4.6%)	32 (4.1%)	36 (4.6%)
5 – 7 days	11 (3.0%)	27 (3.5%)	18 (2.3%)
> 8 days	2(0.6%)	5 (0.6%)	8 (1.0%)
Total	369	776	784

Number of missing data: 5 (1.3%) in 1997, 3 (0.4%) in 2002 and 20 (2.5%) in 2007

CONVERSION

Conversion to laparotomy was necessary in 8 (1.0%) patients, compared to 1.5% in 2002 and 1.1% in 1997. The presence of dense adhesion was the main reason for conversion.

	1997	2002	2007
Dense adhesions	2 (0.5%)	3 (0.4%)	7 (99.9%)
Bowel injury	0 (0.0%)	1 (0.1%)	0 (0.0%)
Uncontrolled haemorrhage	1 (0.3%)	1 (0.1%)	1 (0.1%)
Failed pneumoperitoneum	1 (0.3%)	0 (0.0%)	0 (0.0%)
Unspecified	0 (0.0%)	7 (0.9%)	0 (0.0%)
Total	4 (1.1%)	12 (1.5%)	8 (1.0%)

Data are presented as number and percentage of total number of patients

COMPLICATIONS

Twenty-one patients (2.6%) developed complications, compared to 3.9% in 2002 and 6.1% in 1997. Organ injury occurred in 0.1% compared to 0.4 % in 2002 and 1.6% in 1997.

	1997	2002	2007
Bowel injury	1 (0.3%)	2 (0.3%)	0 (0.0%)
Inferior epigastric artery injury	4 (1.1%)	1 (0.1%)	0 (0.0%)
Major vascular injury	1 (0.3%)	0 (0.0%)	0 (0.0%)
Haemorrhage requiring transfusion	2 (0.5%)	0 (0.0%)	5 (0.6%)
Febrile morbidity	6 (1.6%)	2 (0.3%)	0 (0.0%)
Urinary tract infection	4 (1.1%)	1 (0.1%)	1 (0.1%)
Retention of urine	2 (0.5%)	5 (0.6%)	0 (0.0%)
Emphysema	0 (0.0%)	2 (0.3%)	0 (0.0%)
Pelvic haematoma	0 (0.0%)	1 (0.1%)	0 (0.0%)
Wound infection	4 (1.1%)	1 (0.1%)	1 (0.1%)
Conversion	4 (1.1%)	12 (1.5%)	8 (1.0%)
Re-admission	3 (0.8%)	4 (0.5%)	4 (0.5%)
Re-operation	2 (0.5%)	0 (0.0%)	0 (0.0%)
Persistent ectopic pregnancy	1 (0.3%)	0 (0.0%)	1 (0.1%)
Perforation of uterus	0 (0.0%)	0 (0.0%)	1 (0.1%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

As in 2002, no patient required re-operation, in contrast to 0.3% in 1997.

RE-ADMISSION

As in 2002, four (0.5%) patients required re-admission to hospital, compared to 0.8% in 1997.

	1997	2002	2007
Vaginal bleeding	0 (0.0%)	1 (0.1%)	1 (0.1%)
Pelvic infection	1 (0.3%)	0 (0.0%)	0 (0.0%)
Persistent ectopic pregnancy	1 (0.3%)	0 (0.0%)	0 (0.0%)
Unrelated problems	1 (0.3%)	1 (0.1%)	3 (0.3%)
Unspecified	0 (0.0%)	2 (0.3%)	0 (0.0%)

Data are presented as number and percentage of total number of patients

COMPARISON BETWEEN ELECTIVE AND EMERGENCY OPERATIONS

The operation was performed as an emergency operation in 505 (62.8% versus 59.8% in 2002) cases and elective operation in 274 (34.1% versus 38.3%) cases. Information was not available in 25 cases (3.1% versus 1.9% in 2002).

Emergency operation was associated with longer operating time and more blood loss. There were however no difference in the conversion or complication rate.

	Elective N = 274	Emergency N = 505	P-value
Age (years)	36.0 ± 7.6	31.4 ± 6.2	NS
Operating time (min)	53.4 ± 55.6	58.3 ± 25.5	0.003
Blood loss (ml)	25.5 ± 49.0	115.4 ± 289.3	<0.001
Post-operative hospital stay (days)	1.7 ± 1.6	2.2 ± 1.3	NS
Conversion	5 (1.9)	3 (0.6)	NS
Complication	7 (2.6)	14 (2.8)	NS
Re-admission	0 (0.0)	4 (0.8)	NS

Data are presented as mean ± SD or N (%)

NS: Not significant

3

LAPAROSCOPIC SURGERY - LEVEL 3 PROCEDURES

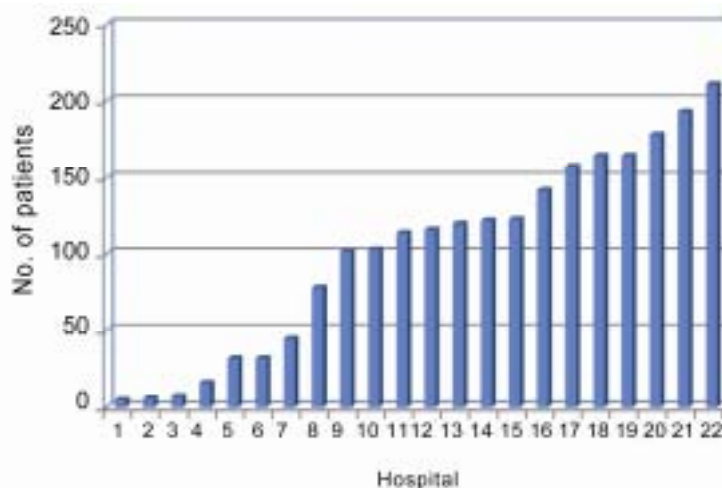
Total number of patients

2,230

The number of level 3 procedures increased from 1385 in 1997 to 2399 in 2002, and decreased to 2230 in 2007.

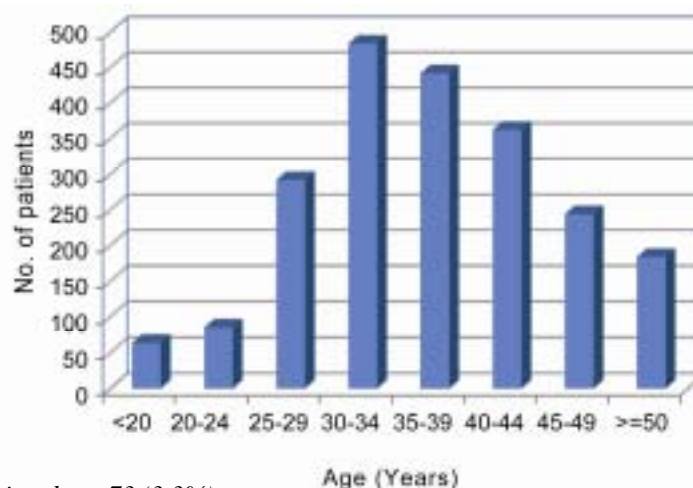
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

As in 2002, 14 units (63.6%) performed over 100 cases of Level 3 procedures a year, compared to only 5 (27.8%) in 1997. One unit performed over 200 cases while 3 units performed less than 10 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 37.0 (SD 9.5) years, compared to 35.5 (SD 8.8) in 2002 and 34.4 (SD 8.0) in 1997. The age distribution was also similar with peak age between 30 and 34. There was an increased in the proportion of women aged 40 or above, with 36.6% (29.2% in 2002 and 12.5% in 1997) aged ≥ 40 and 8.5% (5.2% in 2002 and 0.5% in 1997) aged ≥ 50 .



Number of missing data: 73 (3.3%)

Distribution of age

	1997	2002	2007
< 20 years	36 (1.9%)	38 (1.6%)	64 (3.0%)
20 - 24 years	98 (11.2%)	164 (7.0%)	85 (3.9%)
25-29 years	218 (20.3%)	348 (14.9%)	292 (13.5%)
30 – 34 years	362 (31.3%)	569 (24.3%)	484 (22.4%)
35 – 39 years	348 (22.7%)	537 (23.0%)	442 (20.5%)
40 – 44 years	203 (9.9%)	370 (15.8%)	362 (16.8%)
45 – 49 years	78 (2.1%)	191 (8.2%)	243 (11.3%)
≥ 50 years	38 (0.5%)	121 (5.2%)	184 (8.5%)
Total	1381	2339	2157

Number of missing data: 4 (0.3%) in 1997, 61 (2.5%) in 2002 and 73 (3.3%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to previous audits, the operation was still mainly performed by specialists and the percentage was increasing (68.1% versus 63.5% in 2002 and 60.7% in 1997). There was however an increase in the operation performed by pre-MRCOG doctors from 5.3% in 1997 and 10.4% in 2002 to 17.4% in 2007, of which 90% were assisted by specialists. The operation was assisted by specialists in 37.5% (51.0% in 2002 and 33.4% in 1997) and by nurses in 34.0% (22.1% in 2002 and 24.1% in 1997) of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	15	19	312	1	347
MRCOG	96	7	186	18	307
FHKAM	370	63	252	660	1345
Total	481	89	750	679	1999

Number of missing data: 231 (10.4%)

About 34% (53.1% in 2002) of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 21.5% (17.2% in 2002) were assisted by doctors without accreditation and 10.1% (24.9% in 2002) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 27.8% (29.8% in 2002), of which 47.7% (49.5% in 2002) were assisted by doctors without accreditation.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	134	233	193	63	623
Intermediate	244	89	118	62	513
Advanced	178	38	35	460	711
Total	556	360	346	585	1847

Number of missing data: 383 (17.1%)

OPERATIVE DIAGNOSIS

Benign ovarian tumour was the most common diagnosis and accounted for 82.6% (79.3% in 2002 and 77.0% in 1997) of the cases.

	1997	2002	2007
Benign ovarian tumour	1067 (77.0%)	1902 (79.3%)	1843 (82.6%)
<i>Endometrioma</i>	517 (37.3%)	908 (37.8%)	993 (53.9%)
<i>Ovarian cyst</i>	420 (30.3%)	840 (35.0%)	589 (32.0%)
<i>Dermoid</i>	130 (9.4%)	154 (6.4%)	321 (17.4%)
Endometriosis	396 (28.6%)	668 (28.7%)	412 (18.5%)
Pelvic adhesions	500 (36.1%)	788 (32.8%)	262 (11.7%)
Fibroid	88 (6.4%)	139 (5.8%)	155 (7.0%)
Ectopic pregnancy	198 (14.3%)	152 (6.3%)	102 (4.6%)
Hydrosalpinx	64 (4.6%)	142 (5.9%)	126 (5.7%)
Paraovarian cyst	35 (2.5%)	191 (8.0%)	107 (4.8%)
Fimbrial cyst	18 (1.3%)	0 (0.0%)	39 (1.7%)
Pyosalpinx	3 (0.2%)	1 (0.04%)	18 (0.8%)
Tubo-ovarian abscess	4 (0.3%)	2 (0.08%)	16 (0.7%)
Uterine prolapse	-	-	6 (0.3%)
Cystocele	-	-	5 (0.2%)
Rectocele	-	-	1 (0.04%)
Infertility	6 (0.4%)	2 (0.08%)	2 (0.09%)
Miscellaneous	20 (1.4%)	8 (0.3%)	27 (1.2%)

Data are presented as number and percentage of total number of patients

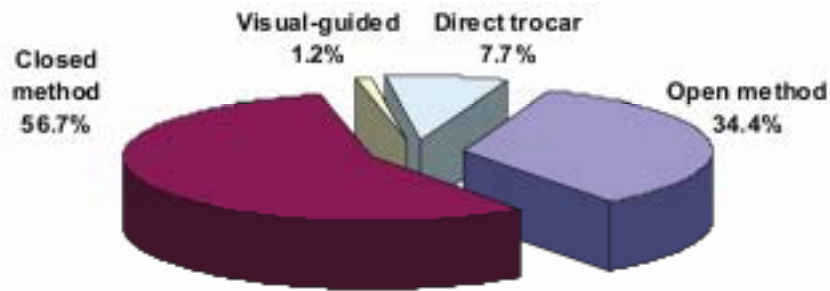
OPERATIVE TECHNIQUES

Primary trocar entry technique

Although closed method was still the most common technique for primary trocar entry, its rate dropped from 62.6% in 2002 to 56.7% in 2007. The use of open method remained at 34.4% while visually guided trocar decreased from 4.4% to 1.2% in 2007. Direct trocar technique was used in 7.7%, which was not reported in 2002.

	2002	2007
Closed method	1460 (62.6%)	1249 (56.7%)
Open method	769 (33.0%)	758 (34.4%)
Visual guided	103 (4.4%)	26 (1.2%)
Direct trocar	0	169 (7.7%)
Total	2332	2202

No. of missing data: 67(2.8%) in 2002 and 28 (1.3%) in 2007



Number of missing data: 28 (1.3%)

The primary trocar was inserted through the umbilical incision in 98.2% of cases, supraumbilically in 1.2% and in the left upper quadrant in 0.6%. The pattern was similar to that in 2002.

	2002	2007
Umbilical	2203 (97.6%)	2094 (98.2%)
Supraumbilical	36 (1.6%)	25 (1.2%)
Left upper quadrant	19 (0.8%)	13 (0.6%)
Total	2258	2132

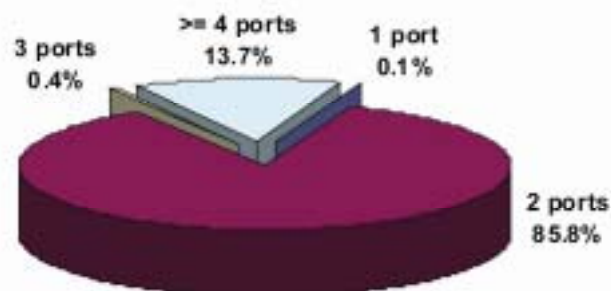
Number of missing data: 141 (5.9%) in 2002 and 98 (4.4%) in 2007 respectively

Number of ports used

Three ports were used in performing the surgery in 85.8% (83% in 2002) of cases. Four or more ports were used in 13.7% (14.2% in 2002) and single port was reported to be used in 2 (7 in 2002) cases.

	2002	2007
1 port	7 (0.3%)	2 (0.09%)
2 ports	42 (1.9%)	8 (0.4%)
3 ports	1866 (82.7%)	1850 (85.8%)
4 ports	333 (13.9%)	292 (13.5%)
> 4 ports	7 (0.3%)	4 (0.2%)
Total	2255	2156

Number of missing data: 47 (6.0%) in 2002 and 74 (3.3%) in 2007



Number of missing data: 74 (3.3%)

Surgical Modalities

As in 2002 and 1997, electrocautery was used in almost 90% of cases, of which bipolar energy alone was used in 1196 (92.2%), unipolar alone in 91 (4.8%) and both in 763 (42.8%). Ultracision remained the second most common energy source and was used in 1.4%. Sutures were used in only about 5%, which was similar to that in 2002 and 1997.

	1997	2002	2007
Electrocautery	1277 (92.2%)	2141 (89.2%)	2050 (91.9%)
Ligature	-	-	4 (0.2%)
Plasmakinetic	-	-	11 (0.5%)
Suture	72 (5.2%)	118 (4.9%)	103 (4.6%)
Endoloop	30 (2.2%)	19 (0.8%)	8 (0.4%)
Laser	45 (3.2%)	17 (0.7%)	4 (0.2%)
Ultracision	0 (0.0%)	24 (1.0%)	31 (1.4%)
Clips/Staples	8 (0.6%)	6 (0.3%)	4 (0.2%)
Use of drain	102 (7.4%)	172 (7.2%)	109 (4.9%)

Data are presented as number and percentage of total number of patients

OPERATIVE PROCEDURES

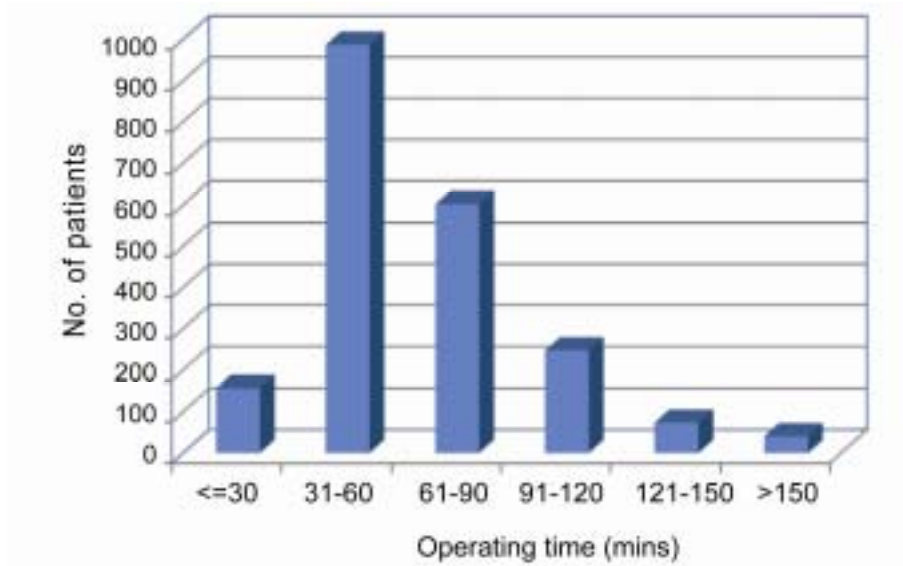
The types and distribution of procedures performed were similar to that in 2002 and 1997. Cystectomy remained the most common procedure performed. In 2007, hysterectomy for uterine prolapse was classified as level 3 procedure and there was a total of 15 cases.

	1997	2002	2007
Cystectomy	897 (64.8%)	1756 (73.3%)	1536 (68.9%)
Salpingo-oophorectomy	149 (10.8%)	305 (12.7%)	318 (14.3%)
Adhesiolysis	259 (18.7%)	498 (20.8%)	245 (11.0%)
Salpingostomy	161 (11.6%)	163 (6.8%)	141 (6.3%)
Salpingectomy	102 (7.4%)	121 (5.0%)	115 (5.2%)
Ablation of endometriosis	102 (7.4%)	228 (9.5%)	102 (4.6%)
Myomectomy	43 (3.1%)	66 (2.8%)	102 (4.6%)
Oophorectomy	30 (2.2%)	62 (2.6%)	46 (2.1%)
Resection of endometriosis	-	-	42 (1.9%)
Hysterectomy	-	-	15 (0.7%)
Miscellaneous	21 (1.5%)	18 (0.8%)	32 (1.4%)

Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 68.9 (SD 32.3) minutes, compared to 67.8 (SD 33.4) in 2002 and 71.5 (SD 36.2) in 1997. The operation was completed within 30 minutes in 157 (7.5% versus 10.2% in 2002 and 9.3% in 1997) and exceeded 120 minutes in 115 (5.5% versus 5.8% in 2002 and 6.2% in 1997) patients.



Number of missing data: 122 (5.5%)

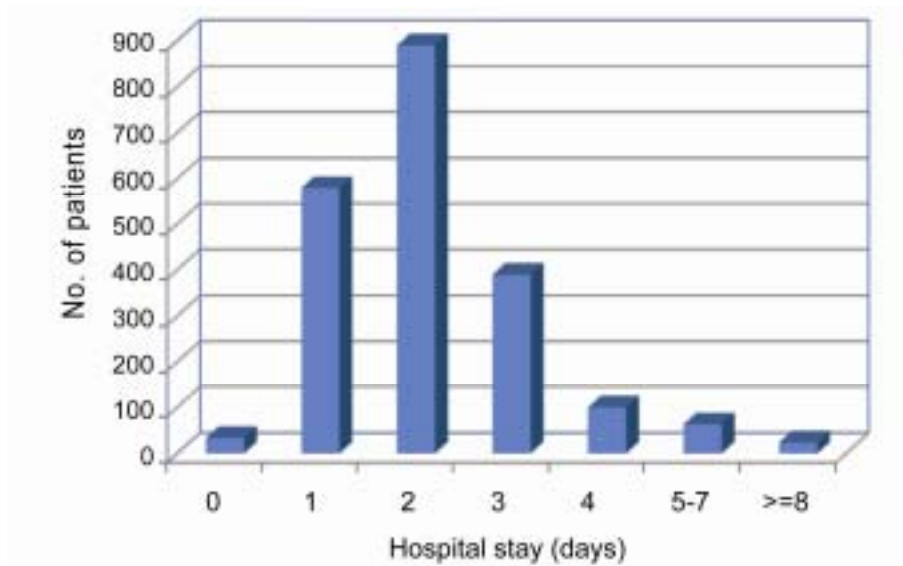
Distribution of operating time

	1997	2002	2007
≤ 30 minutes	127 (9.3%)	241 (10.2%)	157 (7.5%)
31 – 60 minutes	622 (45.7%)	1081 (45.8%)	987 (46.8%)
61 – 90 minutes	364 (26.7%)	637 (27.0%)	602 (28.6%)
91 – 120 minutes	163 (12.0%)	262 (11.1%)	247 (11.7%)
121 – 150 minutes	43 (3.2%)	86 (3.6%)	74 (3.5%)
151 – 180 minutes	27 (2.0%)	32 (1.4%)	31 (1.5%)
> 180 minutes	15 (1.1%)	19 (0.8%)	10 (0.5%)
Total	1361	2358	2108

Number of missing data: 24 (1.7%) in 1997, 41 (1.7%) in 2002 and 122 (5.5%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.3 (SD 2.7) days, compared to 2.3 (SD 1.7) in 2002 and 2.3 (SD 2.2) in 1997. Similar to previous audits, 1.6% of patients were discharged on the day of operation and 1.2% stayed longer than 7 days.



Number of missing data: 149 (6.7%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	23 (1.7%)	40 (1.7%)	34 (1.6%)
1 day	390 (28.7%)	624 (26.3%)	580 (27.9%)
2 days	523 (38.4%)	926 (39.0%)	890 (42.8%)
3 days	275 (20.2%)	479 (20.2%)	390 (18.7%)
4 days	75 (5.5%)	156 (6.6%)	100 (4.8%)
5 – 7 days	61 (4.5%)	124 (5.2%)	63 (3.0%)
8 – 14 days	11 (0.8%)	17 (0.7%)	16 (0.8%)
≥ 15 days	3 (0.2%)	6 (0.5%)	8 (0.4%)
Total	1361	2372	2081

Number of missing data: 24 (1.7%) in 1997, 27 (1.1%) in 2002 and 149 (6.7%) in 2007

CONVERSION

Conversion was necessary in 24 (1.1%) patients, compared to 1.8% in 2002 and 0.9% in 1997. Dense adhesions accounted for most of the conversion (62.5% versus 56.8% in 2002 and 53.8% in 1997). Bowel injury was suspected in a woman with ovarian endometrioma and mild adhesions and was not confirmed on laparotomy. There were 1 case was suspected bowel adhesion at umbilicus and 2 cases of surgical emphysema, one of which was in the omentum and the other was not stated.

	1997	2002	2007
Dense adhesions	7 (0.5%)	25 (1.0%)	15 (0.7%)
Uncontrolled haemorrhage	4 (0.3%)	2 (0.08%)	4 (0.2%)
Organ injury	0 (0.0%)	2 (0.08%)	1 (0.04%)
Poor pelvic access	0 (0.0%)	1 (0.04%)	1 (0.04%)
Carcinoma of ovary	0 (0.0%)	1 (0.04%)	0 (0.0%)
Failure in specimen removal	1 (0.07%)	0 (0.0%)	0 (0.0%)
Severe haemoperitoneum	1 (0.07%)	0 (0.0%)	0 (0.0%)
Emphysema	0 (0.0%)	0 (0.0%)	2 (0.09%)
Unspecified	0 (0.0%)	13 (0.5%)	0 (0.0%)
Total	13 (0.9%)	44 (1.8%)	24 (1.1%)

Data are presented as number and percentage of total number of patients

COMPLICATIONS

Sixty-six (3.0%) patients developed complications, compared to 3.5% in 2002 and 5.7% in 1997. The incidence of febrile morbidity dropped from 1.4% in 1997 and 0.5% in 2002 to 0.3% in 2007 but that of organ injury remained about 0.3%. There was one death being reported, and the details were stated on page 20.

	1997	2002	2007
Bowel injury	2 (0.1%)	3 (0.1%)	7 (0.3%)
Ureteric injury	0 (0.0%)	1 (0.04%)	0 (0.0%)
Vascular injury	0 (0.0%)	2 (0.1%)	0 (0.0%)
Inferior epigastric artery injury	2 (0.1%)	2 (0.08%)	1 (0.04%)
Haemorrhage with transfusion	5 (0.4%)	1 (0.04%)	5 (0.2%)
Subcutaneous haemorrhage	2 (0.1%)	2 (0.08%)	0 (0.0%)
Emphysema	1 (0.05%)	7 (0.3%)	4 (0.2)
Febrile morbidity	19 (1.4%)	11 (0.5%)	6 (0.3%)
Urinary tract infection	9 (0.6%)	6 (0.3%)	5 (0.2%)
Retention of urine	10 (0.7%)	3 (0.1%)	2 (0.1%)
Wound infection	5 (0.4%)	6 (0.3%)	3 (0.1%)
Pelvic haematoma	1 (0.05%)	4 (0.2%)	1 (0.04%)
Ileus	0 (0.0%)	1 (0.04%)	2 (0.08%)
Incisional hernia	2 (0.1%)	0 (0.0%)	0 (0.0%)
Persistent ectopic pregnancy	3 (0.2%)	0 (0.0%)	0 (0.0%)
Conversion	13 (0.9%)	44 (1.8%)	24 (1.1%)
Re-admission	6 (0.4%)	10 (0.4%)	11 (0.5%)
Re-operation	4 (0.3%)	0 (0.0%)	3 (0.1%)
Death	1 (0.05%)	0 (0.0%)	1 (0.04%)
Total	79 (5.7%)	85 (3.5%)	66 (3.0%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

Three patients required re-operation, giving an incidence of 0.1%, compared to 0.04% in 2002 and 0.3% in 1997. One patient had a right ovarian cyst and underwent salpingo-oophorectomy, which turned out to be a papillary serous cystadenoma of borderline malignancy. She subsequently underwent staging laparotomy and pelvic lymph node dissection. The other patient had drainage of tubo-ovarian abscess and complicated by bowel injury and had a re-laparoscopy 2 days later. It was commented that the view was limited due to dilated bowels and the outcome of the patient was not reported. The third patient had bilateral ovarian cysts and underwent bilateral ovarian cystectomy. She had a re-operation and subsequent died, the detail was stated on page 20.

	1997	2002	2007
Unexpected malignancy	1 (0.07%)	0 (0.0%)	1 (0.04%)
Unrecognized bowel injury	0 (0.0%)	0 (0.0%)	1 (0.04%)
Small bowel herniation	1 (0.07%)	0 (0.0%)	0 (0.0%)
Peritonitis	1 (0.07%)	0 (0.0%)	0 (0.0%)
Persistent ectopic pregnancy	1 (0.07%)	0 (0.0%)	0 (0.0%)
Post-operative fever and ileus	0 (0.0%)	1 (0.04%)	0 (0.0%)
Unspecified	0 (0.0%)	0 (0.0%)	1 (0.04%)
Total	4 (0.3%)	1 (0.04%)	3 (0.1%)

Data are presented as number and percentage of total number of patients

RE-ADMISSION

Eleven patients required re-admission to hospital with an incidence of 0.5%, compared to 0.4% in 2002 and 1997.

	1997	2002	2007
Pelvic infection	2 (0.4%)	1 (0.04%)	1 (0.04%)
Persistent ectopic pregnancy	2 (0.4%)	2 (0.08%)	2 (0.09%)
Unrelated problems	2 (0.4%)	3 (0.1%)	3 (0.1%)
Wound infection	0 (0.0%)	2 (0.08%)	2 (0.09%)
Pelvic haematoma	0 (0.0%)	1 (0.04%)	0 (0.0%)
Vault bleeding	0 (0.0%)	0 (0.0%)	2 (0.09%)
Unspecified	0 (0.0%)	1 (0.04%)	1 (0.04%)
Total	6 (0.4%)	10 (0.4%)	11 (0.5%)

Data are presented as number and percentage of total number of patients

COMPARISON BETWEEN ELECTIVE AND EMERGENCY OPERATIONS

The operation was performed as an emergency operation in 296 (14.3% versus 16.1% in 2002) cases and elective operation in 1779 (85.7% versus 80.9% in 2002) cases. Information was not available in 155 (7.0% versus 2.9% in 2002). This information was not captured in 1997.

Emergency operation was associated with younger age, increased blood loss, and operative morbidity.

	Elective N = 1779	Emergency N = 296	P-value
Age (years)	37.7 ± 9.6	32.6 ± 8.2	<0.01
Operating time (min)	68.8 ± 32.1	68.1 ± 32.8	NS
Blood loss (ml)	53 ± 82	108 ± 243	<0.001
Post-operative hospital stay (days)	2.2 ± 2.9	2.8 ± 1.8	NS
Conversion	18 (1.0)	6 (2.0)	NS
Complication	46 (2.6)	19 (6.4)	0.02
Re-admission	2 (0.1)	1 (0.3)	NS

Data are presented as mean ± SD or N (%)

NS: Not significant

4

LAPAROSCOPIC SURGERY – LEVEL 4 PROCEDURES

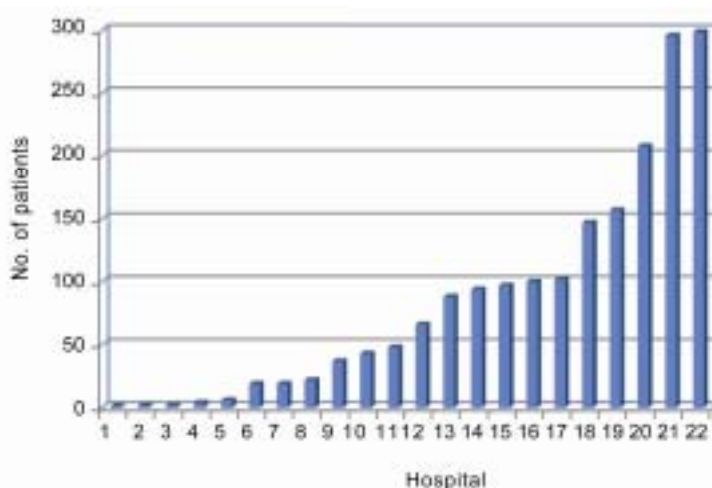
Total number of patients

1857

Compared to 2002, the number of level 4 procedures almost doubled with the actual number increased from 417 in 1997 and 982 in 2002 to 1857 in 2007.

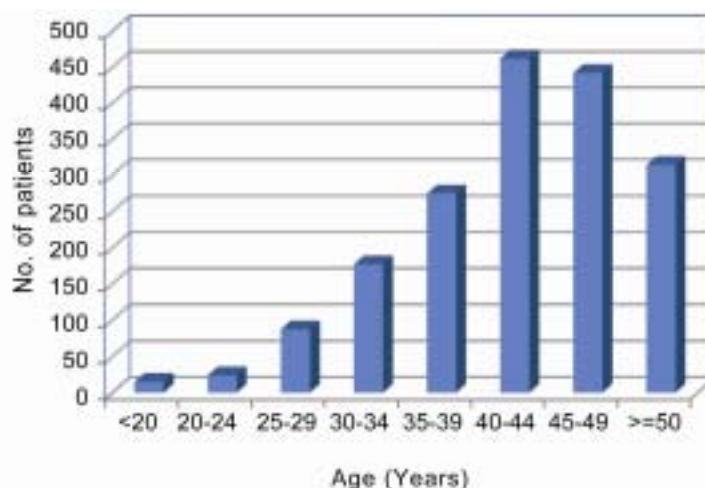
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Thirteen units (59.1%) performed more than 50 Level 4 procedures a year compared to 52.6% in 2002 and 31.3% in 1997. Two units performed almost 300 cases a year while 5 units performed less than 10.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 43.0 (SD 9.6) years, compared to 41.8 (SD 10.3) in 2002 and 41.7 (SD 11.2) in 1997. The age distribution was also similar to that in 1997 with the peak incidence at age 40-44. A total of 17.5% (17.1% in 2002 and 15.8% in 1997) patients aged 50 or above and 7.0% (9.9% in 2002 and 12.8% in 1997) were younger than 30.



Number of missing data: 61 (3.3%)

Distribution of age

	1997	2002	2007
< 20 years	8 (1.9%)	12 (1.2%)	15 (0.8%)
20 - 24 years	11 (2.6%)	29 (3.0%)	24 (1.3%)
25-29 years	34 (8.2%)	55 (5.7%)	87 (4.8%)
30 – 34 years	53 (12.7%)	123 (12.7%)	177 (9.9%)
35 – 39 years	75 (18.0%)	156 (16.1%)	275 (15.3%)
40 – 44 years	91 (21.8%)	236 (24.4%)	462 (25.7%)
45 – 49 years	75 (18.0%)	190 (19.7%)	442 (24.6%)
≥ 50 years	66 (15.8%)	165 (17.1%)	314 (17.5%)
Total	413	966	1796

Number of missing data: 4 (1.0%) in 1997, 16 (1.6%) in 2002 and 61 (3.3%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to previous audits, the operation was mainly performed by specialists (91.5% versus 85.4% in 2002 and 83.5% in 1997). Pre-MRCOG doctors performed only 45 procedures (2.7% versus 3.2% in 2002 and 2.2% in 1997) of which 86.7% were assisted by specialists. The operations were assisted by specialists in 33.5% (48.1% in 2002 and 42.0% in 1997) and by nurses in 47.4% (26.4% in 2002 and 20.2% in 1997) of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	1	4	39	1	45
MRCOG	22	1	75	0	98
FHKAM	192	99	448	792	1531
Total	215	104	562	793	1674

Number of missing data: 183 (9.9%)

Only 9% (29.2% in 2002) of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 16.7% (10% in 2002) were assisted by doctors without accreditation and 20% (41.2%) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 17.3% (24.3% in 2002), which 58.0% (50.5% in 2002) were assisted by doctors without advanced accreditation. For those procedures performed by doctors with advanced accreditation, 13.7% (27.4% in 2002) were assisted by doctors without accreditation and 60.0% (32.2% in 2002) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	24	31	60	29	144
Intermediate	100	60	109	7	276
Advanced	160	117	191	704	1172
Total	284	208	360	740	1592

Number of missing data: 265 (14.3%)

OPERATIVE DIAGNOSIS

The types and distributions of pathologies were similar to that in 1997. Fibroid was the most common diagnosis and accounted for 51.4% (42.2% in 2002 and 36.0% in 1997) of the cases. There was a significant increase in the number of endometrial hyperplasia, carcinoma o corpus and CIN in 2007.

	1997	2002	2007
Fibroid	150 (36.0%)	414 (42.2%)	954 (51.4%)
Endometrioma	63 (15.1%)	139 (14.2%)	337 (18.2%)
Endometriosis	71 (17.0%)	153 (15.6%)	252 (13.6%)
Adenomyosis	21 (5.0%)	69 (7.0%)	199 (10.7%)
Ovarian cyst	53 (12.7%)	153 (15.6%)	196 (10.6%)
Adhesions	110 (26.4%)	236 (24.0%)	180 (9.7%)
Dermoid	27 (6.5%)	43 (4.4%)	109 (5.9%)
Endometrial hyperplasia	6 (1.4%)	4 (0.4%)	89 (4.8%)
CIN	15 (3.6%)	4 (0.4%)	60 (3.2%)
Hydrosalpinx	11 (2.6%)	22 (2.2%)	44 (2.4%)
Carcinoma of corpus	4 (1.0%)	5 (0.5%)	40 (2.2%)
Tubo-ovarian abscess	9 (2.2%)	33 (3.4%)	27 (1.5%)
Genital prolapse	15 (3.6%)	4 (0.4%)	35 (1.9%)
Para-ovarian cyst	5 (1.2%)	53 (5.4%)	21 (1.1%)
DUB	14 (3.4%)	17 (1.7%)	17 (0.9%)
Genuine stress incontinence	5 (1.2%)	20 (2.0%)	13 (0.7%)
Pyosalpinx	1 (0.2%)	22 (2.2%)	11 (0.6%)
Carcinoma of cervix	5 (1.2%)	3 (0.3%)	8 (0.4%)
Adenocarcinoma-in-situ	-	-	5 (0.3%)
Microinvasive Ca of cervix	-	-	6 (0.3%)
Carcinoma of ovary	-	-	3 (0.2%)
Smooth muscle tumour	-	-	4 (0.2%)
Miscellaneous	23 (5.5%)	5 (0.5%)	57 (3.1%)

Data are presented as number and percentage of total number of patients

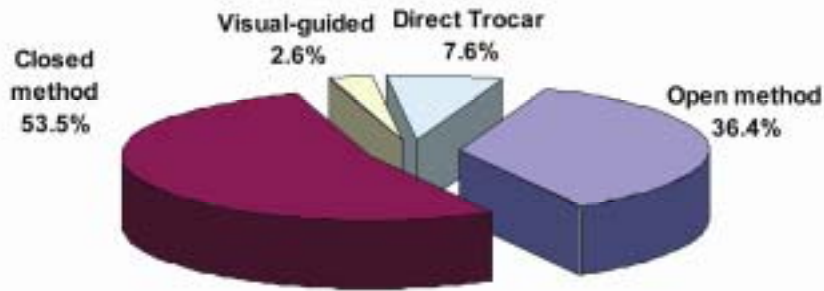
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 53.5% (64.4% in 2002) of cases. Open method was used in 36.4% (34.0% in 2002) and visually guided trocar in 2.6% (5.4% in 2002) cases.

	2002	2007
Closed method	568 (64.4%)	974 (53.5%)
Open method	320 (34.0%)	662 (36.4%)
Visual guided	53 (5.6%)	47 (2.6%)
Direct trocar	0 (0.0%)	138 (7.4%)
Total	941	1821

No. of missing data: 41 (4.2%) in 2002 and 36 (1.9%) in 2007



Number of missing data: 36 (1.9%)

The primary trocar was inserted through the umbilical incision in 95.5%, compared to 98.2% in 2002. Supraumbilical insertion was used more frequent in 2007 (3.8% versus 0.5% in 2002) while left upper quadrant insertion was used in only 0.7% (1.2% in 2002). Information on site of primary trocar entry was not available in 105 (5.7%)

	2002	2007
Umbilical	898 (98.2%)	1674 (95.5%)
Supraumbilical	5 (0.5%)	66 (3.8%)
Left upper quadrant	11 (1.2%)	12 (0.7%)
Total	914	1752

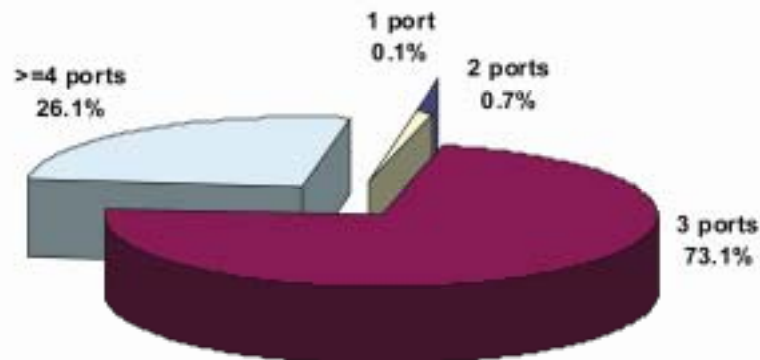
Number of missing data: 68 (6.9%) in 2002 and 105 (5.7%) in 2007 respectively

Number of ports used

Three ports were used in performing the surgery in 73.0% (68.3% in 2002) of cases. Four or more ports were used in 26.2% (28.9% in 2002), of which 5 ports were used in 7 cases. Two or less ports were reported to be used in 14 cases.

	2002	2007
≤ 2 ports	8 (0.9%)	14 (0.8%)
3 ports	630 (68.3%)	1316 (73.1%)
4 ports	284 (30.8%)	460 (25.6%)
> 4 ports	1 (0.1%)	10 (0.6%)
Total	923	1800

Number of missing data: 59 (6.0%) in 2002 and 57 (3.1%) in 2007



Number of missing data: 57 (3.1%)

Surgical Modalities

Similar to previous audits, electrocautery was used in 91.7% of cases (90.0% in 2002 and 92.8% in 1997); of which bipolar energy alone was used in 523 (39.0% in 2002), unipolar alone in 191 (1.7% in 2002) and both in 988 (59.3% in 2002). Suture was used in 21.2% compared to 12.5% in 1997. Ultracision, which was not used in 1997, was used in 9.5% (12.9% in 2002). There was also an increased use of pelvic drain from 7.4% in 1997 to 20.3 in 2002 and 18.0% in 2007.

	1997	2002	2007
Electrocautery	387 (92.8%)	884 (90.0%)	1702 (91.7%)
Ligature	-	-	130 (7.0%)
Plasmakinetic	-	-	202 (10.9%)
Suture	52 (12.5%)	208 (21.2%)	664 (35.8%)
Endoloop	19 (4.6%)	19 (1.9%)	22 (1.2%)
Laser	22 (5.3%)	3 (0.3%)	2 (0.1%)
Ultracision	0 (0.0%)	127 (12.9%)	176 (9.5%)
Clips/Staples	24 (5.8%)	7 (0.7%)	10 (0.5%)
Use of drain	102 (7.4%)	199 (20.3%)	334 (18.0%)

Data are presented as number and percentage of total number of patients

OPERATIVE PROCEDURES

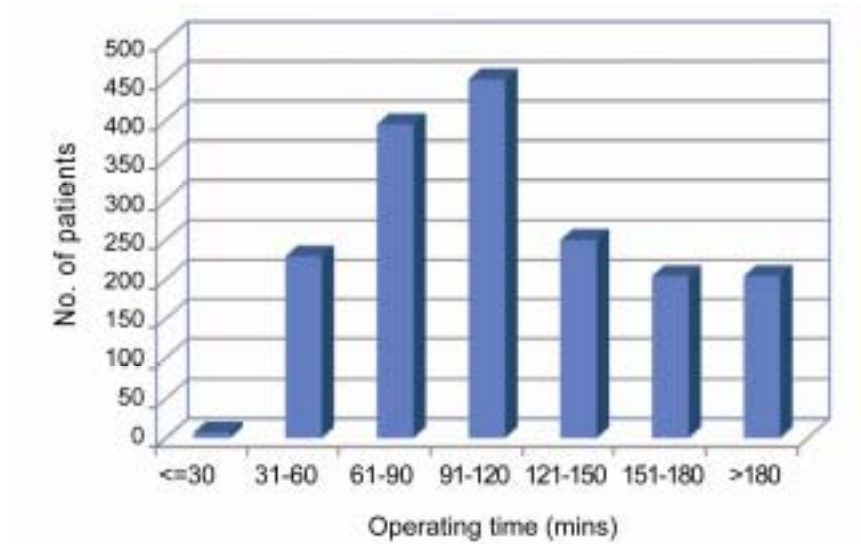
Hysterectomy was the commonest procedure followed by complicated adnexal surgery. Myomectomy became the third most common procedure.

	1997	2002	2007
Hysterectomy	208 (49.9%)	479 (48.8%)	973 (52.4%)
Adnexal surgery	199 (47.7%)	331 (33.7%)	559 (30.1%)
Myomectomy	39 (9.4%)	127 (12.9%)	318 (17.1%)
Adhesiolysis	71 (17.0%)	130 (13.2%)	183 (9.9%)
Ablation of endometriosis	11 (2.6%)	44 (4.5%)	63 (3.4%)
Resection of endometriosis	-	-	53 (2.8%)
Colposuspension	5 (1.2%)	22 (2.2%)	11 (0.6%)
Drainage of abscess	5 (1.2%)	20 (2.0%)	12 (0.6%)
Adenomyomectomy	-	-	5 (0.3%)
LUNA	6 (1.4%)	10 (1.0%)	1 (0.05%)
Miscellaneous	1 (0.2%)	3 (0.3%)	9 (0.5%)

Data are presented as number and percentage of total number of patients

OPERATING TIME

The distribution of operating time was similar to that in 2002 and 1997. The mean operating time was 121.8 (SD 57.2) minutes, compared to 114.6 (SD 57.6) in 2002 and 104.6 (SD 49.2) in 1997. The operation was completed within 30 minutes in 0.4 % (2.2% in 2002 and 3.4% in 1997) and exceeded 120 minutes in 37.8% (32.1% in 2002 and 23.7% in 1997).



