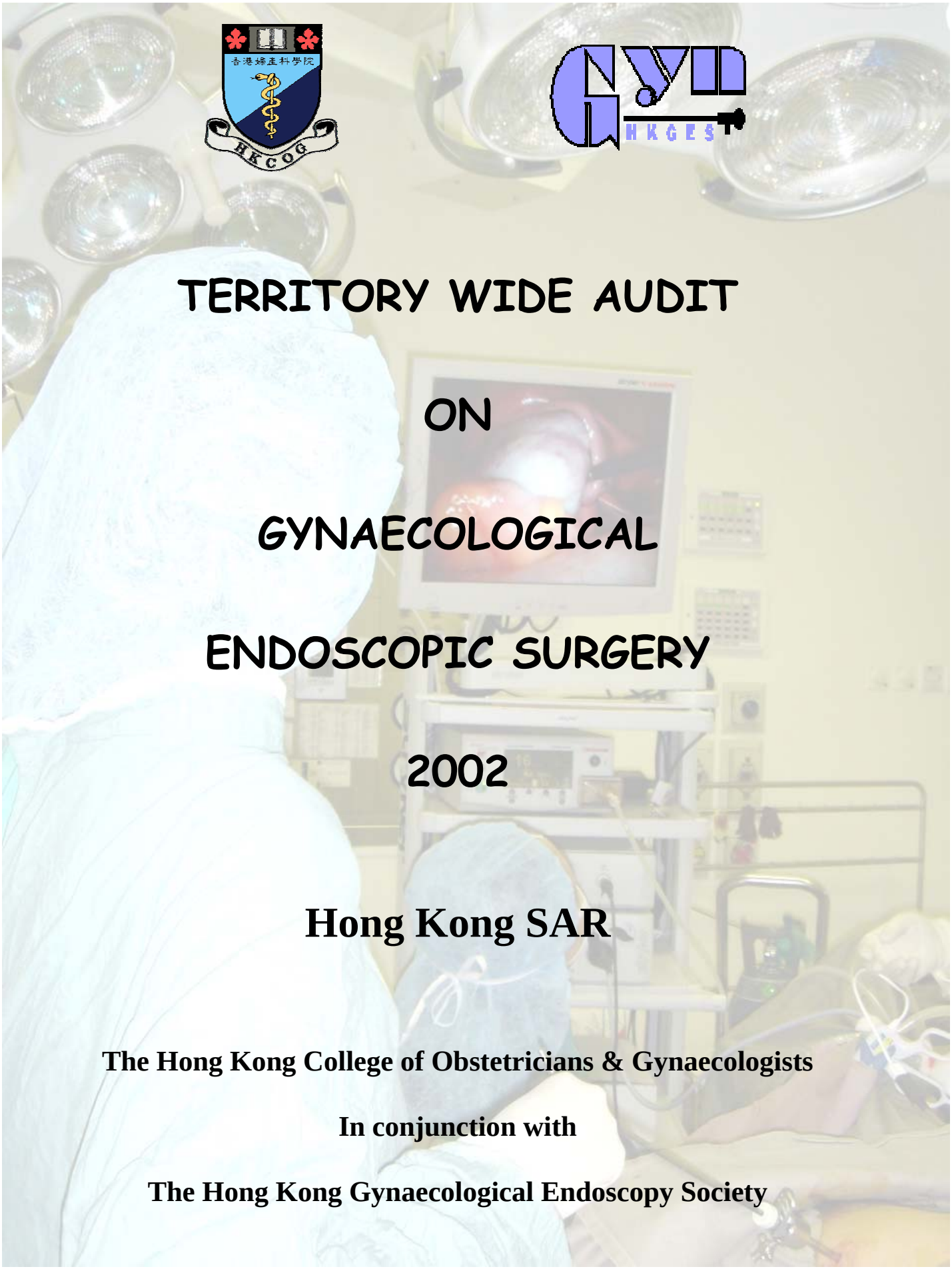


TERRITORY WIDE AUDIT

ON

GYNAECOLOGICAL

ENDOSCOPIC SURGERY

2002

Hong Kong SAR

The Hong Kong College of Obstetricians & Gynaecologists

In conjunction with

The Hong Kong Gynaecological Endoscopy Society

MESSAGE FROM THE HONG KONG COLLEGE OF OBSTETRICIANS AND GYNAECOLOGICSTS

We are delighted to write this forward on the Hong Kong College of Obstetricians and Gynaecologists territory wide audit on gynaecological endoscopic surgery. Audits are a vital part of quality assurance and our college has a distinguished record in this area. The willing participation of so many hospitals and individuals in this endeavour is most commendable and is a singular feature of our college.

As we take stock of what we have done, it is important to consider where this audit can inform us as to where we can improve. Quality assurance is a never ending process. This audit is the result of a great deal of hard work and dedication. Dr Yuen and his team are to be congratulated on this achievement.

Lawrence Tang
President
HKCOG

Tony Chung
Chairman
Quality Assurance Committee

August 2004

MESSAGE FROM THE HONG KONG GYNAECOLOGICAL ENDOSCOPY SOCIETY

It gives my greatest pleasure to introduce this second report on the Territory-Wide Audit on Gynaecological Endoscopic Surgery. As different from the first exercise, this is a comprehensive audit on both the diagnostic and operative gynaecological endoscopy performed in Hong Kong. I must take this opportunity to thank all the participating hospitals and the coordinators for their hard work and dedication in making this audit exercise successful. I must also thank the members of the Working Group for their valuable comments and suggestions in the whole exercise and in finalising this report. Lastly, I would like to express my sincere thank to the Hong Kong College of Obstetricians and Gynaecologists for the enormous effort and support in conducting clinical audits and quality assurance programs, not only in gynaecological endoscopy but also in many other important clinical areas.

PM Yuen
President
HKGES

August 2004

AN OVERVIEW OF THE REPORT

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 gynaecoloigcal 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. A total of 2200 laparoscopic surgeries and 199 hysteroscopic surgeries were audited. This represented about 80% of the laparoscopic and 60% the hysteroscopic surgery performed in the territory in 1997.

Five years after the first audit, the College repeated the same audit with some modification in conjunction with the Hong Kong Gynaecological Endoscopy Society (HKGES). This 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. In addition to that, as initiated by the HKGES, a comprehensive audit on laparoscopic hysterectomy was carried out at the same time. A web-based database program was developed to allow online data entry, anywhere and anytime, and continuous audit in endoscopic surgery is now possible. In the current exercise, 22 hospitals provided data on laparoscopy and hysteroscopy, and the data covered about 85% of all laparoscopies and 98% of all hysteroscoies performed in the territory in 2002. Compared to 1997, the number of operative laparoscopies performed in the whole of Hong Kong doubled while that of operative hysteroscopies increased by 5 folds.

Laparoscopic Surgery

Compared to 1997, the total number of laparoscopic procedures audited increased from 2200 to 6065. The significant increase was not just because of the inclusion of Level 1 procedures (diagnostic and sterilization procedures) in this exercise, but related to the general increase in the performance of laparoscopic surgery in the territory. Over these 5 years period, the total number of operative laparoscopies performed in the whole of Hong Kong has doubled.