Number of missing data: 116 (6.2%)

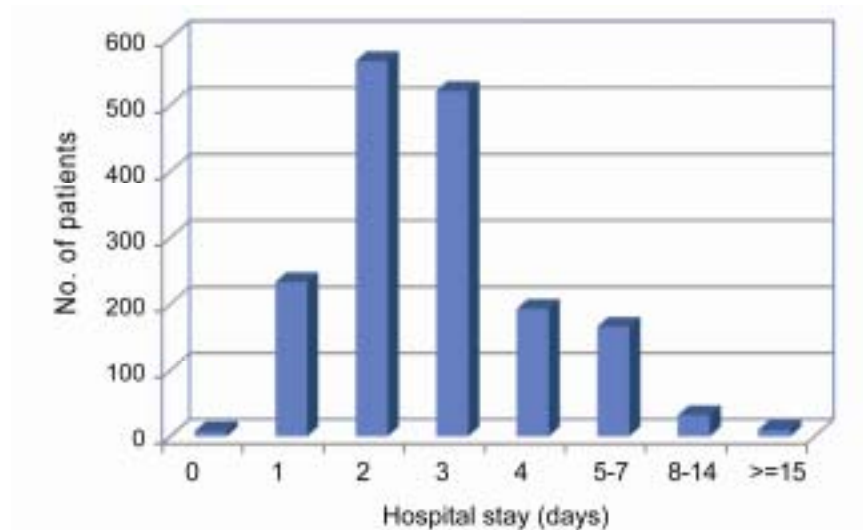
Distribution of operating time

	1997	2002	2007
≤ 30 minutes	14 (3.4%)	21 (2.2%)	7 (0.4%)
31 – 60 minutes	80 (19.3%)	155 (16.0%)	229 (13.2%)
61 – 90 minutes	118 (28.5%)	221 (22.8%)	395 (22.7%)
91 – 120 minutes	104 (25.1%)	262 (27.0%)	452 (26.0%)
121 – 150 minutes	35 (8.5%)	125 (12.9%)	250 (14.4%)
151 – 180 minutes	33 (8.0%)	87 (9.0%)	204 (11.7%)
> 180 minutes	30 (7.2%)	100 (10.3%)	204 (11.7%)
Total	414	971	1741

Number of missing data: 3 (0.7%) in 1997, 11 (1.1%) in 2002 and 116 (6.2%) in 2007

POST-OPERATIVE HOSPITAL STAY

The distribution of post-operative hospital stay was similar to that in 2002 and 1997. The mean post-operative hospital stay was 3.0 (SD 2.1) days, compared to 3.3 (SD 2.3) in 2002 and 3.6 (SD 3.0) in 1997. Eight patients (0.5% versus 1.0% in 2002 and 0.5% in 1997) were discharged on the day of operation and 42 (24% versus 4.1% in 2002 and 5.5% in 1997) stayed longer than 7 days.



Number of missing data: 128 (6.9%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	2 (0.5%)	10 (1.0%)	8 (0.5%)
1 day	52 (12.7%)	78 (8.0%)	233 (13.5%)
2 days	100 (24.2%)	307 (31.6%)	566 (32.7%)
3 days	125 (30.2%)	301 (31.0%)	521 (30.1%)
4 days	44 (10.6%)	118 (12.2%)	193 (11.2%)
5 – 7 days	68 (16.4%)	117 (12.0%)	166 (9.6%)
8 – 14 days	17 (4.1%)	36 (3.7%)	32 (1.9%)
≥ 15 days	6 (1.4%)	4 (0.4%)	10 (0.6%)
Total	414	971	1729

Number of missing data: 3 (0.7%) in 1997, 11 (1.1%) in 2002 and 128 (6.9%) in 2007

COMPLICATIONS

The overall complication rate was 7.6% and was lower than that in 2002 (9.5%) and 1997 (18.0%). The incidence of febrile morbidity decreased from 5.8% in 197 and 1.9% in 2002 to 1.0% in 2007. The incidence of organ injury also decreased from 2.2% in 1997 to 1.2% in 2002 and 1.3% in 200 but the rate of bowel injury increased from 0.2% in 1997 and 0.3% in 2002 and 0.6% in 2007.

	1997	2002	2007
Bladder injury	5 (1.2%)	5 (0.5%)	10 (0.5%)
Ureteric injury	2 (0.5%)	3 (0.3%)	3 (0.2%)
Bowel injury	1 (0.2%)	3 (0.3%)	11 (0.6%)
Inferior epigastric artery injury	1 (0.2%)	1 (0.1%)	0 (0.0%)
Haemorrhage with transfusion	10 (2.4%)	14 (1.4%)	30 (1.6%)
Febrile morbidity	24 (5.8%)	19 (1.9%)	18 (1.0%)
Urinary tract infection	8 (1.9%)	5 (0.5%)	8 (0.4%)
Retention of urine	8 (1.9%)	3 (0.3%)	6 (0.3%)
Wound infection/haematoma	8 (1.9%)	3 (0.3%)	1 (0.1%)
Pelvic/Vault haematoma	3 (0.7%)	14 (1.4%)	14 (0.8%)
Ileus	0 (0.0%)	2 (0.2%)	0 (0.0%)
Deep vein thrombosis	1 (0.2%)	3 (0.3%)	2 (0.1%)
Incisional hernia	1 (0.2%)	0 (0.0%)	0 (0.0%)
Conversion	19 (4.6%)	25 (2.5%)	49 (2.6%)
Re-admission	4 (1.0%)	15 (1.5%)	13 (0.7%)
Re-operation	2 (0.5%)	0 (0.0%)	2 (0.1%)
Miscellaneous	4 (1.0%)	3 (0.3%)	4 (0.2%)
Total	75 (18.0%)	93 (9.5%)	142 (7.6%)

Data are presented as number and percentage of total number of patients

CONVERSION

Conversion to laparotomy was necessary in 47 (2.5%) cases, compared to 2.5% in 2002 and 4.6% in 1997. The main reasons for conversion were due to the presence of dense adhesions (34.0% in 2007 versus 40% in 2002 and 52.6% in 1997) and large pelvic mass (04% in 2007 versus 32% in 2002 and 0% in 1997).

	1997	2002	2007
Dense adhesions	10 (2.4%)	10 (1.0%)	16 (0.9%)
Large pelvic mass	0 (0.0%)	8 (0.8%)	7 (0.4%)
Uncontrolled haemorrhage	2 (0.5%)	2 (0.2%)	8 (0.4%)
Bladder injury	2 (0.5%)	1 (0.1%)	0 (0.0%)
Ureteric injury	1 (0.2%)	0 (0.0%)	1 (0.05%)
Bowel injury	1 (0.2%)	1 (0.1%)	7 (0.4%)
Poor pelvic access	1 (0.2%)	1 (0.1%)	4 (0.2%)
Unexpected malignancy	1 (0.2%)	0 (0.0%)	1 (0.05%)
Surgical emphysema	0 (0.0%)	0 (0.0%)	1 (0.05%)
Broken needle	0 (0.0%)	1 (0.1%)	0 (0.0%)
Unspecified	0 (0.0%)	1 (0.1%)	2 (0.1%)
Total	19 (4.6%)	25 (2.5%)	47 (2.5%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

One patient (0.1%) required re-operation for colostomy following a perforation of sigmoid colon during a laparoscopic hysterectomy and salpingo-oophorectomy. Another patient had a re-operation following laparoscopic oophorectomy for a 8 cm dermoid cyst. There was no other complications and the reason for re-operation was reported to be adhesions.

	1997	2002	2007
Intraperitoneal haemorrhage	1 (0.2%)	0 (0.0%)	0 (0.0%)
Incomplete drainage of abscess	1 (0.2%)	0 (0.0%)	0 (0.0%)
Repair of ureteric fistula	0 (0.0%)	1 (0.1%)	0 (0.0%)
Bowel injury	0 (0.0%)	0 (0.0%)	1 (0.05%)
Adhesions	0 (0.0%)	0 (0.0%)	1 (0.05%)
Total	2 (0.3%)	1 (0.1%)	2 (0.1%)

Data are presented as number and percentage of total number of patients

RE-ADMISSION

Compared to previous audits, re-admission rate increased from 0.4% in 1997 to 1.5% in 2002, and decreased to 0.8% in 2007. Secondary haemorrhage and acute pelvic infection were the most common reasons for re-admission to hospital.

	1997	2002	2007
Secondary haemorrhage	2 (0.5%)	5 (0.5%)	4 (0.2%)
Acute pelvic infection	0 (0.0%)	2 (0.2%)	4 (0.2%)
Repair of ureteric fistula	0 (0.0%)	1 (0.1%)	1 (0.05%)
Wound problem	1 (0.2%)	1 (0.1%)	2 (0.1%)
Bowel obstruction	0 (0.0%)	0 (0.0%)	1 (0.05%)
Fever	0 (0.0%)	0 (0.0%)	1 (0.05%)
Unrelated problems	1 (0.2%)	0 (0.0%)	0 (0.0%)
Unspecified	0 (0.0%)	6 (0.6%)	1 (0.05%)
Total	4 (0.4%)	15 (1.5%)	14 (0.8%)

Data are presented as number and percentage of total number of patients

COMPARISON BETWEEN ELECTIVE AND EMERGENCY OPERATIONS

The operation was performed as an emergency operation in 88 (4.7% versus 8.5% in 2002) cases and elective operation in 1665 (89.7% versus 89.0% in 2002) cases. Information was not available in 104 (5.6% versus 2.5%). This information was not captured in 1997 and therefore there was no data for comparison.

Emergency operation was associated with shorter operating time and longer post-operative length of stay. There were no differences in the conversion rate, re-admission rate and overall complication rate.

	Elective N =1665	Emergency N = 88	P-value
Age (years)	43.6 ± 9.5	36.1 ± 8.9	NS
Operating time (min)	122.6 ± 56.8	97.4 ± 44.4	0.03
Blood loss (ml)	195 ± 232	122 ± 203	NS
Post-operative hospital stay (days)	2.9 ± 2.1	3.8 ± 3.7	<0.001
Conversion	125/1665 (7.5)	7/88 (8.0)	NS
Complication	40/1665 (2.4)	4/88 (4.5)	NS
Re-admission	14/1665 (0.8)	0/88 (0.0)	NS

Data are presented as mean ± SD or N (%)

NS: Not significant

5

LAPAROSCOPIC SURGERY - LEVEL 5 PROCEDURES

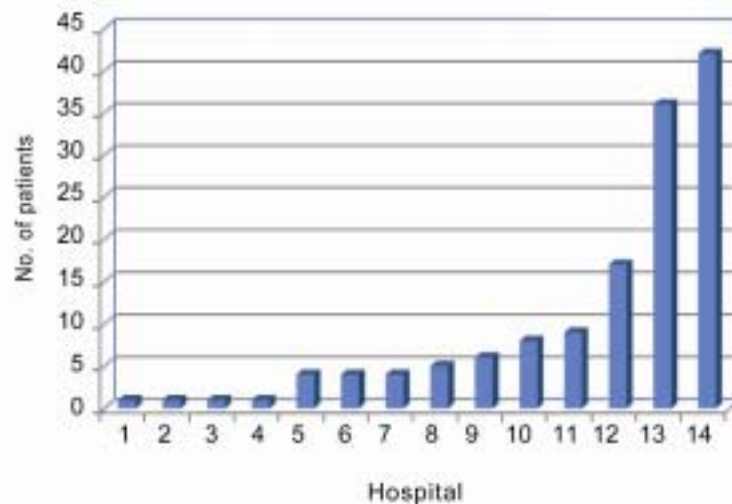
Total number of patients

139

The number of level 5 procedures increased from 6 in 1997 to 14 in 2002 and 139 in 2007.

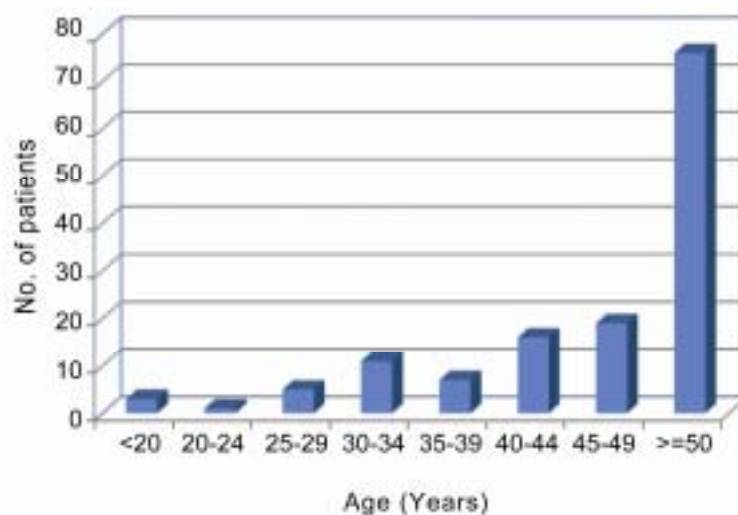
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Level 5 procedures were performed in 14 units, compared to only 3 in 2002. Most units performed less than 10 procedures with only 2 units performed more than 30 procedures.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 50.7 (SD 14.0) years, compared to 47.4 (SD 8.9) in 2002. Three patients were younger than 20 and 55.1% aged 50 or above.



Number of missing data: 1 (0.7%)

Distribution of age

	2002	2007
< 20 years	0 (0.0%)	3 (2.2%)
20 – 24 years	0 (0.0%)	1 (0.7%)
25 – 29 years	0 (0.0%)	5 (3.6%)
30 – 34 years	0 (0.0%)	11 (8.0%)
35 – 39 years	3 (21.4%)	7 (5.1%)
40 – 44 years	2 (14.3%)	16 (11.6%)
45 – 49 years	5 (35.7%)	19 (13.8%)
50 – 54 years	4 (28.6%)	20 (14.5%)
55 – 59 years	0 (0.0%)	22 (15.9%)
≥ 60 years	0 (0.0%)	34 (24.6%)
Total	14	138

Number of missing data: 0 (0.0%) in 2002 and 1 (0.7%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

As in 2002, all the procedures were performed by specialists. Most of the procedures were assisted by specialists (87.8%), with only 8 (6.1%) assisted by nurses, 6 (4.6%) by doctors with MRCOG and 2 (1.5%) by trainees.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	0	0	0	0	0
MRCOG	0	0	0	0	0
FHKAM	2	6	115	8	131
Total	2	6	115	8	131

Number of missing data: 7 (5.0%)

The procedures were performed by doctors with advanced level of accreditation in 97 (77.0%) cases, of which 12.3% were assisted by doctors with accreditation and 8.2% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 24.6%, 35% of which were assisted by doctors without advanced accreditation. For those procedures performed by doctors without accreditation, a third of them were assisted by doctors with our accreditation.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	3	4	2	0	9
Intermediate	2	5	13	0	20
Advanced	12	22	55	8	97
Total	17	31	70	8	126

Number of missing data: 13 (9.4%)

OPERATIVE DIAGNOSIS

Genital malignancy accounted for about 3 quarters of the diagnoses (105 or 75.5%) with carcinoma of corpus being the most common diagnosis, followed by carcinoma of cervix. Genital prolapse was reported in 22 patients, accounting for 15.8%, of which 13 were uterine prolapse and 9 vault prolapse. In contrast to 2002, all except one patient were diagnosed to have carcinoma of corpus, the remaining one had uterine fibroid and pelvic endometriosis.

	2002	2007
Carcinoma of corpus	13 (92.9%)	60 (43.2%)
Carcinoma of cervix	0 (0.0%)	30 (21.6%)
Carcinoma of ovary	0 (0.0%)	7 (5.0%)
Uterine prolapse	0 (0.0%)	12 (8.6%)
Cystocele	0 (0.0%)	11 (7.9%)
Enterocele	0 (0.0%)	2 (1.4%)
Rectocele	0 (0.0%)	2 (1.4%)
Vault prolapse	0 (0.0%)	9 (6.5%)
Genuine stress incontinence	0 (0.0%)	2 (1.4%)
Previous tubal occlusion	0 (0.0%)	5 (3.6%)
Benign ovarian cyst	0 (0.0%)	5 (3.6%)
Borderline ovarian tumour	0 (0.0%)	2 (1.4%)
Uterine sarcoma	0 (0.0%)	2 (1.4%)
Germ cell ovarian tumour	0 (0.0%)	3 (2.2%)
Ca vulva with right PLN	0 (0.0%)	1 (0.7%)
Fibroid with endometriosis	1 (7.1%)	0 (0.0%)
Total	14	139

Data are presented as number and percentage of total number of patients

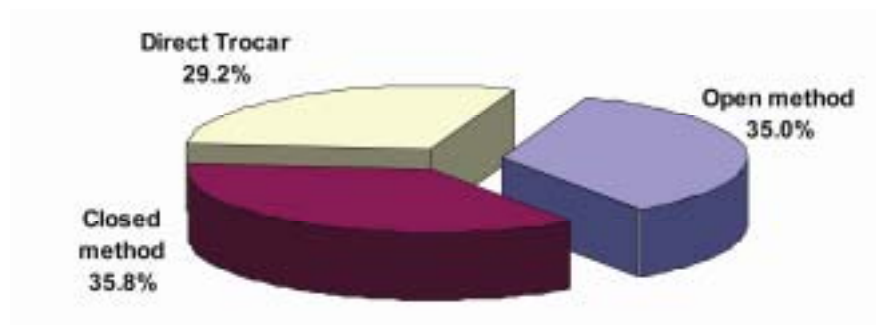
OPERATIVE TECHNIQUES

Primary trocar entry technique

The technique for primary trocar entry was almost evenly distributed among the closed method (35.8%), open method (35.0%) and direct trocar (29.2%). Visually guided trocar was not used.

	2002	2007
Closed method	12 (85.7%)	49 (35.8%)
Open method	2 (14.3%)	48 (35.0%)
Visual guided	0 (0.0%)	0 (0.0%)
Direct trocar	0 (0.0%)	40 (29.2%)
Total	14	139

No. of missing data: 4 (1.4%) in 2007



Number of missing data: 2 (1.4%)

The primary trocar was inserted through the umbilical incision in 87.1%, and supraumbilically in 11.4%. The left upper quadrant insertion was used in only 1.4%.

	2002	2007
Umbilical	13 (92.9%)	115 (87.1%)
Supraumbilical	0 (0.0%)	15 (11.4%)
Left upper quadrant	1 (7.1%)	1 (1.4%)
Total	14	132

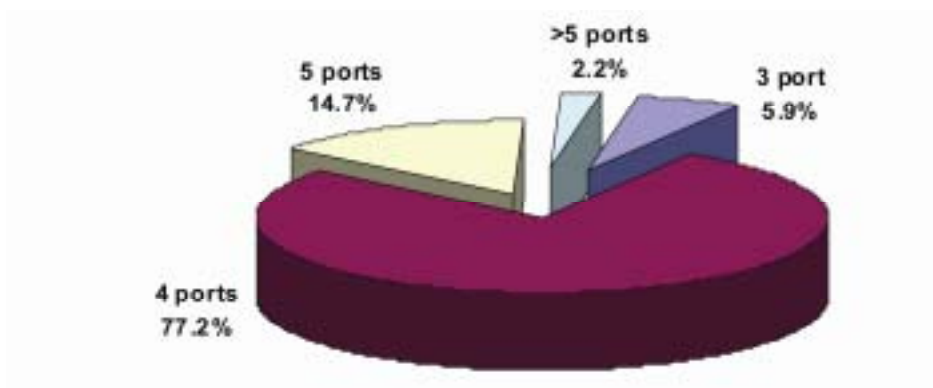
Number of missing data: 7 (5.0%) in 2007 respectively

Number of ports used

Four ports were used in performing the surgery in 77.2% of cases and 5 ports in 14.7%. Three ports were used in only 5.9%, in contrast to 73.1% in Level 4 procedures, 85.8% in Level 3 procedures and 84.5% in Level 2 procedures.

	2002	2007
3 ports	0 (0.0%)	8 (5.9%)
4 ports	14 (100.0%)	105 (77.2%)
5 ports	0 (0.0%)	20 (14.7%)
> 5 ports	0 (0.0%)	3 (2.2%)
Total	14	136

Number of missing data: 3 (2.2%) in 2007



Number of missing data: 3 (2.2%)

Surgical Modalities

Electrocautery was used in 127 cases (91.4%), of which bipolar energy alone was used in 32, unipolar alone in 18 and both in 77. Ligature was used in 22.3%, Plasmakinetic in 14.4% and ultracision in 15.8%. Suture was used in 36.7%. There was a decrease in the use of pelvic drain from 85.7% in 2002 to 20.1% in 2007.

	2002	2007
Unipolar electrocautery	13 (92.9%)	95 (68.3%)
Bipolar electrocautery	14 (100%)	109 (78.4%)
Ligature	-	31 (22.3%)
Plasmakinetic	-	20 (14.4%)
Suture	1 (7.1%)	51 (36.7%)
Endoloop	0 (0.0%)	4 (2.9%)
Laser	0 (0.0%)	5 (3.6%)
Ultracision	3 (21.4%)	22 (15.8%)
Clips/Staples	0 (0.0%)	5 (3.6%)
Use of drain	12 (85.7%)	28 (20.1%)

Data are presented as number and percentage of total number of patients

OPERATIVE PROCEDURES

Pelvic lymphadenectomy was the most common procedure performed, followed by hysterectomy. There were 26 radical hysterectomies and 23 laparoscopic repair of genital prolapse, of which 17 were sacro-colpopexy, 2 paravaginal repair, 1 cystocele repair, 2 rectocele repair and 1 pelvic floor repair. There were 5 tubal re-anastomoses, of which 1 was reported to be robot-assisted.

	2002	2007
Pelvic lymph node dissection	13 (92.9%)	103 (74.1%)
Hysterectomy	14 (100.0%)	69 (49.6%)
Radical hysterectomy	0 (0.0%)	26 (18.7%)
Sacro-colpopexy	0 (0.0%)	17 (12.2%)
Omentectomy	0 (0.0%)	13 (9.4%)
Para-aortic lymph node dissection	0 (0.0%)	10 (7.2%)
Staging procedure	0 (0.0%)	7 (5.0%)
Lap repair of prolapse#	1 (7.1%)	6 (4.3%)
Tubal re-anastomosis	0 (0.0%)	5* (3.6%)
Colposuspension	0 (0.0%)	3 (2.2%)
Vaginal anterior repair	0 (0.0%)	2 (1.4%)
TVT	0 (0.0%)	2 (1.4%)
Hysteropexy	0 (0.0%)	1 (0.7%)

Data are presented as number and percentage of total number of patients

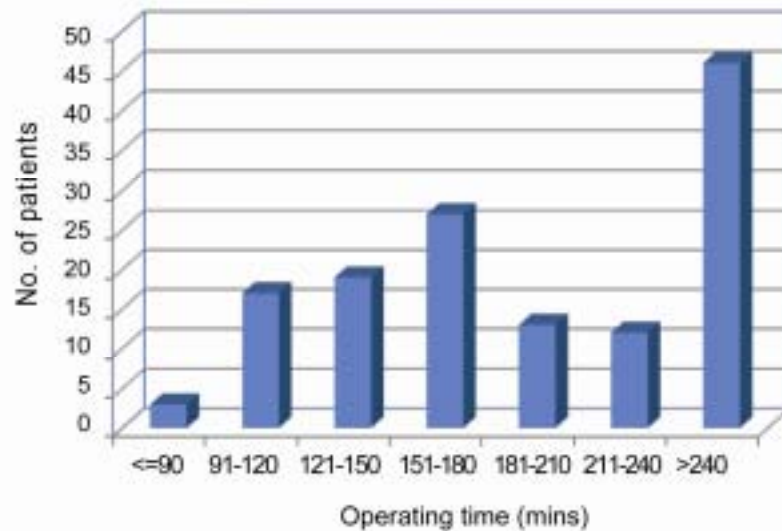
Lap repair of prolapse in 2002 included a high McCall repair

Lap repair of prolapse in 2007 included 2 paravaginal repair, 1 cystocele repair, 2 rectocele repair, 1 pelvic floor repair

* One was robot-assisted

OPERATING TIME

The mean operating time was 274.7 (SD 608.3) minutes, compared to 110 (SD 25.6) in 202. The operating time was within 90 minutes in 3 (21.4%) patients. Only 2 operations lasted longer than 120 minutes and they were performed in the units that had performed one level 5 procedure.



Number of missing data: 2 (1.4%)

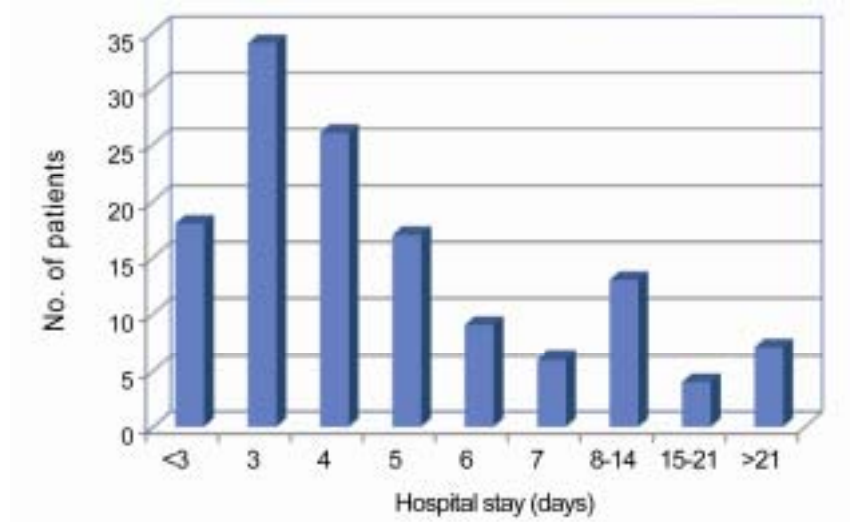
Distribution of operating time

	2002	2007
31 – 60 minutes	0 (0.0%)	1 (0.7%)
61 – 90 minutes	3 (21.4%)	2 (1.5%)
91 – 120 minutes	9 (64.3%)	17 (12.4%)
121 – 150 minutes	1 (7.1%)	19 (13.9%)
151 – 180 minutes	1 (7.1%)	27 (19.7%)
181 – 210 minutes	0 (0.0%)	13 (9.5%)
211 – 240 minutes	0 (0.0%)	12 (8.8%)
> 240 minutes	0 (0.0%)	46 (33.6%)
Total	14	139

Number of missing data: 0 in 2002 and 2 (1.4%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 6.0 (SD 5.7) days, compared to 9.3 (SD 4.0) in 2002. Eighteen (13.4%) patients stayed less than 3 days and 24 (17.9%) patients stayed over 7 days.



Number of missing data: 5 (3.6%)

Distribution of post-operative hospital stay

	2002	2007
< 5 days	2 (14.3%)	78 (58.2%)
5 – 7 days	2 (14.3%)	32 (23.9%)
8 – 14 days	9 (64.3%)	13 (9.7%)
15 – 21 days	1 (7.1%)	4 (3.0%)
> 21 days	0 (0.0%)	7 (5.2%)
Total	14	134

Number of missing data: 5 (3.6%) in 2007

COMPLICATIONS

Complication occurred in 31 patients and the incidence was 22.3%, compared to 14.3% in 2002. Organ injury occurred in 12 patients and the overall incidence was 8.6%; there were 6 bladder injuries, 3 ureteric injuries and 3 bowel injuries. Six patients (4.3%) had haemorrhage requiring transfusion, compared to only 1 (7.1%) in 2002.

	2002	2007
Bladder injury	0 (0.0%)	6 (4.3%)
Ureteric injury	0 (0.0%)	3 (2.2%)
Bowel injury	0 (0.0%)	3 (2.2%)
Inferior epigastric artery injury	0 (0.0%)	0 (0.0%)
Haemorrhage with transfusion	1 (7.1%)	6 (4.3%)
Febrile morbidity	0 (0.0%)	4 (2.9%)
Urinary tract infection	0 (0.0%)	5 (3.6%)
Retention of urine	0 (0.0%)	3 (2.2%)
Wound infection/haematoma	0 (0.0%)	0 (0.0%)
Pelvic/Vault haematoma	0 (0.0%)	1 (0.7%)
Ileus	0 (0.0%)	0 (0.0%)
Deep vein thrombosis	0 (0.0%)	1 (0.7%)
Incisional hernia	0 (0.0%)	0 (0.0%)
Conversion	2 (14.3%)	5 (3.6%)
Re-admission	0 (0.0%)	4 (2.9%)
Re-operation	0 (0.0%)	0 (0.0%)
Intra-abdominal abscess	0 (0.0%)	1 (0.7%)
Right peroneal nerve palsy	0 (0.0%)	1 (0.7%)
Unspecified	1 (7.1%)	0 (0.0%)
Total	2 (14.3%)	31 (22.3%)

Data are presented as number and percentage of total number of patients

CONVERSION

Five patients (3.6%) required a conversion to laparotomy, compared to 2 (14.3%) in 2002. Organ injury was the most common reason for conversion. There were 2 bladder injuries. One occurred in a patient with carcinoma of cervix undergoing laparoscopic radical hysterectomy and pelvic lymph node dissection. The case was also complicated by surgical emphysema requiring admission to Intensive Care Unit. The other bladder injury occurred in a patient with carcinoma of corpus who was reported to have undergone adhesiolysis and division of round ligament only. There were no reported pelvic adhesions or other procedures. There was one bowel injury which occurred in a patient with vault prolapse and left ovarian cyst undergoing laparoscopic sacro-colpopexy & bilateral salpingo-oophorectomy. The reasons for conversion in the last 2 patients were dense adhesions and poor pelvic access. The former was a patient with carcinoma of cervix undergoing laparoscopic radical hysterectomy, and the latter was a case of laparoscopic sacro-colpopexy for uterine prolapse and cystocele.

	2002	2007
Dense adhesions	0 (0.0%)	1 (0.7%)
Uncontrolled haemorrhage	1 (7.1%)	0 (0.0%)
Bladder injury	0 (0.0%)	2 (1.4%)
Bowel injury	0 (0.0%)	1 (0.7%)
Poor pelvic access	0 (0.0%)	1 (0.7%)
Surgical emphysema	0 (0.0%)	1 (0.7%)
Unspecified	1 (7.1%)	0 (0.0%)
Total	2 (14.3%)	5 (3.6%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

As in 2002, no patients required re-operation.

RE-ADMISSION

There were 4 re-admissions reported. One patient had a laparoscopic sacro-colpopexy and para-vaginal repair for vault prolapse and developed persistent vaginal bleeding, suspected to have a fistula. One patient underwent laparoscopic radical hysterectomy for carcinoma of cervix and developed urinary retention and re-admitted for weaning off the Foley's catheter. Two patients with carcinoma of corpus and underwent TLHBSO and LAVHBSO respectively together with pelvic lymph node dissection. They were readmitted for post-operative fever due to urinary tract infection and other unrelated problem respectively.

	2002	2007
Persistent vaginal bleeding	0 (0.0%)	1 (0.7%)
Fever	0 (0.0%)	1 (0.7%)
Urinary retention	0 (0.0%)	1 (0.7%)
Unrelated problems	0 (0.0%)	1 (0.7%)
	0 (0.0%)	4 (2.9%)

Data are presented as number and percentage of total number of patients

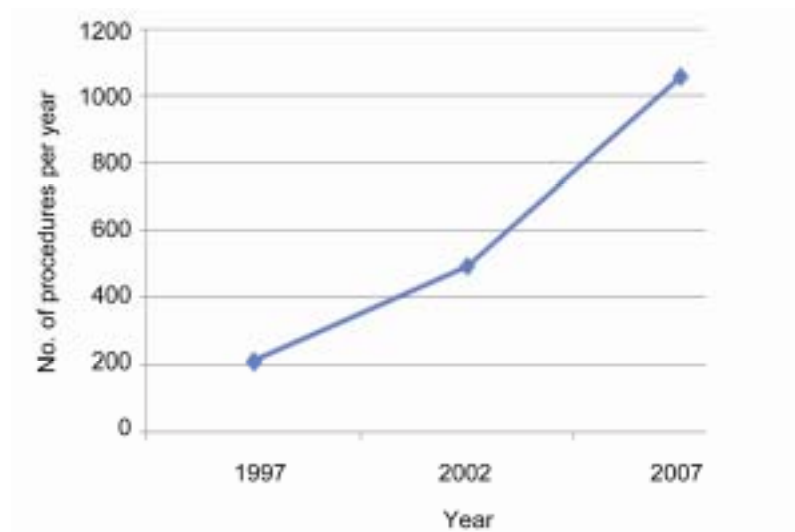
6

LAPAROSCOPIC HYSTERECTOMY

Total number of patients

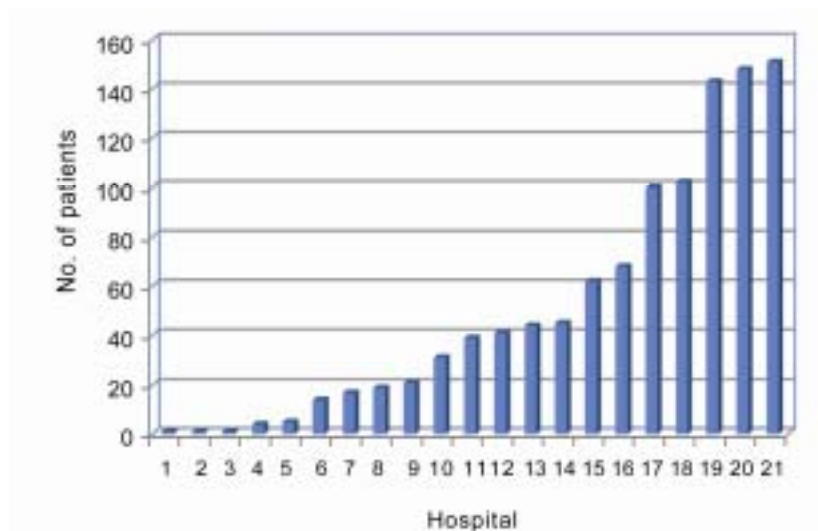
1057

Compared to 1997, there was a 5 fold increase in the number of laparoscopic hysterectomy, with the actual number increased from 209 in 1997 and 492 in 2002 to 1057 in 2007.



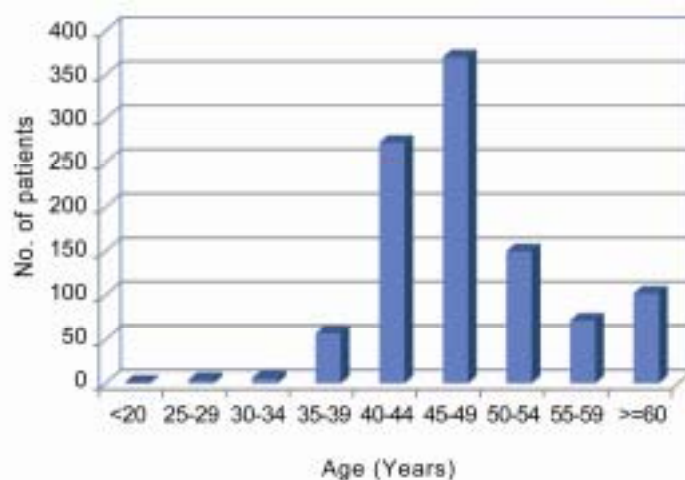
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Laparoscopic hysterectomy was performed in 21 hospitals, compared to only 14 in 2002 and 12 in 1997. Nine units performed less than 20 cases a year and 3 units performed more than 100 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 48.5 (SD 8.5), similar to that of 47.6 (SD 8.4) in 2002 and 47.5 (SD 9.0) in 1997. Over 93% of patients were 40 or older and about 10% were 60 or older. Only 0.5% of patients were younger than 35.



Number of missing data: 23 (2.2%)

Distribution of age

	1997	2002	2007
< 30 years	0 (0.0%)	2 (0.4%)	5 (0.5%)
30 – 34 years	2 (1.0%)	3 (0.6%)	6 (0.6%)
35 – 39 years	25 (12.0%)	38 (7.9%)	57 (5.5%)
40 – 44 years	61 (29.1%)	147 (30.4%)	273 (26.4%)
45 – 49 years	65 (31.1%)	161 (33.3%)	370 (35.8%)
≥ 50 years	56 (26.8%)	133 (27.5%)	323 (31.2%)
Total	209	484	1034

No. of missing data: 8 (1.6%) in 2002 and 23 (2.2%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to previous audits, the operation was mainly performed by specialists in 96.8% (92.9% in 2002 and 94.6% in 1997). Nine cases were performed by pre-membership doctors (0.9%), compared to 0.9% in 2002 and none in 1997, of which about 90% were assisted by specialists. The operations were assisted by specialists in 44.1% (54.1% in 2002 and 51.5% in 1997) and by nurses in 40.9% (23.5% in 2002 and 8.8% in 1997) of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM/ FRCOG	Nurse	
MBBS	0	0	8	1	9
MRCOG	2	1	19	0	22
FHKAM	54	39	273	69	435
FRCOG	27	24	133	331	515
Total	83	64	433	401	981

Number of missing data: 76 (7.2%)

About 5% (20% in 2002) of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 14.9% (8.4% in 2002) were assisted by doctors without accreditation and 19.1% (48.2% in 2002) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 16.3% (19.9% in 2002), of which 48.4% (26.7% in 2002) were assisted by doctors without advanced accreditation. For those procedures performed by doctors with advanced accreditation, 24.7% (18.5% in 2002) were assisted by doctors without accreditation and 50.2% (24.8% in 2002) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	7	6	25	9	47
Intermediate	36	39	80	0	155
Advanced	90	95	188	376	749
Total	133	140	293	385	951

Number of missing data: 106 (10.0%)

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Fibromyoma was the most common diagnosis (55.3%), followed by adenomyosis (16.1%). Forty-seven patients had concurrent fibroid and adenomyosis. There was a significant increase in cancer cases being managed laparoscopically with a total of 125 compared to only 19 in 2002 and 10 in 1997. Carcinoma of corpus was the most common malignant condition and ranked the fourth among all the diagnoses with the incidence increased from 2.4% in 1997 and 3.3% in 2002 to 8.9% in 2007. Laparoscopic hysterectomy was performed in the presence of genital prolapse in 4.3%, compared to 7.2% in 1997 and 0.8% in 2002.

	1997	2002	2007
Fibromyoma	110 (52.6%)	279 (56.7%)	585 (55.3%)
Adenomyosis	18 (8.6%)	60 (12.2%)	170 (16.1%)
Adnexal masses	36 (17.2%)	60 (12.2%)	157 (14.9%)
Carcinoma of corpus	5 (2.4%)	16 (3.3%)	94 (8.9%)
Endometrial hyperplasia	6 (2.9%)	4 (0.8%)	88 (8.3%)
Endometriosis	19 (9.1%)	47 (9.6%)	73 (6.9%)
Genital prolapse	15 (7.2%)	4 (0.8%)	45 (4.3%)
Adhesions	30 (14.4%)	71 (14.4%)	61 (5.8%)
CIN	17 (8.1%)	4 (1.0%)	52 (4.9%)
Post-menopausal bleeding	5 (2.4%)	4 (0.8%)	27 (2.6%)
Dysfunctional uterine bleeding	15 (7.2%)	15 (3.0%)	17 (1.6%)
Endometrial polyp	8 (3.8%)	0 (0.0%)	10 (0.9%)
Carcinoma of cervix	2 (1.0%)	3 (0.6%)	9 (0.9%)
Microinvasive Ca of cervix	3 (1.4%)	1 (0.2%)	6 (0.6%)
Adenocarcinoma in-situ of cervix	0 (0.0%)	1 (0.2%)	5 (0.5%)
Carcinoma of ovary	0 (0.0%)	0 (0.0%)	4 (0.4%)
Miscellaneous	7 (3.3%)	17 (3.5%)	14 (1.3%)*

** Diagnoses included 2 borderline ovarian tumour, 3 smooth muscle tumour, 2 uterine sarcoma and 1 gestational trophoblastic neoplasm and others*

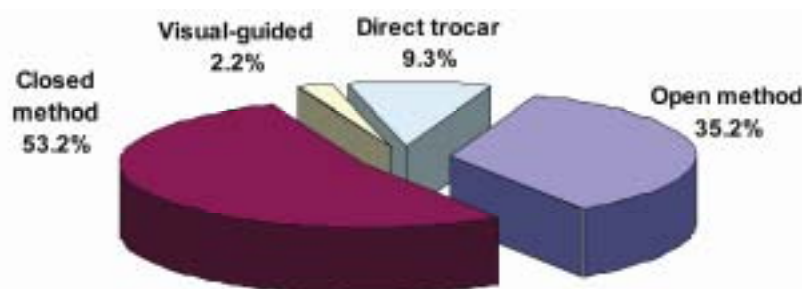
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 553 (53.2%) of cases, compared to 64.4% in 2002. Open method was used in 366 (35.2%), compared to 29.2% in 2002; and visually guided trocar in 23 (2.2%) cases, compared to 6.3% in 2002.

	2002	2007
Closed method	306 (64.4%)	553 (53.2%)
Open method	139 (29.2%)	366 (35.2%)
Visual guided	30 (6.3%)	23 (2.2%)
Direct trocar	0 (0.0%)	97 (9.3%)
Total	475	1039

No. of missing data: 17 (3.5%) in 2002 and 18 (1.7%) in 2007



Number of missing data: 18 (1.7%)

The primary trocar was inserted through the umbilical incision in 95.4%, and supraumbilically in 4.2%. The left upper quadrant insertion was used in only 0.4%.

	2002	2007
Umbilical	456 (98.7%)	951 (95.4%)
Supraumbilical	2 (0.4%)	42 (4.2%)
Left upper quadrant	4 (0.9%)	4 (0.4%)
Total	462	997

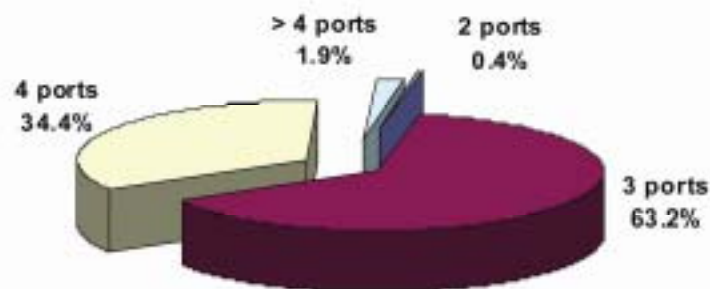
No. of missing data: 30 (6.1%) in 2002 and 60 (5.7%) in 2007

Number of ports used

Similar to 2002, the procedures were performed using 3 ports in 63.2% (64.2% in 2002) of cases, 4 ports in 34.4% (35.6% in 2002) and 2 ports in 0.4% (0.2% in 2002).

	2002	2007
2 ports	1 (0.2%)	4 (0.4%)
3 ports	303 (64.2%)	654 (63.2%)
4 ports	168 (35.6%)	356 (34.4%)
> 4 ports	0 (0.0%)	20 (1.9%)
Total	472	1034

No. of missing data: 20 (4.1%) in 2002 and 23 (2.2%) in 2007



Number of missing data: 23 (2.2%)

Surgical Modalities

Electrocautery remained the most common energy source used, though its usage decreased from 97.1% in 1997 and 95.5% in 2002 to 91.8% in 2007. Bipolar energy alone was used in 25.2% (35.3% in 2002), unipolar alone in 14.2% (0.4% in 2002) and both in 60.6% (64.3% in 2002). Ligature and Plasmakinetic were used in 13.0% and 18.9%. Ultracision, which was used in 10.5%, compared to 17.9% in 2002 and none in 1997. Suture was used in 36.5%, compared to 16.3% in 2002 and 11.0% in 1997. There was also an increase use of pelvic drain from 7.7% in 1997 and 20.3% in 2002 to 22.5 in 2007.