The total number of Level 1 procedures was 1634, accounting for about 28% of all the laparoscopies performed in 2002; about 30% were diagnostic procedures and 70% were for tubal sterilization/occlusion. The operation was mainly performed by doctors with MBBS (37.2%) and MRCOG (28.7%); about half were assisted by specialists. About 70% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 28% were assisted by nurses. The application of rings was the most commonly used method for laparoscopic sterilization, accounting for 66% of cases and clips were used in 34%.

Similar to 1997, operative laparoscopy was mainly performed for the removal of adnexal mass (about 50%), followed by removal of ectopic pregnancy (14.5%), removal of uterus 11.8% and enucleation of fibroid (4.6%). Level 5 procedures were still uncommonly performed. Overall, 60% of the procedures were performed by specialists, 25% by doctors with MRCOG and 15% by pre-MRCOG doctors. Over

50% of the surgeons were not accredited by the College, 27% were accredited with intermediate level and 20% advanced level.

There was a significant change in the practice of primary trocar entry. There was a significant increase in the use of the open technique and the incidence increased from 0.4% to 30%. The use of closed method reduced from 85% to 65% and that of visual-guided trocar reduced from 15% to 5%. Electrosurgery remained the most commonly used energy source.

Conversion was required in 2.0% of all laparoscopies and 1.8% of operative laparoscopies, compared to 5.7% in 1997. Surgical difficulty remained the main reason for conversion, of which dense adhesions accounted for over 70% of the cases. The overall complication rate of all laparoscopies was 2.7% with major complication occurred in 0.7% and minor complication in 2.0%. For operative laparoscopies, the complication rate was 5%, compared to 8% in 1997. Laparoscopic hysterectomy was associated with the highest complication rate of 12.6%, compared with other procedures.

Hysteroscopic Surgery

Compared to 1997, the total number of hysteroscopic procedures audited increased from 199 to 8652. Although about 85% of the cases were diagnostic procedure, there was a 5 fold increase in the total number of operative hysteroscopies performed in the whole of Hong Kong since 1997.

For diagnostic hysteroscopy, three quarters of the procedures were performed as day procedure and about 60% were performed under no anaesthesia or analgesia. Cervical priming was not used in 95% of cases. Normal saline was the distending medium used in 60% and carbon dioxide in 40%. The procedure was performed by specialists in 45%, doctors with MRCOG in 32% and pre-MRCOG doctors in 23%. Failure rate was 1% and the overall complication rate was 1.3%.

For operative hysteroscopy, resection of polyp accounted for 60% of the procedures, compared to 40% in 1997. Although the incidence of resection of fibroid remained unchanged (24%), that of endometrial ablation/resection reduced from 41.2% to 18.3%. Glycine was the distending medium used in about 60%, compared to 90% in 1997. This was because of the increased use of normal saline in up to 36% (7% in 1997), probably related to the introduction of the bipolar operating system. Endometrial preparation was carried out in 21% of all operative hysteroscopies and 45% of those undergoing endometrial ablation/resection. Cervical priming was also not routinely practiced and carried out in only 10%. About 65% of the procedures were performed specialists, 20% by doctors with MRCOG and 20% by pre-MRCOG doctors. The overall complication rate was 2.8% which was significantly lower than the 8.5% in 1997. Excessive fluid absorption (> 1.5 L) was the most common complication and occurred in 1.1% (3.0% in 1997). Resection of fibroid was associated with the highest complication rate of 6.4% compared with other procedures.

GYNAECOLOGICAL ENDOSCOPIC SURGERY SUBCOMMITTEE

This subcommittee comes under the Quality Assurance Committee of the College. Besides the production of this report, the subcommittee has also made recommendation to the College on the guidelines for training of gynaecological endoscopic surgery, and, certificate of accreditation in gynaecological laparoscopic surgery.

Members of Gynaecological Endoscopic Surgery Subcommittee 2002

Dr. CHAN, WT Joseph (Chairman)
Dr. CHIN, KH Robert
Dr. HO, Lau Cheung
Dr. LI, FH Dominic
Dr. LO, SF Leslie
Dr. PANG, Chung Pui
Dr. PUN, Ting Chung
Dr. SIU, KS Catherine
Dr. SO, WK William
Dr. YUEN, Pong Mo

Working Group on Territory wide Gynaecological Endoscopic Surgery Audit 2002

Dr. YUEN, Pong Mo (Chairman)
Dr. CHAN, WT Joseph
Dr. LO, SF Leslie
Dr. PUN, Ting Chung
Dr. PANG, Chung Pui

HOSPITAL COORDINATORS

Hospital	Coordinator
Alice Ho Miu Ling Nethersole Hospital	Dr. NG, Pui Shan
Canossa Hospital	Dr. LEE, Eric
Caritas Medical Centre	Dr. MO, Siu Chee
Evangel Hospital	Dr. LIU, Yuk Kuen
Hong Kong Adventist Hospital	Dr. TSAI, Albert
Hong Kong Central Hospital	Dr. LEE, Eric
Hong Kong Baptist Hospital	Dr. SUM, Tak Keung
Hong Kong Sanatorium & Hospital Ltd	Dr. CHAN, Joseph
Kwong Wah Hospital	Dr. WONG, Kin Sun
Maltida Hospital	Sister LEE, Bernie
North District Hospital	Dr. NG, Pui Shan
Our Lady of Maryknoll Hospital	Dr. WONG, Kin Sun
Pamela Youde Nethersole Eastern Hospital	Dr. WONG, Wilfred
Prince of Wales Hospital	Dr. NG, Pui Shan
Princess Margaret Hospital	Dr. MO, Siu Chee
Queen Elizabeth Hospital	Dr. CHAN, Chung Sum
Queen Mary Hospital	Dr. LAU, Chung Ting
St Paul's Hospital	Dr. CHUNG, Ka Leung
St Teresa's Hospital	Dr. WONG, Shu Pong
Tsuen Wan Adventist Hospital	Dr. SO, Kon Ping
Tuen Mun Hospital	Dr. PANG, Chung Pui
Union Hospital	Dr. YU, Kai Man
United Christian Hospital	Dr. MOK, Chung Wai

PARTICIPATING HOSPITALS IN LAPAROSCOPIC SURGERY AUDIT

Participating hospitals	Number of returns (%)	
Alice Ho Miu Ling Nethersole Hospital	690	(11.38%)
Canossa Hospital	120	(1.98%)
Caritas Medical Centre	66	(1.09%)
Evangel Hospital	1	(0.02%)
Hong Kong Adventist Hospital	29	(0.48%)
Hong Kong Baptist Hospital	229	(3.78%)
Hong Kong Sanatorium & Hospital Ltd	279	(4.60%)
Kwong Wah Hospital	330	(5.44%)
Maltida International Hospital	11	(0.18%)
North District Hospital	1	(0.02%)
Pamela Youde Nethersole Eastern Hospital	476	(7.85%)
Prince of Wales Hospital	518	(8.54%)
Princess Margaret Hospital	447	(7.37%)
Queen Elizabeth Hospital	448	(7.39%)
Queen Mary Hospital	427	(7.04%)
St Paul's Hospital	326	(5.38%)
St Teresa's Hospital	171	(2.82%)
Tseung Kwan O	87	(1.43%)
Tsuen Wan Adventist Hospital	53	(0.87%)
Tuen Mun Hospital	714	(11.77%)
Union Hospital	201	(3.31%)
United Christian Hospital	435	(7.17%)
Unknown	6	(0.10%)
Total	**6065**	

PARTICIPATING HOSPITALS IN HYSTEROSCOPIC SURGERY AUDIT

Participating hospitals	Number of returns (%)	
Alice Ho Miu Ling Nethersole Hospital	1290	(14.91%)
Canossa Hospital	30	(0.35%)
Caritas Medical Centre	367	(4.24%)
Hong Kong Adventist Hospital	17	(0.20%)
Hong Kong Baptist Hospital	104	(1.20%)
Hong Kong Central Hospital	1	(0.01%)
Hong Kong Sanatorium & Hospital Ltd	100	(1.16%)
Kwong Wah Hospital	603	(6.97%)
Maltida International Hospital	6	(0.07%)
Pamela Youde Nethersole Eastern Hospital	389	(4.50%)
Prince of Wales Hospital	768	(8.88%)
Princess Margaret Hospital	768	(8.88%)
Queen Elizabeth Hospital	1268	(14.66%)
Queen Mary Hospital	356	(4.11%)
St Paul's Hospital	104	(1.20%)
St Teresa's Hospital	168	(1.94%)
Tsuen Wan Adventist Hospital	78	(0.90%)
Tseung Kwan O Hospital	198	(2.29%)
Tuen Mun Hospital	994	(11.49%)
Union Hospital	85	(0.98%)
United Christian Hospital	939	(10.85%)
Unknown	19	(0.22%)
Total	**8652**	

Contents

Laparoscopic Surgery Audit

2002

1 LAPAROSCOPIC SURGERY - OVERALL DATA

BACKGROUND INFORMATION ON LAPAROSCOPIC SURGERY DATA

A total of 24 hospitals agreed to participate in the audit exercise, 22 returned audit forms and 21 provided their total number of patients who had undergone laparoscopic surgery in year 2002.

In this exercise, all levels of laparoscopic procedures were included. The total number of cases audited were 6,065; of which 1,634 (26.9%) were Level 1 procedures, 4,174 (68.8%) were operative procedures and 257 (4.2%) were of unknown nature. Of all the operative laparoscopies, 779 or 18.7% (17.1% in 1997) were Level 2, 2399 or 57.5% (63.5% in 1997) were level 3, 982 or 23.5% (19.1% in 1997) were Level 4 and 14 or 0.3% (0.3% in 1997) were level 5 procedures.

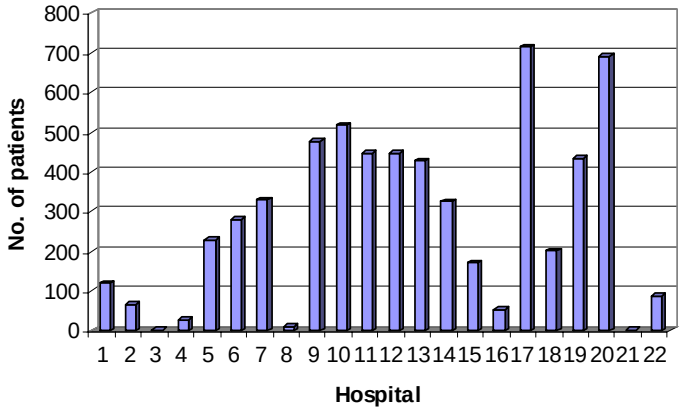
Compared to 1997 audit which did not include Level 1 procedures, there was a 1.9 fold increase in the total number of operative laparoscopy (from 2,200 to 4,174). Excluding the audited case from the 3 hospitals which had not provided their annual data, this exercise audited 84.6% of all the cases undergoing laparoscopic surgery in 2002. The percentage was similar to that in 1997.

Number of patients undergone laparoscopic surgery*	6,514
Number of cases audited	6,065
Percentage of cases audited	93.1%
Number of cases audited excluding those hospitals without annual return	5,510
Adjusted percentage of cases audited	84.6%

** Data obtained from individual hospitals after completion of the data collection*

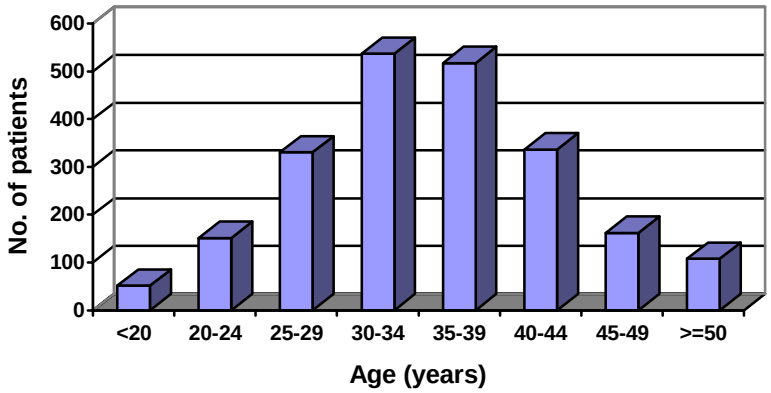
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Most of the units performed more than 100 cases a year and 2 hospitals performed about 700 cases a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 36.3 (SD 8.6), compared to 35.4 (SD 9.1) in 1997. The age distribution was similar to that in 1997. Half of the patients aged between 30 and 39, 5% were 50 or older and less than 2% were below 20.



Number of missing data: 150 (2.5%)

Distribution of age

	1997	2002
< 20 years	51 (2.3%)	81 (1.4%)
20 – 24 years	151 (6.9%)	307 (5.2%)
25 – 29 years	330 (15.1%)	709 (12.0%)
30 – 34 years	537 (24.5%)	1456 (24.6%)
35 – 39 years	517 (23.6%)	1578 (26.7%)
40 – 44 years	336 (15.3%)	987 (16.7%)
45 – 49 years	162 (7.4%)	464 (7.8%)
≥ 50 years	108 (4.9%)	333 (5.6%)
Total	**2192**	**5915**

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

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	1612 (73.3%)	3894 (74.5%)
Laparotomy	468 (21.3%)	960 (18.4%)
Operative laparoscopy	101 (4.6%)	370 (6.1%)
Both	19 (0.9%)	-
Total	**2200**	**5224**

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to 1997, about 60% of the operations were performed by specialists. The operations were performed by doctors with MRCOG in 25% (30% in 1997). Pre-MRCOG doctors performed 17% (5% in 1997) of the procedures, of which 70% were assisted by specialists. The large increase was mainly due to the inclusion of Level 1 procedures in this exercise. The operation was assisted by specialists in 48.8% (33.6% in 1997) and by nurses in 21.4% (22.2% in 1997) of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	60	150	664	66	**940**
MRCOG	212	45	986	122	**1365**
FHKAM	658	288	790	323	**2059**
FRCOG	85	119	201	646	**1050**
Total	**1018**	**602**	**2641**	**1156**	**5414**

Number of missing data: 651 (10.7%)

About 53% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 18.5% were assisted by doctors without accreditation and 25.0% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in 26.6%, almost half of which were assisted by doctors without accreditation. For those procedures performed by doctors with advanced accreditation, 27.4% were assisted by doctors without accreditation and 40.0% by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	440	770	570	592	**2372**
Intermediate	583	284	289	70	**1226**
Advanced	244	140	149	356	**889**
Total	**1267**	**1194**	**1008**	**1018**	**4487**

Number of missing data: 1578 (26.0%)

LEVEL OF PROCEDURES

The level of procedures was defined according to the Guidelines on Laparoscopic Surgery of the HKCOG (see Appendix I). About 28% of all the procedures were level 1. Comparing the distribution of all operative laparoscopies to that in 1997, the proportion of level 2 procedures remained around 18%, while that of level 3 procedures decreased from 63.5% to 57.5% and level 4 procedures increased from 19.1% to 23.5%. Level 5 procedures were still uncommonly performed and accounted for 0.3% only.