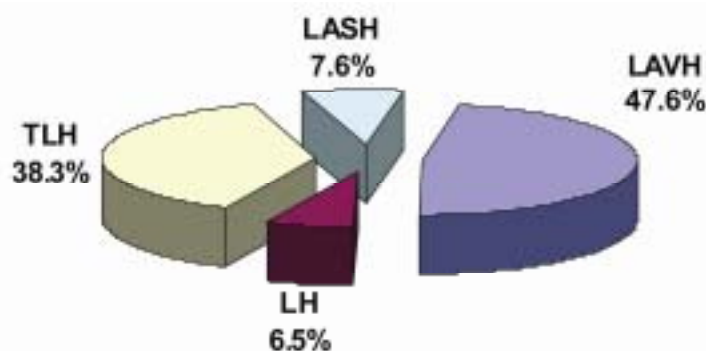
	1997	2002	2007
Electrocautery	203 (97.1%)	470 (95.5%)	970 (91.8%)
Ligature	-	-	137 (13.0%)
Plasmakinetic	-	-	197 (18.9%)
Ultracision	0 (0.0%)	88 (17.9%)	115 (10.5%)
Suture	23 (11.0%)	80 (16.3%)	386 (36.5%)
Endoloop	8 (3.8%)	7 (1.4%)	18 (1.7%)
Laser	4 (1.9%)	0 (0.0%)	2 (0.2%)
Clips/Staples	20(9.6%)	4 (0.8%)	10 (0.9%)
Use of drain	16 (7.7%)	100 (20.3%)	238 (22.5%)

No. of missing data: 5 (2.4%) in 2002 and 23 (2.2%) in 2007

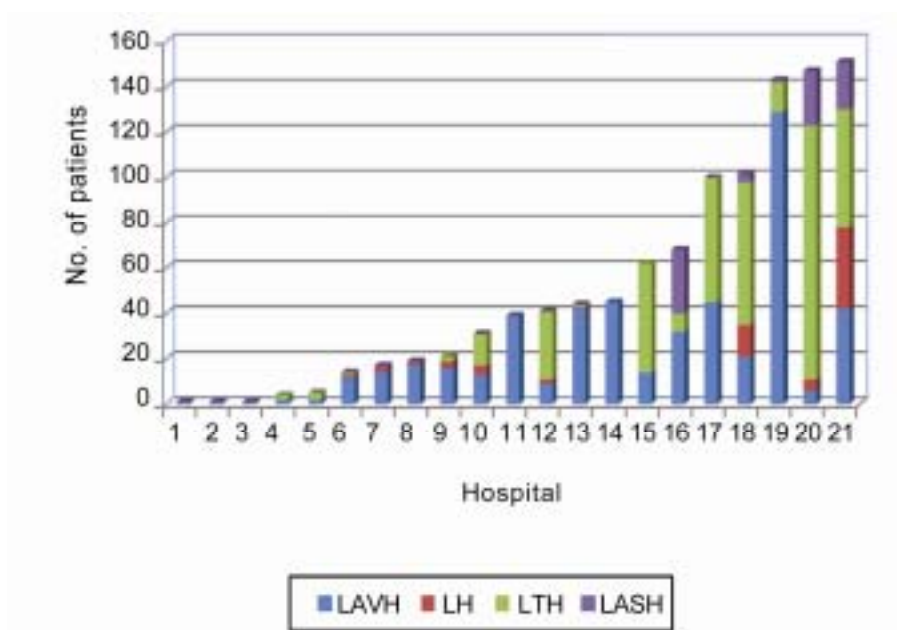
TYPES OF HYSTERECTOMY

The incidence of subtotal hysterectomy increased from 0.5% in 1997 to 10.0% in 2002 but reduced to 7.6% in 2007. The ratio of subtotal to total hysterectomy was 1 in 12 in 2007, compared to 1 in 9 in 2002 and 1 in 200 in 1997. Of the total hysterectomies, the most common type being performed was LAVH (51.5%), followed by TLH (41.4%) and LH (7.1%). Robotic-assistance (TLH) was reported in 1 case. This information was not captured in previous audits.

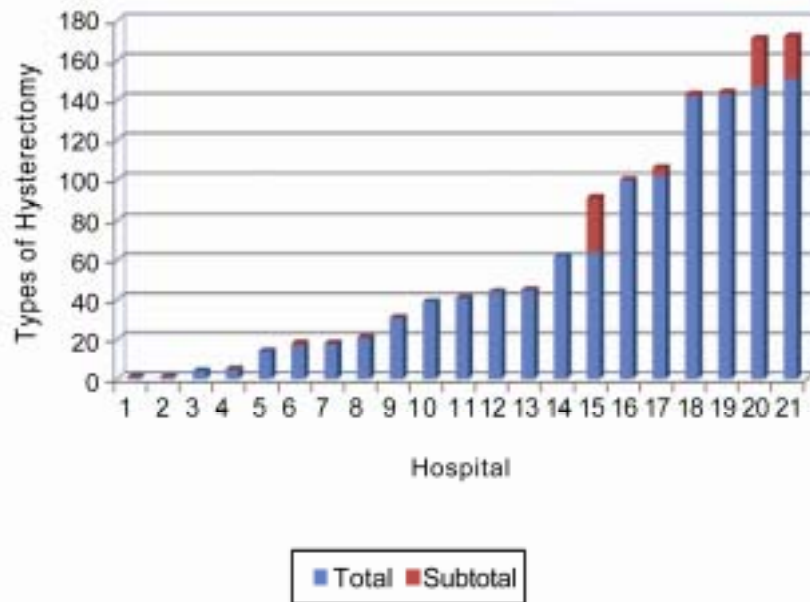
	1997	2002	2007
Total hysterectomy	201 (96.1%)	443 (90%)	976 (92.3%)
Subtotal hysterectomy	1 (0.5%)	49 (10%)	80 (7.6%)
Not specified	7 (3.3%)	0 (0%)	1 (0.1%)
Total	209	492	1057



Number of missing data: 1 (0.1%)



Only 6 of the 21 units performed laparoscopic subtotal hysterectomy with the subtotal to total ratio ranging from 1 in 2.4 to 1 in 143. Three units performed over 20 cases a year and the ratios were 1 in 2.4, 1 in 6.1 and 1 in 7.2 respectively.

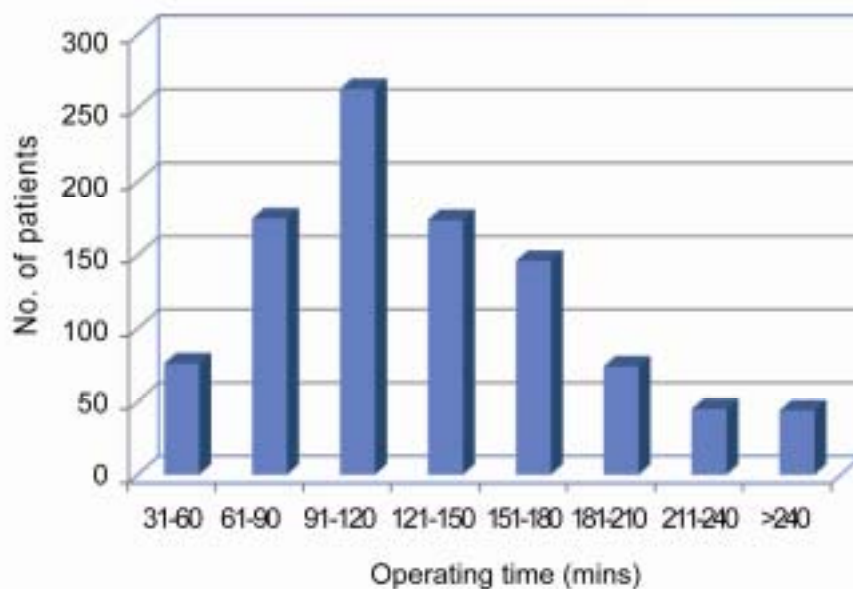


CONCURRENT OPERATION

	1997	2002	2007
Salpingo-oophorectomy	78 (37.3%)	154 (31.3%)	355 (33.6%)
Cystectomy	3 (1.4%)	4 (0.8%)	35 (3.3%)
Pelvic floor repair (vaginal)	5 (2.4%)	1 (0.2%)	5 (0.4%)
Pelvic floor repair (lap)	0 (0.0%)	0 (0.0%)	1 (0.09%)
Pelvic lymph node dissection	1 (0.5%)	10 (2.0%)	1 (0.09%)
TVT	0 (0.0%)	0 (0.0%)	3 (0.3%)
Colposuspension	1 (0.5%)	12 (2.4%)	0 (0.0%)
Omentectomy	-	-	2 (0.2%)
Robotic-assisted	-	-	1 (0.09%)

OPERATING TIME

The mean operating time was 135.3 (SD 61.4) minutes, compared to 128.6 (SD 51.6) in 2002 and 115 (SD 48) in 1997. The operating time was less than 60 minutes in 7.6% (4.4% in 2002 and 8.6% in 1997) and exceeded 180 minutes in 16.3% (12.5% in 2002 and 10.1% in 1997).



Number of missing data: 60 (5.7%)

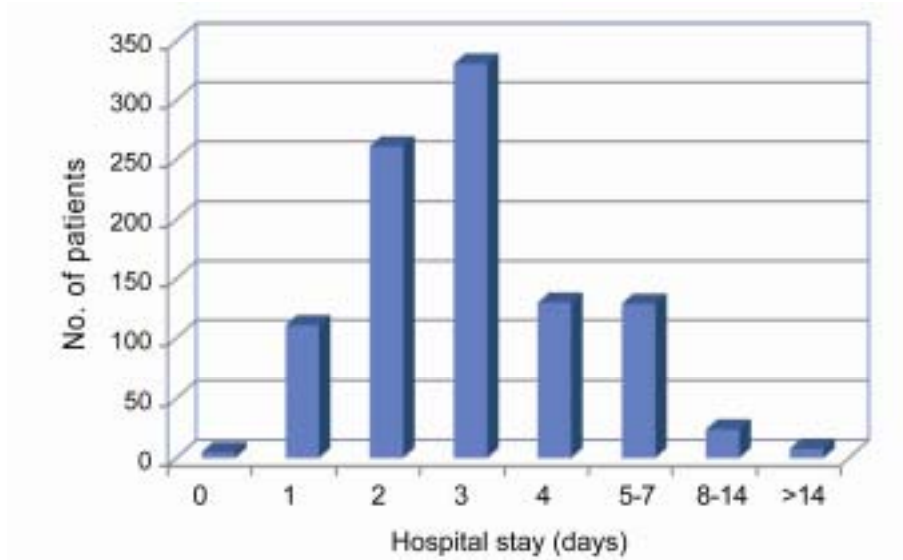
Distribution of operating time

	1997	2002	2007
≤ 30 minutes	1 (0.5%)	2 (0.4%)	0 (0.0%)
31 – 60 minutes	17 (8.2%)	20 (4.0%)	76 (7.6%)
61 – 90 minutes	62 (30.0%)	103 (21.1%)	175 (17.6%)
91- 120 minutes	70 (33.8%)	161 (32.9%)	263 (26.4%)
121 – 150 minutes	24 (11.6%)	86 (17.6%)	174 (17.5%)
151 – 180 minutes	12 (5.8%)	56 (11.5%)	146 (14.6%)
> 180 minutes	21 (10.1%)	61 (12.5%)	163 (16.3%)
Total	207	489	997

Number of missing data: 2 (1.0%) in 1997, 3 (0.6%) in 2002 and 60 (5.7%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 3.3 (SD 2.5) days, compared to 3.7 (SD 2.7) in 2002 and 4.4 (SD 3.3) in 1997. About 70% of the patients were discharged within the first 3 days (66.7% in 2002 and 55% in 1997) and 3.2% stayed longer than 7 days (7.4% in 2002 and 9.5% in 1997).



Number of missing data: 58 (5.5%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	0 (0.0%)	3 (0.6%)	5 (0.5%)
1 day	2 (1.0%)	8 (1.6%)	111 (11.1%)
2 days	40 (19.1%)	147 (30.2%)	261 (26.1%)
3 days	69 (33.0%)	165 (33.9%)	331 (33.1%)
4 days	29 (13.9%)	60 (12.3%)	130 (13.0%)
5 – 7 days	49 (23.4%)	68 (14.0%)	129 (12.9%)
8 – 14 days	17 (8.1%)	33 (6.8%)	24 (2.4%)
≥ 15 days	3 (1.4%)	3 (0.6%)	8 (0.8%)
Total	209	487	999

No. of missing data: 5 (1.0%) in 2002 and 58 (5.5%) in 2007

CONVERSION

Conversion to laparotomy was necessary in 20 patients (1.8%), 6 because of dense adhesions, 6 due to uncontrolled haemorrhage, 3 because of bowel injury and 1 as a result of ureteric injury. The figure was similar to that in 2002 but 2.4 times lower than that in 1997.

	1997	2002	2007
Dense adhesions	6 (2.9%)	4 (0.8%)	6 (0.6%)
Ureteric injury	1 (0.5%)	0 (0.0%)	1 (0.09%)
Bladder injury	1 (0.5%)	1 (0.2%)	1 (0.1%)
Bowel injury	1 (0.5%)	0 (0.0%)	3 (0.3%)
Uncontrolled haemorrhage	1 (0.5%)	2 (0.4%)	6 (0.6%)
Poor pelvic access	0 (0.0%)	0 (0.0%)	5 (0.5%)
Unspecified	0 (0.0%)	3 (0.6%)	1 (0.1%)
Total	10 (4.8%)	10 (2.0%)	20 (1.8%)

Data are presented as number and percentage of total number of patients

COMPLICATIONS

The overall complication rate of laparoscopic hysterectomy was 9.2% in 2007, which was reduced compared to 12.6% in 2002 and 24.4% in 1997. The incidence of organ injury reduced from 3.3% in 1997 to 1.8% in 2002 and 2.2% in 2007. The incidence of significant haemorrhage also reduced from 4.3% in 1997 to 2.0% in 2002 and 1.9% in 2007 while that of febrile morbidity reduced from 8.1% in 1997 to 3.3% in 2002 and 1.5% in 2007. The incidence of vault haematoma was 1.3% which was similar to that in 1997 (1.4%) but lower than that in 2002 (2.8%).

	1997	2002	2007
Bladder injury	4 (1.9%)	4 (0.8%)	10 (0.9%)
Ureteric injury	2 (1.0%)	3 (0.6%)	5 (0.5%)
Bowel injury	1 (0.5%)	1 (0.2%)	8 (0.8%)
Haemorrhage & transfusion	9 (4.3%)	10 (2.0%)	20 (1.9%)
Surgical emphysema	0 (0.0%)	2 (0.4%)	2 (0.2%)
Febrile morbidity	17(8.1%)	16 (3.3%)	16 (1.5%)
Urinary tract infection	7 (3.3%)	5 (1.0%)	5 (0.5%)
Retention of urine	6 (2.9%)	2 (0.4%)	6 (0.6%)
Wound complication	5(2.4%)	1 (0.2%)	1 (0.09%)
Vault haematoma	3 (1.4%)	14 (2.8%)	13 (1.3%)
Ileus	0 (0.0%)	1 (0.2%)	0 (0.0%)
Deep vein thrombosis	1 (0.5%)	2 (0.4%)	2 (0.2%)
Umbilical herniation	1 (0.5%)	0 (0.0%)	0 (0.0%)
Conversion	10 (4.8%)	10 (2.0%)	20 (1.9%)
Re-operation	3 (1.4%)	1 (0.2%)	1 (0.1%)
Re-admission	3 (1.4%)	12 (2.4%)	15 (1.4%)
Lost needle tip	0 (0.0%)	1 (0.2%)	0 (0.0%)
Total	51 (24.4%)	62 (12.6%)	97 (9.2%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

One patient required re-operation because of perforation of sigmoid colon, giving the re-operation rate of 0.09%, compared to 0.23% in 2002 and 1.2% in 1997.

	1997	2002	2007
Bowel injury	0 (0.0%)	0 (0.0%)	1 (0.09%)
Repair of fistula	0 (0.0%)	1 (0.2%)	0 (0.0%)
Intraperitoneal haemorrhage	1 (0.5%)	0 (0.0%)	0 (0.0%)
Vault haemorrhage	1 (0.5%)	0 (0.0%)	0 (0.0%)
Unexpected malignancy	1 (0.5%)	0 (0.0%)	0 (0.0%)
Total	3 (1.2%)	1 (0.2%)	1 (0.09%)

Data are presented as number and percentage of total number of patients

RE-ADMISSION

Fifteen patients (1.4%) required re-admission to hospital and the incidence was lower than that in 2002 (2.4%) and similar to that in 1997 (1.2%). The main reason for re-admission was still vault or secondary bleeding, accounting for a third of the cases (41.7% in 2002 and 66.7% in 1997).

	1997	2002	2007
Vault/secondary bleeding	2 (1.0%)	5 (1.0%)	5 (0.5%)
Acute pelvic infection	0 (0.0%)	1 (0.2%)	2 (0.2%)
Repair of ureteric fistula	0 (0.0%)	1 (0.2%)	1 (0.09%)
Wound pain/infection	1 (0.5%)	0 (0.0%)	1 (0.09%)
Vault haematoma	0 (0.0%)	(0.0%)	2 (0.2%)
Fever	0 (0.0%)	(0.0%)	3 (0.3%)
Other unrelated problem	0 (0.0%)	(0.0%)	1 (0.09%)
Unspecified	0 (0.0%)	5 (1.0%)	0 (0.0%)
Total	3 (1.2%)	12 (2.4%)	15 (1.4%)

Data are presented as number and percentage of total number of patients

COMPARISON BETWEEN TOTAL AND SUBTOTAL HYSTERECTOMY

Subtotal hysterectomy was associated with significantly younger patient age, shorter operating time, smaller amount of blood loss and shorter post-operative stay. There were however no differences in the conversion rate, complication rate and re-admission rate, but the sample size may not be large enough.

	LAVH N = 503	LH N = 69	TLH N = 404	LASH N = 80
Age (years)	48.7 ± 8.6	48.9 ± 7.4	48.8 ± 8.9	45.0 ± 3.4
Operating time (min)	122 ± 57	154 ± 46	150 ± 67	131 ± 53
Blood loss (ml)	262 ± 270	190 ± 127	223 ± 202	207 ± 263
Post-operative stay (days)	3.0 ± 2.3	3.3 ± 1.8	3.7 ± 2.8	2.8 ± 0.9
Conversion	14 (2.8%)	0 (0.0%)	5 (1.2%)	1 (1.3%)
Complication	44 (8.7%)	1 (1.4%)	44 (10.9%)	8 (10.0%)
<i>Ureteric injury</i>	1	1	2	0
<i>Bladder injury</i>	6	0	3	1
<i>Bowel injury</i>	2	0	5	1
<i>Haemorrhage</i>	13	0	5	2
<i>Febrile</i>	4	0	10	2
<i>Pelvic/vault haematoma</i>	6	0	87	0
Re-admission	6 (1.2%)	1 (1.4%)	7 (1.7%)	0 (0.0%)

Data are presented as mean ± SD or N (%)

NS: Not significant

OPERATIVE OUTCOME FOR FIBROIDS AND ADENOMYOSIS

Uterine size was reported for those cases with the diagnosis of uterine fibroids or adenomyosis in the current audit. There were a total of 708 cases with fibroid alone occurring in 538 cases, adenomyosis only in 123 and both co-exist in 47. Fibroid size was available in 466 cases, 46.4% was > 6 cm, 34.8% was 4-6 cm and 18.9 was < 4 cm.

Fibroid size	2007
< 4 cm	88 (18.9%)
4-6 cm	162 (34.8%)
> 6 cm	216 (46.4%)
Total	466

No. of missing data: 119 (20.3%)

Uterine size was not reported in 19 (2.7%) cases. Uterine size between 10-12 weeks accounted for 46.3%, while it was reported to be normal in 2.3% and > 16 weeks in 8.6%. Sixteen cases were reported to have normal sized uterus, 10 were reported to have fibroids and 6 adenomyosis. Of the 10 cases of fibroids, the largest size of the fibroid was 0-3 cm in 5, 4-6 cm in 1, >6 cm in 2 (1 pedunculated and 1 intramural fibroid) and not reported in 2 (1 with uterine prolapse and 1 with endometriotic cyst 5-8 cm).

Uterine Size	2007
Normal	16 (2.3%)
≤ 8 weeks	139 (20.2%)
10-12 weeks	319 (46.3%)
14-16 weeks	156 (22.6%)
> 16 weeks	59 (8.6%)
Total	689

No. of missing data: 19 (2.7%)

Number of cases

Type of hysterectomy was not stated in 1 patient who had uterine size of 10-12 weeks. Overall, LAVH was performed more frequently for fibroids and adenomyosis, followed by TLH, LASH and LH. However, TLH was more frequently performed when uterine size was > 16 weeks.

	LAVH	LH	TLH	LASH	All
Normal	11	0	4	1	16
≤ 8 weeks	80	6	44	9	139
10-12 weeks	179	18	91	30	318
14-16 weeks	63	15	54	24	156
> 16 weeks	14	6	28	11	59
Total	347	45	221	75	688

Type of hysterectomy was not available in 1 patient with uterine size 10-12 weeks

Mean operating time

Overall, mean operating time was longest in LH and shortest in LAVH. Operating time was similar between LAVH and TLH when uterine size was ≤ 8 weeks but TLH took longer when uterine size was > 8 weeks. Operating time was longest in LASH when uterine size was > 16 weeks.

	LAVH	LH	TLH	LASH	All
Normal	135 ± 80	-	139 ± 48	180	139 ± 69
≤ 8 weeks	116 ± 61	139 ± 39	113 ± 39	100 ± 34	115 ± 53
10-12 weeks	117 ± 53	162 ± 54	148 ± 58	120 ± 38	129 ± 56
14-16 weeks	107 ± 49	143 ± 34	154 ± 56	137 ± 41	131 ± 53
> 16 weeks	162 ± 44	187 ± 37	187 ± 66	203 ± 80	183 ± 61
Total	117 ± 56	156 ± 46	147 ± 58	134 ± 53	131 ± 58

Data are presented as mean and standard deviation in minutes

Post-operative hospital stay

Post-operative hospital stay was similar among different types of hysterectomy, irrespective of the size of the uterus.

	LAVH	LH	TLH	LASH	All
Normal	3.5 ± 1.3	-	3.0 ± 1.4	3.0	3.3 ± 1.3
≤ 8 weeks	3.3 ± 3.0	3.2 ± 0.4	2.9 ± 1.0	2.7 ± 0.7	3.1 ± 2.4
10-12 weeks	2.9 ± 1.9	3.3 ± 1.1	3.2 ± 1.2	2.6 ± 0.9	3.0 ± 1.6
14-16 weeks	2.2 ± 1.5	2.5 ± 0.8	3.1 ± 1.5	2.9 ± 1.0	2.6 ± 1.5
> 16 weeks	2.8 ± 1.3	3.4 ± 1.8	2.9 ± 1.2	3.0 ± 1.0	2.9 ± 1.2
Total	2.8 ± 2.1	3.1 ± 1.1	3.1 ± 1.3	2.8 ± 0.9	2.9 ± 1.7

Data are presented as mean and standard deviation in days

Conversion

The number of patients with fibroids and/or adenomyosis required conversion was 15, giving a conversion rate of 2.1%. Uterine size was reported in all these patients. Conversion mainly occurred in those undergoing LAVH and uterus of normal size and 14-16 weeks had higher conversion rate. There was no conversion was reported in LH and 1 only in both TLH and LASH.

	LAVH	LH	TLH	LASH	All
Normal	1 (9.1%)	-	0 (0.0%)	0 (0.0%)	1 (6.3%)
≤ 8 weeks	1 (1.3%)	0 (0.0%)	1 (2.3%)	0 (0.0%)	2 (1.4%)
10-12 weeks	6 (3.4%)	0 (0.0%)	0 (0.0%)	1 (3.3%)	7 (2.2%)
14-16 weeks	5 (7.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (3.2%)
> 16 weeks	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total	13 (3.7%)	0 (0.0%)	1 (0.5%)	1 (1.3%)	15 (2.2%)

Data are presented as number and percentage of individual cases

Complication

Complication occurred in 60 patients with the diagnosis of fibroids and/or adenomyosis, giving a complications rate of 8.5%. Uterine size was reported in all but 1 patients. Overall complication was highest in LASH followed by LAVH. Complication rate was highest in LAVH when uterine size was between 10-16 weeks. Complication rate was lowest in LH irrespective of uterine size.

	LAVH	LH	TLH	LASH	All
Normal	1 (9.1%)	-	0 (0.0%)	0 (0.0%)	1 (6.3%)
≤ 8 weeks	6 (7.5%)	0 (0.0%)	6 (13.6%)	2 (22.2%)	14 (10.1%)
10-12 weeks	18 (10.1%)	1 (5.6%)	5 (5.5%)	2 (6.7%)	26 (8.2%)
14-16 weeks	8 (12.7%)	0 (0.0%)	3 (5.6%)	2 (8.3%)	13 (8.3%)
> 16 weeks	1 (7.1%)	0 (0.0%)	2 (7.1%)	2 (18.2%)	5 (8.5%)
Total	34 (9.8%)	1 (2.2%)	16 (7.3%)	8 (10.7%)	59 (8.6%)

Data are presented as number and percentage of individual cases

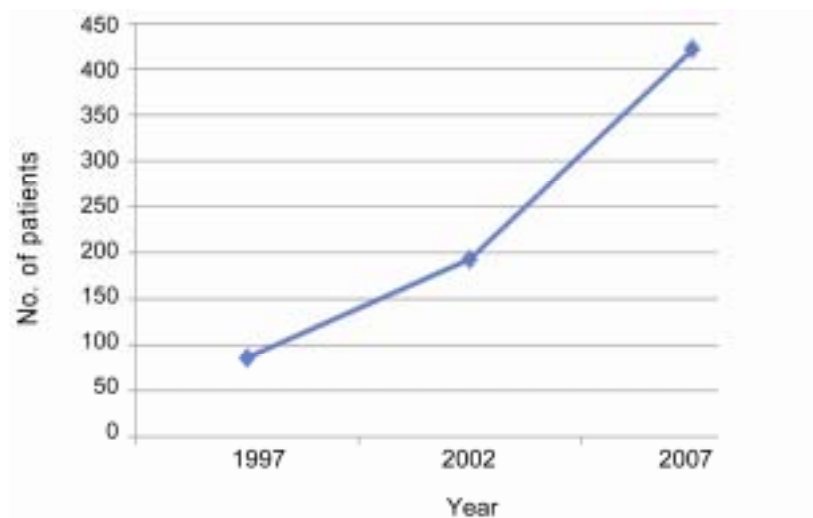
7

LAPAROSCOPIC MYOMECTOMY

Total number of patients

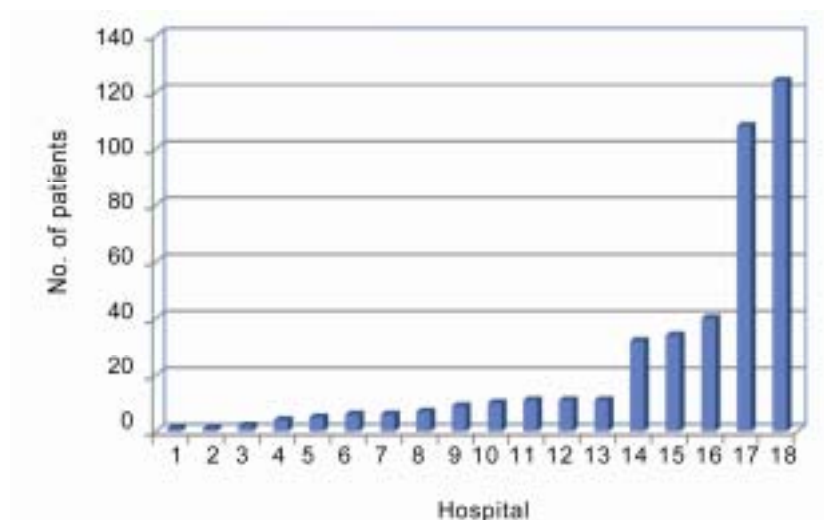
422

Compared to 1997, there was a 5 fold increase in the number of laparoscopic myomectomy with the actual number increased from 86 in 1997 to 193 in 2002 and 422 in 2007. As no detailed analysis was performed for this procedure in 1997, the data was compared with that of 2002 only.



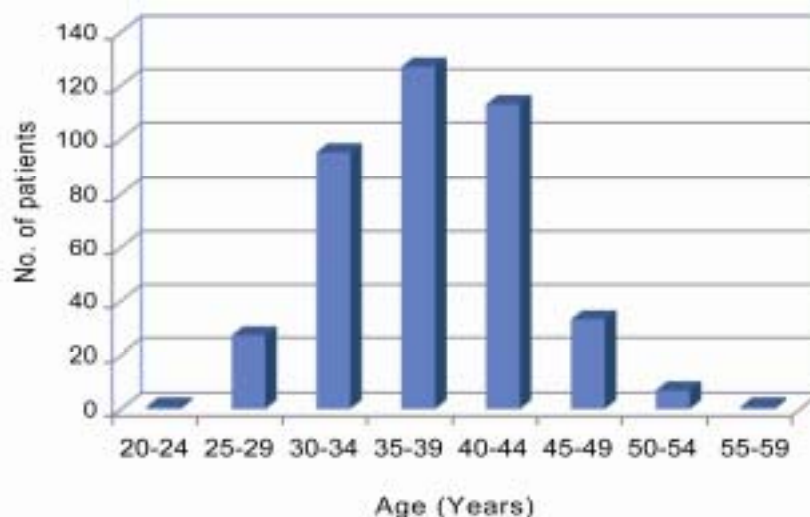
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Laparoscopic myomectomy was performed in 18 hospitals (16 in 2002). The number performed in each unit was small except two which performed over 100 cases a year. In 2002, only one hospital performed over 60 cases a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 37.6 (SD 5.6), compared to 37.5 (SD 6.3) in 2002. Almost 40% of patients aged 40 or above and only 1.9% aged 50 or above. This compared to 32.8% and 4.8% respectively in 2002.



No. of missing data: 18 (4.3%)

Distribution of age

	2002	2007
20 – 24 years	3 (1.6%)	1 (0.2%)
25 – 29 years	11 (5.8%)	27 (6.7%)
30 – 34 years	52 (27.5%)	95 (23.5%)
35 – 39 years	61 (32.3%)	127 (31.4%)
40 – 44 years	44 (32.2%)	113 (28.0%)
45 – 49 years	9 (4.8%)	33 (8.2%)
≥ 50 years	9 (4.8%)	8 (1.9%)
Total	189	404

No. of missing data: 4 (2.1%) in 2002 and 18 (4.3%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by specialists (96.8% in 2007 and 91.0% in 2002). As in 2002, pre-membership doctors performed only 3 procedures (1.7%), of which all were assisted by specialists. Compared with 2002, a higher proportion of the operation was assisted by nurses (77.5% in 2007 and 48.5% in 2002) and a lower proportion was assisted by specialists (14.1% in 2007 and 33.3% in 2002).

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM/ FRCOG	Nurse	
MBBS	0	0	3	0	3
MRCOG	3	0	5	0	8
FHKAM	7	8	27	57	99
FRCOG	6	5	14	212	237
Total	16	13	49	269	347

Number of missing data: 75 (17.8%)

Majority of the procedures (86.1%) were performed by doctors with advanced accreditation in gynaecological laparoscopy and over 80% were assisted by nurses. The corresponding figures in 2002 were 53.7% and 55.2% respectively. Only 6.3% (34.6% in 2002) of the procedures were performed by doctors without accreditation, of which 20% (7.1% in 2002) were assisted by doctors without accreditation and 60% (58.9% in 2002) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 7.5% (11.7% in 2002), of which 54.2% (68.4% in 2002) were assisted by doctors without advanced accreditation or nurses.

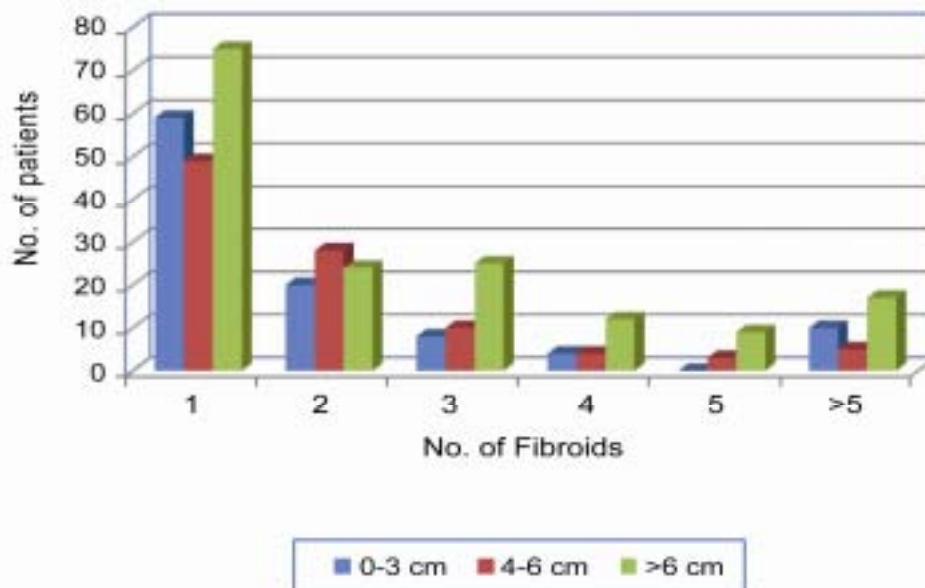
Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	4	1	3	12	20
Intermediate	9	0	11	4	24
Advanced	19	11	15	228	273
Total	32	12	29	244	317

Number of missing data: 105 (24.9%)

OPERATIVE DIAGNOSIS

Eleven patients did not have a diagnosis of uterine fibroids, 9 of them had adenomyosis and 2 had ovarian cysts. Another 9 patients had concurrent diagnosis of fibroid and adenomyosis. It is not known how many patients underwent adenomyomectomy.

Information on the number and/or the largest size of the fibroids were not available in 60 (14.2%) patients, compared to 5 (2.6%) in 2002. Similar to 2002, the mean number of fibroids was 2 (range 1 to >9). About 50% (58.8% in 2002) of patients had solitary fibroid and another 20% (20% in 2002) with 2 fibroids.



No. of missing data: 60 (14.2%)

The largest size of the fibroids were greater than 6 cm in 45% (31.0% in 2002), between 4-6 cm in 27.3% (35.3% in 2002) and 3 cm or less in 27.9% (33.7% in 2002).

No. of fibroids	Largest size of fibroids			Total
	<= 3 cm	4-6 cm	> 6 cm	
1	59	49	75	183
2	20	28	24	72
3	8	10	25	43
4	4	4	12	20
5	0	3	9	12
> 5	10	5	17	32
Total	101	99	162	362

Number of missing data: 60 (14.2%)

Almost 80% of the fibroid uterii were of 12 weeks size or less and only 3.3% were larger than 16 weeks size. Similar data were not captured in previous audits.

Uterine size	2007
Normal	53 (15.9%)
≤ 8 weeks	100 (30.0%)
10-12 weeks	111 (26.3%)
14-16 weeks	58 (17.4%)
> 16 weeks	11 (3.3%)
Total	333

Number of missing data: 89 (21.1%)

About 45% of the deepest type of fibroid was intramural only 6.1% were submucosal and 14.1% were pedunculated. Similar data were not captured in previous audits.

Fibroid locations	2007
Intramural	149 (43.7%)
Subserosal	123 (36.1%)
Pedunculated	48 (14.1%)
Submucosal	21 (6.1%)
Total	341

Number of missing data: 81 (19.2%)

The deepest (submucosal) fibroids were greater than 6 cm in 3.1% and intramural fibroids greater than 6 cm occurred in 26.5%.

No. of fibroids	Deepest type of fibroids			Total
	<= 3 cm	4-6 cm	> 6 cm	
Intramural	16	39	86	141
Subserosal	49	26	42	117
Pedunculated	16	19	10	45
Submucosal	3	8	10	21
Total	84	92	148	324

Number of missing data: 98 (23.2%)

CONCURRENT PATHOLOGY

Ovarian cyst was the most common concurrent pathology encountered during laparoscopic myomectomy.

	2002	2007
Ovarian cyst	54 (28.0%)	135 (32.0%)
Pelvic Endometriosis	29 (15.0%)	75 (17.8%)
Adhesions	35 (18.1%)	26 (6.2%)
Adenomyosis/Adenomyoma	9 (4.7%)	18 (4.3%)
Hydrosalpinx	5 (2.6%)	6 (1.4%)
Paraovarian cyst	10 (5.2%)	3 (0.7%)
Tubal pregnancy	2 (1.0%)	1 (0.2%)
Tubo-ovarian abscess	2 (1.0%)	0 (0.0%)

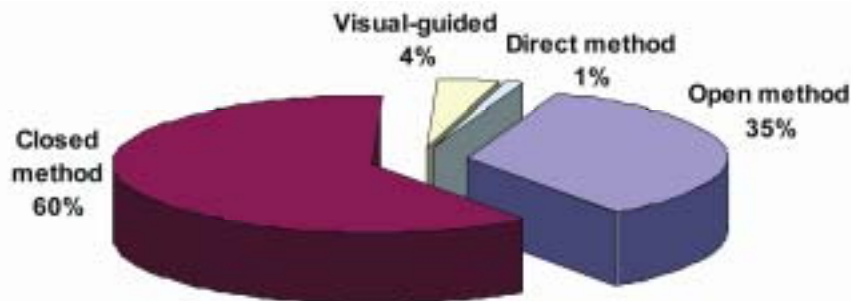
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 247 (60.1%) (113 or 60.8% in 2002) of cases. Open method was used in 143 (34.8%) (70 or 37.6% in 2002) and visually guided trocar in 17 (4.1%) (3 or 1.6% in 2002) cases.

	2002	2007
Closed method	113 (60.8%)	247 (60.1%)
Open method	70 (37.6%)	143 (34.8%)
Visual guided	3 (1.6%)	17 (4.1%)
Direct trocar	0	4 (1.0%)
Total	186	411

No. of missing data: 7 (3.6%) in 2002 and 11 (2.6%) in 2007



Number of missing data: 11 (2.6%)

The primary trocar was inserted through the umbilical incision in 96.7% (98.9% in 2002) while supraumbilically in 2.5% (1.1% in 2002) and via left upper quadrant in 0.8% (none in 2002).

	2002	2007
Umbilical	183 (98.9%)	381 (96.7%)
Supraumbilical	2 (1.1%)	10 (2.5%)
Left upper quadrant	0 (0.0%)	3 (0.8%)
Total	185	394

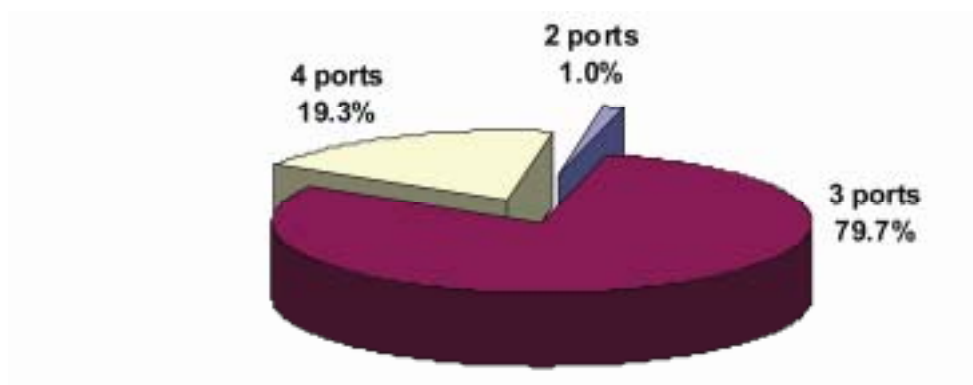
No. of missing data: 8 (4.1%) in 2002 and 28 (6.6%) in 2007

Number of ports used

The procedures were performed using 3 ports in 79.7% of cases, 4 ports in 19.3% and 2 ports in 1.0%.

	2002	2007
2 ports	3 (1.7%)	4 (1.0%)
3 ports	128 (71.1%)	318 (79.7%)
4 ports	49 (27.2%)	77 (19.3%)
Total	180	1034

No. of missing data: 13 (6.7%) in 2002 and 23 (5.5%) in 2007



Number of missing data: 23 (5.5%)

Surgical Modalities

Electrocautery was used in over 88.6% of cases; of which bipolar energy alone was used in 48 (28.1%), unipolar alone in 4 (2.3%) and both in 119 (69.6%). Suture was used in 62.2% only. Ultracision was used in 17.1% and pelvic drain was used in 28.5%.

	2002	2007
Electrocautery	171 (88.6%)	410 (97.2%)
Ligature	-	1 (0.2%)
Plasmakinetic	-	1 (0.2%)
Ultracision	33 (17.1%)	62 (14.7%)
Suture	120 (62.2%)	268 (63.5%)
Endoloop	1 (0.5%)	4 (0.9%)
Laser	0 (0.0%)	0 (0.0%)
Clips/Staples	4 (2.1%)	3 (0.70%)
Use of drain	55 (28.5%)	50 (11.8%)

CONCURRENT OPERATION

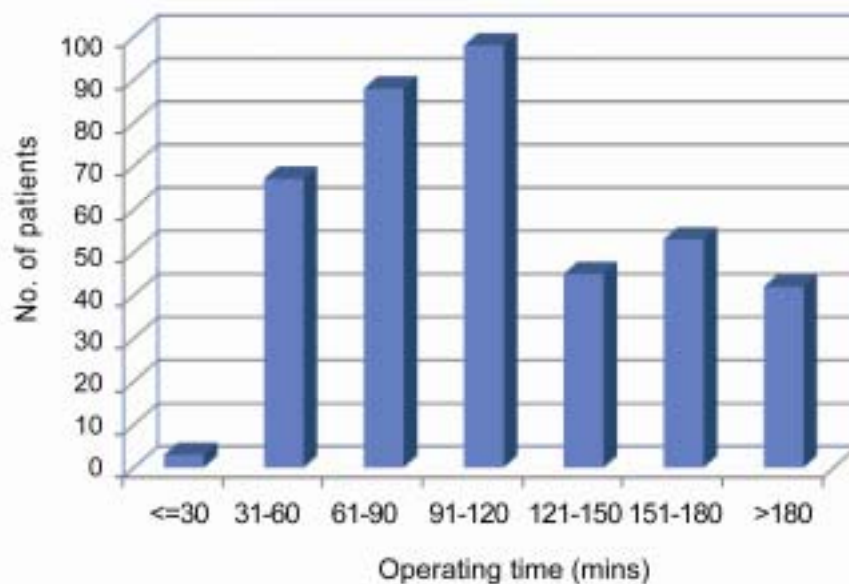
Cystectomy was the most common concurrent operation and the incidence was 28%. Ten patients had salpingo-oophorectomy; 9 were unilateral and 1 was bilateral.

	2002	2007
Cystectomy	54 (28.0%)	125 (29.6%)
Ablation of endometriosis	12 (6.2%)	60 (14.2%)
Adhesiolysis	26 (13.5%)	31 (7.3%)
Salpingo-oophorectomy	10 (5.2%)	11 (2.6%)
Salpingectomy	4 (2.1%)	4 (0.9%)
Salpingostomy	3 (1.6%)	2 (0.5%)
Ovarian drilling	0 (0.0%)	1 (0.2%)
LUNA	1 (0.5)	0 (0.0%)
Others	0 (0.0%)	5 (1.2%)

Others in 2007 (proximal tubal cannulation, hysteroscopic myomectomy, excision of bladder endometriosis, appendectomy, adenomyomectomy)

OPERATING TIME

The mean operating time was 121.3 (SD 58.6) minutes, compared to 125.6 (SD 71.8) in 2002. The operating time was 60 minutes or less in 17.7% (17.6% in 2002) and exceeded 180 minutes in 10.6% (15.0% in 2002).



Number of missing data: 26 (6.2%)

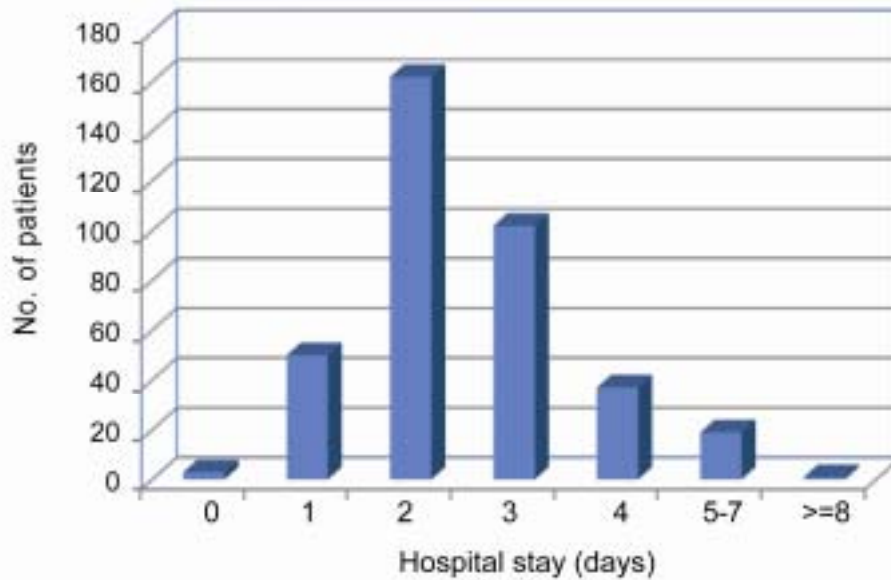
Distribution of operating time

	2002	2007
≤ 30 minutes	2 (1.0%)	3 (0.8%)
31 – 60 minutes	32 (16.6%)	67 (16.9%)
61 – 90 minutes	41 (21.2%)	88 (22.2%)
91- 120 minutes	44 (22.8%)	98 (24.7%)
121 – 150 minutes	20 (10.4%)	45 (11.4%)
151 – 180 minutes	23 (11.9%)	53 (13.4%)
> 180 minutes	29 (15.0%)	42(10.6%)
Total	191	396

Number of missing data: 2 (1.0%) in 2002 and 26 (6.2%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.5 (SD 1.1) days, compared to 3.0 (SD 1.5) in 2002. The patients were discharged within the first days in 14.2% (10.3% in 2002) and 0.3% (1.6% in 2002) stayed longer than 7 days.