	1997	**2002**
Level 1	-	1634
Level 2	374	779
Level 3	1385	2399
Level 4	417	982
Level 5	6	14
Total	**2182**	**5808**

Number of missing data: 18 (0.8%) in 1997 and 257(4.2%) in 2002

Distribution of level of procedures in each hospital

Hospital	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Total**
1	1	4	58	52	0	115
2	11	10	32	7	0	60
3	0	0	1	0	0	1
4	1	5	18	4	0	28
5	24	15	146	38	0	223
6	40	14	147	62	0	263
7	123	53	136	12	0	324
8	2	0	8	1	0	11
9	84	51	182	144	1	462
10	130	155	155	53	0	493
11	217	44	131	29	1	422
12	144	68	175	40	0	427
13	108	57	168	74	0	407
14	4	10	161	131	0	306
15	15	16	105	22	0	158
16	6	16	26	1	0	49
17	391	79	173	49	12	704
18	37	7	101	42	0	187
19	118	59	155	80	0	412
20	161	90	272	141	0	664
21	0	0	1	0	0	1
22	15	24	46	0	0	85
Total	**1632**	**777**	**2397**	**982**	**14**	**5802**

Number of missing data: 263 (4.3%)

TYPE OF PROCEDURES

For operative procedures, laparoscopic surgery was most commonly performed for removal of adnexal mass which accounted for over 50% of the cases. Laparoscopic management of ectopic pregnancy accounted for 14.5% (18.5% in 1997) and laparoscopic hysterectomy was performed in 11.1% (9.5% in 1997).

	Operative procedures	
	1997	**2002**
Surgery for ectopic pregnancy	406	643
Surgery for adnexal mass	1193	2485
Hysterectomy	209	492
Myomectomy	86	193
Total	**2225**	**4408**

Distribution of type of procedure in each hospital

Hospital	Ectopic pregnancy	Adnexal Mass	Hysterectomy	Myomectomy
1	3	65	30	18
2	9	31	0	0
3	0	0	0	1
4	0	21	0	1
5	9	148	21	14
6	16	168	22	17
7	59	134	0	0
8	0	8	0	0
9	26	221	68	27
10	89	136	23	6
11	49	122	13	5
12	65	161	19	0
13	53	186	40	6
14	10	177	61	62
15	6	117	1	5
16	3	26	0	1
17	93	154	46	1
18	5	122	16	4
19	62	160	40	18
20	61	283	92	7
21	1	0	0	0
22	23	44	0	0
Total	**642**	**2484**	**492**	**193**

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.

The distribution and ranking of the pathologies encountered was similar to that in 1997, except that the incidence of pregnancy related problems increased from 12.5% to 21.8% and that of disease of the cervix reduced from 0.6% to 0.1%.

	1997	**2002**
Disease of the uterus	310 (8.7%)	812 (10.0%)
Disease of the cervix	23 (0.6%)	9 (0.1%)
Disease of the Fallopian tubes	138 (3.9%)	309 (3.8%)
Disease of the ovaries	1260 (35.5%)	2583 (31.7%)
Disease of the pelvic peritoneum	1321 (37.2%)	2608 (32.0%)
Genital displacement/urinary disorders	23 (0.6%)	26 (0.3%)
Menstrual disorders	21 (0.6%)	26 (0.3%)
Pregnancy related problems	442 (12.5%)	1779 (21.8%)
Miscellaneous	12 (0.3%)	0 (0.0%)
Total	**3550**	**8152**

Detailed Breakdown of Individual Diagnosis

Disease of the uterus

This constituted 10% of all diagnoses, compared to 8.7% in 1997. Fibromyoma remained the most common diagnosis and accounted for over 80% of the cases in this category.

	1997	**2002**
Fibromyoma	259 (83.5%)	672 (82.8%)
Adenomyosis	22 (7.1%)	111 (13.7%)
Carcinoma of corpus	6 (1.9%)	19 (2.3%)
Endometrial polyps	8 (2.6%)	0 (0.0%)
Endometrial hyperplasia	6 (1.9%)	5 (0.6%)
Trauma	5 (1.6%)	3 (0.4%)
Miscellaneous	4 (1.3%)	2 (0.2%)
Total	**310**	**812**

Disease of the cervix

Compared to 1997, the incidence reduced from 0.6% to 0.1%. Cervical intraepithelial neoplasia was still the most common diagnosis in this category.

	1997	2002
Cervical intraepithelial neoplasia	15 (65.2%)	6 (66.7%)
Micro-invasive carcinoma of cervix	5 (21.7%)	0 (0.0%)
Carcinoma of cervix	3 (13.0%)	3 (33.3%)
Total	**23**	**9**

Disease of the ovaries

This remained the second most common category and constituted 31.7% of all the diagnoses, compared to 35.5% in 1997. Over 99% of the diseases were benign in nature. Ovarian malignancy occurred in 0.1%, compared to 0.2% in 1997.

	1997	2002
Endometriotic cysts	585 (46.4%)	1126 (43.6%)
Dermoid cysts	158 (12.5%)	315 (12.2%)
Benign tumours/cysts	492 (39.0%)	1116 (43.2%)
Polycystic ovarian diseases	14 (1.1%)	22 (0.9%)
Bleeding corpus luteum	8 (0.6%)	2 (0.1%)
Carcinoma of ovary	2 (0.2%)	2 (0.1%)
Mosaic Turners	1 (0.1%)	0 (0.0%)
Total	**1260**	**2583**

Disease of the Fallopian tubes

This constituted 3.8% of all diagnoses, similar to the 3.9% in 1997. Hydrosalpinx was the most common diagnosis in this category.

	1997	2002
Hydrosalpinx	93 (67.4%)	238 (77.0%)
Pyosalpinx	7 (5.1%)	29 (9.4%)
Tubo-ovarian abscess	13 (9.4%)	36 (11.7%)
Fimbrial cysts	21 (15.2%)	0 (0.0%)
Acute pelvic infection	0 (0.0%)	3 (1.0%)
Chronic pelvic infection	0 (0.0%)	1 (0.3%)
Miscellaneous	4 (2.9%)	2 (0.6%)
Total	**138**	**309**

Disease of the pelvic peritoneum

This was the most common category and constituted 32.0% of all diagnoses, compared to 37.2% in 1997. Pelvic adhesions and endometriosis were the two most common diagnoses in this category.

	1997	2002
Endometriosis	534 (40.4%)	991 (38.0%)
Adhesions	738 (55.9%)	1469 (56.3%)
Paraovarian cysts	45 (3.4%)	143 (5.5%)
Miscellaneous	4 (0.3%)	5 (0.2%)
Total	**1321**	**2608**

Genital displacement/urinary disorders

The incidence reduced from 0.6% to 0.3%. The incidence of genital prolapse reduced by 80% while that of genuine stress incontinence increased by almost 4 fold.

	1997	2002
Genital prolapse	17 (73.9%)	4 (15.4%)
Genuine stress incontinence	5 (21.7%)	22 (84.6%)
Vault prolapse	1 (4.3%)	0 (0.0%)
Total	**23**	**26**

Menstrual disorders

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

	1997	2002
Dysfunctional uterine bleeding	16 (76.2%)	21 (80.8%)
Post-menopausal bleeding	5 (23.8%)	5 (19.2%)
Total	**21**	**26**

Pregnancy related problems

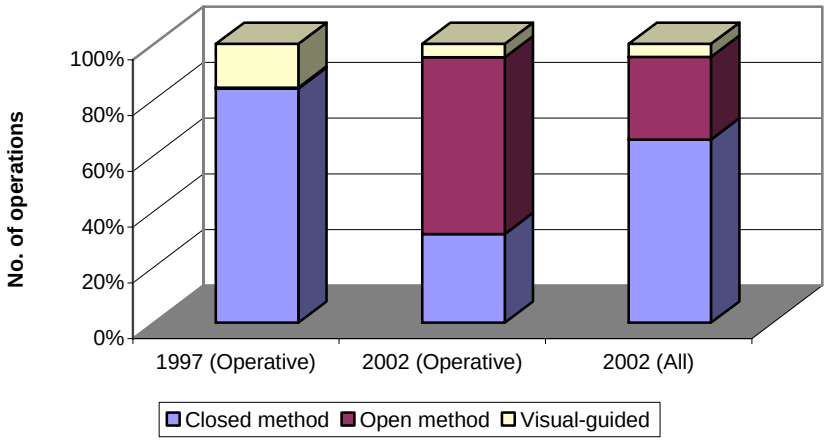
This was the third most common category and the incidence increased by 1.7 fold. Condition leading to sterilization was the most common diagnosis, as this exercise included all levels of laparoscopic procedures. Excluding tubal sterilization, ectopic pregnancy was the most common diagnosis and accounted for over 95% of the diagnoses.

	1997	2002
Ectopic pregnancy	422 (95.5%)	634 (34.8%)
Infertility	11 (2.5%)	24 (1.3%)
Condition leading to sterilisaton	4 (0.9%)	1164 (63.9%)
Failed sterilization	3 (0.7%)	0 (0.0%)
Persistent ectopic pregnancy	2 (0.5%)	0 (0.0%)
Total	**442**	**1822**

OPERATIVE TECHNIQUES

Primary trocar entry technique

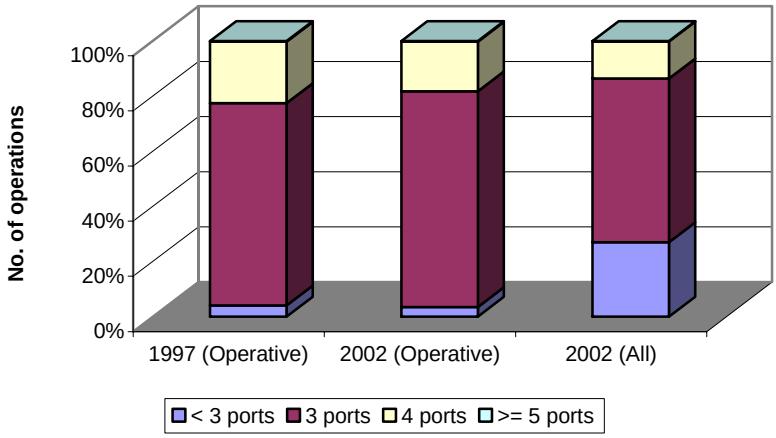
Although closed method remained the most common technique for primary trocar entry, its incidence reduced from over 80% to 65.7%. This was because of the substantial increase in the use of the open method and the incidence increased from 0.4% to 29.7%. Visually guided trocar was used in only about 5%, compared to 15.7% in 1997.



Number of missing data: 267 (4.4%)

Number of ports used

Because of the inclusion of level 1 procedures, there was an increase in the proportion of procedures using less than 3 ports, from 4.1% to 27.0%. Excluding level 1 procedures, over 95% of cases were performed using 3 or 4 ports (95.7% in 1997).



Number of missing data: 429 (7.1%)

Surgical modalities

Electrocautery was the most common energy source used. Ultracision, which was not reported in 1997, was used in 3.8% of operative laparoscopy. There was an increase in the use of drain from 6.8% to 9.5%.

	1997	2002	
		Operative	All
Electrocautery	2018 (91.7%)	3748 (89.8%)	4017 (66.2%)
Ultracision	0 (0.0%)	157 (3.8%)	168 (2.8%)
Laser	74 (3.4%)	24 (0.6%)	28 (0.5%)
Suture	133 (6.0%)	339 (8.1%)	367 (6.1%)
Endoloop	83 (3.8%)	65 (1.6%)	77 (1.3%)
Clips/Staples	36 (1.6%)	17 (0.4%)	165 (2.7%)
Use of drain	149 (6.8%)	398 (9.5%)	423 (7.0%)
Total	**2084**	**3841**	**5144**

Number of missing data: 116 (5.3%) in 1997, 333 (8.0%) and 921 (15.2%) in 2002 respectively

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. Excluding tubal sterilization/occlusion, the first 5 most common operative procedures were cystectomy (46.8%), adhesiolysis (19.5%), salpingectomy (16.6%), salpingo-oophorectomy (13.1%) and hysterectomy (11.8%). The ranking was the same as in 1997 with little changes in the incidence.

Ovarian surgery

Cystectomy was the most common procedure in this category. The incidence of ovarian drilling increased from 0.5%to 1.3%. Aspiration or fenestration of cyst was not reported in this exercise, compared to 0.9% in 1997.

	1997	2002	
		Operative	All
Cystectomy	970 (44.1%)	1952 (46.8%)	1952 (32.2%)
Salpingo-oophorectomy	252 (11.5%)	548 (13.1%)	548 (9.0%)
Oophorectomy	41 (1.9%)	94 (2.3%)	94 (1.5%)
Ovarian drilling	11 (0.5%)	53 (1.3%)	53 (0.9%)
Fenestration of cyst	10 (0.5%)	0 (0.0%)	0 (0.0%)
Aspiration of cyst	8 (0.4%)	0 (0.0%)	0 (0.0%)
Ovarian biopsy	4 (0.2%)	3 (0.07%)	5 (0.08%)
Ablation of cyst wall	3 (0.1%)	0 (0.0%)	0 (0.0%)
Total	**2200**	**4174**	**6065**

Tubal surgery

Tubal sterilization/occlusion accounted for 57% of all tubal surgeries. Excluding sterilization procedures, salpingectomy was the most common procedure in this category.

	1997	2002	
		Operative	All
Salpingectomy	346 (15.7%)	692 (16.6%)	692 (11.4%)
Salpingostomy	164 (7.5%)	181 (4.3%)	181 (3.0%)
Cornual resection	2 (0.09%)	2 (0.05%)	2 (0.03%)
Segmental resection	1 (0.05%)	0 (0.0%)	2 (0.03%)
Removal of residual tubal stump	1 (0.05%)	0 (0.0%)	0 (0.0%)
Tubal occlusion/sterilization	-	43 (1.0%)	1164 (19.2%)
Glucose injection	1 (0.05%)	0 (0.0%)	0 (0.0%)
Total	**2200**	**4174**	**6065**

Uterine surgery

Hysterectomy was the most common procedure performed in this category and the incidence increased from 9.5% to 11.8%. The incidence of myomectomy also increased from 3.9% to 4.6% while myolysis was not reported in this exercise (0.7% in 1997).