Number of missing data: 48 (11.4%)

Distribution of post-operative hospital stay

	2002	2007
0 day	2 (1.0%)	3 (0.8%)
1 day	18 (9.3%)	50 (13.4%)
2 days	57 (29.5%)	162 (43.3%)
3 days	59 (30.6%)	102 (27.3%)
4 days	28 (14.5%)	37 (9.9%)
5 – 7 days	23 (11.9%)	19 (5.1%)
8 – 14 days	3 (1.6%)	1 (0.3%)
Total	190	374

Number of missing data: 3 (1.6%) in 2002 and 48 (11.4%) in 2007

CONVERSION

Conversion to laparotomy was required in 4 (0.9%) patients (5 or 2.6% in 2002), 1 because of dense pelvic adhesions, 2 for retrieval of fibroids and 1 for surgical emphysema. There was no conversion for uncontrollable haemorrhage.

	2002	2007
Uncontrolled haemorrhage	1 (0.5%)	0 (0.0%)
Broken needle	1 (0.5%)	0 (0.0%)
Unspecified	3 (1.6%)	0 (0.0%)
Dense pelvic adhesions	0 (0.0%)	1 (0.2%)
Retrieval of fibroids	0 (0.0%)	2 (0.5%)
Surgical emphysema	0 (0.0%)	1 (0.2%)
Total	5 (2.6%)	4 (0.9%)

Data are presented as number and percentage of total number of patients

COMPLICATIONS

Thirteen patients had complication, giving an incidence of 3.1%, compared to 5.2% in 2002. Significant haemorrhage requiring transfusion occurred in 5 (1.2%), compared to 1.0% in 2002. No febrile morbidity was reported, compared to 0.5% in 2002. Two patients required re-admission, one for bowel obstruction and one for wound gapping. No re-operation was reported and it is not known whether the case with bowel obstruction resolved spontaneously or required surgical correction. No patients required re-operation or re-admission to hospitals in 2002.

	2002	2007
Haemorrhage requiring transfusion	2 (1.0%)	5 (1.2%)
Febrile morbidity	1 (0.5%)	0 (0.0%)
Retention of urine	1 (0.5%)	0 (0.0%)
Wound complication	1 (0.5%)	1 (0.2%)
Deep vein thrombosis	1 (0.5%)	0 (0.0%)
Conversion	5 (2.6%)	4 (0.9%)
Bowel obstruction	0 (0.0%)	1 (0.2%)
Surgical emphysema	0 (0.0%)	3 (0.7%)
Total	10 (5.2%)	13 (3.1%)

Data are presented as number and percentage of total number of patients

RE-OPERATION AND RE-ADMISSION

As in 2002, no patients required re-operation or re-admission to hospitals in 2007.

OPERATIVE OUTCOME BY UTERINE AND FIBROID SIZE

Uterine size

A total of 333 (78.9%) cases reported the uterine size. Operating time, post-operative hospital stay and conversion rate increased with the size of the uterus. Complication rate also tended to increase with uterine size.

Uterine size	OT time (min)	Post-op Stay (d)	Conversion	Complication
Normal	74 ± 35	2.1 ± 0.9	0 (0.0%)	0 (0.0%)
≤ 8 weeks	102 ± 50	2.3 ± 1.0	0 (0.0%)	4 (4.0%)
10-12 weeks	132 ± 52	2.6 ± 1.0	1 (0.9%)	1 (0.9%)
14-16 weeks	166 ± 58	2.6 ± 1.1	1 (1.7%)	5 (8.6%)
> 16 weeks	202 ± 70	3.3 ± 1.1	1 (9.1%)	1 (9.1%)
Total	122 ± 61	2.5 ± 1.0	3 (0.9%)	11 (3.3%)

No. of missing data: 22 (7.1%) in OT time, 43 (12.9%) in post-operative stay

Sizes of the largest fibroid

A total of 390 (92.4%) cases reported the largest fibroid size. Operating time and post-operative hospital stay increased with the size of the uterus. Complication rate also increased with fibroid size while conversion occurred only in fibroids > 6 cm.

Fibroid size	OT time (min)	Post-op Stay (d)	Conversion	Complication
≤ 3 cm	90 ± 45	2.0 ± 0.9	0 (0.0%)	0 (0.0%)
4-6 cm	111 ± 49	2.6 ± 1.3	0 (0.0%)	2 (1.8%)
> 6 cm	150 ± 58	2.7 ± 1.1	3 (1.7%)	10 (5.7%)
Total	123 ± 58	2.5 ± 1.1	3 (0.8%)	12 (3.1%)

No. of missing data: 18 (4.6%) in OT time, 45 (11.5%) in post-operative stay

Types of the deepest fibroid

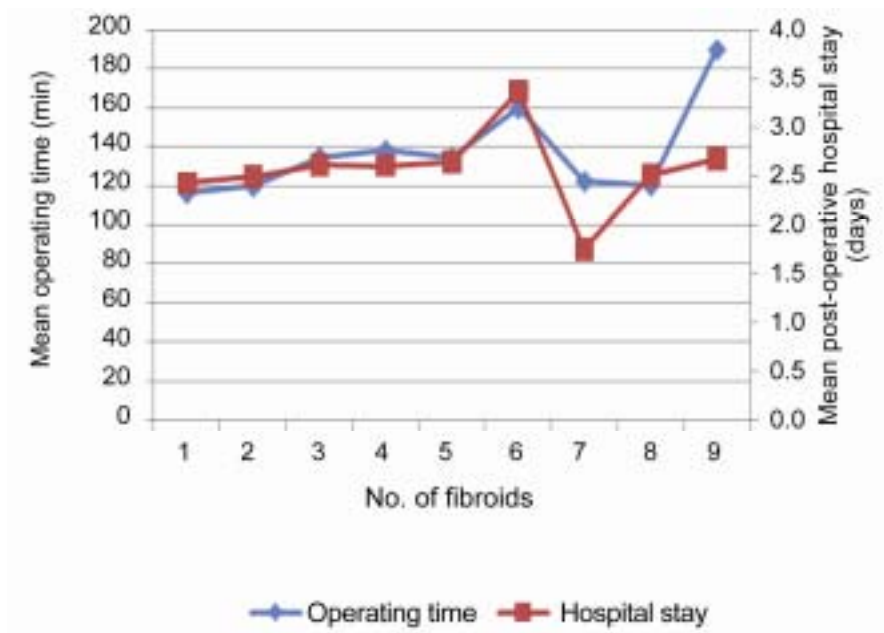
A total of 341 (81.8%) cases reported the deepest type of fibroid removed. Operating time and post-operative hospital stay increased with the depth of the deepest fibroid. However, conversion and complication rate occurred only when the deepest fibroid was subserosal or intramural.

Fibroid type	OT time (min)	Post-op Stay (d)	Conversion	Complication
Intramural	141 ± 57	2.6 ± 1.1	2 (1.3%)	4 (2.7%)
Subserosal	112 ± 65	2.3 ± 1.1	1 (0.8%)	5 (4.2%)
Pedunculated	90 ± 41	2.2 ± 1.6	0 (0.0%)	0 (0.0%)
Submucosal	134 ± 38	2.5 ± 0.8	0 (0.0%)	0 (0.0%)
Total	121 ± 59	2.5 ± 1.1	3 (0.9%)	11 (3.2%)

No. of missing data: 19 (5.6%) in OT time, 38 (11.1%) in post-operative stay

Number of fibroids

Number of fibroids were reported in 357 (84.6%) cases. Operating time was constant at 120-140 minutes but peaked when the number of fibroids reached 6 and 9 where the operating time was 160 and 190 minutes. Post-operative hospital stay was also constant at 2.4-2.6 days and peaked at 3.4 days when the number of fibroids reached 6.



Using 6 as the cut off, operating time was significantly higher when the number of fibroids was 6 or more, however, there were no differences in the post-operative hospital stay and the rate of conversion and complication.

	< 6 fibroids N = 330	>= 6 fibroids N = 27	P-value
Operating time (min)	121 ± 57	154 ± 62	0.006
Hospital stay (d)	2.5 ± 1.1	2.9 ± 1.2	NS
Conversion rate	3 (0.9%)	0 (0.0%)	NS
Complication rate	11 (3.3%)	1 (3.7%)	NS

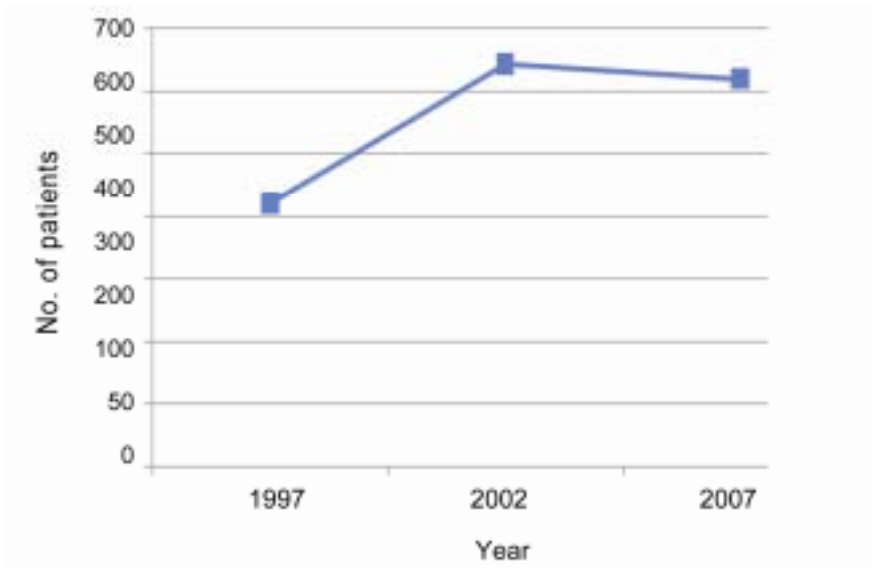
8

LAPAROSCOPIC MANAGEMENT OF ECTOPIC PREGNANCY

Total number of patients

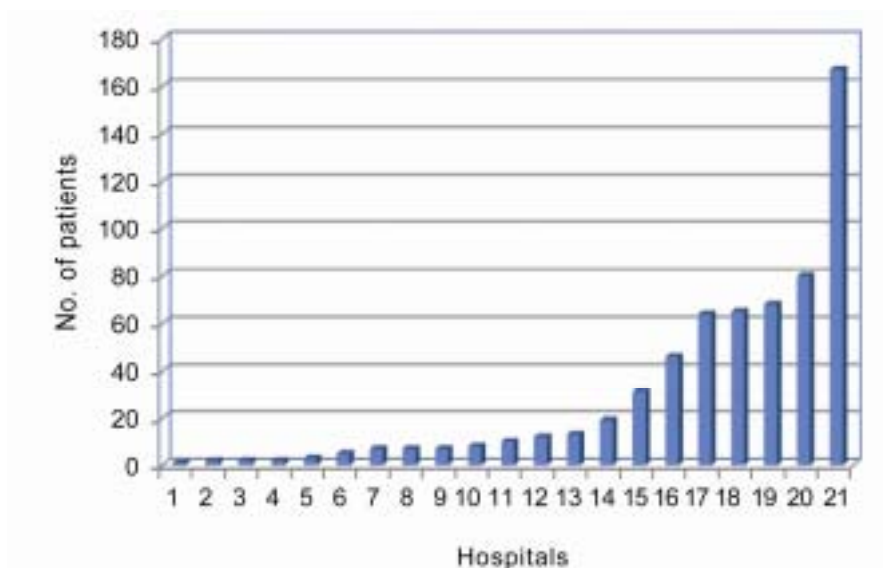
619

Compared to 1997, there was only a 1.5 fold increase in the number of laparoscopic management of ectopic pregnancy with the actual number increased from 420 in 1997 to 643 in 2002 and decreased slightly to 619 in 2007.



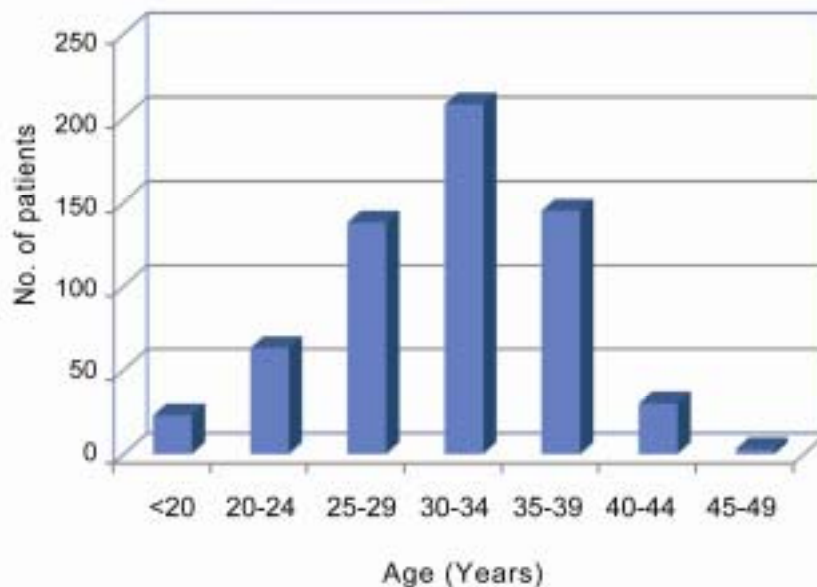
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

About 70% (50% in 2002 and 68.8% in 1997) of the units performed less than 30 cases a year and only 5 units performed more than 60 a year. One unit performed over 160 cases a year.



AGE DISTRIBUTION OF PATIENTS

The distribution of age was similar to that in 1997 and 2002. The mean age of the patients was 31.2 (SD 5.7) years, compared to 30.8 (SD 5.9) in 2002 and 30.1 (SD 5.8) in 1997. Twenty-three (3.7%) patients (2.7% in 2002 and 4.1% in 1997) were younger than 20 and 33 (5.4%) aged 40 or above (6.7% in 2002 and 5.5% in 1997).



Number of missing data: 9 (1.5%)

Distribution of age

	1997	2002	2007
< 20 years	17 (4.1%)	17 (2.7%)	23 (3.8%)
20 – 24 years	58 (13.8%)	70 (11.1%)	63 (10.3%)
25 – 29 years	114 (27.2%)	177 (28.1%)	138 (22.6%)
30 – 34 years	129 (30.8%)	192 (30.5%)	208 (34.1%)
35 – 39 years	78 (18.6%)	131 (20.8%)	145 (23.8%)
40 – 44 years	22 (5.3%)	41 (6.5%)	30 (4.9%)
45 – 49 years	1 (0.2%)	1 (0.2%)	3 (0.5%)
Total	419	629	610

Number of missing data: 1 (0.2%) in 1997, 14 (2.2%) in 2002 and 9 (1.5%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

Contrary to previous audits, the operation was performed mainly by specialists (36.3% versus 39.7% in 2002 and 35.0% in 1997) and pre-membership doctors (35.5% versus 23.9% in 2002 and 7.1% in 1997). About 65% of the procedures performed by pre-membership doctors were assisted by pre-membership doctors (8.8% in 2007). Doctors with MRCOG performed only 28.2% of the procedure, (36.4% in 2002 and 57.9% in 1997), of which almost 70% of the procedures were assisted by pre-membership doctors, in contrast to 64.4% by specialists in 2002. This was probably related to the huge loss of senior doctors in HA hospitals in that year.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	35	40	135	0	210
MRCOG	114	6	47	0	167
FHKAM	133	9	23	16	181
FRCOG	8	3	1	22	34
Total	290	58	206	38	592

Number of missing data: 27 (4.4%)

About 58% of the procedures (64% in 2002) were performed by doctors without accreditation in gynaecological laparoscopy, of which 41.7% (33.6% in 2002) were assisted by doctors without accreditation and 1.2% (5.6% in 2002) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 30% (32% in 2002), of which 19.7% (29% in 2002) were assisted by doctors with accreditation. Only 11% (4% in 2002) of the procedures were performed by doctors with advanced accreditation, 54.2% (30% in 2002) were assisted by doctors without accreditation and 5.9% (55% in 2002) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	138	144	45	4	331
Intermediate	139	25	10	4	178
Advanced	33	3	1	26	63
Total	310	172	56	34	572

Number of missing data: 47 (7.6%)

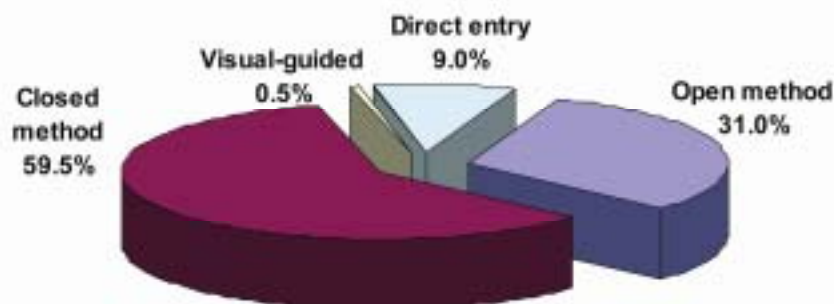
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was still the most common technique for primary trocar entry and was used in 365 (59.5% versus 64.9% in 2002) of cases. Open method was used in 190 (31.0% versus 29.9% in 2002). There was a decrease in the use of visually guided trocar from 5.2% in 2002 to 0.5% in 2007. The use of direct trocar entry was not reported in previous audits, however, it was used in 9% of cases in 2007.

	2002	2007
Closed method	408 (64.9%)	365 (59.5%)
Open method	188 (29.9%)	190 (31.0%)
Visual guided	33 (5.2%)	3 (0.5%)
Direct trocar	0 (0.0%)	55 (9.0%)
Total	629	613

Number of missing data: 14 (2.2%) in 2002 and 6 (1.0%) in 2007



Number of missing data: 6 (1.0%)

The primary trocar was inserted through the umbilical incision in 99.2% of cases. The supraumbilical and left upper quadrant was used for trocar insertion in 2 and 3 patients respectively.

	2002	2007
Umbilical	616 (99.6%)	589 (99.2%)
Supraumbilical	1 (0.2%)	2 (0.3%)
Left upper quadrant	1 (0.2%)	3 (0.5%)
Total	618	594

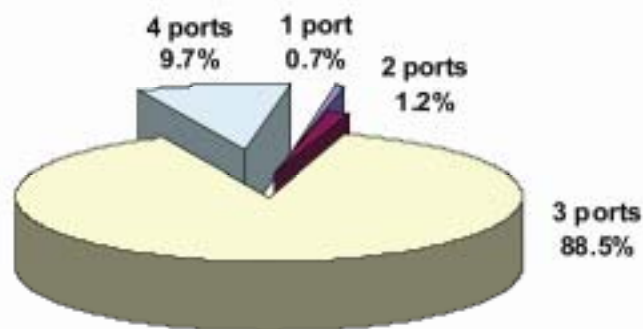
No. of missing data: 25 (3.9%) in 2002 and 25 (4.0%) in 2007

Number of ports used

The procedures were performed using 3 ports in 81.1% of cases, 4 ports in 16.3% and 2 or less port in 2.7%.

	2002	2007
1 port	4 (0.7%)	4 (0.7%)
2 ports	12 (2.0%)	7 (1.2%)
3 ports	498 (81.1%)	537 (88.5%)
4 ports	100 (16.3%)	59 (9.7%)
Total	614	607

No. of missing data: 29 (4.5%) in 2002 and 12 (1.9%) in 2007



Number of missing data: 12 (1.9%)

Surgical Modalities

Similar to previous audits, electrocautery was used in over 90% of cases (92.1% in 2002 and 91.7% in 1997); of which bipolar energy alone was used in 492 (85.0% versus 73.0% in 2002), unipolar alone in 16 (2.8% versus 3.2% in 2002) and both in 71 (12.2% versus 23.8% in 2002). Endoloop was used less commonly used as compared to previous audits (1.1% versus 5.8% in 2002 and 8.8% in 1997).

	1997	2002	2007
Electrocautery	385 (91.7%)	592 (92.1%)	579 (93.5%)
Ligature	-	-	1 (0.2%)
Plasmakinetic	-	-	0 (0.0%)
Ultracision	0 (0.0%)	5 (0.8%)	19 (3.1%)
Suture	5 (1.2%)	13 (2.0%)	12 (1.9%)
Endoloop	37 (8.8%)	37 (5.8%)	7 (1.1%)
Laser	0 (0.0%)	0 (0.0%)	0 (0.0%)
Clips/Staples	2 (0.5%)	1 (0.2%)	0 (0.0%)
Use of drain	26 (6.2%)	17 (2.6%)	29 (4.7%)

Number of missing data: 5 (2.4%) in 2002

TYPES OF ECTOPIC PREGNANCY

Ectopic pregnancy occurred on the right side in 331 (53.5% versus 54.3% in 2002 and 49.8% in 1997) patients, left side in 276 (44.6% versus 45.2% in 2002 and 46.9% in 1997), bilateral in 1 (0.2% versus 0 in 2002 and 1997) and was not specified in 11 (1.8% versus 0.5% in 2002 and 3.3% in 1997). The incidence of cornual/interstitial pregnancy increased from 1.7% in 1997, 2.9% in 2002 to 3.6% in 2007.

There seems to be an increase in the number of extra-tubal ectopic pregnancies. The number of ovarian pregnancy increased from 2 in 1997 and 2002 to 9 in 2007 and that of abdominal pregnancy increased from 2 in 1997 to 5 in 2007.

	1997	2002	2007
Tubal pregnancy	409 (97.3%)	532 (82.7%)	553 (89.3%)*
<i>Fimbrial</i>	20 (4.9%)	7 (1.3%)	26 (4.7%)
<i>Ampullary</i>	230 (56.2%)	450 (84.6%)	383 (69.3%)
<i>Isthmus</i>	29 (7.1%)	34 (6.4%)	76 (13.7%)
<i>Interstitial</i>	4 (1.0%)	9 (1.7%)	7 (1.3%)
<i>Cornual</i>	3 (0.7%)	10 (1.9%)	16 (2.9%)
<i>Whole tube involved</i>	11 (2.7%)	14 (2.6%)	46 (8.3%)
<i>Not specified</i>	112 (27.4%)	8 (1.5%)	0 (0.0%)
Ovarian pregnancy	2 (0.5%)	2 (0.3%)	9 (1.5%)
Abdominal pregnancy	2 (0.5%)	0 (0.0%)	5 (0.8%)
Not specified	7 (1.7%)	109 (17.0%)	52 (8.4%)
Total	420	643	619

*One patient in 2007 had bilateral ectopic pregnancy involving left isthmus and right cornual region.

The ectopic pregnancy was ruptured in 194 patients (31.3% versus 28.7% in 2002 and 28.6% in 1997). Haemoperitoneum was present in 495 (80.0%) patients (80.0% versus 81.8% in 2002 and 71.9% in 1997) and 127 patients (20.5% versus 13.7% in 2002) were haemodynamically unstable. The mean volume of haemoperitoneum was 331 (SD 468) ml compared to 211 (SD 206) ml in 2002 and 360 (SD 485) ml in 1997.

OPERATIVE PROCEDURES

Salpingectomy was performed in 78.6% (85.6% in 2002 and 69.2% in 1997), only 2 (0.4% versus 2.7% in 2002) of which had a prior attempt of salpingostomy. Salpingostomy was performed in only 6.0%, compared to 12.4% in 2002 and 26.5% in 1997. The incidence of cornual resection increased from 0.5% in 1997 and 0.3% in 2002 to 15% in 2007. Similarly, the incidence of excision of ovarian pregnancy increased from 0.2% in 1997 and 0.3% in 2002 to 1.3% in 2007.

	1997	2002	2007
Salpingectomy	285 (69.2%)	513 (85.6%)	482 (78.6%)
Salpingostomy	109 (26.5%)	74 (12.4%)	37 (6.0%)
Removal of POG	9 (2.2%)	1 (0.2%)	5 (0.8%)
Salpingo-oophorectomy	3 (0.7%)	6 (1.0%)	9 (1.5%)
Cornual resection	2 (0.5%)	2 (0.3%)	9 (1.5%)
Ovarian pregnancy excision	1 (0.2%)	2 (0.3%)	8 (1.3%)
Control of bleeding	2 (0.5%)	1 (1.0%)	1 (0.2%)
Miscellaneous	2 (0.5%)	0 (0.0%)	2 (0.3%)
Total	412	599	613

Number of missing data: 8 (1.9%) in 1997, 45 (7.0%) in 2002 and 6 (1.0%) in 2007

CONCURRENT OPERATIVE PROCEDURES

	1997	2002	2007
Adhesiolysis	40 (9.5%)	79 (12.3%)	32 (5.2%)
Cystectomy	17 (4.0%)	28 (4.4%)	21 (3.4%)
Sterilization	6 (1.4%)	24 (3.7%)	8 (1.3%)
Ablation of endometriosis	4 (1.0%)	6 (0.9%)	1 (0.2%)
Oophorectomy	0 (0.0%)	2 (0.3%)	1 (0.2%)
Myomectomy	0 (0.0%)	2 (0.3%)	1 (0.2%)
Miscellaneous	2 (0.4%)	0 (0.0%)	0 (0.0%)

COMPARISON BETWEEN SALPINGECTOMY AND SALPINGOSTOMY

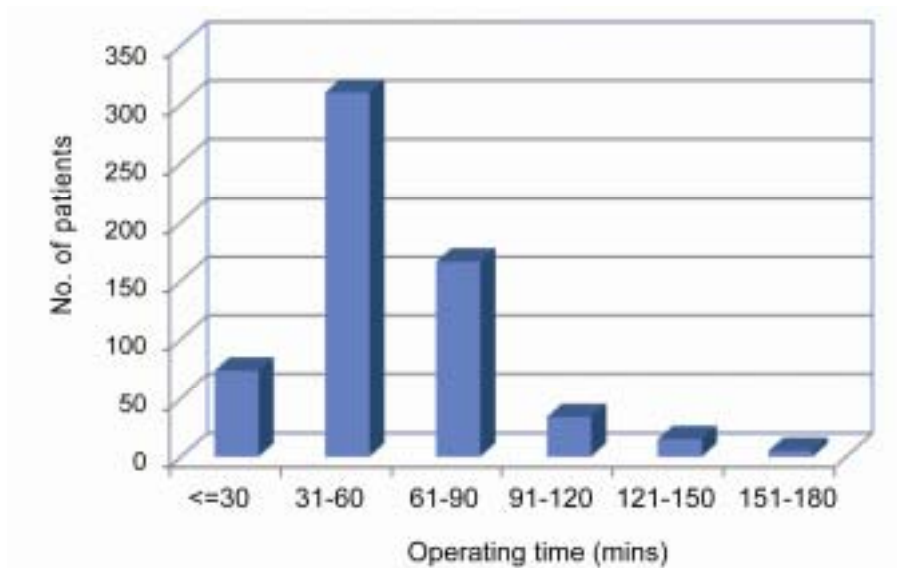
There were no difference between salpingectomy and salpingostomy with regards to patient's age, operating time, hospital stay and complication rate.

	Salpingectomy N = 482	Salpingostomy N = 37
Age (years)	31.0 (SD 5.6)	29.7 (SD 5.0)
Mean operating time (min)	57.8 (SD 25.9)	58.8 (SD 22.2)
Mean post-operative hospital stay (days)	2.1 (SD 1.1)	2.2 (SD 1.1)
Complication rate (%)	2.7%	2.7%

No significant difference between the 2 groups

OPERATING TIME

The mean operating time was 59.1 (SD 26.0) minutes, compared to 55.7 (SD 25.4) in 2002 and 65.2 (SD 31.5) in 1997. The operation was completed within 30 minutes in 12.1% (17.5% in 2002 and 11.9% in 1997) and exceeded 120 minutes in 3.3% (1.7% in 2002 and 4.2% in 1997).



Number of missing data: 16 (2.6%)

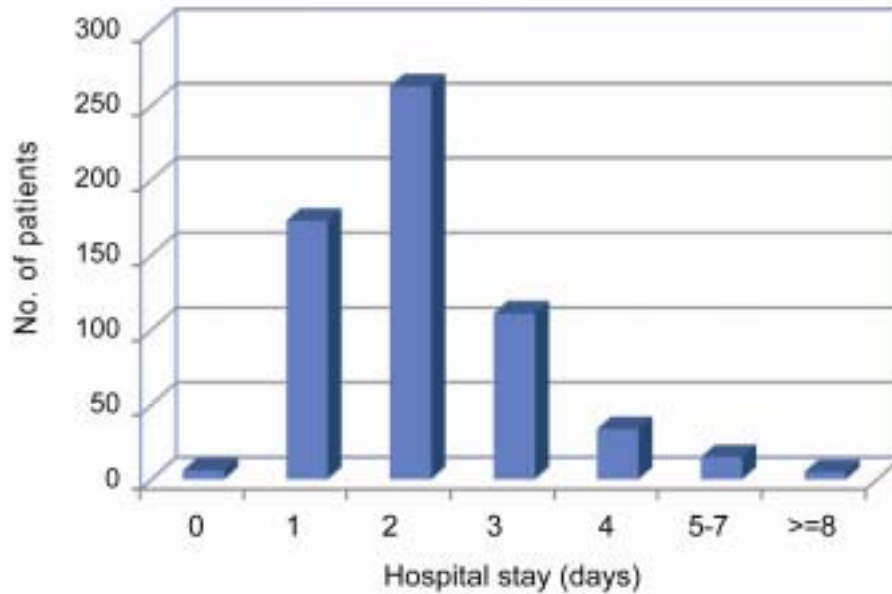
Distribution of operating time

	1997	2002	2007
≤ 30 minutes	48 (11.9%)	111 (17.5%)	73 (12.1%)
31 – 60 minutes	207 (51.1%)	324 (51.5%)	310 (51.4%)
61 – 90 minutes	97 (24.0%)	156 (24.6%)	166 (27.5%)
91- 120 minutes	36 (8.9%)	32 (5.0%)	34 (5.6%)
121 – 150 minutes	10 (2.5%)	7 (1.1%)	15 (2.5%)
151 – 180 minutes	5 (1.2%)	4 (0.6%)	5 (0.8%)
> 180 minutes	2 (0.5%)	0 (0.0%)	0 (0.0%)
Total	405	634	603

Number of missing data: 15 (3.6%) in 1997, 9 (1.4%) in 2002 and 16 (2.6%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.1 (SD 1.2) days, compared to 2.4 (SD 1.3) in 2002 and 2.5 (SD 2.4) in 1997. Post-operative stay was within 1 day in 29.5% (22.2% in 2002 and 21.9% in 1997) and longer than 7 days in 0.8 % (0.8% in 2002 and 1.0% in 1997).



Number of missing data: 12 (1.9%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	3 (0.7%)	14 (2.2%)	6 (1.0%)
1 day	88 (21.2%)	128 (20.0%)	173 (28.5%)
2 days	168 (40.5%)	274 (42.8%)	263 (43.3%)
3 days	108 (26.0%)	157 (24.5%)	111 (18.3%)
4 days	29 (7.0%)	32 (5.0%)	34 (5.6%)
5 – 7 days	15 (3.6%)	30 (4.7%)	15 (2.5%)
8 – 14 days	2 (0.5%)	4 (0.6%)	5 (0.8%)
≥ 15 days	2 (0.5%)	1 (0.2%)	0 (0.0%)
Total	415	640	607

Number of missing data: 5 (1.2%) in 1997, 3 (0.5%) in 2002 and 12 (1.9%) in 2007

CONVERSION

Conversion to laparotomy was necessary in 11 patients and the incidence was 1.1% (3.4% in 2002 and 1.2% in 1997). The presence of dense pelvic adhesions and cornual/interstitial pregnancy accounted for the main reasons for conversion.

	1997	2002	2007
Dense adhesions	1 (0.2%)	6 (0.9%)	3 (0.5%)
Cornual/Interstitial pregnancy	0 (0.0%)	6 (0.9%)	2 (0.3%)
Unstable haemodynamics	0 (0.0%)	2 (0.3%)	0 (0.0%)
Uncontrolled bleeding	2 (0.5%)	1 (0.2%)	2 (0.3%)
Bowel injury	0 (0.0%)	1 (0.2%)	0 (0.0%)
Failed pneumoperitoneum	1 (0.2%)	0 (0.0%)	0 (0.0%)
Severe haemoperitoneum	1 (0.2%)	0 (0.0%)	3 (0.5%)
Unspecified	0 (0.0%)	6 (0.9%)	1 (0.2%)
Total	5 (1.2%)	22 (3.4%)	11 (1.8%)

Data are presented as number and percentage of total number of patients

COMPLICATIONS

The overall complication rate associated with laparoscopic management of ectopic pregnancy was 4.5%, compared to 5.8% in 2002 and 7.6% in 1997. There was no visceral injury. Two patients required re-operation and 2 patients had persistent ectopic pregnancy, both did not undergo another surgery.

	1997	2002	2007
Bowel injury	1 (0.2%)	1 (0.2%)	0 (0.0%)
Inferior epigastric artery injury	2 (0.5%)	1 (0.2%)	0 (0.0%)
Major vascular injury	1 (0.2%)	0 (0.0%)	0 (0.0%)
Haemorrhage with transfusion	3 (0.7%)	0 (0.0%)	5 (0.8%)
Surgical emphysema	0 (0.0%)	1 (0.2%)	0 (0.0%)
Subcutaneous haemorrhage	0 (0.0%)	2 (0.3%)	0 (0.0%)
Febrile morbidity	10 (2.4%)	2 (0.3%)	0 (0.0%)
Urinary tract infection	5 (1.2%)	1 (0.2%)	2 (0.3%)
Perforation of uterus	0 (0.0%)	0 (0.0%)	1 (0.2%)
Retention of urine	3 (0.7%)	3 (0.5%)	0 (0.0%)
Wound infection	3 (0.7%)	2 (0.3%)	0 (0.0%)
Conversion	5 (1.2%)	22 (3.4%)	11 (1.8%)
Re-admission	5 (1.2%)	5 (0.8%)	7 (1.1%)
Re-operation	0 (0.0%)	0 (0.0%)	2 (0.3%)
Persistent ectopic pregnancy	4 (3.6%)	0 (0.0%)	2 (0.3%)
Total	32 (7.6%)	37 (5.8%)	28 (4.5%)

Data are presented as number and percentage of total number of patients

RE-ADMISSION

Seven patients (1.1%) required re-admission to hospital after laparoscopic surgery for ectopic pregnancy. This compared to 0.8% in 2002 and 1.2% in 1997. Two patients were reported to have persistent ectopic pregnancy.

	1997	2002	2007
Persistent ectopic pregnancy	3 (0.7%)	0 (0.0%)	2 (0.3%)
Pelvic infection	2 (0.5%)	0 (0.0%)	0 (0.0%)
Failed salpingostomy	0 (0.0%)	1 (0.2%)	0 (0.0%)
Vaginal bleeding	0 (0.0%)	1 (0.2%)	1 (0.2%)
Unrelated problem	0 (0.0%)	1 (0.2%)	3 (0.5%)
Unspecified	0 (0.0%)	2 (0.3%)	1 (0.2%)
Total	5 (1.2%)	5 (0.8%)	7 (1.1%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

Two patients required re-operation, giving an incidence of 0.3%, compared to 0% in both 2002 and 1997. One patient had a diagnostic laparoscopy followed by re-operation for ruptured cornual pregnancy. No other information was reported. She stayed in hospital for 5 days. The other patient had a fimbrial ectopic pregnancy with salpingectomy performed. The surgeon was reported to be a specialist and the reason for re-operation was reported to be "immediate because not trained for lap surgery". The patient stayed in hospital for 3 days with no other complications.

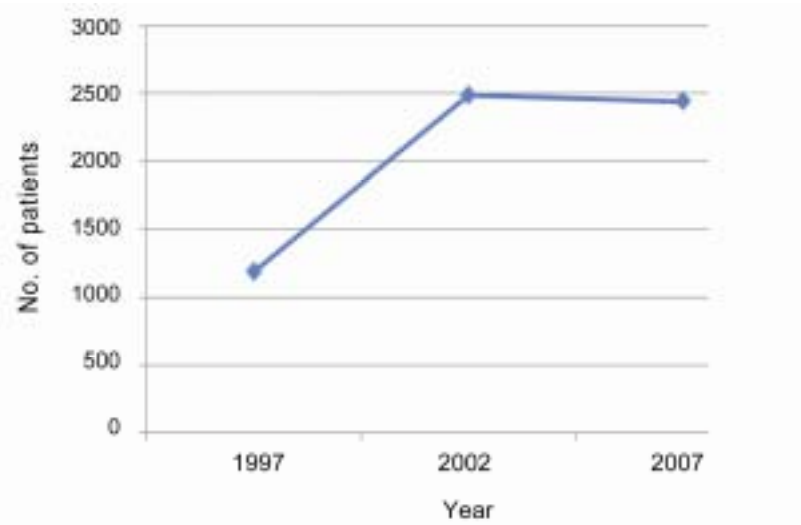
9

LAPAROSCOPIC MANAGEMENT OF ADNEXAL MASSES

Total number of patients

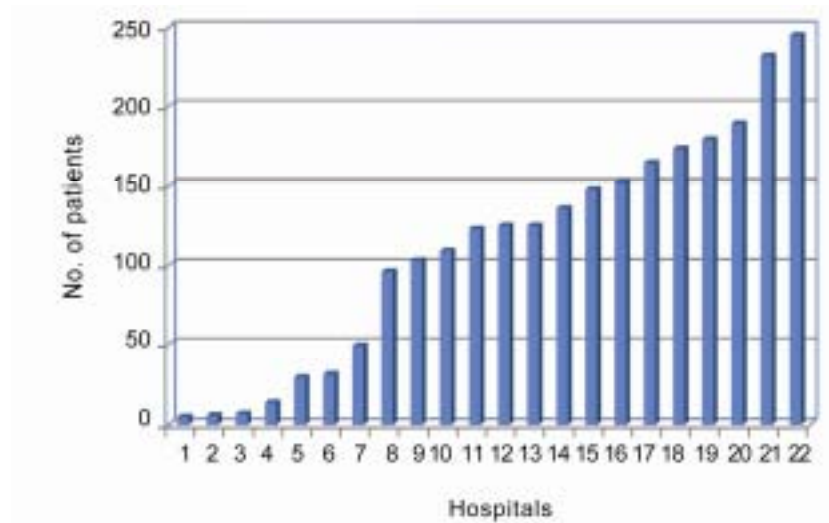
2,442

Compared to 1997, there was a 2 fold increase in the number of laparoscopic management of adnexal masses with the actual number increased from 1,186 in 1997 to 2,485 in 2002 and remained 2,442 in 2007.



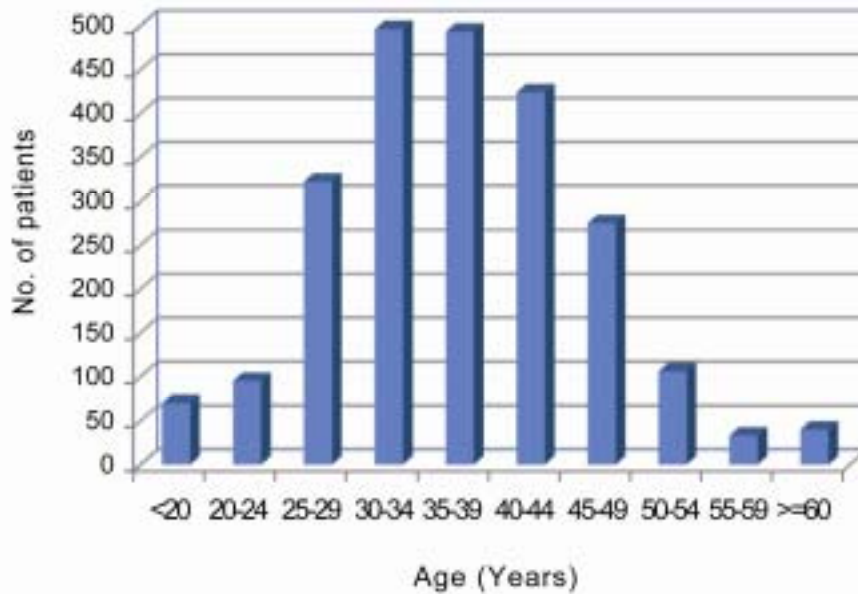
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

There was a general increase in the number of laparoscopic management of adnexal masses. Most units (47.6%) performed more than 100 cases a year, compared to 70.0% in 2002 and 16.7% in 1997. While 7 units performed less than 50 cases a year, 2 units performed more than 200 cases a year.



AGE DISTRIBUTION OF PATIENTS

The age distribution was similar to that in previous audits. The mean age of the patients was 37.0 (SD 9.4%) years, compared to 35.6 (SD 8.8) in 2002 and 35.4 (SD 8.6) in 1997. The age was less than 20 in 3.0% (1.8% in 2002 and 2.5% in 1997) of patients and 50 or above in 7.6% (51% in 2002 and 3.6% in 1997).



Number of missing data: 88 (3.6%)

Distribution of age

	1997	2002	2007
< 20 years	30 (2.5%)	43 (1.8%)	70 (3.0%)
20 – 24 years	69 (5.8%)	173 (7.1%)	95 (4.0%)
25 – 29 years	166 (14.1%)	332 (13.7%)	322 (13.7%)
30 – 34 years	291 (24.6%)	586 (24.1%)	496 (21.1%)
35 – 39 years	299 (25.3%)	576 (23.8%)	493 (20.9%)
40 – 44 years	205 (17.4%)	397 (16.3%)	424 (18.0%)
45 – 49 years	78 (6.6%)	200 (8.2%)	275 (11.7%)
≥ 50 years	43 (3.6%)	123 (5.1%)	179 (7.6%)
Total	1181	2429	2354

Number of missing data: 5 (0.4%) in 1997, 56 (23.4%) and 88 (3.6%) in 2007

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by specialists (68.8% versus 64.5% in 2002 and 63.3% in 1997). Doctors with MRCOG performed 15.3% of the procedures (25.2% in 2002 and 30.8% in 1997). Pre-membership doctors performed 350 procedures (15.9% versus 10.3% in 2002 and 5.9% in 1997), of which 12 or 3.4% (1.7% in 2002) were assisted by pre-membership doctors. Of all the procedures, 36.0% of the operations were assisted by specialists (51.1% in 2002 and 36.6% in 1997) and 37.0% by nurses (23.5% in 2002 and 23.5% in 1997).

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	Specialist	Nurse	
MBBS	12	20	317	1	350
MRCOG	97	7	214	18	336
FHKAM	314	43	208	275	840
FRCOG	73	27	52	518	670
Total	496	97	791	812	2196

Number of missing data: 246 (10.1%)

Only 32.3% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy (compared to 53.5% in 2002), of which 20.3% (16.5% in 2002) were assisted by doctors without accreditation and 12.1% (25.6% in 2002) were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 27.0% (28.3% in 2002), of which 46.6% (46.0% in 2002) were assisted by doctors without accreditation. About 40% (18.3% in 2002) of the procedures were performed by doctors with advanced accreditation, 22.1% (28.7% in 2002) were assisted by doctors without accreditation and 68.8% (55.0% in 2002) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	133	225	218	80	656
Intermediate	256	91	137	65	549
Advanced	182	41	40	562	825
Total	571	357	395	707	2030

Number of missing data: 412 (16.9%)

TYPES OF ADNEXAL MASSES

Some patients could have more than one type of adnexal mass. Fimbrial cyst was not listed as a distinct diagnosis in previous audits and was possibly coded as paraovarian cyst unless specified. Endometriotic cyst was the most common pathology encountered, accounting for almost half of the pathologies. There were 2 cases of ovarian fibroma.

	1997	2002	2007
Endometriotic cyst	563 (47.2%)	1362 (54.8%)	1514 (62.0%)
Ovarian cyst	463 (38.8%)	1185 (47.7%)	829 (33.9%)
Dermoid cyst	154 (12.9%)	340 (13.7%)	459 (18.8%)
Paraovarian cyst	41 (3.4%)	152 (6.1%)	143 (5.9%)
Fimbrial cyst	18 (1.5%)	0 (0.0%)	64 (2.6%)

Bilateral disease occurred in 501 (20.5 versus 19.7% in 2002 and 14.8% in 1997); of which 113 or 22.1% (104 or 21.2% in 2002) were of different pathology. As in previous audits, endometriotic cyst was the most common bilateral ovarian disease (24.1% versus 22.4% in 2002 and 20.8% in 1997). The incidence of bilateral disease for dermoid cyst was 9.3% (10.7% in 2002 and 11.0% in 1997) and paraovarian cyst was 9.2% (9.4% in 2002 and 7.3% in 1997).