	1997	2002	
		Operative	All
Hysterectomy	209 (9.5%)	492 (11.8%)	492 (8.1%)
Myomectomy	86 (3.9%)	193 (4.6%)	193 (3.2%)
Myolysis	15 (0.7%)	0 (0.0%)	0 (0.0%)
Repair of uterine perforation	2 (0.09%)	1 (0.02%)	1 (0.02%)
Excision of rudimentary horn	1 (0.05%)	0 (0.0%)	0 (0.0%)
Total	**2200**	**4174**	**6065**

Other Pelvic Surgery

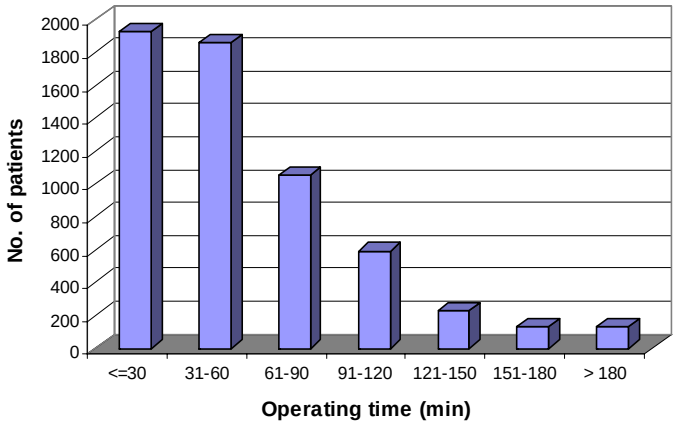
Adhesiolysis was reported to have been performed in 19.5% of cases, similar to that in 1997. However, it was not possible to differentiate whether the adhesiolysis was performed as a primary operation or as part of an operative procedure. Ablation or resection of endometriosis was performed in about 8% while the other operative procedures were uncommonly performed (<0.5%).

	1997	2002	
		Operative	All
Adhesiolysis	413 (18.8%)	816 (19.5%)	826 (13.6%)
Ablation/resection of endometriosis	174 (7.9%)	362 (8.7%)	364 (6.0%)
Colposuspension	5 (0.2%)	22 (0.5%)	22 (0.4%)
Drainage of abscess	5 (0.2%)	20 (0.5%)	20 (0.3%)
Pelvic lymphadenectomy	4 (0.2%)	13 (0.3%)	13 (0.2%)
LUNA	6 (0.3%)	10 (0.2%)	10 (0.2%)
Chromotubation	0 (0.0%)	5 (0.1%)	21 (0.3%)
Control of bleeding	12 (0.5%)	5 (0.6%)	5 (0.08%)
Extraction of products of gestation	9 (0.4%)	1 (0.1%)	1 (0.02%)
Appendicectomy	2 (0.09%)	4 (0.1%)	4 (0.07%)
Cholecystectomy	2 (0.09%)	0 (0.0%)	0 (0.0%)
High McCall vault suspension	1 (0.05%)	1 (0.1%)	1 (0.02%)
Moschowitz culdoplasty	1 (0.05%)	0 (0.0%)	0 (0.0%)
Staging laparoscopy	1 (0.05%)	0 (0.0%)	0 (0.0%)
Removal of translocated IUCD	1 (0.05%)	0 (0.0%)	0 (0.0%)
Removal of omental nodule	1 (0.05%)	0 (0.0%)	0 (0.0%)
Total	**2200**	**4174**	**6065**

LUNA- Laparoscopic utero-sacral nerve ablation

OPERATING TIME

The mean operating time for all operations was 60.9 (SD 46.4) minutes and that for operative laparoscopies only was 75.5 (SD 45.5) minutes, compared to 75.4 (SD 40.8) in 1997. The operation was completed within 60 minutes in 51.9% and lasted longer than 120 minutes in only 9%.



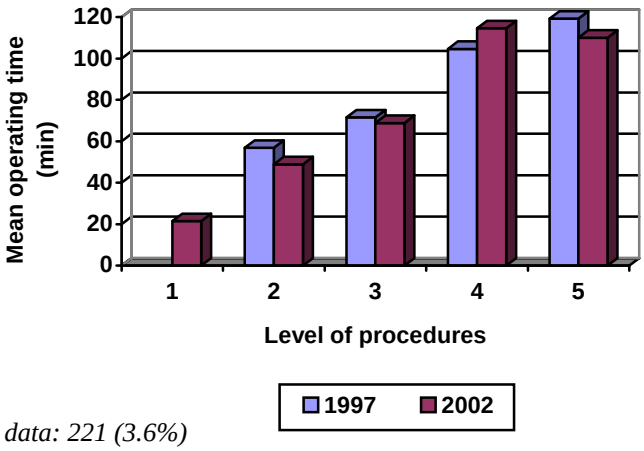
Number of missing data: 46 (2.1%)

Distribution of operating time

	1997	2002	
		Operative	All
≤ 30 minutes	220 (10.2%)	497 (12.1%)	1924 (32.5%)
31 - 60 minutes	899 (41.7%)	1608 (39.1%)	1855 (31.3%)
61 - 90 minutes	547 (25.4%)	988 (24.0%)	1054 (17.8%)
91 - 120 minutes	296 (13.7%)	561 (13.6%)	592 (10.0%)
121 - 150 minutes	84 (3.9%)	218 (5.3%)	227 (3.8%)
151 - 180 minutes	63 (2.9%)	122 (3.0%)	133 (2.2%)
> 180 minutes	45 (2.1%)	120 (2.9%)	130 (2.2%)
Total	**2154**	**4114**	**5915**

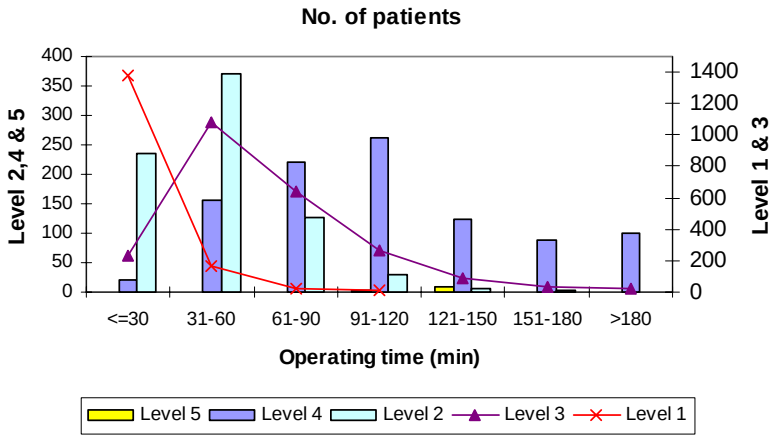
Number of missing data: 46 (2.1%) in 1997, 60 (1.4%) and 150 (2.5%) respectively in 2002

Level 4 and 5 procedures (114.6 and 110.0 min respectively) required significantly longer operating time than level 2 and 3 procedures (48.9 and 68.8 min respectively). Compared to 1997, the mean operating time was shortened by 8-10 minutes except for level 3 procedures where the difference was only 3 minutes.