	Unilateral	Bilateral
Ovarian cyst	713 (92.5%)	58 (7.5%)
Endometriotic cyst	926 (75.9%)	294 (24.1%)
Dermoid cyst	381 (90.7%)	39 (9.3%)
Paraovarian cyst	119 (90.8%)	12 (9.2%)
Fimbrial cyst	58 (95.1%)	3 (4.9%)

The size of the adnexal mass was less than 5 cm in 48.4% of cases (50% in 2002 and 48% in 1997), between 5 and 8 cm in 39.8% (40% in 2002 and 44% in 1997) and greater than 8 cm in 11.8% (10% in 2002 and 8% in 1997).

	< 5 cm	5 – 8 cm	> 8 cm
Ovarian cyst	449	278	102
Endometriotic cyst	706	668	140
Dermoid cyst	165	201	93
Paraovarian cyst	85	43	15
Fimbrial cyst	52	8	4
Total	1457	1198	354

LEVEL OF PROCEDURES

Most of the procedures performed were Level 3 (76.5% versus 81.7% in 2002 and 89.1% in 1997). Twenty-two (0.9% versus 1.8% in 2002) cases were reported as a diagnostic and tubal occlusion procedure and so were classified as level 1. Two cases were Level 5 procedure as laparoscopic sacrocolpopexy was performed at the same time.

	1997	2002	2007
Level 1	0 (0.0%)	45 (1.8%)	22 (0.9%)
Level 2	18 (1.5%)	31 (1.2%)	65 (2.7%)
Level 3	1057 (89.1%)	2031 (81.7%)	1867 (76.5%)
Level 4	106 (8.9%)	300 (12.1%)	486 (19.9%)
Level 5	0 (0.0%)	0 (0.0%)	2 (0.1%)
Unclassified	5 (0.4%)	78 (3.1%)	0 (0.0%)
Total	1186	2485	2442

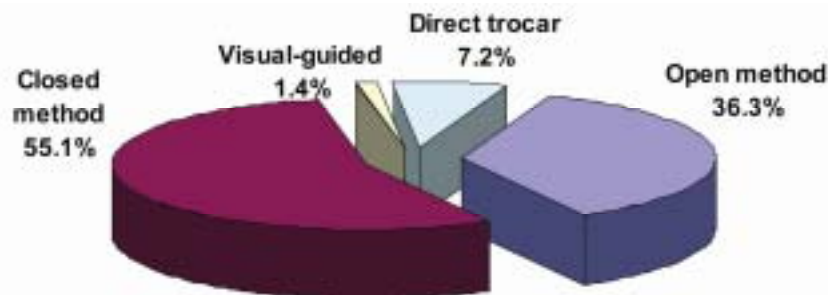
OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 1331 (55.1% versus 62.0% in 2002) of cases. Open method was used in 876 (36.3% versus 33.1% in 2002). The use of visually guided trocar dropped from 4.9% in 2002 to only 1.4% in 2007. Direct trocar entry was used in 175 (7.2% versus 0% in 2002) cases.

	2002	2007
Closed method	1491	1331
Open method	796	876
Visual guided	119	34
Direct trocar	0	175
Total	2406	2416

Number of missing data: 79 (3.2%) in 2002 and 26 (1.1%) in 2007



Number of missing data: 26 (1.1%)

The primary trocar was inserted through the umbilical incision in 2294 (98.0% versus 97.6% in 2002) cases. The supraumbilical and left upper quadrant was used for trocar insertion in 32 (1.4% versus 1.4% in 2002) and 16 (0.7% versus 1.0% in 2002) respectively.

	2002	2007
Umbilical	2274 (97.6%)	2294 (98.0%)
Supraumbilical	33 (1.4%)	32 (1.4%)
Left upper quadrant	24 (1.0%)	16 (0.7%)
Total	2331	2342

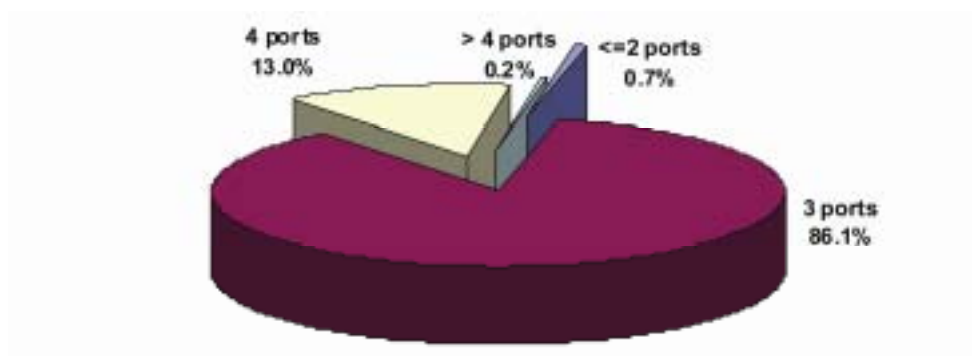
No. of missing data: 154 (6.2%) in 2002 and 100 (4.1%) in 2007

Number of ports used

The procedures were performed using 3 ports in 86.2% (81.7% in 2002) of cases, 4 or more ports in 13.2% (15.4% in 2002) and 2 or less port in 2.8%.

	2002	2007
1 port	15 (0.6%)	2 (0.1%)
2 ports	51 (2.8%)	14 (0.6%)
3 ports	1900 (81.7%)	2033 (86.1%)
4 ports	355 (15.3%)	306 (13.0%)
5 ports	4 (0.1%)	5 (0.2%)
Total	2324	2360

No. of missing data: 160 (6.4%) in 2002 and 82 (3.4%) in 2007



Number of missing data: 82 (3.4%)

Surgical Modalities

Electrocautery was used in 91.1% (87.4% in 2002 and 93.2% in 1997); of which bipolar energy alone was used in 1269 (51.9% versus 52.4% in 2002), unipolar alone in 71 (2.9% versus 3.7% in 2002) and both in 884 (36.2% versus 43.8% in 2002). The use of laser decreased from 3.5% in 1997 and 0.6% in 2002 to 0.1% in 2007. Ultracision was used in 1.4% (1.2% in 2002) and suture in 5.8% (5.6% in 2002 and 5.1% in 1997).

	1997	2002	2007
Electrocautery	1105 (93.2%)	2172 (87.4%)	2224 (91.1%)
Ligasure	-	-	7 (0.3%)
Plasmakinetic	-	-	14 (0.6%)
Ultracision	0 (0.0%)	29 (1.2%)	34 (1.4%)
Suture	61 (5.1%)	140 (5.6%)	142 (5.8%)
Endoloop	22 (1.9%)	23 (0.9%)	9 (0.4%)
Laser	42 (3.5%)	15 (0.6%)	3 (0.1%)
Clips/Staples	7 (0.6%)	5 (0.2%)	5 (0.2%)
Use of drain	93 (7.8%)	204 (7.8%)	148 (6.1%)

OPERATIVE PROCEDURES

Some patients could have more than one operative procedure performed. Cystectomy was the most common procedure performed and drainage of cyst was performed in 27 (0.9%) cases, compared to 1.8% in 2002. In 17 cases (0.7% versus 1.8% in 2002), the laparoscopy was reported as a diagnostic procedure only.

	1997	2002	2007
Cystectomy	968 (82.0%)	1910 (76.9%)	1920 (78.6%)
Salpingo-oophorectomy	168 (14.2%)	344 (13.8%)	404 (16.5%)
Oophorectomy	37 (3.1%)	81 (3.3%)	64 (2.6%)
Fenestration of cyst	7 (0.6%)	4 (0.2%)	6 (0.2%)*
Aspiration of cyst	5 (0.4%)	1 (0.04%)	
Ablation of cyst wall	1 (0.1%)	0 (0.0%)	0 (0.0%)
Diagnostic only	0 (0.0%)	45 (1.8%)	16 (0.7%)

Number of missing data: 5 (0.4%) in 1997, 69 (2.8%) in 2002 and 42 (1.7%)

* Reported as drainage of cyst or abscess

CONCURRENT OPERATIVE PROCEDURES

	1997	2002	2007
Adhesiolysis	177 (14.9%)	424 (17.1%)	250 (10.2%)
Ablation/resection of EM*	93 (7.8%)	234 (9.4%)	171 (7.0%)
Myomectomy	25 (2.2%)	64 (2.6%)	137 (5.6%)
Salpingectomy	32 (2.7%)	78 (3.1%)	58 (2.4%)
Salpingostomy	8 (0.6%)	31 (1.2%)	30 (1.2%)
Miscellaneous	25 (2.1%)	12 (0.5%)	45 (1.8%)

*EM: Endometriosis

PATHOLOGY IN THOSE CASES LABELLED AS DIAGNOSTIC PROCEDURE

A total of 16 cases were reported as diagnostic procedure. Three patients had bilateral disease, 2 had endometriotic cysts and 1 fimbrial cyst. Four patients were reported to have pelvic endometriosis, 1 mild and 3 severe in nature, and 2 with adenomyosis. Two reported to have pelvic adhesions, 1 moderate and 1 severe degree. One patient with an ovarian cyst of < 5 cm had concurrent appendicitis.

	< 5 cm	5 – 8 cm	> 8 cm
Ovarian cyst	9	0	0
Endometriotic cyst	3	3	0
Dermoid cyst	0	0	0
Paraovarian cyst	0	0	1
Fimbrial cyst	0	0	2
Total	12	3	5

The patient with paraovarian cyst of >8 cm underwent cystectomy. Two patients with a left ovarian cyst < 4 cm underwent haemostasis, presumably due to bleeding ovarian cyst. Another patient with a left ovarian cyst < 4 cm underwent ovarian biopsy only. Two patients were reported to have adhesiolysis only, 1 with bilateral fimbrial cysts and the other had bilateral endometriotic cysts. The patient with a small ovarian cyst and appendicitis was reported to have appendicectomy only. No procedure was reported in the remaining 9 patients.

RISK OF CYST RUPTURE DURING OPERATION

The incidence of operative rupture of the adnexal cyst was related to the pathology of the cyst. It was highest in endometriotic cyst (61.4%) and lowest in paraovarian cyst (16.6%). The overall rupture rate in laparoscopic management of adnexal cyst was 47.4% (compared with 46.7% in 2002)

	Rupture rate							
	< 5 cm		5 – 8 cm		> 8 cm		Total	
	N	%	N	%	N	%	N	%
Ovarian cyst	449	39.4	278	30.6	102	35.3	829	35.9
Endometriotic cyst	706	59.5	668	61.1	140	72.1	1514	61.4
Dermoid cyst	165	23.6	201	30.8	93	32.3	459	26.6
Paraovarian cyst	85	30.6	43	18.6	15	26.7	143	26.6
Total	1405	47.1	1190	47.3	350	48.9	2945	47.4

N: Total number of cases

The risk of operative rupture of the cyst was also related to the type of surgery performed. Cystectomy (45.6% in 2007 versus 50.1% in 2002) was associated with a higher risk of cyst rupture when compared to oophorectomy (28.8% in 2007 versus 31.8% in 2002). The calculation was based on those cases where the procedure had been performed on the cyst.

	Rupture rate during cystectomy							
	< 5 cm		5 – 8 cm		> 8 cm		Total	
	N	%	N	%	N	%	N	%
Ovarian cyst	499	30.1	348	20.4	94	26.6	941	26.1
Endometriotic cyst	618	61.5	550	63.5	116	74.1	1284	63.5
Dermoid cyst	137	24.8	153	35.3	56	44.6	346	32.7
Paraovarian cyst	58	55.2	32	34.4	11	18.2	101	44.6
Total	1312	45.4	1083	44.8	277	49.8	2672	45.6

N: Total number of cases

	Rupture rate during oophorectomy							
	< 5 cm		5 – 8 cm		> 8 cm		Total	
	N	%	N	%	N	%	N	%
Ovarian cyst	64	9.4	85	14.1	45	22.2	194	14.4
Endometriotic cyst	56	57.1	86	51.2	22	63.6	164	54.9
Dermoid cyst	25	16.0	41	14.6	34	14.7	100	15.0
Paraovarian cyst	14	21.4	9	22.2	2	50.0	25	24.0
Total	159	28.3	221	29.0	103	29.1	483	28.8

N: Total number of cases

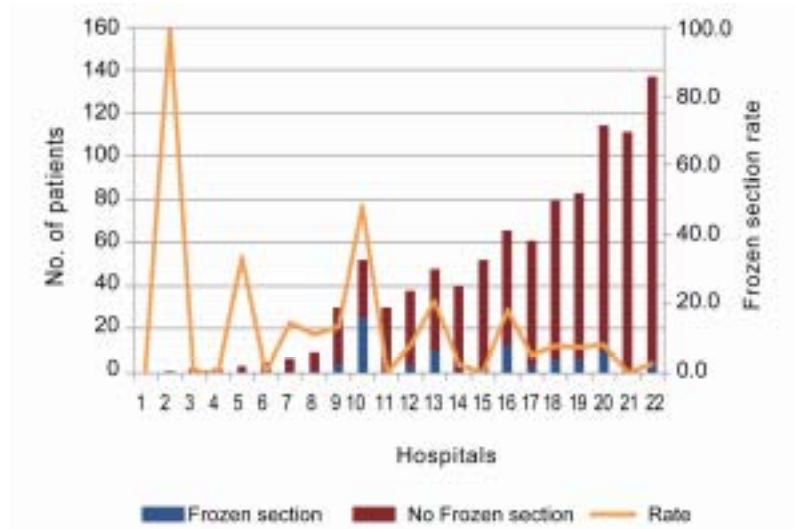
Similar to 2002, rupture rate was lowest when the surgeon had acquired advanced accreditation in laparoscopic surgery and highest for surgeon with intermediate accreditation.

	Rupture rate					
	Nil		Intermediate		Advanced	
	N	%	N	%	N	%
Ovarian cyst	256	39.8	201	43.8	269	27.5
Endometriotic cyst	377	65.0	341	73.3	651	57.5
Dermoid cyst	128	24.2	124	39.5	166	24.7
Paraovarian cyst	58	25.9	30	23.8	42	28.5
Total	819	48.0	696	57.3	1128	44.2

N: Total number of cases

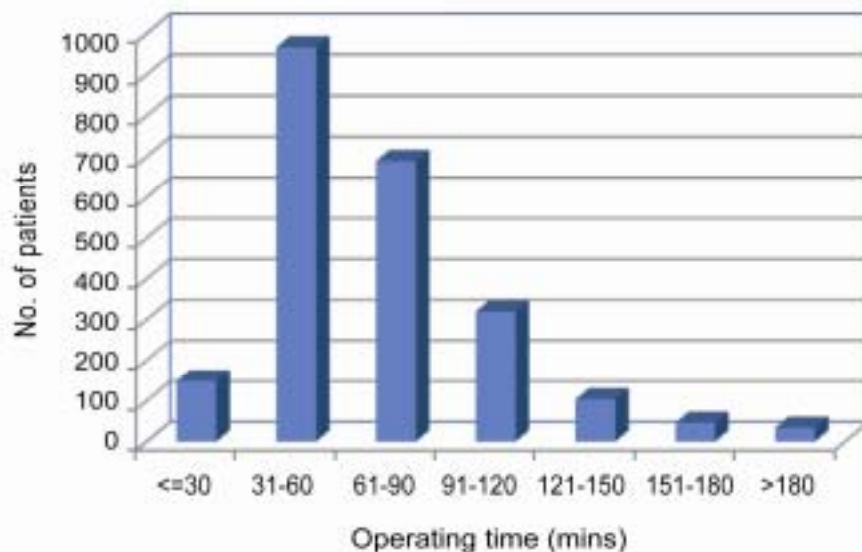
FROZEN SECTION

Frozen section was less frequently performed compared with previous audits. Fifteen hospitals (68.2%) performed frozen section during laparoscopic management of ovarian cyst compared to 15 (75%) in 2002 and 11 (61.1%) in 1997. The frequency ranged from 2.5% to 48.1% (1.6% to 72.6% in 2002) with an average of 16.8% (14.7% in 2002 and 9.4% in 1997). Five units performed only 1 frozen section in the whole year. Of the 87 cases with frozen section performed, the pathological finding was not reported in 7 cases. There was only 1 case of borderline malignancy and no carcinoma was reported.



OPERATING TIME

The mean operating time was 74.9 (SD 41.4) minutes, compared to 70.8 (SD 36.3) in 2002 and 73.8 (SD 37.8) in 1997. The operation was completed within 30 minutes in 6.4% (9.9% in 2002 and 9.2% in 1997) and exceeded 120 minutes in 8.0% (7.2% in 2002 and 7.5% in 1997).



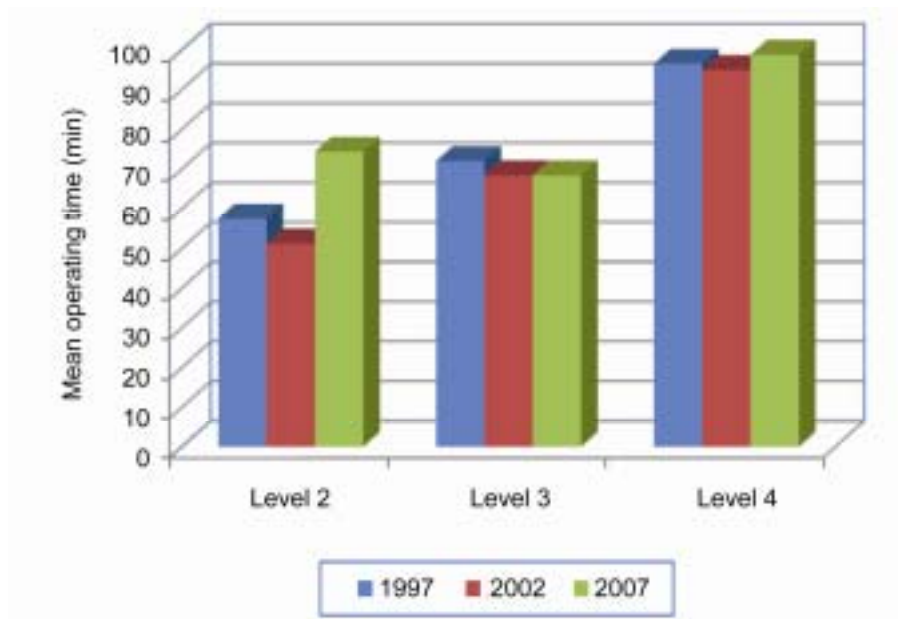
Number of missing data: 132 (5.4%)

Distribution of operating time

	1997	2002	2007
≤ 30 minutes	108 (9.2%)	242 (9.9%)	149 (6.5%)
31 – 60 minutes	498 (42.5%)	1054 (43.1%)	967 (41.9%)
61 – 90 minutes	324 (27.7%)	660 (27.0%)	690 (29.9%)
91- 120 minutes	153 (13.1%)	313 (12.8%)	320 (13.9%)
121 – 150 minutes	38 (3.2%)	99 (4.1%)	104 (4.5%)
151 – 180 minutes	36 (3.1%)	43 (1.8%)	46 (2.0%)
> 180 minutes	14 (1.2%)	32 (1.3%)	34 (1.5%)
Total	1171	2443	2310

Number of missing data: 15 (3.6%) in 1997, 42 (1.7%) in 2002 and 132 (5.4%) in 2007

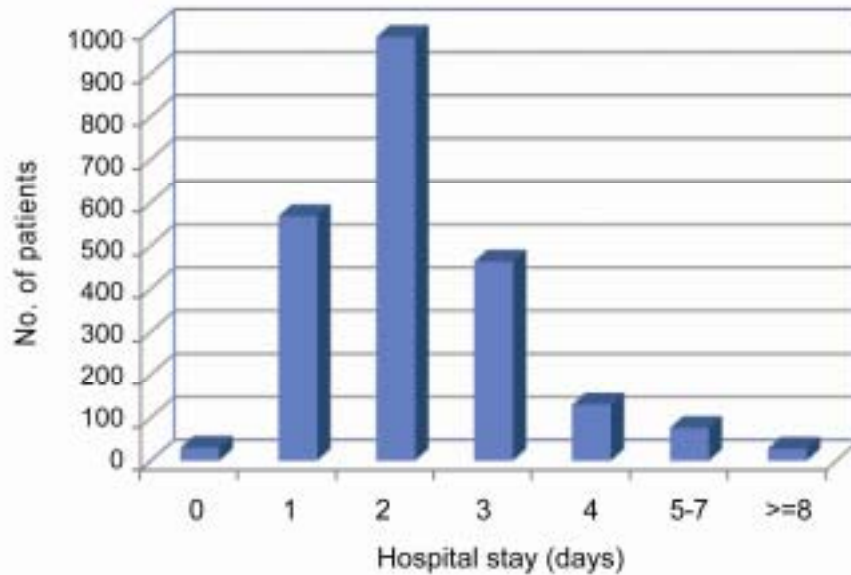
Similar to previous audits, operating time increased with the level of the procedure and the mean for Level 4 procedures (98.8 min) was significantly longer than that for Level 3 (68.4 min) and 2 (74.4 min) procedures ($p < 0.001$). The corresponding figures for level 2-4 procedures in 2002 and 1997 were 51.2 and 57.5, 68.4 and 72.0 and 94.9 and 96.5 minutes respectively.



Number of missing data: 118 (4.7%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 74.8 (SD 41.5) days, compared to 2.4 (SD 1.7) in 2002 and 2.3 (SD 2.2) in 1997. Post-operative hospital stay was less than 4 days in 89.7% (86.4% in 2002 and 88.8% in 1997) and more than 7 days in 1.2% (1.1% in 2002 and 0.8% in 1997).



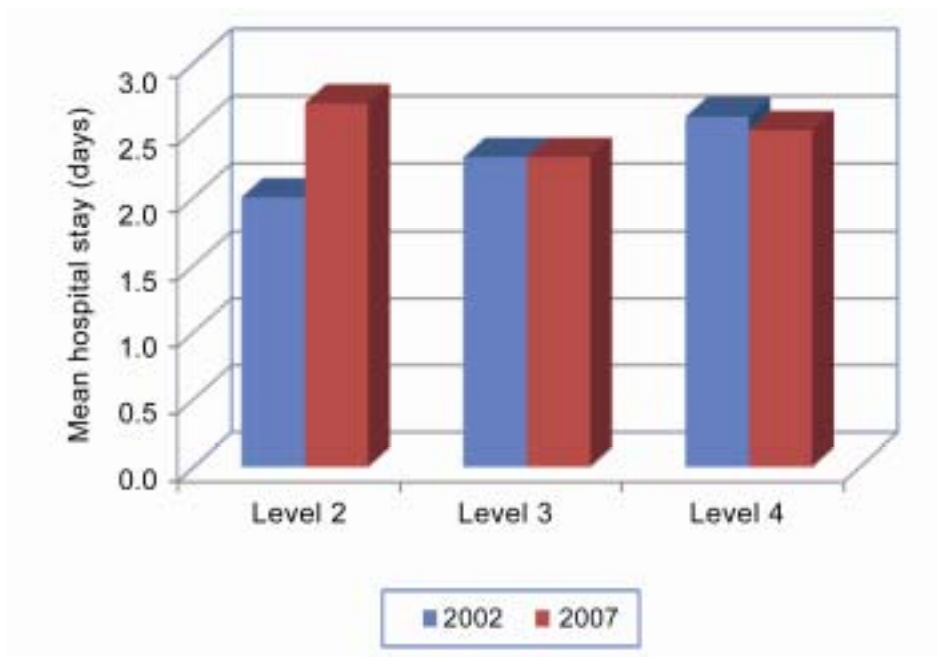
Number of missing data: 163 (6.7%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	10 (0.9%)	38 (1.5%)	30 (1.3%)
1 day	300 (25.8%)	616 (25.1%)	568 (24.9%)
2 days	461 (39.6%)	953 (38.8%)	984 (43.2%)
3 days	263 (22.6%)	518 (21.1%)	463 (20.3%)
4 days	67 (5.8%)	168 (6.8%)	130 (5.7%)
5 – 7 days	55 (4.7%)	140 (5.7%)	76 (3.3%)
8 – 14 days	6 (0.5%)	19 (0.8%)	28 (1.2%)
≥ 15 days	3 (0.3%)	7 (0.3%)	0 (0.0%)
Total	1165	2459	2279

Number of missing data: 261 (1.8%) in 1997, 26 (1.0%) in 2002 and 163 (6.7%) in 2007

There was a significant difference in the post-operative hospital stay among different level of procedure ($p=0.001$). Level 1 was associated with the longest hospital stay (3 days), probably because of the high conversion rate to laparotomy in this group (36.4% compared to 22.2% in 2002).



CONVERSION

The overall conversion rate was 1.6%, compared to 2.9% in 2002 and 1.0% in 1997. The conversion was associated with severe pelvic adhesions in 63.2% and visceral injury, confirmed or suspected, in 13.2%.

	1997	2002	2007
Dense adhesions	7 (0.6%)	38 (1.5%)	24 (1.0%)
Large pelvic tumour	0 (0.0%)	3 (0.1%)	0 (0.0%)
Uncontrolled bleeding	3 (0.3%)	1 (0.04%)	4 (0.2%)
Unexpected malignancy	1 (0.08%)	2 (0.08%)	1 (0.04%)
Poor pelvic access	0 (0.0%)	3 (0.1%)	1 (0.04%)
Bowel injury*	0 (0.0%)	1 (0.04%)	4 (0.2%)
Bladder injury	0 (0.0%)	0 (0.0%)	1 (0.04%)
Emphysema	0 (0.0%)	0 (0.0%)	2 (0.08%)
Failure in specimen removal	1 (0.08%)	1 (0.04%)	0 (0.0%)
Unspecified	0 (0.0%)	0 (0.0%)	1 (0.04%)
Total	12 (1.0%)	72 (2.9%)	38 (1.6%)

Data are presented as number and percentage of total number of patients

* Confirmed or suspected

COMPLICATIONS

The overall complication rate decreased with each subsequent audit and was 3.2% in 2007, compared to 4.8% in 1992 and 6.6% in 1997. However, there was a trend towards an increase in the rate of visceral injury with the overall rate being 0.37% in 2007 compared to 0.24% in 2002 and 0.17% in 1997. This was mainly attributed by the increase in bowel injury with the actual number of patients doubled in each subsequent audit year. The incidence of urinary tract injury remained very low. There was 1 death reported and the detailed was stated on page 20.

	1997	2002	2007
Bowel injury	2 (0.2%)	4 (0.2%)	8 (0.3%)
Bladder injury	0 (0.0%)	1 (0.04%)	1 (0.08%)
Ureteric injury	0 (0.0%)	1 (0.04%)	0 (0.0%)
Vascular injury	0 (0.0%)	2 (0.08%)	0 (0.0%)
Inferior epigastric artery injury	2 (0.2%)	3 (0.1%)	1 (0.08%)
Haemorrhage with transfusion	4 (0.3%)	4 (0.2%)	5 (0.2%)
Surgical emphysema	2 (0.2%)	6 (0.2%)	6 (0.08%)
Subcutaneous haemorrhage	0 (0.0%)	2 (0.08%)	0 (0.0%)
Febrile morbidity	19 (1.6%)	13 (0.5%)	6 (0.2%)
Urinary tract infection	10 (0.8%)	6 (0.2%)	6 (0.2%)
Retention of urine	12 (1.0%)	3 (0.1%)	2 (0.08%)
Wound problems	8 (0.7%)	5 (0.2%)	4 (0.2%)
Incisional hernia	2 (0.2%)	0 (0.0%)	0 (0.0%)
Ileus	0 (0.0%)	0 (0.0%)	2 (0.08%)
Pelvic haematoma	1 (0.1%)	3 (0.1%)	2 (0.08%)
Conversion	12 (1.0%)	72 (2.9%)	38 (1.6%)
Re-operation	4 (0.4%)	0 (0.0%)	3 (0.1%)
Re-admission	4 (0.4%)	9 (0.4%)	6 (0.2%)
Death	0 (0.0%)	0 (0.0%)	1 (0.08%)
Total	78 (6.6%)	119 (4.8%)	79 (3.2%)

Data are presented as number and percentage of total number of patients

Complication and conversion rate stratified according to level of procedures

In contrast to previous audits where conversion and complication rates increase with the level of procedure, a reverse relationship was seen in 2007. This may be because 59.8% of Level 4 procedures were performed by doctors with advanced accreditation, compared to 38.7% for Level 3 and only 17.5% for Level 2 procedures. In fact, 52.6% of Level 2 procedures were performed by doctors with no accreditation, compared to 34.5% for Level 3 and 18.4% for Level 4 procedures. There was no difference in the risk of visceral injury among the levels of procedures.

	Conversion rate			Complication rate		
	1997	2002	2007	1997	2002	2007
Level 2	0.0%	0.0%	4.6%	4.5%	0.0%	6.2%
Level 3	0.9%	1.9%	1.1%	6.2%	3.6%	2.8%
Level 4	2.8%	3.3%	0.8%	12.3%	6.3%	2.5%

RE-ADMISSION

Six patients required re-admission to hospital and the incidence was 0.2% (0.4% in 2002 and 0.3% in 1997). The patient with reported death was not included.

Conversion Rate	1997	2002	2007
Pelvic infection	1 (0.08%)	2 (0.08%)	1 (0.04%)
Abdominal pain	0 (0.0%)	2 (0.08%)	1 (0.04%)
Wound infection	0 (0.0%)	1 (0.04%)	2 (0.08%)
Pelvic haematoma	0 (0.0%)	1 (0.04%)	0 (0.0%)
Unrelated problems	3 (0.24%)	1 (0.04%)	2 (0.08%)
Unspecified	0 (0.0%)	2 (0.08%)	0 (0.0%)
Total	4 (0.3%)	9 (0.4%)	6 (0.2%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

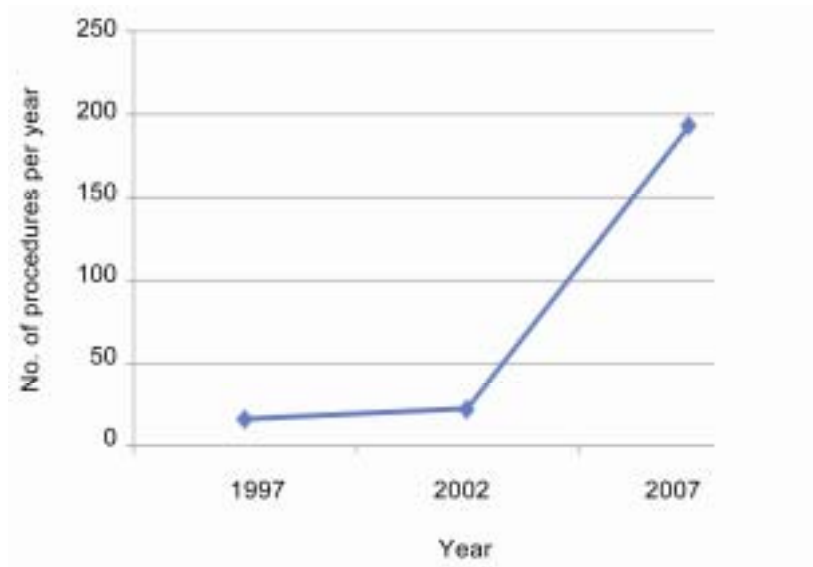
Three patients required re-operation, giving an incidence of 0.1%, compared to 0% in 2002 and 0.3% in 1997. One patient with drainage of tubo-ovarian abscess required re-laparoscopy 2 days later and the other patient underwent oophorectomy for a large dermoid cyst (>8cm). The exact reasons for the re-operation were not reported. The third patient was the one who died after bilateral ovarian cystectomy and the details was stated on page 20.

10 LAPAROSCOPIC MANAGEMENT OF GENITAL MALIGNANCY

Total number of patients

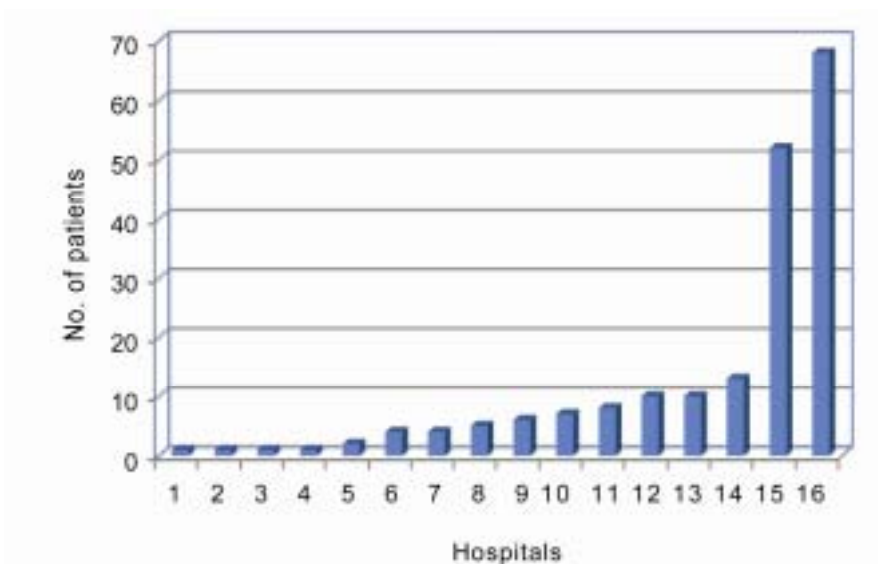
193

Compared to 1997, there was a 12 fold increase in the number of laparoscopic management of genital malignancy with the actual number increased from 16 in 1997 and 22 in 2002 to 193 in 2007. There was no detail analysis for this category of disease in previous audits.



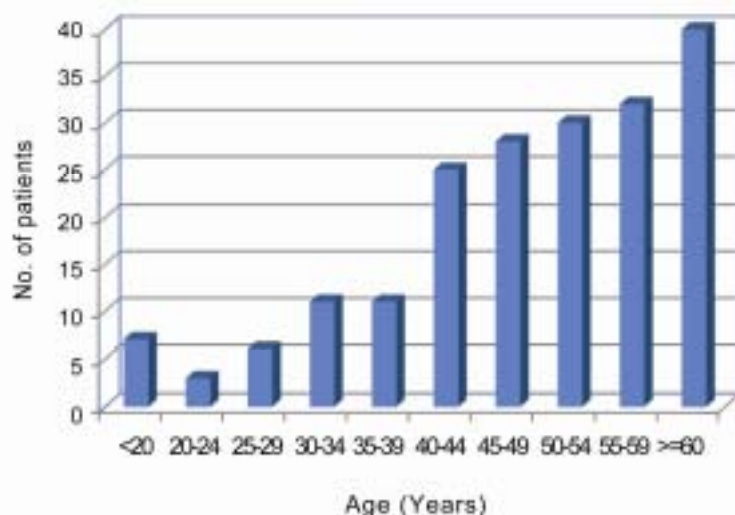
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Laparoscopic management of genital malignancy was performed in 16 hospitals. Most units performed less than 10 cases a year and 2 units performed more than 50 cases a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 50.1 (SD 14.7). Over 93% of patients were 40 or older and about 10% were 60 or older. Only 0.5% of patients were younger than 35.



Distribution of age

	2007
< 20 years	7 (3.6%)
20 – 24 years	3 (1.6%)
25 – 29 years	6 (3.1%)
30 – 34 years	11 (5.7%)
35 – 39 years	11 (5.7%)
40 – 44 years	25 (13.0%)
45 – 49 years	28 (14.5%)
50 – 54 years	30 (15.5%)
55 – 59 years	32 (16.6%)
≥ 60 years	40 (20.7%)
Total	193

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by specialists in 97.2%. Only 2 cases were performed by pre-membership doctors (0.9%) and 3 by doctors with MRCOG, all except one were assisted by specialists. The operations were assisted by specialists in 86.4% and by nurses in 6.8% of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	Specialist	Nurse	
MBBS	0	0	2	0	2
MRCOG	1	0	2	0	3
FHKAM	4	3	90	1	98
FRCOG	1	3	59	11	74
Total	7	6	153	12	177

Number of missing data: 16 (8.2%)

Over 70% of the procedures were performed by doctors with advanced accreditation in gynaecological laparoscopy, of which 37.9% were assisted by doctors without accreditation and 8.9% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 16.7%, of which 55.2% were assisted by doctors without advanced accreditation. A total of 21 procedures performed by doctors without accreditation, 8 (38.1%) were assisted by doctors without accreditation and 9 (42.9%) by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	8	5	8	9	21
Intermediate	7	9	13	0	29
Advanced	18	29	66	11	124
Total	33	43	87	11	174

Number of missing data: 19 (9.8%)

OPERATIVE DIAGNOSIS

Carcinoma of corpus was the most common diagnosis (53.1%), followed by carcinoma of cervix (20.6%) and borderline ovarian malignancy (7.3%).

	2007
Uterine Malignancy	110
Carcinoma of corpus	103 (53.1%)
Uterine sarcoma	2 (1.0%)
Smooth muscle tumour	2 (1.0%)
Low grade endometrial sarcoma	2 (1.0%)
Gestational trophoblastic neoplasm	1 (0.5%)
Cervical Malignancy	46
Carcinoma of cervix	40 (20.6%)
Microinvasive Ca of cervix	6 (3.1%)
Ovarian Malignancy	32
Carcinoma of ovary	13 (6.7%)
Borderline ovarian malignancy	11 (5.2%)
Previous borderline ovarian malignancy	4 (2.1%)
Sex cord ovarian tumour	2 (1.0%)
Germ cells ovarian tumour	2 (1.0%)
Other Malignancy	3
Carcinoma of vulva	1 (0.5%)
Miscellaneous*	2 (1.0%)

* 1 pelvic tumour and 1 suspected carcinoma of ovary

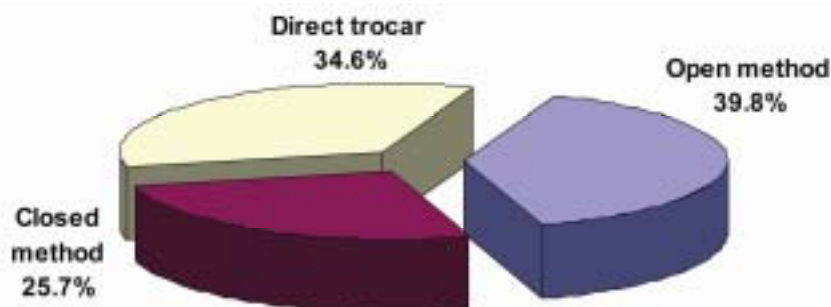
OPERATIVE TECHNIQUES

Primary trocar entry technique

Open method was the most common technique for primary trocar entry and was used in 76 (39.8%) of cases, followed by direct trocar technique (34.6%). Closed method was used in 25.7% and visually guided trocar was not used at all. Among the 2 hospitals which performed most of the procedures, open method was used in 92% in one unit while direct trocar technique was used in 95.6% in the other unit.

	2007
Closed method	49 (25.7%)
Open method	76 (39.8%)
Visual guided	0 (0.0%)
Direct trocar	66 (34.6%)
Total	191

No. of missing data: 2 (1.0%)



Number of missing data: 2 (1.0%)

The primary trocar was inserted through the umbilical incision in 91.4%, and supraumbilically in 7.6%. The left upper quadrant insertion was used in only 1.1%.

	2007
Umbilical	169 (91.4%)
Supraumbilical	14 (7.6%)
Left upper quadrant	2 (1.1%)
Total	185

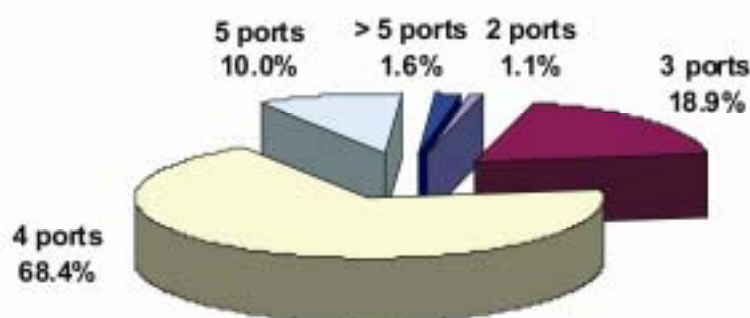
No. of missing data: 8 (4.1%)

Number of ports used

The procedures were performed using 4 ports in 68.4% of cases, 3 ports in 18.9% and 5 or more ports in 11.6%.

	2007
<3 ports	2 (1.0%)
3 ports	36 (18.9%)
4 ports	130 (68.4%)
5 ports	19 (10.0%)
> 5 ports	3 (1.6%)
Total	190

No. of missing data: 3 (1.6%)



Number of missing data: 3 (1.6%)

Surgical Modalities

Electrocautery was the most common energy source used (89.1%). Bipolar energy alone was used in 40 (23.3%), unipolar alone in 32 (18.6%) and both in 100 (58.1%). Ligature, Plasmakinetic and ultracision were used in 31.6%, 11.9% and 13.5% respectively. Suture was used in 34.2%.

	2007
Electrocautery	172 (89.1%)
Ligature	61 (31.6%)
Plasmakinetic	23 (11.9%)
Ultracision	26 (13.5%)
Suture	66 (34.2%)
Endoloop	3 (1.6%)
Laser	7 (3.6%)
Clips/Staples	5 (2.6%)
Use of drain	26 (13.5%)

No. of missing data: 7 (3.6%)

OPERATIVE PROCEDURES

A total of 120 patients underwent simple hysterectomy, 94 (78.3%) were performed for carcinoma of corpus and 9 for carcinoma of cervix. Over 60% were TLH, of which 77.0% were for carcinoma of corpus. Concurrent pelvic lymph node (LN) dissection was performed in 52, pelvic and para-aortic LN dissection in 5, para-aortic LN dissection in 1.

Of the 25 cases of radical hysterectomy, concurrent pelvic LN dissection was performed in 23. All except one were performed for carcinoma of cervix and the remaining one was for carcinoma of corpus. The 2 cases without pelvic LN dissection were both carcinoma of cervix.

Twenty patients underwent LN dissection without concurrent hysterectomy, 16 pelvic alone, 2 para-aortic alone and 2 pelvic and para-aortic. Six patients were diagnosed to have carcinoma of cervix, 4 carcinoma of corpus and 4 carcinoma of ovary. The remaining 6 cases included borderline ovarian malignancy (1), sex cord stromal tumour (1), Sertoli-Leydig cells tumour (1), immature teratoma (1), low grade endostromal sacroma (1) and carcinoma of vulva (1).

Of the 6 staging laparoscopies, 4 with concurrent hysterectomy, pelvic LN dissection and omentectomy, 1 with hysterectomy and omentectomy and 1 with pelvic LN dissection alone. Four patients were having ovarian malignancy, 2 carcinoma of ovary and 2 borderline ovarian malignancy, 1 carcinoma of cervix and low grade endostromal sacroma.

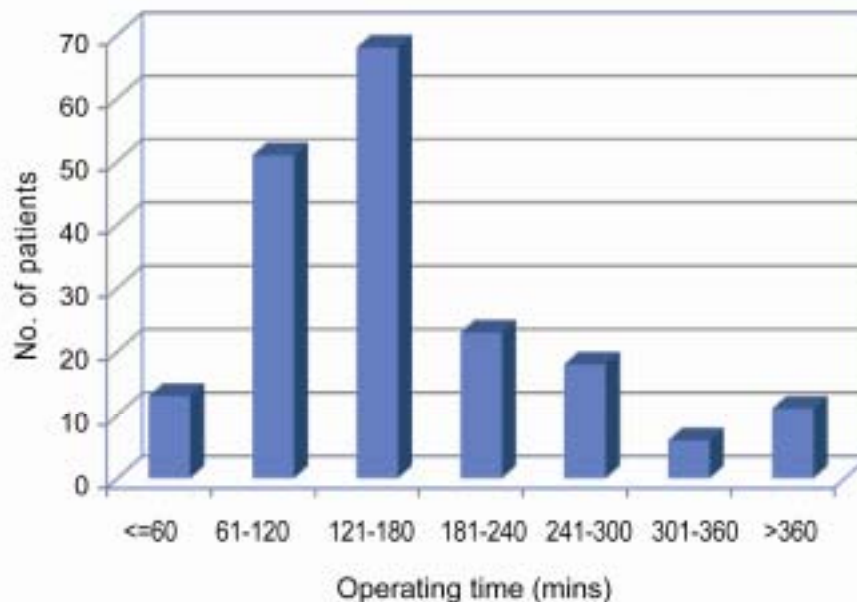
Overall, salpingo-oophorectomy or oophorectomy was performed in 13 patients, 10 unilateral and 3 bilateral. Cystectomy was performed in 7 patients, all unilateral only.

	2007
Hysterectomy	120 (62.2%)
LAVH	38
LH	8
TLH	74
Radical hysterectomy	25 (13.0%)
Pelvic LN Dissection	98 (50.8%)
Para-aortic LN Dissection	10 (5.2%)
Omentectomy	11 (5.7%)
Staging laparoscopy	6 (3.1%)
Others*	4 (2.1%)
Total	

* Others included debulking of recurrent tumour (1), resection of pelvic tumour (2) and radical vulvectomy (1)

OPERATING TIME

The mean operating time was 179 (SD 122) minutes, ranging from 15 minutes to 855 minutes. The operating time was 60 minutes or less in 6.8% and exceeded 240 minutes in 18.4%.



Number of missing data: 3 (1.6%)

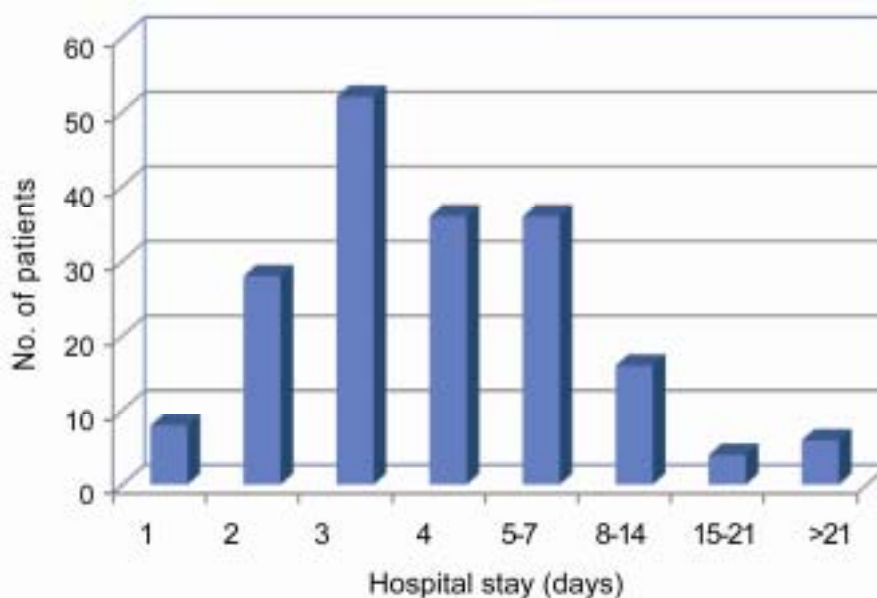
Distribution of operating time

	2007
≤ 30 minutes	3 (1.6%)
31 – 60 minutes	10 (5.3%)
61 – 90 minutes	14 (7.4%)
91 – 120 minutes	37 (19.5%)
121 – 150 minutes	35 (18.4%)
151 – 180 minutes	33 (17.1%)
181 – 240 minutes	23 (12.1%)
241 – 300 minutes	18 (9.5%)
301 – 360 minutes	6 (3.2%)
> 360 minutes	11 (5.8%)
Total	190

Number of missing data: 3 (1.6%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 5.1 (SD 4.6) days, ranging from 1 to 26 days. About 66.7% of the patients were discharged within the first 4 days and 6.8% stayed longer than 7 days.



Number of missing data: 7 (3.6%)

Distribution of post-operative hospital stay

	2007
1 day	8 (4.3%)
2 days	28 (15.1%)
3 days	52 (28.0%)
4 days	36 (19.4%)
5 – 7 days	36 (19.4%)
8 – 14 days	16 (14.0%)
15 – 21 days	4 (2.2%)
> 21 days	6 (3.2%)
Total	186

No. of missing data: 7 (3.6%)

CONVERSION

Conversion to laparotomy was necessary in 10 patients (5.2%), 4 because of dense adhesions, 2 due to bladder injury and 1 because of bowel injury. Two patients developed surgical emphysema together with dense adhesion (1) and bladder injury (1). Malignancy accounted for 3 conversions, all involved the ovary and the diagnosis was made on frozen section. The age of the patients were 26, 34 and 41. The nature of the subsequent procedures were not reported in all 3 patients.

	2007
Dense adhesions	4
Bladder injury	2
Bowel injury	1
Surgical emphysema	2*
Malignancy	3
Total	10 (5.2%)

Data are presented as number and percentage of total number of patients

** together with dense adhesion (1) and bladder injury (1)*

COMPLICATIONS

The overall complication rate was 22.3%. Besides conversion, febrile morbidity was the most common complication and occurred in 4.7%. The incidence of organ injury was 5.2% while that of haemorrhage requiring transfusion was 3.1%.

	2007
Bladder injury	4 (2.1%)
Ureteric injury	3 (1.6%)
Bowel injury	3 (1.6%)
Haemorrhage & transfusion	6 (3.1%)
Surgical emphysema	2 (1.0%)
Febrile morbidity	9 (4.7%)
Urinary tract infection	6 (3.1%)
Retention of urine	2 (1.0%)
Vault haematoma	4 (2.1%)
Deep vein thrombosis	1 (0.5%)
Conversion	10 (5.2%)
Re-operation	2 (1.0%)
Re-admission	5 (2.6%)
Total	43 (22.3%)

Data are presented as number and percentage of total number of patients

RE-OPERATION

Two patient required re-operation. A 53 years old patient underwent total laparoscopic hysterectomy and left salpingo-oophorectomy for previous right borderline ovarian tumour. It was complicated by perforation of sigmoid colon requiring colostomy. The other was a 27 years old patient who had salpingo-oophorectomy for papillary serous cystadenoma of borderline malignancy and subsequently underwent staging laparotomy with pelvic lymph node dissection.

RE-ADMISSION

Re-admission was reported in 5 (2.6%) patients including 2 infection (vault and urinary tract infection), 1 vault bleeding requiring re-suturing, 1 bladder training and 1 other related problem.

	2007
Vault bleeding	1
Vault infection	1
Urinary tract infection with fever	1
Bladder training	1
Other unrelated problem	1
Total	5 (2.6%)

Data are presented as number and percentage of total number of patients

COMPARISON BETWEEN SIMPLE AND RADICAL HYSTERECTOMY

Radical hysterectomy was associated with significantly younger patient age, longer operating time, larger amount of blood loss and longer post-operative stay. Overall complication rate was higher in radical hysterectomy, in particular the risk of haemorrhage. The conversion rate was also higher in radical hysterectomy and the lack of statistical significance was likely related to the small sample size. There was no difference in the re-admission rate.

	Hysterectomy		P-value
	Simple (N = 120)	Radical (N = 25)	
Age (years)	54.4 ± 12.2	47.7 ± 10.8	0.01
Operating time (min)	162 ± 77	376 ± 170	<0.001
Blood loss (ml)	192 ± 122	692 ± 668	0.001
Post-operative stay (days)	4.3 ± 3.5	10.3 ± 7.1	<0.001
Conversion	1 (0.8%)	2 (8.0%)	NS
Complication	16 (13.3%)	14 (56%)	<0.001
<i>Ureteric injury</i>	1 (0.8%)	2 (8.0%)	NS
<i>Bladder injury</i>	1 (0.8%)	2 (8.0%)	NS
<i>Bowel injury</i>	2 (1.7%)	0 (0.0%)	NS
<i>Haemorrhage</i>	0 (0.0%)	6 (24%)	<0.001
<i>Febrile</i>	4 (3.3%)	3 (12.0%)	NS
<i>Pelvic/vault haematoma</i>	3 (2.5%)	0 (0.0%)	NS
Re-admission	4 (3.3%)	1 (4.0%)	NS

Data are presented as mean ± SD or N (%)

NS: Not significant

CARCINOMA OF CORPUS

There was a total of 103 cases of carcinoma of corpus. In 2 cases, the diagnosis was only made after hysterectomy, one LAVH and the other was abdominal. The former patient was converted to laparotomy because of dense adhesions but the exact procedure performed was not reported. The latter patient underwent laparoscopic bilateral salpingo-oophorectomy and pelvic LN dissection.

Ninety-four patients underwent hysterectomy and 73 with concurrent salpingo-oophorectomy. Pelvic LN dissection was done in 48 patients, pelvic and para-aortic in 5, para-aortic alone in 1 and 40 without LN dissection. Omentectomy was performed in 3 patients. One patient underwent radical hysterectomy with pelvic LN dissection. Four patients underwent LN dissection without hysterectomy, 3 pelvic and 1 pelvic with para-aortic. Exact procedure was not specified in 4 patients; 2 had a conversion for bowel injury and dense adhesions respectively, 1 had procedure terminated because of ECG changes, and 1 was reported to have diagnostic laparoscopy only.

	2007
Hysterectomy only	8 (7.8%)
Hysterectomy + Pelvic LN dissection	10 (9.7%)
Hysterectomy + Para-aortic LN dissection	1 (1.0%)
Hysterectomy + Pelvic and Para-aortic LN dissection	2 (1.9%)
Hysterectomy + SO	32 (31.1%)
Hysterectomy + SO + Pelvic LN dissection*	38 (36.9%)
Hysterectomy +SO + Pelvic and Para-aortic LN dissection	3 (2.9%)
Pelvic LN dissection alone	1 (1.0%)
SO + Pelvic LN dissection alone	2 (1.9%)
SO + Pelvic and Para-aortic LN dissection	1 (1.0%)
Radical hysterectomy + SO + Pelvic LN dissection	1 (1.0%)
Not specified	4 (3.9%)
Total	103

Data are presented as number and percentage of total number of patients

SO - Salpingo-oophorectomy

** 3 had omentectomy as well*

Conversion was required in 2 patients because of adhesions and bladder injury respectively. The overall complication rate was 14.6% and organ injury occurred in 2.9%. Readmission was reported in 3 patients because of vault haemorrhage, fever and other unrelated problem.

Complication	2007
Bladder injury	2 (1.9%)
Ureteric injury	1 (1.0%)
Haemorrhage & transfusion	1 (1.0%)
Febrile morbidity	4 (3.9%)
Urinary tract infection	2 (1.9%)
Retention of urine	1 (1.0%)
Vault haematoma	1 (1.0%)
Vault infection	1 (1.0%)
Intra-abdominal abscess	1 (1.0%)
Conversion	2 (1.9%)
Re-admission	3 (2.9%)
Total	15 (14.6%)

Data are presented as number and percentage of total number of patients

Hysterectomy without pelvic lymph node dissection (PLND) was associated with shorter operating time and reduced blood loss. There was no difference in the overall complication rate but there were 3 organ injuries, all occurred in hysterectomy with pelvic lymph node dissection.

	Hysterectomy		
	No PLND (n = 40)	PLND (n = 48)	
Age (years)	56.9 ± 12.6	55.9 ± 13.4	NS
Operating time (min)	128 ± 38	180 ± 54	<0.001
Blood loss (ml)	160 ± 105	223 ± 130	0.02
Post-operative stay (days)	3.7 ± 1.7	5.0 ± 4.9	NS
Conversion	0 (0.0%)	0 (0.0%)	NS
Complication	4 (10%)	6 (12.5%)	NS
<i>Ureteric injury</i>	0 (0.0%)	1 (2.1%)	NS
<i>Bladder injury</i>	0 (0.0%)	1 (2.1%)	NS
<i>Bowel injury</i>	0 (0.0%)	1 (2.1%)	NS
<i>Haemorrhage</i>	0 (0.0%)	0 (0.0%)	NS
<i>Febrile</i>	2 (5.0%)	0 (0.0%)	NS
<i>Pelvic/vault haematoma</i>	0 (0.0%)	1 (2.1%)	NS
Re-admission	1 (2.5%)	2 (4.2%)	NS

Data are presented as mean ± SD or N (%)

NS: Not significant

CARCINOMA OF CERVIX

There were a total 40 cases of carcinoma of cervix. Radical hysterectomy was performed in 24, 22 together with pelvic LN dissection and 2 without. Simple hysterectomy was performed in 9 cases, all were TLH. Lymph node dissection alone was performed in 6 patients, 3 pelvic, 2 para-aortic and 1 both. Laparoscopic ultrasound was performed in 2 patients, 1 underwent pelvic LN dissection and 1 staging procedure.

	2007
Radical hysterectomy + Pelvic LN dissection	22 (55.0%)
Radical hysterectomy	2 (5.0%)
Hysterectomy	9 (22.5%)
Pelvic LN dissection	2 (5.0%)
Para-aortic LN dissection	2 (5.0%)
Pelvic and Para-aortic LN dissection	1 (2.5%)
Lap USG + Pelvic LN dissection	1 (2.5%)
Lap USG + Staging procedure	1 (2.5%)
Total	40

Data are presented as number and percentage of total number of patients

Two patients required a conversion, 1 because of adhesions and the other was due to bladder injury and surgical emphysema. Overall complication occurred in 15 patients (37.5%).

Complication	2007
Bladder injury	2 (5.0%)
Ureteric injury	2 (5.0%)
Haemorrhage & transfusion	2 (5.0%)
Surgical emphysema	2 (5.0%)
Febrile morbidity	3 (7.5%)
Urinary tract infection	3 (7.5%)
Retention of urine	1 (2.5%)
Deep vein thrombosis	1 (2.5%)
Peroneal nerve palsy	1 (2.5%)
Conversion	2 (5.0%)
Re-operation	1 (2.5%)
Total	15 (37.5%)

Data are presented as number and percentage of total number of patients

CARCINOMA OF OVARY

There were 13 cases of carcinoma of ovary. Four underwent hysterectomy with salpingo-oophorectomy (3 bilateral and 1 unilateral), 1 had pelvic LN dissection and omentectomy, 1 pelvic LN dissection and 1 omentectomy. Five patients underwent salpingo-oophorectomy (2 bilateral and 3 unilateral) and 2 with pelvic LN dissection and omentectomy. Two underwent pelvic LN dissection, one of them underwent omentectomy and appendicectomy. One patient underwent unilateral cystectomy and one had a conversion because of surgical emphysema and adhesions.

	2007
Hysterectomy + SO	1 (7.7%)
Hysterectomy + SO + Pelvic LN dissection + Omentectomy	1 (7.7%)
Hysterectomy + SO + Pelvic LN dissection	1 (7.7%)
Hysterectomy + SO + Omentectomy	1 (7.7%)
SO	3 (23.1%)
SO + Pelvic LN + Omentectomy	2 (15.4%)
Pelvic LN dissection	1 (7.7%)
Pelvic LN dissection + Omentectomy + Appendicectomy	1 (7.7%)
Cystectomy	1 (7.7%)
Conversion	1 (7.7%)
Total	13

Data are presented as number and percentage of total number of patients

SO - Salpingo-oophorectomy

Two (15.2%) patients required a conversion, 1 because of surgical emphysema and adhesions and the other due to dense pelvic adhesions. There were no other complications reported.

	2007
Conversion	1
Surgical emphysema	1
Dense pelvic adhesions	1
Total	2 (15.2%)

Data are presented as number and percentage of total number of patients

Hysteroscopic Surgery

Territory Wide Audit 2007



11

HYSTEROSCOPIC SURGERY OVERALL DATA

BACKGROUND INFORMATION ON HYSTEROSCOPIC SURGERY DATA

A total of 24 hospitals agreed to participate in the audit exercise and 20 returned the audit forms in hysteroscopic surgery in year 2007.

Unlike 2002 but same as in 1997, Level 1 hysteroscopic procedure (Diagnostic hysteroscopy) was excluded in this audit exercise. The total number of audit forms returned was 1,612, of which 583 cases were Level 1, 783 were Level 2 and 246 were Level 3. The total number of cases audited was therefore 1,029.

The number was similar to that in 2002 (1,076) but over 5 fold increased compared with 1997 (199). As most of the units did not provide the total number of cases undergoing hysteroscopic surgery in their units, the percentage of cases audited in 2007 was unknown.

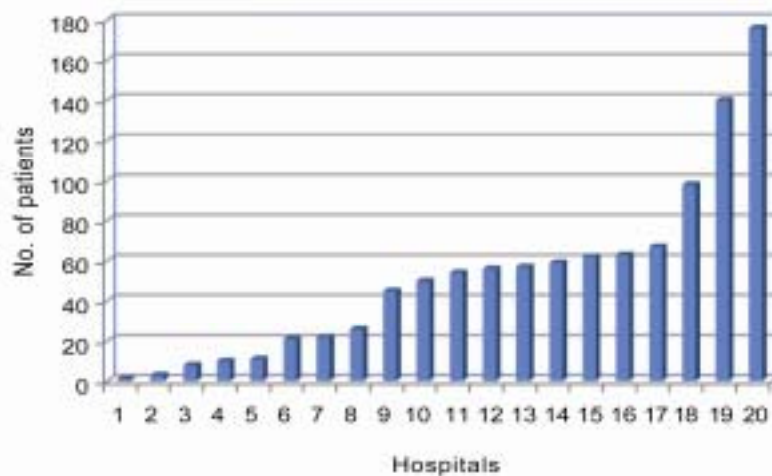
Total number of patients

1,029

The total number of operative hysteroscopies increased by 5 fold from 199 in 1997 to 1076 in 2002 and plateaued at 1029 in 2007.

CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

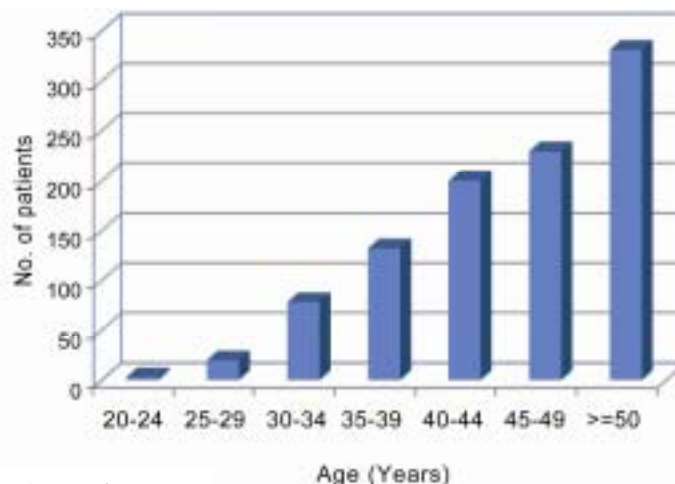
The number of hospitals performing hysteroscopic surgery increased from 14 in 1997 to 22 in 2002 and reduced to 20 in 2007. There were wide variations in the number of procedures performed in different hospitals. Similar to 2002, most units (14 versus 15 in 2002) performed less than 60 cases a year and only 2 units (4 in 2002) performed over 100 cases a year.



AGE DISTRIBUTION OF PATIENTS

Overall, the mean age of the patients was 46.4 (SD 9.7) years, compared to 47.4 (SD 10.4) years in 2002 and 43.7 (SD 8.7) in 1997.

The number of operative hysteroscopies increased with increasing age. About a third of the procedures were performed in women aged 50 or above. This is similar to that in 2002 (35.1%) but higher than that in 1997 (15.2%).



Number of missing data: 36 (3.5%)

Distribution of age

	1997	2002	2007
< 20 years	0 (0.0%)	0 (0.0%)	0 (0.0%)
20 – 24 years	2(1.0%)	8 (0.8%)	3 (0.3%)
25 – 29 years	6(3.0%)	22 (2.1%)	20 (2.0%)
30 – 34 years	13(6.6%)	54 (5.1%)	78 (7.9%)
35 – 39 years	36(18.2%)	125 (11.8%)	132 (13.3%)
40 – 44 years	56(28.3%)	228 (21.5%)	200 (20.1%)
45 – 49 years	55(27.8%)	252 (23.7%)	229 (23.1%)
≥ 50 years	30(15.2%)	373 (35.1)	331 (33.3%)
Total	198	1062	993

Number of missing data: 1(0.5%) in 1997, 14 (1.3%) in 2002 and 36 (3.5%) in 2007

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Endometrial polyp (58.8% versus 28.1% in 1997) was the most common diagnosis in those undergoing operative hysteroscopy, followed by normal uterine cavity (18.8% versus 19.4% in 2002 and 29.1% in 1997) and submucosal fibroid (14.4% versus 16.5% in 2002 and 21.0% in 1997).

	1997	2002	2007
Endometrial polyp	56 (28.1%)	584 (58.8%)	686 (66.7%)
Normal uterine cavity	58 (29.1%)	193 (19.4%)	193 (18.8%)
Submucosal fibroid	40 (20.1%)	164 (16.5%)	148 (14.4%)
Fibroid polyp	43 (21.6%)	132 (13.3%)	121 (11.8%)
Uterine synechiae	8 (4.0%)	15 (1.5%)	18 (1.7%)
Uterine septum	1 (0.5%)	5 (0.5%)	7 (0.7%)
Others	12 (6.0%)	45 (4.5%)	35 (3.4%)
Total	198	993	1029

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

About 72% (62.6% in 2002 and 64.3% in 1997) of the procedures were performed by specialists, and 13.0% (21.1% in 2002 and 29.9% in 1997) were performed by those with MRCOG. Pre-membership doctors performed 15% (21.1% in 2002 and 5.7% in 1997) of the procedures and over 85% of which were level 2 procedures. Only 21.8% (29.8% in 2002 and 22.7% in 1997) of the procedures were performed by doctors without an assistant and 31.8% (22.50% in 2002 and 8.8% in 1997) with nurses being the assistant.

Surgeon \ Assistant	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	36	8	11	87	9	151
MRCOG	36	8	0	86	1	131
FHKAM	91	156	19	53	138	457
FRCOG	57	27	3	9	173	269
Total	220	199	33	235	321	1008

Number of missing data: 21 (2.0%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Information on endometrial preparation was missing in 12 (1.2%) (12.0% in 2002) cases. Of the remaining 1,017 cases, 858 (83.4%) were performed without endometrial preparation, compared to 97.8% in 2002 and 57.3% in 1997. Only 159 patients underwent endometrial preparation; 149 (93.7%) received GnRH analogue, 7 (4.4%) progestogen and 3 (1.9%) danazol. The corresponding figures in 2002 were GnRH analogue 72.9%, progestogen 6.0% and danazol 21.0%.

Information on cervical priming was missing in 9 (0.9% versus 9.9% in 2002) cases. Of the remaining 1020 cases, 569 (55.3%) did not undergo cervical priming, compared to 94.1%. Cervical priming was carried out in 451 patients; misoprostol was used in 399 (88.5% versus 86.5% in 2002), cervagem in 5 (1.1% versus 12.6% in 2002), others in 47 (10.4% versus 1.0%). Prophylactic antibiotic was only used in 240 (23.3%) patients, compared to 14.7% in 2002. These data were not captured in the 1997 audit.

Anaesthetic methods

Information on the anaesthetic method was not recorded in 11 (1.1% versus 4.4% in 2002) cases. Most of the procedures were performed under general anaesthesia (80.8%) and 3.6% were under regional anaesthesia. The corresponding figures in 2002 were 67.9% and 2.5% respectively.

	2002	2007
No anaesthesia	240 (23.3%)	135 (13.3%)
General anaesthesia	696 (67.9%)	823 (80.8%)
Paracervical block	44 (4.3%)	2 (0.2%)
Regional anaesthesia	26 (2.5%)	37 (3.6%)
Intravenous sedation	21 (2.0%)	15 (1.5%)
Others	2 (0.2%)	6 (0.6%)
Total	1029	1018

Number of missing data: 47 (4.4%) and 11 (1.1%)

Surgical tools

As in previous audits, electrical energy was the only energy source used in hysteroscopic surgery. There was an increase in the use of bipolar system 45 (4.4%) though conventional unipolar system remained the main system used.

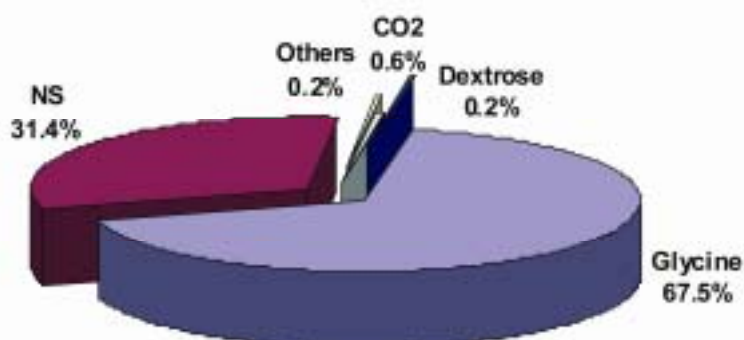
In 2007, roller ball alone was used in 38 (3.7% versus 11.5% in 2002 and 25.6% in 1997), cutting loop alone in 461 (44.8% versus 45.1% in 2002 and 54.8% in 1997) and both were used in 80 (7.8% versus 8.9% in 2002 and 19.6% in 1997). There was an increase in the use of hysteroscopic scissors (15.8% versus 3.5% in 2002) and forceps (7.2% versus 2.3% in 2002). Thermal balloon ablation was performed in only 1 (0.1%), compared to 24 (2.2%) in 2002. In replace of Thermal balloon ablation, NovaSure endometrial ablation were performed in 16 (1.6%) cases.

	1997	2002	2007
Cutting loop	92 (54.8%)	319 (45.1%)	461 (55.7%)
Rollerball	43 (25.6%)	81 (11.5%)	38 (4.6%)
Loop & Ball	33 (19.6%)	63 (8.9%)	80 (9.7%)
Scissors	-	25 (3.5%)	131 (15.8%)
Forceps	-	16 (2.3%)	60 (7.2%)
Novasure	-	-	16 (1.9%)
Thermal Balloon	-	24 (3.4%)	1 (0.1%)
Total	168	707	828

Number of missing data: 31 (15.6% in 1997, 369 (34.3%) and 201 (19.5%)

Distension fluid

Glycine (642 or 67.5%) remained the most common distension fluid used (58.9% in 2002 and 89% in 1997). Normal saline was reported to have been used in 299 or 31.4% (36.8% in 2002 and 7% in 1997), the increase however did not match up with the number of bipolar system used (45 or 4.4%). Dextrose solution was used in 2 cases while the other 2 were a mixture of glycine and normal saline, and normal saline and carbon dioxide respectively.



Number of missing data: 78 (7.6%)

Fluid balance

Excessive fluid absorption (> 1500 ml) occurred in 1 patient undergoing operative hysteroscopy. The incidence was reduced compared with previous audits. Sixteen patients had a negative fluid balance which ranged from 20 ml to 1650 ml. The patient with a negative fluid balance of 1650ml was a case of fibroid resection. She was reported to have haemorrhage and required transfusion.

	1997	2002	2007
Positive Balance			
> 1500 ml	6 (3.2%)	12 (1.8%)	3 (0.5%)
1001 – 1500 ml	2 (1.1%)	3 (0.5%)	2 (0.4%)
501 – 1000 ml	15 (8.0%)	30 (4.5%)	29 (5.1%)
≤ 500 ml	160 (85.1%)	602 (90.5%)	518 (91.2%)
Negative Balance			
≤ 500 ml	3 (1.6%)	14 (2.1%)	15 (2.6%)
> 500 ml	2 (1.1%)	4 (0.6%)	1 (0.2%)
Total	188	665	568

Number of missing data: 11 (5.5%) in 1997, 411(38.2%) in 2002 and 461 (44.8%) in 2007 respectively
Fluid balance = Fluid in – Fluid out

OPERATIVE PROCEDURES

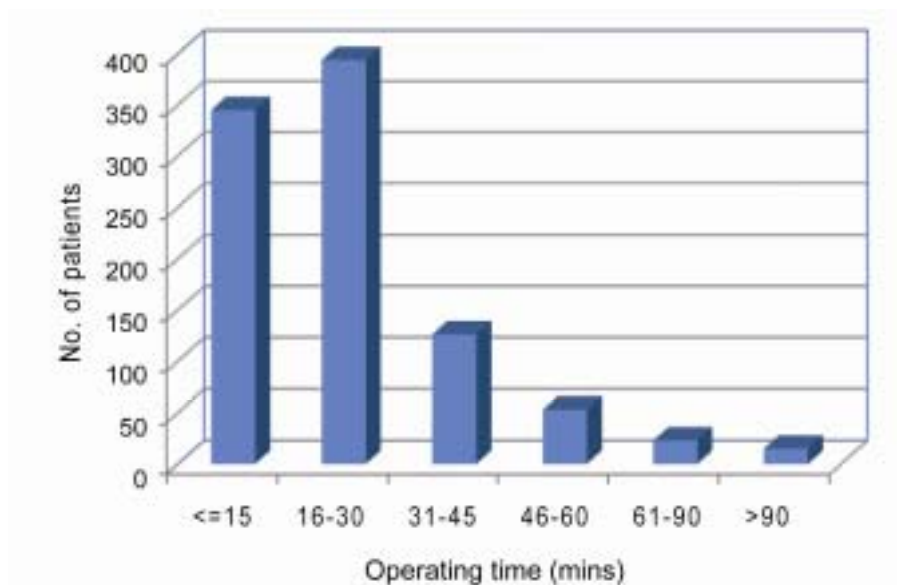
Some patients could have more than one operative procedure performed. Polypectomy remained the most common procedure and the rate is increasing. Although the rate of resection of fibroid remained unchanged, that of endometrial ablation/resection reduced from 41.2% in 1997 to 18.3% in 2002 and 12.0% in 2009.

	1997	2002	2007
Polypectomy	79 (39.7%)	635 (60.8%)	650 (64.6%)
Resection of fibroid	47 (23.6%)	251 (24.0%)	263 (26.1%)
Endometrial ablation	53 (26.6%)	138 (13.2%)	94 (9.3%)
Endometrial resection	20 (10.1%)	37 (3.5%)	27 (2.7%)
Resection and ablation	9 (4.5%)	17 (1.6%)	22 (2.2%)
Adhesiolysis	8 (4.0%)	11 (1.1%)	20 (2.0%)
Division of septum	1 (0.5%)	8 (0.8%)	7 (0.7%)
Proximal tubal cannulation	1 (2.0%)	7 (0.7%)	23 (2.2%)
Total	199	1044	1006

Number of missing data: 32 (3.0%) in 2002 and 23 (2.2%) in 2007
Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 25.4 (SD 19.4) minutes, compared to 22.7 (SD 18.1) minutes in 2002 and 39.5 (SD 23.6) minutes in 1997. The operation was completed within 30 minutes in 77.3% (80% in 2002 and 55.2% in 1997) and prolonged procedures (> 60 minutes) constituted only 4.0% (3.2% in 2002 and 9.9% in 1997) of operative procedures.



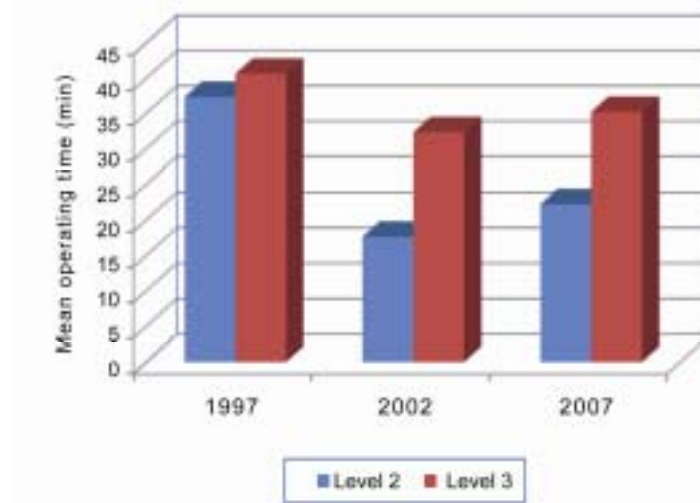
Number of missing data: 73 (7.1%)

Distribution of operating time

	1997	2002	2007
≤ 15 minutes	15(7.8%)	453 (48.8%)	345 (36.1%)
16 – 30 minutes	91(47.4%)	300 (32.3%)	394(41.2%)
31 – 45 minutes	37(19.3%)	95 (10.2%)	126 (13.2%)
46 – 60 minutes	30(15.6%)	50 (5.4%)	53 (5.5%)
61 – 90 minutes	14(7.3%)	17 (1.8%)	23 (2.4%)
> 90 minutes	5(2.6%)	13 (1.4)	15 (1.6%)
Total	192	928	956

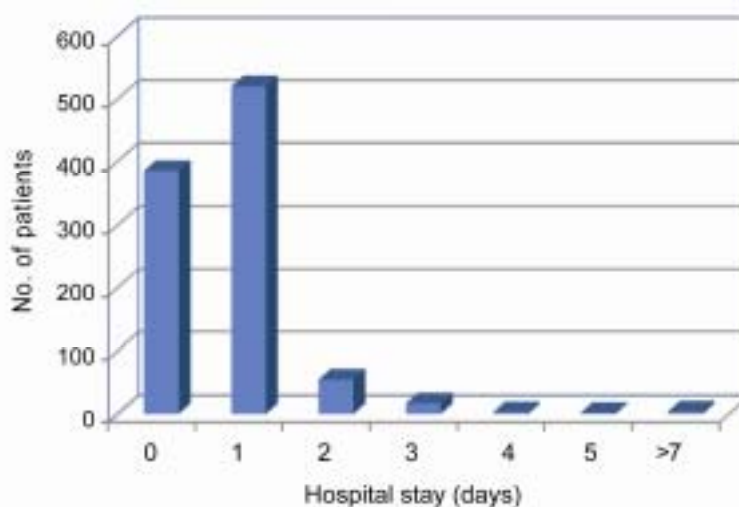
Number of missing data: 7 (3.5%), 148 (13.8%) and 73 (7.1%) respectively

The mean operating time for Level 2 procedures was 22.2 (SD 16.5) minutes, compared with 17.6 (SD 13.1) minutes in 2002 and 37.3 (SD 26.9) minutes in 1997. The mean operating time for Level 3 procedures was 35.2 (SD 23.7) minutes, compared with 32.3 (SD 21.9) minutes in 2002 and 40.6 (SD 21.5) minutes in 1997.



POST-OPERATIVE HOSPITAL STAY

The mean hospital stay was days 1.2 (SD 0.8), compared to 0.8 (SD 0.8) days in 2002 and 1.6 (SD 1.4) days in 1997. Almost 40% (37% in 2002 and 5.5% in 1997) of operative hysteroscopy were discharged on the day of operation. Prolonged hospital stay (≥ 4 days) occurred in about 0.6% (1% in 2002 and 8.2% in 1997).



Number of missing data: 43 (4.2%)

Distribution of post-operative hospital stays

	1997	2002	2007
0 day	10 (5.5%)	388 (37.0%)	385 (39.0%)
1 day	108 (59.0%)	573 (54.7%)	520 (52.7%)
2 days	39 (21.3%)	59 (5.6%)	55 (5.6%)
3 days	11 (6.0%)	17 (1.6%)	17 (1.7%)
4 – 6 days	11 (6.0%)	11 (1.0%)	5 (0.5%)
≥ 7 days	4 (2.2%)	0 (0.0%)	4 (0.4%)
Total	183	1048	986

Number of missing data: 16 (8.0%) in 1997, 28 (2.6%) in 2002 and 43 (4.2%) in 2007 respectively

COMPLICATIONS

The overall complication rate decreased over the past 10 years from 8.5% in 1997 to 2.8% in 2002 and 2.0% in 2007. Excessive fluid absorption decreased from 3.0% in 1997 and 1.3% in 2002 to 0.1% in 2007. The rate of failed surgery increased from 0% in 1997 and 0.2% in 2002 to 0.5% in 2007. The rate of uterine perforation and cervical laceration also decreased to <0.5%.

	1997	2002	2007
Failed surgery	0 (0.0%)	2 (0.2%)	5 (0.5%)
Uterine perforation	3 (1.5%)	6 (0.6%)	5 (0.5%)
Fluid absorption > 1.5 L	6 (3.0%)	14 (1.3%)	1 (0.1%)
Cervical laceration	3 (1.5%)	8 (0.8%)	4 (0.4%)
Incomplete surgery	4 (2.0%)	4 (0.4%)	4 (0.4%)
Haemorrhage	0 (0.0%)	1 (0.09%)	2 (0.2%)
Pelvic infection	1 (0.5%)	0 (0.0%)	0 (0.0%)
Others	2 (1.0%)	0 (0.0%)	0 (0.0%)
Incidence	17 (8.5%)	30 (2.8%)	21 (2.0%)

Data are presented as number and percentage of total number of patients

Failure to complete the surgery occurred in 5 patients and the reason was patient coughing during the procedure which was performed under local anaesthetic, failed to distend the cavity, failed to reach the stalk of a 2 cm submucosal fibroid, uterine perforation and instrument failure respectively.

Incomplete surgery occurred in 4 patients and scissors was the only device reported to be used. Three cases involved removal of endometrial polyp and the removal was failed in 2 and not specified in 1. One case involved the removal of a 2 cm fibroid polyp and the incomplete procedure was due to severe distortion of uterine cavity with prolonged operation.

There was only 1 case of excessive fluid absorption (> 1.5L) being reported. It involved a case of resection of a 2 cm type 1 submucosal fibroid (80% intracavity) by a specialist and assisted by another specialist. The procedure took 108 minutes and the fluid deficit was 2,700 ml.

Complications with regard to surgical tools

The use of cutting loop was associated with the highest complication rate. Uterine perforation was associated with the use of cutting loop in 60% of cases. The only case of excessive fluid absorption (> 1.5 L) was associated with the use of cutting loop.

	Level 2	Level 3	Overall
Ball	0.0%	0.41%	0.1%
Ball & Loop	0.0%	0.0%	0.0%
Loop	0.64%	3.25%	1.26%
Scissors	0.64%	0.0%	0.49%
Unknown	0.38%	0.0%	0.29%
Total	1.67%	3.66%	2.13%

12

HYSTEROSCOPIC SURGERY – LEVEL 2 PROCEDURES

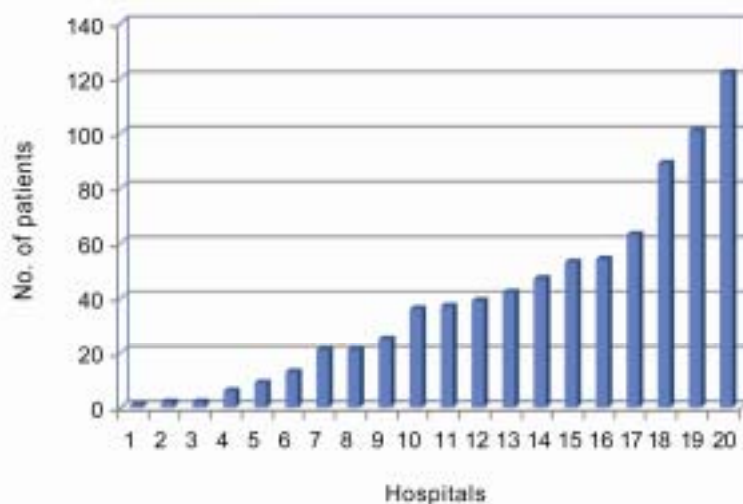
Total number of patients

783

The total number of level 2 procedures increased by 10 fold from 74 in 1997 to 734 in 2002 and plateaued at 783 in 2007.

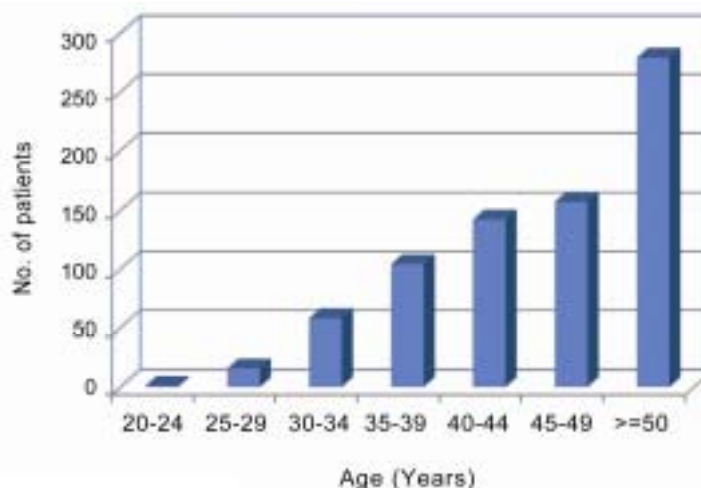
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing level 2 procedures increased from 12 in 1997 to 20 in 2002 and 2007. In general, there was an increase in the number of procedures performed in all units. Most units performed less than 60 procedures a year and 2 units performed over 100 procedures.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 47.1 (SD 10.2) years, compared to 48.8 (SD 11.2) in 2002 and 43.7 (SD 8.7) in 1997. Most of the patients (90.1% versus 81.0% in 2002 and 89.4% in 1997) were 35 or older, and 36.9% (42.1% in 2002 and 15.2% in 1997) aged 50 or above.



Number of missing data: 26 (3.3%)

Distribution of age

	1997	2002	2007
20 – 24 years	2 (2.7%)	3 (0.4%)	1 (0.1%)
25 – 29 years	3 (4.1%)	13 (1.8%)	16 (2.1%)
30 – 34 years	6 (8.1%)	36 (5.0%)	58 (7.7%)
35 – 39 years	14 (18.9%)	86 (11.8%)	10 (13.7%)
40 – 44 years	12 (16.2%)	139 (19.1%)	142 (18.8%)
45 – 49 years	17 (23.0%)	144 (19.8%)	157 (20.7%)
≥ 50 years	20 (27.0%)	306 (42.1%)	279 (36.9%)
Total	74	727	757

Number of missing data: 7 (1.0%) in 2002 and 26 (3.3%) in 2007

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Endometrial polyp remained the most common diagnosis and accounted over 80% of the diagnoses. Fibroid polyp was replaced by normal uterine cavity to be the second most common diagnosis and its rate dropped from 35.1% in 1997 to 15.0% in 2002 and 18.9% in 2007.

	1997	2002	2007
Endometrial polyp	42 (56.8%)	537 (77.2%)	623 (81.2%)
Normal uterine cavity	1 (1.4%)	101 (14.5%)	145 (18.9%)
Fibroid polyp	26 (35.1%)	104 (15.0%)	95 (12.4%)
Submucosal fibroid	1 (1.4%)	16 (2.3%)	24 (3.1%)
Endocervical polyp	4 (5.4%)	15 (2.2%)	13 (1.7%)
Uterine synechiae	3 (4.1%)	7 (1.0%)	8 (1.0%)
Retained IUCD	1 (1.4%)	0 (0.0%)	2 (0.3%)
Others	4 (5.4%)	4 (0.6%)	9 (1.2%)
Total	74	695	767

Number of missing data: 39 (5.3%) in 2002 and 16 (2.0%) in 2007

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

Most of the procedures were performed by specialists and its rate increased from 58.9% in 1997 to 59.5% in 2002 and 70.7% in 2007. While those with MRCOG performed only 12.4 % of the cases (21.5% in 2002 and 37.0% in 1997) and pre-membership doctors performed 16.9% (19.1% in 2002 and 4.1% in 1997) of cases.

Surgeon \ Assistant	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	36	8	6	70	9	129
MRCOG	34	3	0	57	1	95
FHKAM	72	98	11	27	124	332
FRCOG	40	20	1	2	146	209
Total	182	129	18	156	280	765

Number of missing data: 18 (2.5%) in 2002 and 18 (2.3%) in 2007

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 51 (6.5%) patients, compared to 2.7% in 2002 and 8.1% in 1997. GnRH analogue was used in 46 (90.2%) and progestogen in 5 (9.8%), while danazol was no longer being used in 2007. The corresponding figures in 2002 were GnRH analogue 64.7%, progestogen 17.6%, and danazol 17.6%.

Cervical priming was carried out in 291 (37.2%) patients, compared to 17.6% in 2002. Same as 2002, misoprostol was the most common agent used and the rate increased from 85.2% to 94.8%. Cervagem was only used in 3 cases in 2007, compared to 15 in 2002, and the agent was not specified in 12. Prophylactic antibiotic was used in 154 (19.7%) patients, compared to 9.8% in 2002.

Anaesthetic methods

There was an increase in the use of general anaesthesia and its rate increased from 65.2% in 2002 to 75.7% (n= 593) in 2007. The use of regional anaesthesia increased from 1.3% in 2002 to 3.5% (n=27) in 2007 and intravenous sedation from 0.7% in 2002 to 2.1% (n=16) in 2007. The use of paracervical block dropped from 6.4% in 2002 to 0.4% in 2007. No anaesthesia was used in 132 (16.9%), compared to 26.2% in 2002. Information was not recorded in the remaining 10 patients.

Surgical tools

Monopolar system was used in 318 (40.6%) and bipolar system in 27 (3.4%). Both systems were used in 1 case and information was not reported in 439 cases. In 2002, bipolar system was used in 3.4%.