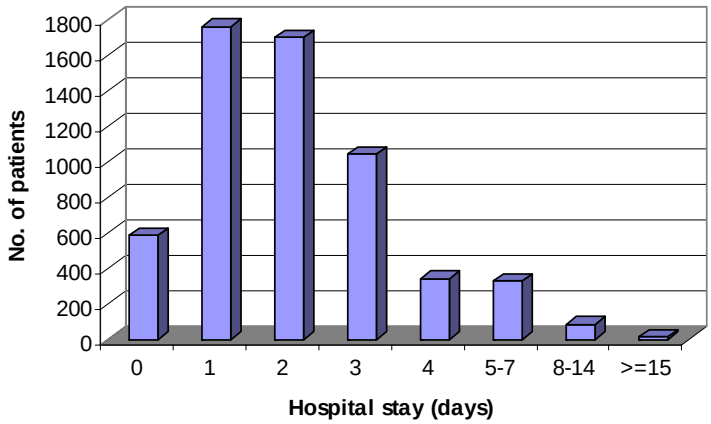
Number of missing data: 221 (3.6%)

Overall, operating time was longer for more advanced laparoscopic procedures. In most of the patients, operating time was within 30 minutes for level 1 procedures, within 60 minutes for level 2, 90 minutes for level 3, 120 minutes for level 4 and longer than 120 minutes for level 5 procedures.



POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay for all operations was 2.3 (SD 1.8) days and that for operative laparoscopies was 2.5 (SD 1.9) days, compared to 2.5 (SD 2.4) in 1997. Over 80% of the patients were discharged within the first 3 days. Overall, 10% of patients were discharged on the day of operation and that after operative laparoscopy was 2.2% (1.8% in 1997). The incidence of prolonged hospital stay (> 7 days) remained unchanged.



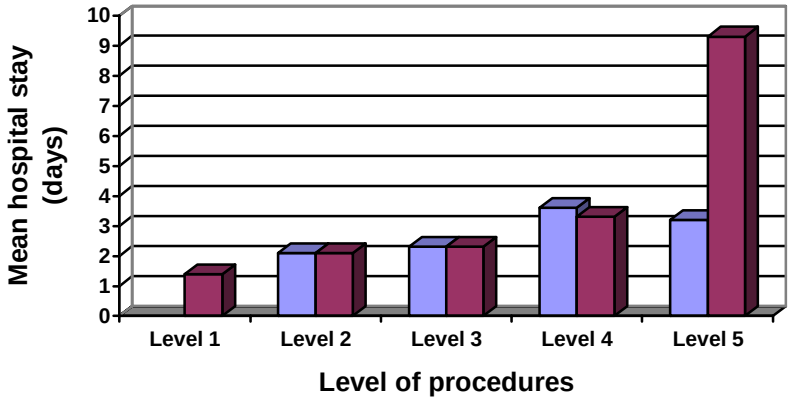
Number of missing data: 199 (3.3%)

Distribution of post-operative hospital stay

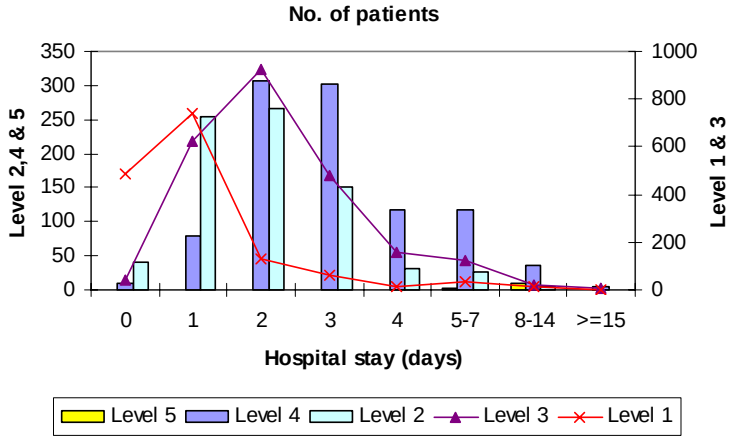
	1997	2002	
		Operative	All
0 day	40 (1.8%)	90 (2.2%)	588 (10.0%)
1 day	575 (26.5%)	956 (23.1%)	1762 (30.0%)
2 days	749 (34.5%)	1501 (36.3%)	1703 (29.0%)
3 days	485 (22.4%)	932 (22.5%)	1042 (17.8%)
4 days	137(6.3%)	307 (7.4%)	341 (5.8%)
5 – 7 days	142 (6.5%)	270 (6.5%)	330 (5.6%)
8 – 14 days	30 (1.4%)	66 (1.6%)	85 (1.4%)
≥ 15 days	10 (0.5%)	12 (0.3%)	15 (0.3%)
Total	**2170**	**4134**	**5866**

Number of missing data: 30 (1.4%) in 1997, 40 (1.0%) and 199 (3.3%) respectively in 2002

The mean post-operative hospital stay for level 2, 3 and 4 procedures were similar to that in 1997, but that for level 5 procedures was almost tripled.



Patients stayed longer in hospital after more advanced laparoscopic surgery. Most patients were discharged within one day after level 1 procedures, 2 days after level 2 procedures, 3 days after level 3 and 4 days after level 4 and longer than 5 days after level 5 procedures.



COMPLICATIONS

Major complications

Major complication rate decreased from 1.7% to 1.0% of all operative laparoscopic surgeries. As in 1997, organ injury accounted for about half of the major complications. While the incidence of visceral injury remained the same (0.4% versus 0.5% in 1997), that of vascular injury decreased from 0.4% to 0.1%.

	1997	2002	
		Operative	All
Bladder injury	5 (0.2%)	5 (0.1%)	5 (0.08%)
Ureteric injury	2 (0.09%)	4 (0.1%)	4 (0.07%)
Bowel injury	4 (0.2%)	8 (0.2%)	9 (0.2%)
Major vascular injury	1 (0.05%)	2 (0.05%)	2 (0.03%)
Inferior epigastric artery injury	7 (0.3%)	4 (01%)	4 (0.07%)
Haemorrhage requiring transfusion	15 (0.7%)	16 (0.4%)	16 (0.3%)
Deep vein thrombosis	1 (0.05%)	3 (0.07%)	3 (0.05%)
Pneumomediastinum	1 (0.05%)	0 (0.0%)	0 (0.0%)
Incisional hernia	2 (0.09%)	0 (0.0%)	0 (0.0%)
Total	**38 (1.7%)**	**42 (1.0%)**	**43 (0.7%)**

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% to 2.6%. Febrile morbidity remained the most common minor complication but its incidence reduced from 2.3% to 0.9%.