Cutting loop alone was used in 59.5% (65.6% in 2002 and 94.1% in 1997), roller ball alone in 0.7% (2.0% in 2002 and 2.0% in 1997), and both were used in 1.6% (1.3% in 2002 and 3.9% in 1997). Second generation ablation tools were used in 17 cases, 16 Novasure and 1 Thermal Balloon, compared to 24 Thermal Balloons in 2002. There was an increase in the use of hysteroscopic scissors and the number increased from 21(5.3%) in 2002 to 131 (22.6%) in 2007

	1997	2002	2007
Cutting loop	48 (94.1%)	261 (65.6%)	345 (59.5%)
Rollerball	1 (2.0%)	8 (2.0%)	4 (0.7%)
Loop & Ball	2 (3.9%)	5 (1.3%)	9 (1.6%)
Scissors	-	21 (5.3%)	131 (22.6%)
Forceps	-	4 (1.0%)	59 (10.2%)
Novasure	-	-	16 (2.8%)
Thermal Balloon	-	24*	1 (0.2%)
Total	51	398	580

Number of missing data: 23 (31.1%) in 1997, 336 (45.8%) in 2002 and 203 (25.9%) in 2007

** Thermal Balloon endometrial ablation was considered as Level 3 procedure in 2002*

Distension fluid

Glycine was the most common distension fluid and was used in 52.5%, compared to 44.7% in 2002 and 79% in 1997. Normal saline was used in 41.1%, compared to 51.0% in 2002 and 13.9% in 1997. CO₂ was used in only 0.8% (4.3% in 2002).

	1997	2002	2007
Glycine	57 (79.2%)	312 (44.7%)	411 (52.5%)
Normal Saline	10 (13.9%)	356 (51.0%)	292 (41.1%)
CO ₂	0 (0.0%)	30 (4.3%)	6 (0.8%)
Others*	5 (6.9%)	0 (0.0%)	2 (0.3%)
Total	72	698	710

Number of missing data: 2 (2.7%) in 1997, 36 (4.9%) in 2002 and 73 (9.3%) in 2007

**Others referred to Lactated Ringer in 1997 and Dextrose in 2007*

OPERATIVE PROCEDURES

Some patients could have more than one operative procedure performed. As in 2002 and 1997, resection of endometrial polyp was the most common procedure, followed by resection of fibroid polyp. Endometrial ablation using second generation was performed in 17 cases, all using NovaSure except 1 (Thermal Balloon). Similar procedure was grouped under Level 3 procedure in 2002 and involved 24 cases using Thermal Balloon.

	1997	2002	2007
Resection of endometrial polyp	42 (56.8%)	611 (85.1%)	613 (78.3%)
Resection of fibroid polyp	26 (35.1%)	93 (13.0%)	115 (14.7%)
Proximal tubal cannulation	4 (5.4%)	6 (0.8%)	23 (2.9%)
Simple adhesiolysis	3 (4.1%)	4 (0.6%)	10 (1.3%)
Endometrial ablation*	-	24 ¹	17 ² (2.2%)
Total	74	718	767

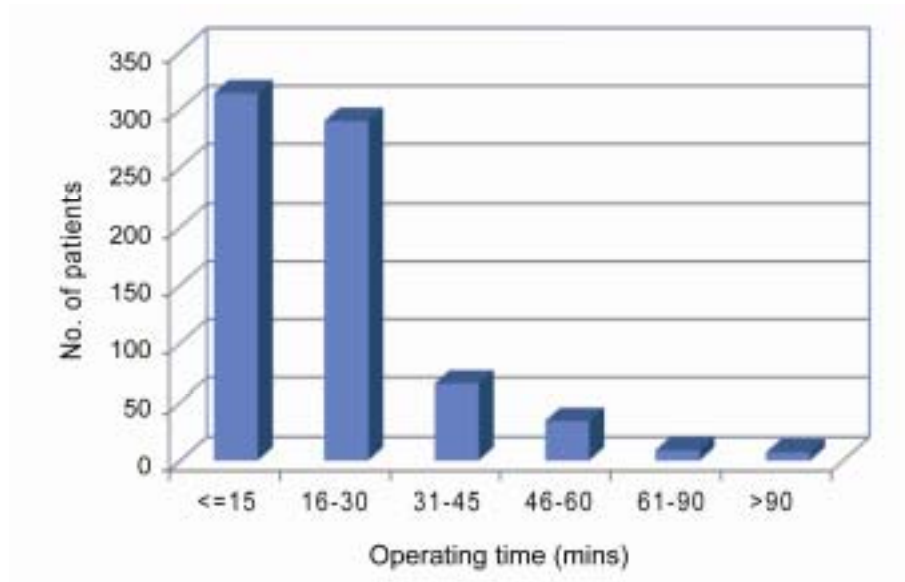
Number of missing data: 16 (2.2%) in 2002 and 16 (2.0%) in 2007

Data are presented as number and percentage of total number of patients

**Endometrial ablation using second generation ablation tools*

OPERATING TIME

The mean operating time was 22.2 (SD 16.5) minutes, compared to 17.6 (SD 13.1) in 2002 and 37.3 (SD 26.9) in 1997. The operating time was within 30 minutes in 84.0% of cases (83.0% in 2002 and 63.2% in 1997) and exceeded 60 minutes in 2.3% (3.9% in 2002 and 8.8% in 1997).



Number of missing data: 64 (8.2%)

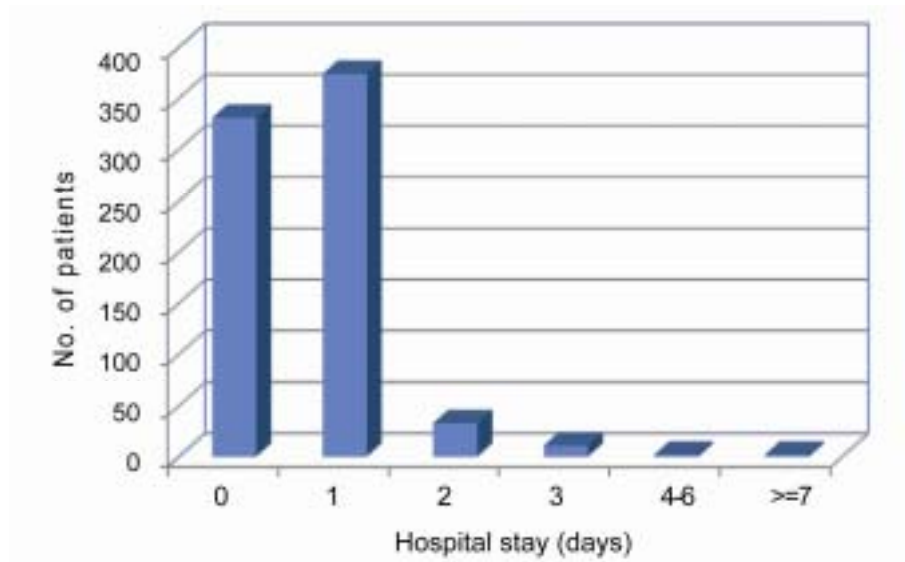
Distribution of operating time

	1997	2002	2007
≤ 15 minutes	11 (16.2%)	378 (62.3%)	314 (43.7%)
16 – 30 minutes	32 (47.1%)	126 (20.8%)	290 (40.3%)
31 – 45 minutes	9 (13.2%)	58 (9.6%)	65 (9.0%)
46 – 60 minutes	10 (14.7%)	37 (6.1%)	34 (4.7%)
61 – 90 minutes	4 (5.9%)	14 (2.3%)	9 (1.3%)
> 90 minutes	2 (2.9%)	10 (1.6%)	7 (1.0%)
Total	68	607	719

Number of missing data: 6 (8.1%) in 1997, 127 (17.3%) in 2002 and 64 (8.2%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.7) days, compared to 0.6 (SD 0.7) in 2002 and 1.7 (SD 1.6) in 1997. A total of 331 patients (42.3%) were discharged on the day of operation and 4 (0.5%) stayed for 4 days or longer. The corresponding figures in 2002 were 46.0% and 0.8% and in 1997 were 9.1% and 10.6% respectively.



Number of missing data: 30 (3.8%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	6 (9.1%)	326 (46.0%)	331 (44.0%)
1 day	38 (57.6%)	340 (48.0%)	374 (49.7%)
2 days	11 (16.7%)	29 (4.1%)	33 (4.4%)
3 days	4 (6.1%)	8 (1.1%)	11 (1.5%)
4 – 6 days	4 (6.1%)	3 (0.8%)	2 (0.2%)
7 – 9 days	3 (4.5%)	0 (0.0%)	2 (0.2%)
Total	66	709	753

Number of missing data: 8 (10.8%) in 1997, 25 (0.9%) in 2002 and 30 (3.8%) in 2007 respectively

COMPLICATIONS

Eleven patients developed complications and the incidence was 1.5%, compared to 2.0% in 2002 and 4.1% in 1997. In contrast to previous audits, incomplete and failed surgery were the 2 most common complications in 2007. The reasons for the failed surgery were:

1. failed to distend cavity,
2. failed to reach the stalk of the polyp,
3. uterine perforation and
4. patient coughing during the procedure performed under local anaesthetic.

The reasons for incomplete surgery were:

1. severe distortion of the cavity and prolonged operation,
2. failed to remove the polyp by scissors,
3. sessile polyp and
4. not stated.

Uterine perforation was the third most common complication and there was no case of excessive fluid absorption.

	1997	2002	2007
Cervical laceration	1(1.4%)	6 (0.8%)	1 (0.1%)
Fluid absorption > 1.5L	2 (2.7%)	4 (0.6%)	0 (0.0%)
Uterine perforation	2 (2.7%)	3 (0.4%)	3 (0.4%)
Incomplete surgery	0 (0.0%)	2 (0.3%)	4 (0.5%)
Failed surgery	0 (0.0%)	1 (0.1%)	4 (0.5%)
Further surgery	0 (0.0%)	0 (0.0%)	1 (0.2%)
Incidence	3 (4.1%)	15 (2.0%)	11 (1.5%)

Data are presented as number and percentage of total number of patients

13

HYTSCROSCOPIC SURGERY – LEVEL 3 PROCEDURES

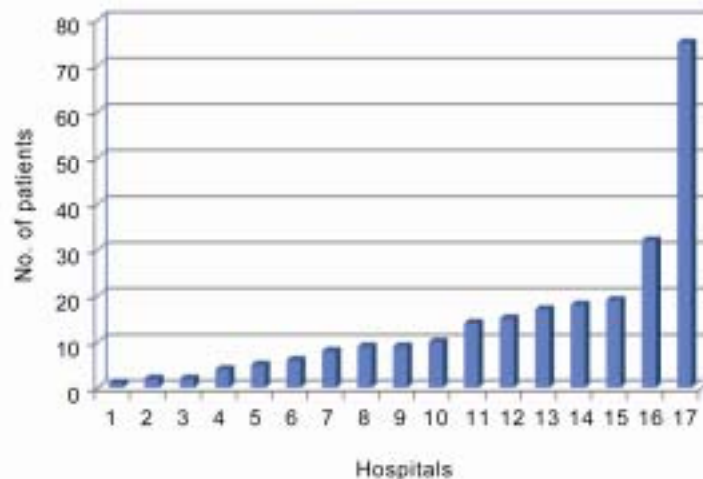
Total number of patients

246

The total number of level 3 procedures increased by 2.7 fold from 125 in 1997 to 342 in 2002 but decreased by about 30% to 246 in 2007.

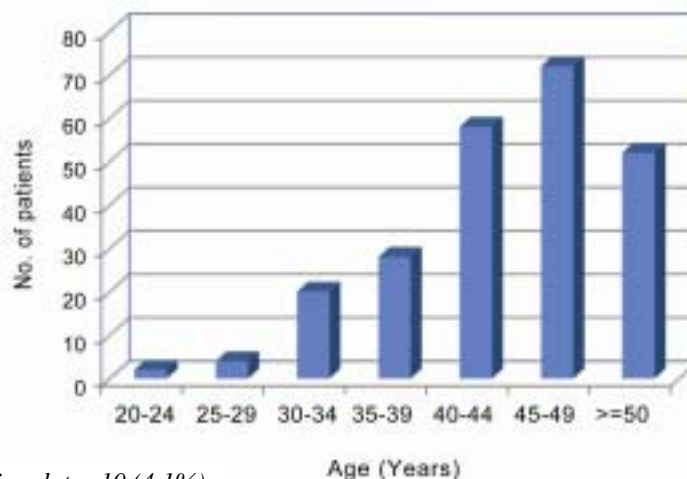
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing level 3 procedures was 17, compared to 13 in 1997 and 18 in 2002. Most units performed less than 20 cases a year and about 30% of the cases were performed in one single unit. The situation was similar to that in 2002.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 44.3 (SD 7.2) years compared to 44.4 (SD 7.7) in 2002 and 42.6 (SD 6.3) in 1997. Most of the patients (89.0% versus 90.1% in 2002 and 91.9% in 1997) were 35 or older, and 22.2% (20.0% in 2002 and 8.1% in 1997) aged 50 or above.



Number of missing data: 10 (4.1%)

Distribution of age

	1997	2002	2007
20 – 24 years	0 (0.0%)	5 (1.5%)	2 (0.8%)
25 – 29 years	3 (2.4%)	9 (2.7%)	4 (1.7%)
30 – 34 years	7 (5.6%)	18 (5.4%)	20 (8.5%)
35 – 39 years	22 (17.7%)	39 (11.6%)	28 (11.9%)
40 – 44 years	44 (35.5%)	88 (26.6%)	58 (24.6%)
45 – 49 years	38 (30.6%)	108 (32.2%)	72 (30.5%)
≥ 50 years	10 (8.1%)	67 (20.0%)	52 (22.0%)
Total	124	335	236

Number of missing data: 1 (0.8%) in 1997, 7 (2.0%) in 2002 and 10 (4.1%) in 2007 respectively

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Submucosal fibroid was the most common diagnosis. Unlike previous audits, endometrial polyp replaced normal uterine cavity as the second most common diagnosis.

	1997	2002	2007
Submucosal fibroid	37 (29.6%)	148 (49.7%)	124 (51.9%)
Endometrial polyp	10 (8.0%)	47 (15.8%)	63 (26.4%)
Normal uterine cavity	56 (44.8%)	92 (30.9%)	48 (20.1%)
Fibroid polyp	17 (13.6%)	28 (9.4%)	26 (10.9%)
Uterine synechiae	4 (3.2%)	8 (2.7%)	11 (4.6%)
Uterine septum	1 (0.8%)	5 (1.7%)	6 (2.5%)
Endocervical polyp	2 (1.6%)	0 (0.0%)	2 (0.8%)
Total	125	298	239

Number of missing data: 44 (12.9%) in 2002 and 7 (2.8%) in 2007

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

Most of the procedures were performed by specialists (76.1% versus 69.6% in 2002 and 67.7% in 1997). The procedures were performed by doctors with MRCOG in 14.8% (19.9% in 2002 and 25.6% in 1997) and by pre-membership doctors in 9.1% (9.9% in 2002 and 6.6% in 1997).

Surgeon \ Assistant	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	0	0	5	17	0	22
MRCOG	2	5	0	29	0	36
FHKAM	19	58	8	26	14	125
FRCOG	17	7	2	7	27	60
Total	38	70	15	79	41	243

Number of missing data: 3 (1.2%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 108 (43.9%) patients, compared to 37.2% in 2002 and 64.0% in 1997. Similar to 2002, GnRH analogue was the most common agent used, rather than danazol as in 1997. GnRH analogue was used in 103 (95.4%), danazol in 3 (2.8%) and progestogen in 2 (1.9%). Data were not available in 4 patients. The corresponding figures in 2002 were 74.1%, 21.6% and 4.3%.

Cervical priming was carried out in 160 (65.0%) patients, compared to 29.0% in 2002. Misoprostol was used in 123 (76.9%), cervagem in 2 (1.3%) and unspecified in 35 (21.9%). Prophylactic antibiotic was used in 86 (35.0%) patients, compared to 25.1% in 2002.

Anaesthetic methods

General anaesthesia was the predominant anaesthetic method and was used in 230 (93.5%) patients, compared to 72.7% in 2002. It had virtually replaced intravenous sedation (0 or 05) and no anaesthesia (3 or 1.2%) which were either not used or rarely used, in contrast to 4.7% and 17.5% respectively in 2002. Regional anaesthesia was used in 12 (4.9%), similar to that in 2002 (5.0%). Information was not recorded in the remaining 1 (0.4%) patients.

Surgical tools

Monopolar system was used in 188 (76.4%) and bipolar system in 17 (6.9%). Both systems were used in 1 case and information was not reported in 40 cases. In 2002, bipolar system was used in only 1.2%.

Cutting loop alone was used in 47.2% (47.2% in 2002 and 35.9% in 1997), roller ball alone in 13.8% (23.6% in 2002 and 37.6% in 1997), and both were used in 28.9% (18.8% in 2002 and 26.5% in 1997). Versapoint was reported to be used in 1 case (0.4%) Endometrial ablation performed using second generation ablation tools was classified as Level 2 procedure in 2007 and therefore was not reported here.

	1997	2002	2007
Cutting loop	42 (35.0%)	146 (47.9%)	116 (50.2%)
Rollerball	44 (36.7%)	73 (23.9%)	34 (14.7%)
Loop & Ball	34 (28.3%)	58 (19.0%)	71 (30.7%)
Knife electrode	0 (0.0%)	0 (0.0%)	2 (0.9%)
Needle electrode	0 (0.0%)	0 (0.0%)	1 (0.4%)
Thermal Balloon	-	24 (7.9%)	-
Others	0 (0.0%)	4 (1.3%)	2 (0.9%)
Total	120	305	231

Number of missing data: 8 (6.3%) in 1997, 33 (9.6%) in 2002 and 15 (6.1%) in 2007

* Thermal Balloon endometrial ablation was consider as Level 3 procedure in 2002

Distension fluid

Glycine was the most common distension fluid used and constituted of the 231 (97.1%) cases, compared to 86.74% in 2002 and 96.8% in 1997. Normal saline was used in 2.9% compared to 5.7% in 2002 and 2.4% in 1997.

	1997	2002	2007
Glycine	120 (96.8%)	287 (86.7%)	231 (93.9%)
Normal Saline	3 (2.4%)	19 (5.7%)	7 (2.9%)
Dextrose 5%	0 (0.0%)	24 (7.3%)	0 (0.0%)
Dextran	1 (0.8%)	0 (0.0%)	0 (0.0%)
CO ₂	0 (0.0%)	1 (0.3%)	0 (0.0%)
Total	124	331	238

Number of missing data: 1 (0.8%) in 1997, 11 (3.2%) in 2002 and 8 (3.3%) in 2007

OPERATIVE PROCEDURES

Some patients could have more than one operative procedure performed. Resection of fibroid became the most common procedure in 2007 and accounted for 60.2% (48.8% in 2002 and 37.6% in 1997). Endometrial ablation/resection was the second most common procedure and accounted for 51.2%, compared to 59.2% in 2002 and 65.6% in 1997.

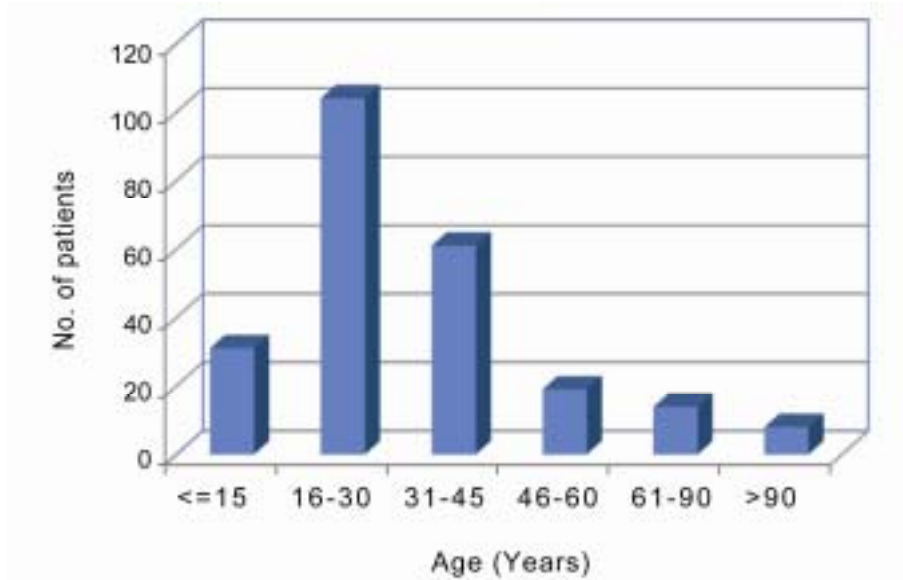
	1997	2002	2007
Resection of submucosal fibroid	47 (37.6%)	158 (48.8%)	122 (49.6%)
Endometrial ablation	53 (42.4%)	138 (42.6%)	77 (31.3%)
Endometrial resection	20 (16.0%)	37 (11.4%)	27 (11.0%)
Resection and ablation	9 (7.2%)	17 (5.2%)	22 (8.9%)
Resection of fibroid polyp	-	-	26 (10.6%)
Resection of endometrial polyp	13 (10.4%)	24 (7.4%)	37 (15.0%)
Adhesiolysis	5 (4.0%)	7 (2.2%)	10 (4.1%)
Division of uterine septum	1 (0.8%)	7 (2.2%)	7 (2.8%)
Total	125	326	246

Number of missing data: 16 (4.7%) in 2002

Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 35.2 (SD 23.7) minutes, compared to 32.3 (SD 21.9) in 2002 and 40.6 (SD 21.5) in 1997. The operating time was 30 minutes or less in 56.9% (62.9% in 2002 and 50.8% in 1997) and exceeded 60 minutes in 9.3% (7.5% in 2002 and 10.5% in 1997).



Number of missing data: 9 (3.7%)

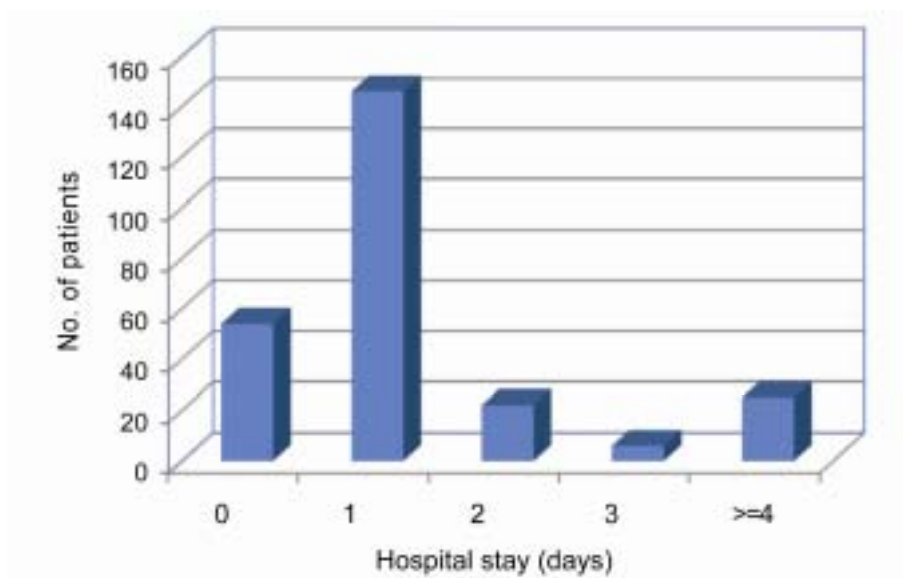
Distribution of operating time

	1997	2002	2007
≤ 15 minutes	4 (3.2%)	75 (23.4%)	31 (13.1%)
16 – 30 minutes	59 (47.6%)	127 (39.6%)	104 (43.9%)
31 – 45 minutes	28 (22.6%)	58 (18.1%)	61 (25.7%)
46 – 60 minutes	20 (16.1%)	37 (11.5%)	19 (8.0%)
61 – 90 minutes	10 (8.1%)	14 (4.4%)	14 (5.9%)
> 90 minutes	3 (2.4%)	10 (3.1%)	8 (3.4%)
Total	124	321	237

Number of missing data: 1 (0.8%) in 1997, 21 (6.2%) in 2002 and 9 (3.7%) respectively

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.3 (SD 1.1) days, compared to 1.0 (SD 0.8) in 2002 and 1.7 (SD 1.3) in 1997. Following the procedure, 23.2% (18.4% in 2002 and 3.4% in 1997) of the cases were discharged on the same day. Most of the patients (85.8%) were discharged within the first day (87.0% in 2002 and 63.2% in 1997) and 2.1% (1.5% in 2002 and 6.9% in 1997) stayed for 4 days or longer.



Number of missing data: 13 (5.3%)

Distribution of post-operative hospital stay

	1997	2002	2007
0 day	4 (3.4%)	62 (18.3%)	54 (23.2%)
1 day	70 (59.8%)	233 (68.7%)	146 (62.7%)
2 days	28 (23.9%)	30 (8.8%)	22 (9.4%)
3 days	7 (6.0%)	9 (2.7%)	6 (2.6%)
4 – 6 days	7 (6.0%)	5 (1.5%)	3 (1.3%)
≥ 7 days	1 (0.9%)	0 (0.0%)	2 (0.8%)
Total	117	339	233

Number of missing data: 8 (6.4%) in 1997, 3 (0.9%) in 2002 and 13 (5.3%) in 2007 respectively

COMPLICATIONS

Eight patients developed complications and the incidence was 3.3%, compared to 4.4% in 2002 and 9.6% in 1997. Cervical laceration became the most common complication. Only one patient had excessive fluid absorption (>1.5L) following resection of submucosal fibroid. The 2 cases of uterine perforations were resection of submucosal fibroid and rollerball endometrial ablation. The procedure was failed in 1 patient due to instrument failure. There was no case of incomplete surgery in contrast to 0.3% in 2002 and 3.2% in 1997.

	1997	2002	2007
Cervical laceration	2 (1.6%)	2 (0.6%)	3 (1.2%)
Uterine perforation	1 (0.8%)	3 (0.9%)	2 (0.8%)
Haemorrhage	0 (0.0%)	0 (0.0%)	2 (0.8%)
Fluid absorption > 1.5 L	4 (3.2%)	10 (2.9%)	1 (0.4%)
Failed surgery	0 (0.0%)	1 (0.3%)	1 (0.4%)
Incomplete surgery	4 (3.2%)	2 (0.6%)	0 (0.0%)
Acute pelvic infection	1 (0.8%)	0 (0.0%)	0 (0.0%)
Others	2 (1.6%)	0 (0.0%)	0 (0.0%)
Incidence	12 (9.6%)	15 (4.4%)	8 (3.3%)

14

ENDOMETRIAL ABLATION / RESECTION

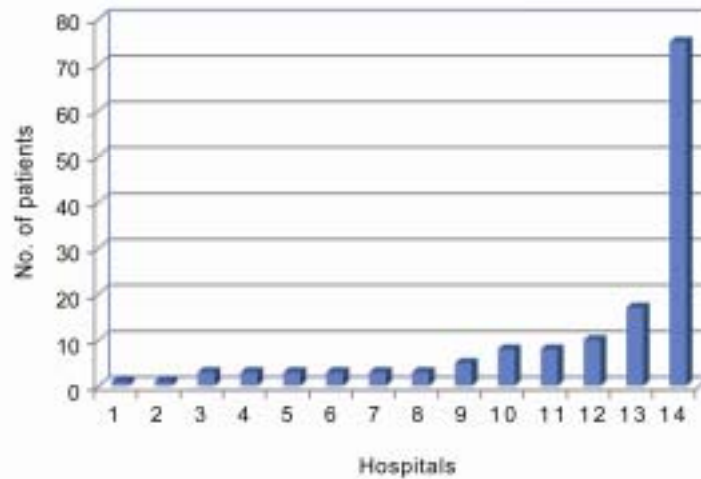
Total number of patients

143

The number of endometrial ablation/resection increased by 2.3 fold from 82 in 1997 to 192 in 2002 and decreased by 25% to 143 in 2007.

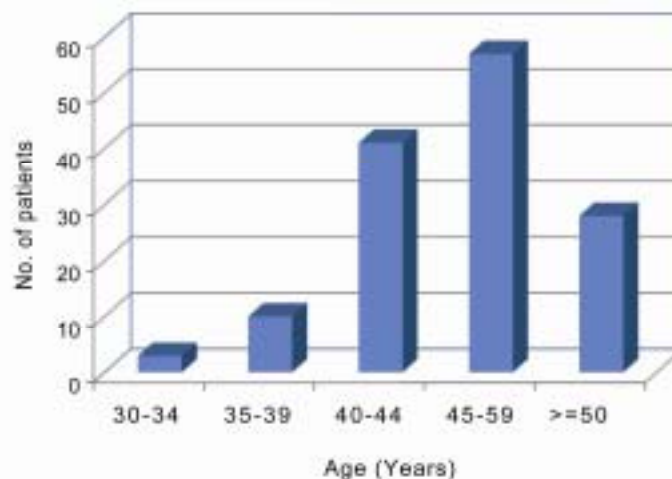
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing endometrial ablation/resection increased from 11 in 1997 to 14 in 2002 and 2007. Similar to 1997, the total number of procedures performed in most units was small. One hospital performed 75 procedures which accounted for 52.4% of the total number of cases.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 45.6 (SD 4.8) years, compared to was 45.7 (SD 5.7) in 2002 and 43.3 (SD 4.3) in 1997. Three patients (2.2%) were younger than 35 and 28 (20.1%) aged 50 or above. The corresponding figures in 2002 were 3.2% and 17.6% respectively, and in 1997 were 2.4% and 7.3% respectively.



Number of missing data: 4 (2.8%)

Distribution of age

	1997	2002	2007
20 – 24 years	0 (0.0%)	1 (0.5%)	0 (0.0%)
25 – 29 years	1 (1.2%)	3 (1.6%)	0 (0.0%)
30 – 34 years	1 (1.2%)	2 (1.1%)	3 (2.2%)
35 – 39 years	7 (8.5%)	9 (4.8%)	10 (7.2%)
40 – 44 years	37 (45.1%)	61 (32.6%)	41 (29.5%)
45 – 49 years	30 (36.6%)	78 (41.7%)	57 (41.0%)
≥ 50 years	6 (7.3%)	33 (17.6%)	28 (20.1%)
Total	82	187	139

Number of missing data: 5 (2.6%) in 2002 and 4 (2.8%) in 2007

OPERATIVE DIAGNOSIS

The information was not available in 10 patients (7.0%). Some patients could have more than one diagnosis. Normal uterine cavity was the commonest diagnosis. Endometrial polyp was the second most common diagnosis and its rate increased from 13.4% in 1997 to 22.7% in 2002 and 34.6% in 2007. Two patients with congenital uterine abnormality underwent endometrial ablation, 1 with didelphys uterus and 1 with bicornuate uterus.

	1997	2002	2007
Normal uterine cavity	57 (69.5%)	81 (49.7%)	56 (42.1%)
Endometrial polyp	11 (13.4%)	37 (22.7%)	46 (34.6%)
Submucosal fibroid	15 (18.3%)	36 (22.1%)	22 (16.5%)
Fibroid polyp	4 (4.9%)	20 (12.3%)	20 (15.0%)
Endocervical polyp	2 (2.4%)	0 (0.0%)	1 (0.8%)
Uterine septum	0 (0.0%)	1 (0.6%)	0 (0.0%)
Total	82	163	133

Number of missing data: 29 (15.1%) in 2002 and 10 (7.0%)

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

Most of the procedures were performed by specialists 66.2% (61.8% in 2002 and 63.3% in 1997) and MRCOG 22.5% (24.6% in 2002 and 31.6% in 1997). The procedure was performed by pre-membership doctors in 11.3% (13.2% in 2002 and 5.1% in 1997) cases.

Surgeon \ Assistant	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	0	0	4	12	0	16
MRCOG	4	4	0	24	0	32
FHKAM	10	30	9	17	7	73
FRCOG	9	2	1	3	6	21
Total	23	36	14	56	13	142

Number of missing data: 1 (0.7%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Information was not available in 3 (2.1%) cases. Endometrial preparation was carried out in 71 (50.7%) patients, compared to 44.9% in 2002 and 85.4% in 1997. Similar to 2002, GnRH analogue was the most common agent used in contrast to danazol in 1997. GnRH analogue was used in 69 (97.2%) cases while danazol and progestogen were used in only 1 (1.4%) patient each. The corresponding figures in 2002 were 70.9%, 24.1% and 5.1%.

Cervical priming was carried out in 97 (68.8%) patients, compared to 21.9% in 2002. Misoprostol was used in 80 (82.5%), cervagem in 2 (2.1%) and lamichel in 4 (4.1%). Prophylactic antibiotic was used in 25 (17.5%) patients, compared to 20.8% in 2002.

Effects of endometrial preparation on endometrial ablation/resection

Endometrial preparation was not associated with any difference in operating time, fluid balance and post-operative hospital stay. However, those with endometrial preparation were more likely to have concurrent operation. There was no difference in the complication rate. This is in contrast to 2002 where endometrial preparation was associated with significantly shorter operating time, lower concurrent operation rate and higher complication rate.

	Prepared N = 71	Not prepared N = 69	P value
Operating time (min)	32.3 ± 15.3	29.6 ± 25.4	NS
Fluid balance (ml)	206 ± 208	185 ± 274	NS
Hospital stay (days)	1.1 ± 1.7	1.1 ± 0.7	NS
Concurrent operation (%)	40 (56.3%)	19 (27.5%)	0.01
Complication rate (%)	2 (2.8%)	2 (2.9%)	NS

NS – No Significance

Data are presented as number and percentage of total number of patients

Similar findings were found when thermal balloon (n = 1) and Novasure (n = 16) endometrial ablation were excluded. Novasure endometrial ablation does not require endometrial preparation while thermal balloon does.

	Prepared N = 70	Not prepared N = 53	P value
Operating time (min)	32.6 ± 15.3	34.6 ± 26.2	NS
Fluid balance (ml)	206 ± 208	185 ± 274	NS
Hospital stay (days)	1.1 ± 1.7	1.2 ± 0.8	NS
Concurrent operation (%)	40 (57.1%)	19 (35.8%)	0.02
Complication rate (%)	2 (2.9%)	2 (3.8%)	NS

NS – No Significance

Data are presented as number and percentage of total number of patients

Anaesthetic methods

Anaesthetic method was recorded in all but 1 patient. General anaesthesia was the predominant anaesthetic method and was used in 125 (88.0%), compared to 82.4% in 2002. Regional anaesthesia was used in 8 (5.6%) and intravenous sedation in 9 (6.3%). The corresponding figures in 2002 were 7.2% and 10.5% respectively.

Surgical tools

Seventeen patients underwent endometrial ablation using the second generation ablation tools; 16 with NovaSure and 1 with thermal balloon. This compared to 24 patients in 2002, all with thermal balloon. Of the remaining 118 patients with reported tools, rollerball alone was used in 34 or 28.8% (39.9% in 2002 and 51.3% in 1997), cutting loop in 24 or 20.3% (19.0% in 2002 and 13.8% in 1997), both electrodes were used in 60 or 50.8% (32.7% in 2002 and 35.0% in 1997). Bipolar system was used in 10 patients (7.0%), compared to 2.0% in 2002; cutting loop was used alone in 2, rollerball alone in 1 and both in 12.

	1997	2002	2007
Cutting loop	11 (13.4%)	32 (17.6%)	24 (17.8%)
Rollerball	41 (50.%)	67 (36.8%)	34 (25.2%)
Loop & Ball	28 (34.1%)	55 (30.2%)	60 (44.4%)
Novasure	0 (0.0%)	-	16 (11.9%)
Thermal Balloon	0 (0.0%)	24 (13.2%)	1 (0.7%)
VersaPoint	0 (0.0%)	4 (2.2%)	0
Total	82	182	135

Number of missing data: 10 (5.2%) in 2002 and 8 (5.6%) in 2007

** Thermal Balloon endometrial ablation was consider as Level 3 procedure in 2002*

Distension fluid

Of the 126 cases who had undergone conventional endometrial ablation/resection, glycine was used as the distending medium in 120 (98.4%) cases, compared to 91.1% in 2002 and 97.6% in 1997. Normal saline was used in 2 (1.6%) cases, compared to 5.4% in 2002 and 1.2% in 1997. Data was not available in 4 (3.2%) cases. Of the 10 cases reported to have used bipolar device, normal saline was used in only 1 case, the remaining 9 all used glycine as the distending fluid. On the other hand, of the 97 cases reported to have used monopolar device, glycine was the distending medium in 96 and normal saline in 1.

	1997	2002	2007
Glycine 1.5%	80 (97.6%)	153 (91.1%)	120 (98.4%)
Normal saline	1 (1.2%)	9 (5.4%)	2 (1.6%)
Dextrose 5%	0 (0.0%)	6 (3.6%)	0 (0.0%)
CO ₂	0 (0.0%)	1 (0.6%)	0 (0.0%)
Unspecified	1 (1.2%)	6 (3.6%)	0 (0.0%)
Total	82	168	122

Number of missing data: 17 (8.9%) in 2002 and 21 (14.7%) in 2007

OPERATIVE PROCEDURES

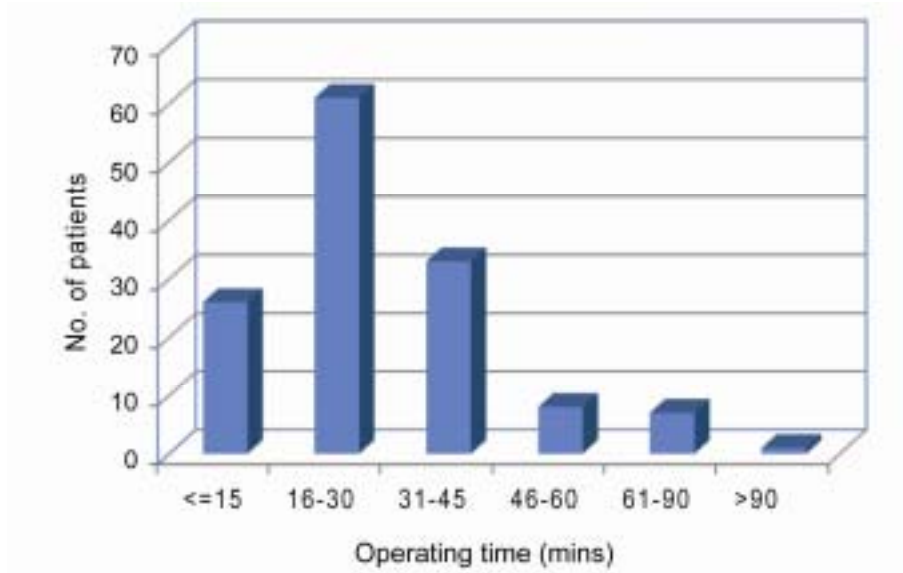
Some patients could have more than one operative procedure. Thermal balloon endometrial ablation was performed in only 1 case, compared to 24 (12.5%) in 2002. This was due to the use of Novasure which was reported in 16 cases. Conventional endometrial ablation was performed in 53.8% (59.4% in 200 and 64.4% in 1997), endometrial resection in 18.9% (19.3% in 2002 and 24.4% in 1997) and a combination of both in 15.4% (19.3% in 2002 and 11.0% in 1997). Concurrent resection of fibroid and endometrial polyp were performed in 25.9% (17.2% in 2002 and 13.4% in 1997) and 16.1% (10.9% in 2002 and 12.2% in 1997).

	1997	2002	2007
Thermal Balloon Ablation	0 (0.0%)	24 (12.5%)	1 (0.7%)
NovaSure Ablation	0 (0.0%)	0 (0.0%)	16 (11.2%)
Endometrial ablation	53 (64.6%)	114 (59.4%)	77 (53.8%)
Endometrial resection	20 (24.4%)	37 (19.3%)	27 (18.9%)
Resection and ablation	9 (11.0%)	17 (8.9%)	22 (15.4%)
Resection of fibroid	11 (13.4%)	33 (17.2%)	37 (25.9%)
Resection of polyp	10 (12.2%)	21 (10.9%)	23 (16.1%)
Total	82	192	143

Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 30.8 (SD 20.4) minutes, compared to 28.2 (SD 19.3) in 2002 and 38.4 (SD 18.5) in 1997. Most of the operations were completed within 30 minutes 87 or 64.0% (70.1% in 2002 and 54.9% in 1997) and 8 or 5.9% (3.9% in 2002 and 6.1% in 1997) exceeded 60 minutes.



Number of missing data: 7 (4.9%)

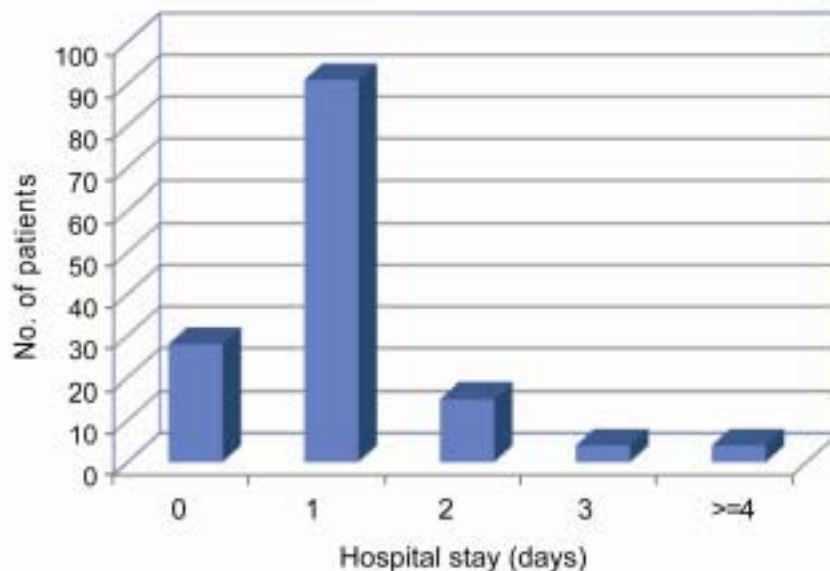
Distribution of operating time

	1997	2002	2007
≤ 15 minutes	0 (0.0%)	52 (28.6%)	26 (19.1%)
16-30 minutes	45 (54.9%)	83 (45.6%)	61 (44.9%)
31-45 minutes	20 (24.4%)	24 (13.2%)	33 (24.3%)
46-60 minutes	12 (14.6%)	16 (8.8%)	8 (5.9%)
61-90 minutes	4 (4.9%)	3 (1.6%)	7 (5.1%)
> 90 minutes	1 (1.2%)	4 (2.2%)	1 (0.7%)
Total	82	182	143

Number of missing data: 10 (5.2%) in 2002 and 7 (4.9%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.3 (SD 1.2) days, compared to 1.0 (SD 0.8) in 200 and 1.7 (SD 1.4) in 1997. Following the procedure, 19.7% (23.4% in 2002 and 1.3% in 1997) of the cases were discharged on the same day. Most of the patients (83.8%) were discharged within the first day (86.8% in 2002 and 64.6% in 1997) and 1.4% (1.0% in 2002 and 7.4% in 1997) stayed for 4 days or longer.



Number of missing data: 1 (0.7%)

Distribution of post-operative hospital stays

	1997	2002	2007
0 day	1 (1.3%)	45 (23.8%)	28 (19.1%)
1 day	50 (63.3%)	119 (63.0%)	91 (64.1%)
2 days	18 (22.8%)	18 (9.5%)	15 (10.6%)
3 days	4 (5.1%)	5 (2.7%)	4 (2.8%)
4-6 days	5 (6.1%)	2 (1.0%)	3 (2.1%)
7 days	1 (1.3%)	0 (0.0%)	1 (0.7%)
Total	79	189	142

Number of missing data: 3 (3.7%) in 1997, 3 (1.6%) in 2002 and 1 (0.7%) in 2007 respectively

COMPLICATIONS

Three patients developed complications and the incidence was 2.1%, compared to 2.1% in 2002 and 6.1% in 1997. Perforation of uterus occurred in 2, one had an endometrial resection with thickened endometrium and no endometrial priming, and the other had a rollerball ablation with endometrial priming. None of the patients developed excessive fluid absorption (>1.5L). Severe haemorrhage requiring suturing and intra-operative transfusion was reported in 1 case. The patient had a 2 cm fibroid polyp and underwent resection of fibroid polyp and endometrial ablation.

	1997	2002	2007
Perforation of uterus	0 (0.0%)	1 (0.5%)	2 (1.4%)
Fluid absorption > 1.5 L	1 (1.2%)	3 (1.6%)	0 (0.0%)
Cervical laceration	1 (1.2%)	0 (0.0%)	0 (0.0%)
Incomplete surgery	2 (2.4%)	0 (0.0%)	0 (0.0%)
Others	2 (2.4%)	0 (0.0%)	1 (0.7%)
Incidence	5 (6.1%)	4 (2.1%)	3 (2.1%)

Data are presented as number and percentage of total number of patients

15

HYSTEROSCOPIC RESECTION OF FIBROID

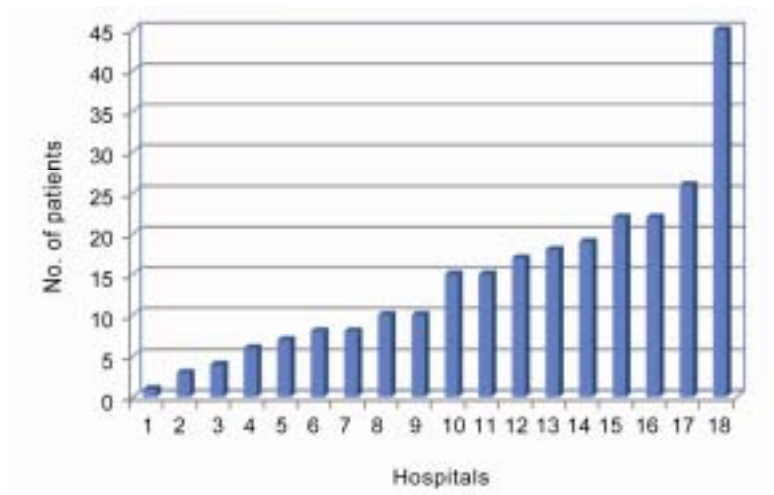
Total number of patients

256

The number of hysteroscopic resection of fibroid increased by 5.3 fold from 47 in 1997 to 251 in 2002 and remained at 256 in 2007.

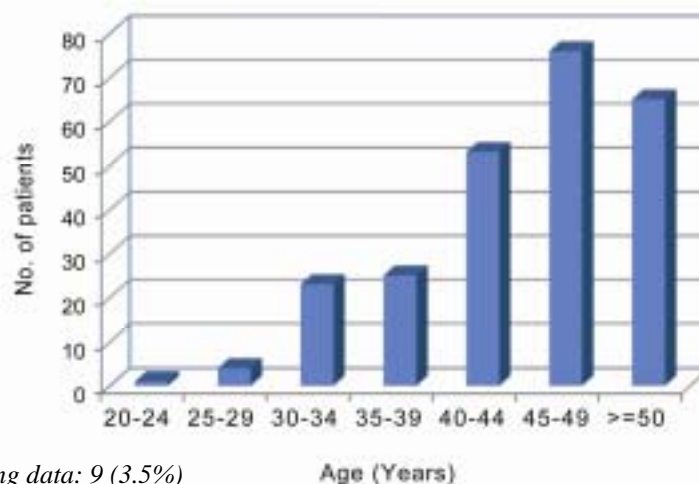
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing resection of fibroid increased from 10 in 1997 to 18 in 2002 and 2007. Similar to previous audits, most units performed less than 20 cases a year. One unit performed 46 cases which accounted for 18% of the total number of cases and was less than that in 2002.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 45.1 (SD 7.9) years, compared to 44.9 (SD 8.6) in 2002 and 41.6 (SD 6.4) in 1997. Twenty-eight (11.3%) patients were younger than 35 and 65 (26.3%) were 50 or older. The corresponding figures in 2002 were 10.1% and 26.7% respectively, and in 1997 were 13.0% and 8.7% respectively.



Number of missing data: 9 (3.5%)

Distribution of age

	1997	2002	2007
20 – 24 years	0 (0.0%)	6 (2.4%)	1 (0.4%)
25 – 29 years	1 (2.2%)	3 (1.2%)	4 (1.6%)
30 – 34 years	5 (10.9%)	16 (6.5%)	23 (9.3%)
35 – 39 years	12 (26.1%)	30 (12.1%)	25 (10.1%)
40 – 44 years	12 (26.1%)	60 (24.3%)	53 (21.5%)
45 – 49 years	12 (26.1%)	66 (26.7%)	76 (30.8%)
≥ 50 years	4 (8.7%)	66 (26.7%)	65 (26.3%)
Total	46	247	247

Number of missing date: 1 (2.1%) in 1997, 4 (1.6%) in 2002 and 9 (3.5%) in 2007 respectively

OPERATIVE DIAGNOSES

Information was not available in 2 (0.8%) cases. Of the remaining 254 patients, 136 (53.5%) had submucosal fibroid and 108 (42.5%) had fibroid polyp; 5 of them had co-existing pathology. Thirty-seven patients had co-existing endometrial polyp.

	1997	2002	2007
Submucosal fibroid	35 (74.5%)	131 (55.3%)	136 (53.5%)
Fibroid polyp	12 (25.5%)	111 (46.8%)	108 (42.5%)
Endometrial polyp	0 (0.0%)	11 (4.6%)	49 (19.3%)
Uterine septum	0 (0.0%)	2 (0.8%)	0 (0.0%)
Uterine synechia	0 (0.0%)	0 (0.0%)	1 (0.4%)
Total	47	237	254

Number of missing date: 14 (5.6%) in 2002 and 2 (0.8%) in 2007

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

Almost 80% of the operations were performed by specialists (72.8% in 2002 and 59.6% in 1997). The operations were performed doctors with MRCOG in 9.8% (20.2% in 2002 and 25.5% in 1997) and by pre-membership doctors in 10.2% (10.3% in 2002 and 10.6% in 1997).

Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	6	0	1	19	0	26
MRCOG	1	3	0	21	0	25
FHKAM	25	57	7	23	22	134
FRCOG	12	15	0	1	41	69
Total	44	75	8	64	63	254

Number of missing date: 2(0.8%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 76 (29.8%) patients compared to 18.9% in 2002 and 40.4% in 1997. Same as 2002, GnRH analogue was the most common agent used, in contrast to danazol in 1997. GnRH analogue was used in 71 (93.4%), progesterone in 3 (3.9%) and danazol in 2 (2.6%). The corresponding figures in 2002 were 79.1%, 2.3% and 18.6% respectively. Information was not available in 1 (0.4%) cases.

Cervical priming was carried out in 146 patients (57.0%), compared to 27.6% in 2002. Misoprostol was used in 117 (80.1%), Lamitel in 28 (19.2%) and cervagem in 1 (0.7%). The corresponding figures in 2002 were 85.7%, 0% and 14.3% respectively. Prophylactic antibiotic was used in 96 (37.5%) patients, compared to 21.9% in 2002.

Anaesthetic methods

General anaesthesia was used in 238 (93.7%), regional anaesthesia in 6 (2.4%) and conscious sedation in 3 (1.2%), paracervical block in 1 (0.4%). The corresponding figures in 2002 were 96.7%, 2.8% and 0.5% respectively. Information was not recorded in the remaining 2 (0.8%) patients.

Surgical tools

Monopolar system was used in 179 (69.9%) and bipolar system in 17 (6.6%). Both systems were used in 1 case and information was not reported in 40 cases. In 2002, bipolar system was used in only 1.2%.

Cutting loop alone was used in 71.2% (75.1% in 2002 and 68.2% in 1997). Both cutting loop and roller ball were used in 17.7% (16.7% in 2002 and 25.0% in 1997). Roller ball alone was reported to have been used in 2.7% patients, compared to 6.7% in 2002 and 6.8% in 1997.

	1997	2002	2007
Cutting loop	30 (68.2%)	157 (75.1%)	161 (71.2%)
Rollerball	3 (6.8%)	14 (6.7%)	6 (2.7%)
Loop & Ball	11 (25.0%)	35 (16.7%)	40 (17.7%)
Scissors	0 (0.0%)	0 (0.0%)	10 (4.4%)
Forceps	0 (0.0%)	0 (0.0%)	8 (3.5%)
Curette	0 (0.0%)	0 (0.0%)	1 (0.4%)
VersaPoint	0 (0.0%)	3 (1.4%)	0 (0.0%)
Total	44	209	226

Number of missing data: 3 (6.4%) in 1997, 42 (16.7%) in 2002 and 30 (11.7%) in 2007

Distension fluid

Glycine was used as the distending medium in 223(90.7%) cases, compared to 85.3% in 2002 and 95.7% in 1997. Normal saline was used in 23 (9.3%) in contrast to 10.8% in 2002 and 2.1% in 1997. The distending medium was not specified in 10 (3.9%) patients.

	1997	2002	2007
Glycine 1.5%	45 (95.7%)	214 (88.4%)	223 (90.7%)
Normal saline	1 (2.1%)	27 (11.2%)	23 (9.3%)
Dextrose 5%	0 (0.0%)	0 (0.0%)	0 (0.0%)
CO ₂	0 (0.0%)	1 (0.4%)	0 (0.0%)
Dextran	1 (2.1%)	0 (0.0%)	0 (0.0%)
Total	47	242	246

Number of missing data: 9 (3.6%) in 2002 and 10 (3.9%) in 2007

OPERATIVE PROCEDURES

Resection of submucosal fibroid alone was performed in 115 (44.9%) cases and resection of fibroid polyp alone in 134 (52.3%). Both procedures were performed at the same time in 7 (2.7%) cases. There were discrepancy in the type of fibroid resected and the type of fibroid diagnosed in 34 cases. There were no differentiation between resection of submucosal fibroid and fibroid polyp in previous audits.

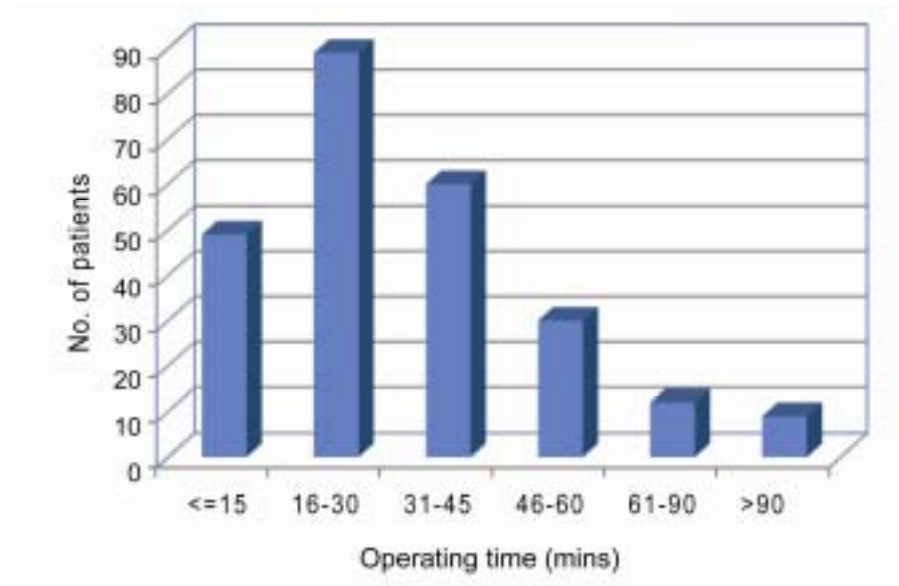
Endometrial ablation was performed at the same operation in 32 or 12.5% (3.9 in 2002 and 4.2% in 1997), endometrial resection in 13 or 5.1% (4.0% in 2002 and 19.1% in 1997) and resection of endometrial polyp in 25 or 9.8% (4.8% in 2002 and 0% in 1997) patients.

	1997	2002	2007
Endometrial ablation	2 (4.3%)	35 (13.9%)	32 (12.5%)
Endometrial resection	9 (19.1%)	10 (4.0%)	13 (5.1%)
Resection of endometrial polyp	0 (0.0%)	12 (4.8%)	25 (9.8%)
Total	47	251	256

Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 35.3 (SD 24.5) minutes, compared to 34.5 (SD 22.3) in 2002 and 45.4 (SD 26.2) in 1997. The procedure was completed within 30 minutes in 55.4% of cases (56.5% in 2002 and 43.5% in 1997) and exceeded 60 minutes in 8.4% (8.1% in 2002 and 17.3% in 1997).



Number of missing data: 7 (2.7%)

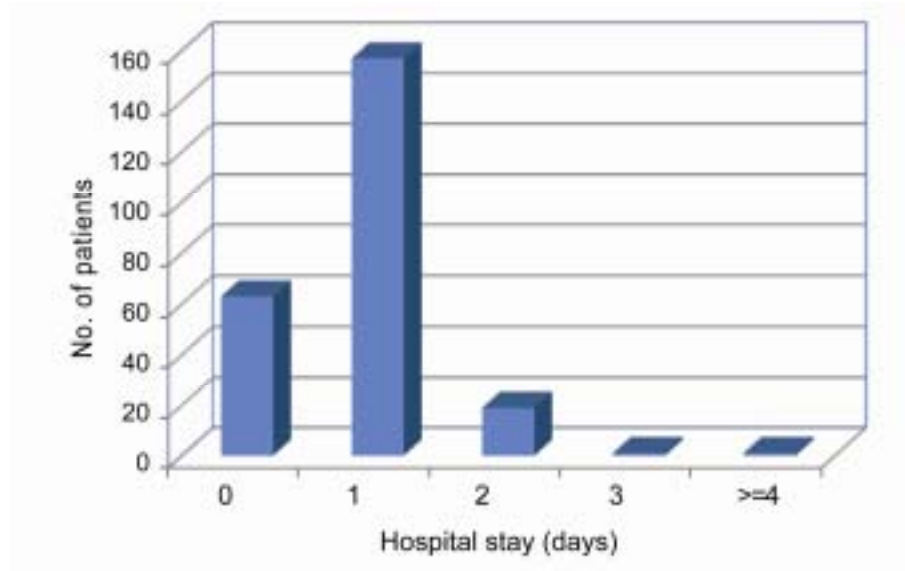
Distribution of operating time

	1997	2002	2007
≤ 15 minutes	4 (8.7%)	48 (20.7%)	49 (19.7%)
16 – 30 minutes	16 (34.8%)	68 (35.8%)	89 (35.7%)
31 – 45 minutes	9 (19.6%)	48 (20.7%)	60 (24.1%)
46 – 60 minutes	9 (19.6%)	34 (14.7%)	30 (12.0%)
61 – 90 minutes	6 (13.0%)	11 (4.7%)	12 (4.7%)
> 90 minutes	2 (4.3%)	8 (3.4%)	9 (3.6%)
Total	46	232	249

Number of missing data: 1 (2.1%) in 1997, 19 (7.6%) in 2002 and 7 (2.7%) in 2007 respectively

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.5) days, compared to 1.1 (SD 0.7) in 2002 and 1.6 (SD 0.9) in 1997. Majority of the patients were discharged within the first day (91.3% in 2007 versus 85.6% in 2002 and 59.6% in 1997) and only 1 (0.4% in 2007 versus 1.6% in 2002 and 4.8% in 1997) stayed 4 days or longer.



Number of missing data: 15 (5.9%)

Distribution of post-operative hospital stays

	1997	2002	2007
0 day	1 (2.4%)	29 (11.7%)	63 (26.1%)
1 day	24 (57.1%)	184 (73.9%)	157 (65.1%)
2 days	12 (28.6%)	26 (10.4%)	19 (7.9%)
3 days	3 (7.1%)	6 (2.4%)	1 (0.4%)
4 days	1 (2.4%)	3 (1.2%)	0 (0.0%)
5 days	1 (2.4%)	1 (0.4%)	1 (0.4%)
Total	42	249	241

Number of missing data: 5 (10.6%) in 1997, 2 (0.8%) in 2002 and 15 (5.9%) in 2007 respectively

COMPLICATIONS

Ten patients developed complications and the incidence was 3.9%, compared to 6.4% in 2002 and 12.8% in 1997. Cervical laceration was the most common complication and occurred in 1.2%, followed by haemorrhage. Excessive fluid absorption (>1.5L) occurred in only 1 patient and the incidence was 0.4%, which was 10 times lower than previous audits. Uterine perforation occurred in 1 and the surgery was failed in 1 due to failure to reach the fibroid stalk. One (0.5%) patient had an incomplete surgery due to severe distortion of uterine cavity and prolonged operation. The incidence of incomplete surgery was similar to 2002 but much reduced when compared to the 6.4% in 1997.

	1997	2002	2007
Cervical laceration	2 (4.3%)	4 (1.9%)	3 (1.2%)
Haemorrhage	0 (0.0%)	1 (0.5%)	2 (0.8%)
Fluid absorption > 1.5 L	2 (4.3%)	11 (4.4%)	1 (0.4%)
Perforation of uterus	0 (0.0%)	2 (1.0%)	1 (0.4%)
Failed surgery	0 (0.0%)	1 (0.5%)	1 (0.4%)
Incomplete surgery	3 (6.4%)	1 (0.5%)	1 (0.4%)
Total	6 (12.8%)	16 (6.4%)	10 (3.9%)

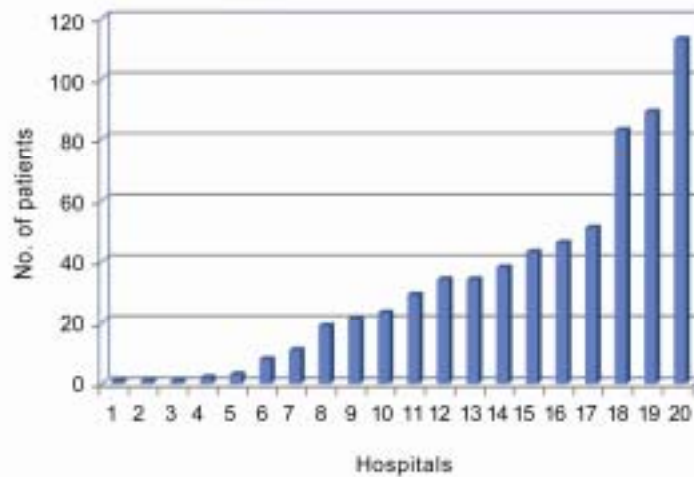
16 HYSTEROSCOPIC RESECTION OF ENDOMETRIAL POLYP

Total number of patients **650**

The number of hysteroscopic resection of endometrial polyps increased by 11.5 fold from 55 in 1997 to 635 in 2002 and remained at 650 in 2007.

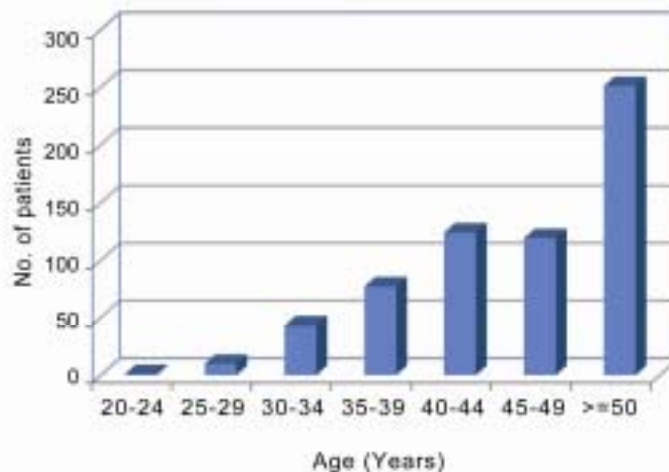
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

As in 2002, 20 units performed resection of endometrial polyps and the overall number in each unit was increasing. Eight units performed less than 20 cases a year and 1 units performed over 100 cases which accounted for 17.4% of the total number of cases.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 47.8 (SD 10.3) years, compared to 49.4 (SD 11.1) in 2002. The frequency of the procedure increased with increasing age. Thirty-eight (6.0%) patients were younger than 35 and 282 (44.4%) aged 50 or more. The corresponding figures in 2002 were 6.0% and 44.4% respectively.



Number of missing data: 25 (3.8%)

Distribution of age

	2002	2007
20 – 24 years	0 (0.0%)	1 (0.2%)
25 – 29 years	9 (1.4%)	10 (1.6%)
30 – 34 years	29 (4.6%)	43 (6.9%)
35 – 39 years	75 (11.8%)	77 (12.3%)
40 – 44 years	112 (17.6%)	124 (19.8%)
45 – 49 years	124 (19.5%)	119 (19.0%)
≥ 50 years	282 (44.4%)	251 (40.2%)
Total	631	625

Number of missing date: 4 (0.6%) in 2002 and 25 (3.8%) in 2007

OPERATIVE DIAGNOSES

Information was not available in 6 (0.9%) cases. Of the remaining 644 patients, 24 (3.7% versus 3.9% in 2002) had concurrent submucosal fibroid and 15 (2.3% versus 2.2% in 2002) had fibroid polyp. Eight patients had co-existing endocervical or cervical polyp.

	2002	2007
Submucosal fibroid	25 (4.1%)	24 (3.7%)
Fibroid polyp	14 (2.3%)	15 (2.3%)
Endocervical/Cervical polyp	14 (2.3%)	8 (1.2%)
Uterine septum	2 (0.3%)	3 (0.5%)
Uterine synechia	0 (0.0%)	2 (0.3%)
Total	606	644

Number of missing date: 29 (4.6%) in 2002 and 6 (0.9%) in 2007

Data are presented as number and percentage of total number of patients

QUALIFICATIONS OF SURGEON AND ASSISTANT

Most of the operations were performed by specialists (67.7% versus 56.5% in 2002) and MRCOG (14.7% versus 23.5% in 2002). The procedure was performed by pre-membership doctors in 17.6%, compared to 20.0% in 2002, of which only 8.1% were not assisted by doctors, compared to 51.6% in 2002.

Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	28	8	10	56	9	111
MRCOG	31	5	0	56	1	93
FHKAM	63	68	3	15	112	261
FRCOG	33	10	2	3	119	167
Total	155	91	15	130	241	632

Number of missing date: 18(2.8%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 53 (8.2% versus 2.7% in 2002) patients; 7 underwent concurrent endometrial ablation and 1 resection of fibroid. GnRH analogue was used in 48 (90.6% versus 66.7% in 2002) and progestogen in 5 (9.4% versus 13.3%). Danazol was not used in 2002, compared to 20% in 2004. Information was not available in 7 (1.1%) cases.

Cervical priming was carried out in 248 patients (38.4% versus 16.6%). Misoprostol was used in 240 (96.8% versus 83.0% in 2002), cervagem in 4 (1.6% versus 14.9%) and Lamigel in 4 (1.6% versus 0% in 2002). Information was not available in 5 (0.8%) cases. Prophylactic antibiotic was used in 124 (19.1% versus 8.5% in 2002) patients.

Anaesthetic methods

General anaesthesia was used in 481 (74.0% versus 57.1% in 2002), paracervical block in 1 (0.3% versus 6.8% in 2002), conscious sedation in 6 (0.9% versus 0% in 2002) and regional anaesthesia in 29 (4.5% versus 1.6% in 2002). The procedures were performed under no anaesthesia in 124 (19.3% versus 27.1% in 2002) patients. Information was not recorded in the remaining 8 (1.2% versus 6.5% in 2002) patients.

Surgical tools

Monopolar system was used in 266 (40.9%) and bipolar system in 23 (3.5%). No patients employed both systems during the procedure and information was not reported in 60 (9.2%) cases. In 2002, bipolar system was used in only 2.8%.

Cutting loop alone was used in 280 (43.1% versus 62.0% in 2002) and roller ball alone was used in 3 (0.5% versus 0.6% in 2002). Both devices were used in 25 (3.9% versus 4.1% in 2002%) cases. Hysteroscopic scissors in 118 (18.2% versus 21.0% in 2002). Information was not available in 1 (0.2%).

	2002	2007
Cutting loop	212 (62.0%)	280 (57.0%)
Rollerball	2 (0.6%)	3 (0.6%)
Loop & Ball	14 (4.1%)	25 (5.1%)
Scissors	72 (21.1%)	118 (24.0%)
Forceps	16 (4.7%)	52 (10.6%)
Curette	3 (0.9%)	10 (2.0%)
VersaPoint	18 (5.3%)	6 (1.2%)
Total	342	491

Number of missing data: 293 (46.1%) in 2002 and 159 (24.5%) in 2007

Distension fluid

Glycine was used in 353 (54.3% versus 40.5% in 2002) cases and was the most common distending medium used. Normal saline was in 245 (37.7% versus 50.6% in 2002) cases and CO₂ in 4 (0.6% versus 4.1% in 2002) patients. Information was not available in 44 (6.8% versus 4.9% in 2002) cases.

	2002	2007
Glycine 1.5%	214 (88.4%)	354 (58.4%)
Normal saline	27 (11.2%)	246 (40.6%)
Dextrose 5%	0 (0.0%)	2 (0.3%)
CO ₂	1 (0.4%)	74 (0.6%)
Dextran	0 (0.0%)	0 (0.0%)
Total	242	606

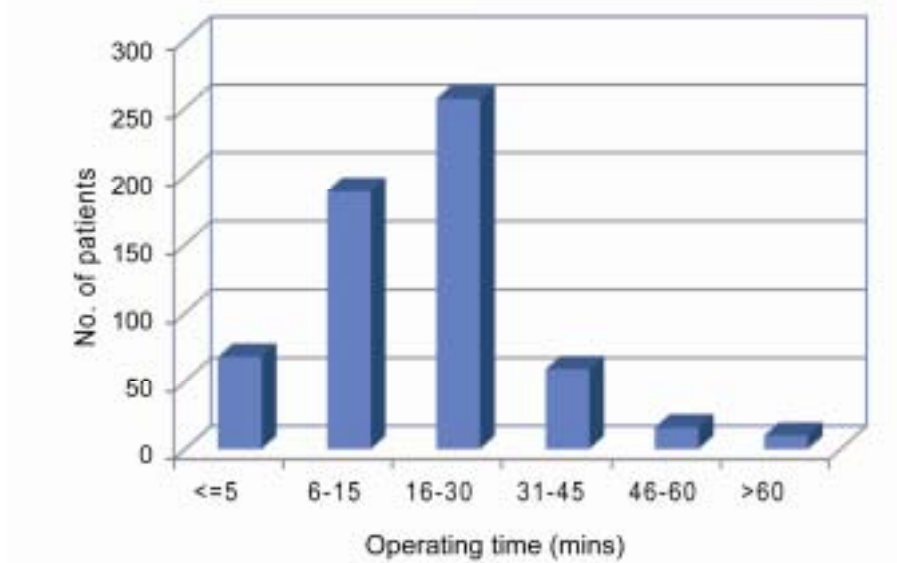
Number of missing data: 393 (61.9%) in 2002 and 44 (6.8%) in 2007

OPERATIVE PROCEDURES

Endometrial ablation was performed at the same operation in 22 (3.4% versus 2.2% in 2002), endometrial resection in 4 (0.6% versus 0.3% in 2002) and resection of fibroid in 25 (3.8% versus 1.9%) patients. Division of adhesion was performed in 2 (0.3%) and division of septum in 3 (0.5%)

OPERATING TIME

The mean operating time was 21.1 (SD 14.4) minutes, compared to 16.4 (SD 11.8) in 2002. The procedure was completed within 15 minutes in 42.9% (65.9% in 2002) of cases and exceeded 60 minutes in 1.7% (0.4% in 2002).



Number of missing data: 51 (7.8%)

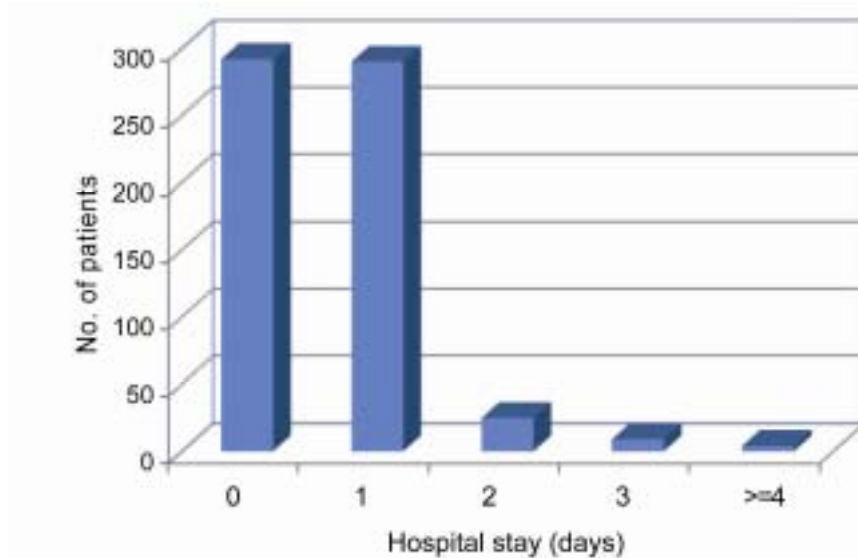
Distribution of operating time

	2002	2007
≤ 5minutes	59 (11.2%)	68 (11.4%)
6 – 15 minutes	287 (54.7%)	189 (31.6%)
16 – 30 minutes	138 (26.3%)	257 (42.9%)
31 – 45 minutes	30 (5.7%)	59 (9.8%)
46 – 60 minutes	9 (1.7%)	16 (2.7%)
> 60 minutes	2 (0.4%)	10 (1.7%)
Total	525	599

Number of missing data: 110 (11.3%) in 2002 and 51 (7.8%) in 2007

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.8) days, compared to 1.1 (SD 0.4) in 2002. Majority of the patients were discharged within the first day (93.9% versus 85.6% in 2002) and 4 (0.8% versus 1.6% in 2002) stayed 4 days or longer.



Number of missing data: 30 (4.6%)

Distribution of post-operative hospital stays

	2002	2007
0 day	301 (49.3%)	292 (47.1%)
1 day	277 (45.3%)	290 (46.8%)
2 days	23 (3.8%)	25 (4.0%)
3 days	6 (1.0%)	9 (1.5%)
≥ 4 days	4 (0.7%)	4 (0.8%)
Total	611	620

Number of missing data: 24 (3.8%) in 2002 and 30 (4.6%) in 2007

COMPLICATIONS

Nine patients developed complications and the incidence was 1.4%, compared with 1.3% in 2002. Three patients had incomplete surgery (0.5% versus 0.5% in 2002) and was the most common complications. The reasons for incomplete surgery were 1) failed to remove the polyp by scissors; 2) sessile polyp and 3) not stated. Two (0.3% versus 0% in 2002) patients had failed surgery because of patient coughing during procedure and failed to distend cavity respectively. Uterine perforation occurred in 1 (0.2% versus 0.5% in 2002) patients and cervical laceration occurred in 1 (0.2%).

	2002	2007
Incomplete surgery	2 (0.5%)	3 (0.5%)
Failed surgery	0 (0.0%)	2 (0.3%)
Cervical laceration	4 (0.6%)	1 (0.2%)
Perforation of uterus	3 (0.5%)	1 (0.2%)
Total	8 (1.3%)	9 (1.4%)

APPENDIX I

GUIDELINES FOR TRAINING IN GYNAECOLOGICAL ENDOSCOPIC SURGERY

Levels of Training in Laparoscopic Surgery

Level 1 Basic Procedures

The minimum requirement is the performance of 20 supervised diagnostic laparoscopies and/or tubal ligations under video-control before being allowed to operate unsupervised. This level of training is to establish techniques of laparoscopy with special emphasis on hand-eye coordination using TV monitor.

Level 2 Minor Procedures

The minimum requirement is the supervised performance of 20 of the following procedures before performing unsupervised surgery:

1. Salpingectomy for tubal pregnancy in the absence of haemodynamic instability
2. Simple adhesiolysis
3. Salpingectomy for hydrosalpinx with mild pelvic adhesions
4. Cautery of minor stage endometriosis (AFS Stage I-II disease)
5. Myolysis
6. Ovarian drilling
7. Aspiration / fenestration of cyst

Level 3 Intermediate Procedures

This level of procedures should be carried out with the assistance of an experienced laparoscopist until training is judged to be satisfactory. A minimum of 10 operative procedures should be performed before appropriate skills might be developed, although the exact number may vary between individuals. The following procedures are considered as appropriate for this level:

1. Oophorectomy or cystectomy for benign ovarian cysts of less than 8 cm
2. Laparoscopic management of moderate endometriosis (AFS Stage III disease)
3. Salpingostomy

4. Myomectomy for pedunculated fibroid

Level 4 Major Procedures

This level of laparoscopic surgery should be performed by surgeons who have achieved level 3 competence. At least 20 procedures should be performed under supervision before these surgeons are considered competent to operate unsupervised. The following procedures are considered as level 4:

1. Hysterectomy
2. Myomectomy for non-pedunculated fibroid greater than 3 cm.
3. Laparoscopic management of large benign ovarian tumours (>8cm.)
4. Laparoscopic management of severe endometriosis (AFS Stage IV disease)
5. Adhesiolysis for severe pelvic adhesions, enterolysis and ureteric dissection
6. Laparoscopic management of pelvic abscess
7. Retropubic bladder neck suspension
8. Uterosacral nerve ablation

Level 5 Advanced Procedures

This advanced level of laparoscopic surgery should only be performed by experienced laparoscopists who are well recognized for their expertise. The following procedures are considered as level 5:

1. Lymphadenectomy
2. Radical hysterectomy for malignant conditions
3. Pelvic floor support other than colposuspension
4. Presacral neurectomy

Levels of Training in Hysteroscopic Surgery

Level 1 Basic Procedures

The minimum requirement is supervised performance of 20 diagnostic hysteroscopies before being allowed to operate unsupervised.

Level 2 Minor Procedures

The minimum requirement is supervised performance of 10 minor operative procedures before operating unsupervised. The following procedures are considered as level 2:

1. Hysteroscopic polypectomy
2. Proximal fallopian tube cannulation
3. Division of mild synechiae

Level 3 Major Procedures

This level of surgery should be performed by surgeons experienced in hysteroscopic surgery. The following procedures are considered as level 3:

1. Endometrial ablation/resection
2. Division of uterine septum
3. Resection of submucosal fibroid
4. Division of significant synechiae

**Revised 1998
Endoscopic Surgery Subcommitte**

APPENDIX IIA

HKCOG Laparoscopic Surgery Data Form 2007

Hospital _____

Qualification (*circle the highest level only*) _____

Patient's Particulars								
Initial only (Surname first)								
Name : _____								
Age: _____	HKID: (<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> </tr> </table>)							
at least 4 digit								

Surgeon: MBBS / MRCOG / FHKAM(O&G) / FRCOG HKCOG Accreditation: Nil / Intermediate / Advanced
1st Assistant: Doctor: MBBS/ MRCOG/ FHKAM(O&G)/ FRCOG HKCOG Accreditation: Nil / Intermediate / Advanced Nurse _____

Date of operation: ____ (DD) ____ (MM) ____ (YY)**Date of discharge:** ____ (DD) ____ (MM) ____ (YY)**Emergency operation:** No / Yes**Type of procedure:** Diagnostic / Tubal occlusion / Operative [HKCOG Level (*select highest*): 2 / 3 / 4 / 5]**Operative Diagnosis** (*Pathology related to surgery only, co-existing diagnoses should not be listed*)

	(R) Size (cm)			(L) Size (cm)			Ruptured (R)	Ruptured (L)
Benign ovarian tumour	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Endometriotic cyst	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Dermoid cyst	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Paraovarian cyst	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Borderline cystadenoma	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Fimbrial cyst	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Hydrosalpinx	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Pyosalpinx	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Tubo-ovarian abscess	0-4	5-8	> 8	0-4	5-8	> 8	No / Yes	No / Yes
Pelvic endometriosis:	minimal / mild / moderate / severe (<i>excluding ovarian endometrioma</i>)							
Pelvic adhesions:	minimal / mild / moderate / severe (<i>should only be coded if this is a primary or sole procedure</i>)							

Ectopic pregnancy: Side: L / R / Not applicable	Size: _____ (cm)		Ruptured: No / Yes		Haemoperitoneum: _____ ml			
Site: Fimbrial / Ampullary / Isthmus / Interstitial / Cornual / Tubal (if whole tube involved) / Ovarian / Abdominal / Cervical								
Haemodynamic instability: No / Yes Contra-lateral tube: Normal/ Abnormal / Absent Attempted salpingostomy: No / Yes								

Fibroid: Uterine size: Normal/ ≤ 8 weeks/ 10-12 weeks/ 14-16 weeks/ > 16 weeks	Number: _____		Largest size: 0-3/ 4-6/ > 6 cm					
Types: Pedunculated / Subserosal / Intramural / Submucosal (<i>select the deepest type within the uterus</i>)								

Adenomyosis: Uterine size: Normal/ ≤ 8 weeks / 10-12 weeks / 14-16 weeks / > 16 weeks								
DUB	PMB	CIN	Endometrial polyps	Endometrial hyperplasia				
Ca corpus	Ca ovary	Ca Cervix	Micro-invasive Ca Cervix	Genuine stress incontinence				
Uterine prolapse	Cystocele	Enterocoele	Rectocele	Vault prolapse				
Normal pelvis	PCOD	Failed sterilisation	Ovarian entrapment	Bleeding ovarian cyst				
Condition leading to tubal occlusion	Others _____							

Frozen Section sent : No / Yes

Dx: _____

Operative Procedure

Cystectomy	R / L / B	Tubal occlusion: Clips / Ring / Electrocautery / Partial salpingectomy	Diagnostic
Oophorectomy	R / L / B	Ablation of pelvic endometriosis	Staging laparoscopy
Salpingo-oophorectomy	R / L / B	Resection of pelvic endometriosis	Second look laparoscopy
Salpingectomy	R / L / B	Adhesiolysis	Pelvic lymphadenectomy
Salpingostomy	R / L / B	Colposuspension	Para-aortic lymphadenectomy
Myomectomy		Sacro-colpexy	Radical hysterectomy
Hysterectomy: LAVH/LH/TLH / LASH		Hysteropexy	
		Others _____	

Operative details

Primary entry: Open/ Close/ Direct entry / Visual-guided
Site: Umbilical / Supraumbilical / LUQ
Total no. of ports (incl primary port): _____
Monopolar Bipolar
Suture Endoloop
Laser Ultrasonic incision
Ligasure Plasma-kinetic
Clip / stapler Drain
Intra-operative blood loss _____ ml
Surgery time _____ min. (skin to skin)

Complications

Injury to epigastric vessel	Ileus
Injury to other major vessel	Pelvic/Vault haematoma
Haemorrhage requiring transfusion [#]	Incisional hernia
Significant emphysema	Gas embolism
Bladder injury	Deep vein thrombosis
Ureter injury	Re-admission [Ⓛ]
Bowel injury	Reason: _____
Febrile morbidity*	Conversion to Laparotomy [Ⓜ]
UTI	Reason: _____
Retention of urine	Subsequent Laparotomy
Wound infection	Reason: _____
	Death _____
	Others _____

Ⓛ-Ⓛ Please refer to appendix on the back of the page

Haemorrhage due to operation

* Fever > 38 °C on 2 occasion 4 hours apart excluding 1st 24 hrs

HKCOG Laparoscopic Surgery Data Form 2007

- For unplanned readmission due to complication resulting from laparoscopic surgery done after January 2007
 - Just fill in complication column and patient's particulars
 - If the patient requires laparoscopic operation, please fill in a new audit form for that operation

Classification of hysterectomy (adopted by the Cochrane Database)

- **LAVH** (Laparoscopic-assisted vaginal hysterectomy)
 - a combined laparoscopic and vaginal approach with division of uterine artery performed vaginally
- **LH** (Laparoscopic hysterectomy)
 - a combined laparoscopic and vaginal approach with laparoscopic division of the uterine artery; the remainder of the procedure is completed vaginally
- **TLH** (Total laparoscopic hysterectomy)
 - entire operation is performed laparoscopically, including suturing of the vaginal vault
- **LASH** (Laparoscopic-assisted subtotal hysterectomy)
 - laparoscopic removal of the uterine body with preservation of the cervix

Appendix

- | 1. Reason for Readmission | 2) Reason for Conversion | |
|--------------------------------|--------------------------------------|--------------------------|
| a) Bowel obstruction | a) Bladder injury | g) Poor pelvic access |
| b) Intraperitoneal bleeding | b) Bowel injury | h) Poor vaginal access |
| c) Repair of fistula/injury | c) Dense pelvic adhesion | i) Uncontrolled bleeding |
| d) Repair of incisional hernia | d) Fail to maintain pneumoperitoneum | j) Unexpected malignancy |
| e) Pelvic sepsis | e) Failure in specimen removal | k) Ureteric injury |
| f) Vault haemorrhage | f) Instrument failure | |
| g) Unexpected malignancy | | |
| h) Other unrelated problems | | |

HKCOG Levels of Training in Laparoscopic Surgery

Level 1 Basic Procedures

1. Diagnostic laparoscopy
2. Laparoscopic tubal occlusion

Level 2 Minor Procedures

1. Salpingectomy for tubal pregnancy
2. Simple adhesiolysis
3. Salpingectomy for hydrosalpinx with mild pelvic adhesions
4. Ablation of minor stage endometriosis (AFS Stage I-II)
5. Myolysis
6. Ovarian drilling
7. Aspiration / fenestration of cyst

Level 3 Intermediate Procedures

1. Oophorectomy or cystectomy for benign ovarian cysts of 8 cm or less
2. Resection of moderate endometriosis (AFS Stage III)
3. Salpingostomy / Salpingotomy
4. Myomectomy for pedunculated fibroid or non-pedunculated fibroid of 3 cm or less
5. Hysterectomy for prolapse

Level 4 Major Procedures

1. Hysterectomy
2. Myomectomy for non-pedunculated fibroid greater than 3 cm

3. Excision of ovarian tumours greater than >8cm
4. Resection of severe endometriosis (AFS Stage IV)
5. Adhesiolysis for severe pelvic adhesions, enterolysis and ureteric dissection
6. Management of pelvic abscess
7. Retropubic bladder neck suspension

Level 5 Advanced Procedures

1. Lymphadenectomy
2. Radical hysterectomy for malignant conditions
3. Pelvic floor support other than colposuspension
4. Presacral neurectomy

APPENDIX IIB
HKCOG Hysteroscopic Surgery Data Form 2007

Hospital

Qualification

Patient's Particulars									
Initial only (Surname first)									
Name: _____									
Age: _____	HKID: (<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>)								
at least 4 digit									

Surgeon: MBBS / MRCOG / FHKAM (O&G) / FRCOG	
Others _____	
1st Assistants : Doctor - MBBS/MRCOG/FHKAM(O&G)	
Nurse	

Date of operation: ____ (DD) ____ (MM) ____ (YY) **Date of discharge:** ____ (DD) ____ (MM) ____ (YY)

Endometrial Preparation: **Agent:** None / Progestogen / Danazol / GnRHa
Dose /Duration _____

Cervical priming: Agent: None / Cervagem / Misoprostol / Others _____

Prophylactic antibiotics: No / Yes

Anaesthetics: None / Paracervical block / Conscious Sedation / GA / Regional / Others: _____

Operative Finding (please record the number and largest diameter where appropriate)

Uterine size ____ week	Cavity length ____ cm	Normal cavity
Submucosal fibroid	n= ____ largest ____ cm	Intracavity proportion ____ %
Endometrial polyp	n= ____ largest ____ cm	Fibroid polyp ____ cm
Uterine septum	partial / full	Uterine synechiae* mild / moderate / severe
Others _____		(*refer to appendix)

Procedure **HKCOG Level:** 2 / 3 (please select and refer to appendix for classification)

Endometrial ablation	Device system	Monopolar	Bipolar
Endometrial resection	Device type		
Resection of fibroid	Roller Ball/Bar	Scissors	Laser
Resection of fibroid polyp	Cutting loop	Thermal Balloon	Novasure
Resection of endometrial polyp	Others _____		
Division of adhesion	Distension medium: Glycine / NS / CO ₂ / Others _____		
Division of septum	Fluid monitoring: Yes / No	Fluid in : _____ ml	
Proximal tubal cannulation		Fluid out: _____ ml	
Others _____	Procedure time: _____ min		

Hysteroscopic Complication

1. Cervical laceration No /Yes
2. Perforation of uterus No /Yes
3. Injury of adjacent organs (specify _____) No /Yes
4. Fluid overload (> 1.5L and/or hyponatraemia) No /Yes
5. Haemorrhage requiring management No /Yes
- specify _____
6. Failed surgery No /Yes
- reason _____
7. Incomplete surgery No /Yes
- reason _____
8. Further surgery No /Yes
- specify _____
9. Unintended readmission (within 28 days) No /Yes
- reason _____
10. Others _____

Items for Failed/Incomplete Surgery

- a. Failed to distend the cavity
- b. Failed to enter the cavity
- c. False tract
- d. Heavy bleeding
- e. Impending uterine perforation
- f. Instrument failure
- g. Prolonged operation
- h. Severe distortion of the cavity
- i. Significant fluid deficit
- j. Unexpected malignancy

Appendix

Hysteroscopic Classification of Intrauterine Adhesions (March 1978)

Mild:	<1/4 of uterine cavity involved; Filmy adhesions; Ostial areas and upper fundus minimally involved or clear
Moderate:	1/4 - 3/4 of uterine cavity involved; Walls not agglutinated – adhesions only; Ostial areas and upper fundus partially occluded
Severe:	>3/4 of uterine cavity involved; Agglutination of walls and thick bands; Ostial areas and upper cavity occluded

Levels of Training in Hysteroscopic Surgery

Level 1 Basic Procedures

1. Diagnostic hysteroscopy

Level 2 Minor Procedures

1. Hysteroscopic resection of polyp
2. Proximal fallopian tube cannulation
3. Division of mild synechiae
4. Endometrial ablation with second generation ablation tools

Level 3 Major Procedures

1. Hysteroscopic endometrial ablation/resection
2. Division of uterine septum
3. Resection of submucosal fibroid
4. Division of significant synechiae