	1997	2002	
		Operative	All
Febrile morbidity	50 (2.3%)	36 (0.9%)	37 (0.6%)
Urinary tract infection	22 (1.0%)	15 (0.4%)	16 (0.3%)
Retention of urine	21 (1.0%)	12 (0.3%)	13 (0.2%)
Wound complication	15 (0.7%)	10 (0.2%)	14 (0.2%)
Vault/Pelvic haematoma	4 (0.4%)	20 (0.5%)	20 (0.3%)
Pelvic infection	5 (0.2%)	0 (0.0%)	0 (0.0%)
Uterine/ Vaginal perforation	3 (1.0%)	0 (0.0%)	0 (0.0%)
Others	5 (0.2%)	16 (0.4%)	20 (0.3%)
Total	**125 (5.7%)**	**109 (2.6%)**	**120 (2.0%)**

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

Trocar related complications

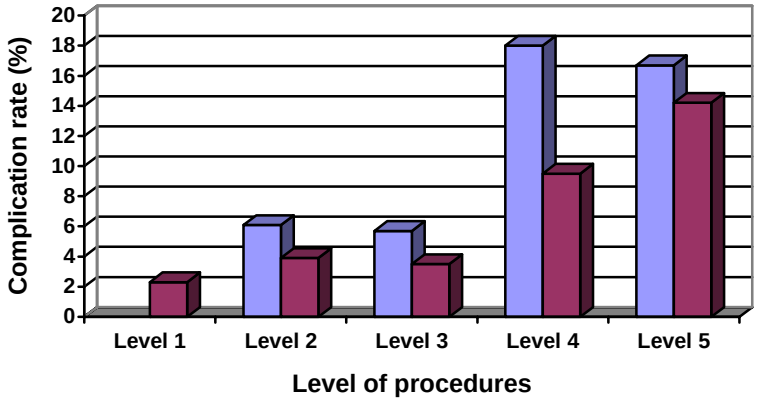
Trocar related complications occurred in 0.6% of all laparoscopies and 0.8% of operative laparoscopies (1.4% in 1997). Bowel injury occurred in 0.02% while vascular injury, essentially inferior epigastric artery injury, occurred in 0.07%. There was a 2 fold increase in the incidence of surgical emphysema reported in this exercise.

	1997	2002	
		Operative	All
Bowel injury	1 (0.05%)	1 (0.02%)	1 (0.02%)
Major vascular injury	1 (0.05%)	0 (0.0%)	0 (0.0%)
Inferior epigastric artery injury	7 (0.3%)	4 (0.1%)	4 (0.07%)
Surgical emphysema	3 (0.1%)	12 (0.3%)	12 (0.2%)
Trocar site haematoma/infection	19 (0.9%)	14 (0.3%)	19 (0.3%)
Trocar site hernia	2 (0.1%)	1 (0.02%)	1 (0.02%)
Total	**33 (1.5%)**	**32 (0.8%)**	**37 (0.6%)**

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

Breakdown of complication rates

Compared to 1997, there was a reduction of the complication rate across all levels of operative laparoscopy. The reduction was largest for level 4 procedures (from 18.0% to 9.5%) and least for level 5 procedures (from 16.6 to 14.2%). Overall the complication rate of operative laparoscopy decreased from 7.5% to 5.0%.



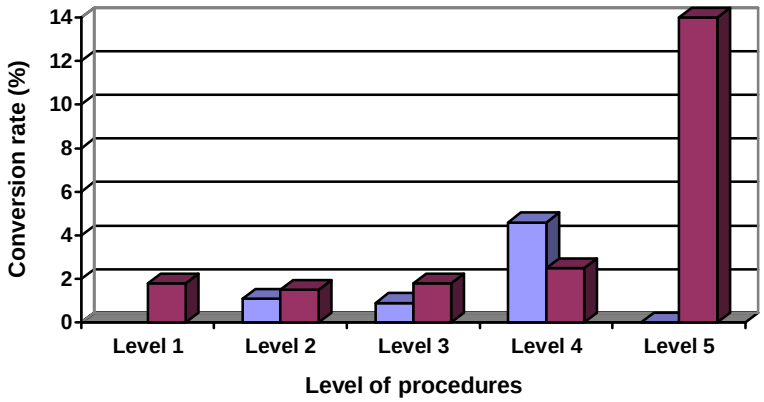
CONVERSION

Conversion was required in 2.0% of all laparoscopies and 1.8% of operative laparoscopies, compared to 5.7% in 1997. Surgical difficulty remained the main reason for conversion, of which dense adhesions accounted for over 70% of the cases.

	1997	2002	
		Operative	All
Surgical difficulty	29 (1.3%)	54 (1.3%)	80 (1.3%)
Dense adhesions	*20 (0.9%)*	*38 (0.9%)*	*60 (1.0%)*
Uncontrolled haemorrhage	*8 (0.4%)*	*6 (0.1%)*	*6 (0.01%)*
Poor pelvic access	*1 (0.05%)*	*2 (0.05%)*	*2 (0.03%)*
Large pelvic mass	*0 (0.0%)*	*8 (0.2%)*	*8 (0.1%)*
Cornual/interstitial pregnancy	*0 (0.0%)*	*0 (0.0%)*	*4 (0.07%)*
Miscellaneous	*4 (0.2%)*	*0 (0.0%)*	*0 (0.0%)*
Inadvertent organ injury	4 (0.2%)	5 (0.1%)	5 (0.08%)
Bladder injury	*2 (0.1%)*	*2 (0.04%)*	*2 (0.03%)*
Ureteric injury	*1 (0.05%)*	*1 (0.02%)*	*1 (0.02%)*
Bowel injury	*1 (0.05%)*	*2 (0.04%)*	*2 (0.03%)*
Instrument problems	1 (0.05%)	1 (0.02%)	1 (0.02%)
Broken needle	*0 (0.0%)*	*1 (0.02%)*	*1(0.02%)*
Fail to maintain pneumoperitoneum	*1 (0.05%)*	*0 (0.0%)*	*0 (0.0%)*
Unexpected malignancy	1 (0.05%)	1 (0.02%)	3 (0.05%)
Unspecified	0 (0.0%)	22 (0.5%)	30 (0.5%)
Total	**125 (5.7%)**	**83 (2.0%)**	**119 (2.0%)**

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

In contrast to 1997 where the conversion rate was almost 4-fold higher in level 4 procedures, the conversion rate was highest for level 5 procedures but was around 2% for all other procedures.



RE-ADMISSION

The incidence of unplanned re-admission to hospital after laparoscopic surgery was 0.6%, similar to that in 1997. Post-operative infection and secondary haemorrhage remained the most common reasons for unplanned re-admission.

	1997	2002	
		Operative	All
Pelvic infection	3 (0.1%)	3 (0.07%)	3 (0.05%)
Secondary haemorrhage	2 (0.09%)	5 (0.1%)	5 (0.08%)
Persistent ectopic pregnancy	3 (0.1%)	2 (0.05%)	2 (0.03%)
Wound infection	0 (0.0%)	2 (0.05%)	5 (0.08%)
Wound pain	1 (0.05%)	1 (0.02%)	1 (0.02%)
Pelvic haematoma	0 (0.0%)	1 (0.02%)	1 (0.02%)
Repair of ureteric fistula	0 (0.0%)	1 (0.02%)	1 (0.02%)
Unexpected malignancy	0 (0.0%)	0 (0.0%)	1 (0.02%)
Unrelated problems	4 (0.2%)	3 (0.07%)	3 (0.05%)
Unspecified	0 (0.0%)	7 (0.2%)	11 (0.2%)
Total	**13 (0.6%)**	**25 (0.6%)**	**33 (0.5%)**

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

RE-OPERATION

Four patients had undergone subsequent laparotomy and the incidence of re-operation was 0.07%, much lower than the 0.5% in 1997. In one patient, the laparotomy was performed for the repair of ureteric fistula. The exact reason for re-operation in the remaining three cases was not clearly stated. One patient developed fever and ileus after a laparoscopic salpingostomy for unilateral hydrosalpinx. The other patient was labeled to have undergone a diagnostic laparoscopy without any surgical procedures performed and was diagnosed to have carcinoma of corpus. The remaining patient had an ovarian endometrioma with dense adhesions and required a conversion.

	1997	2002	
		Operative	All
Bowel injury	2 (0.09%)	0 (0.0%)	0 (0.0%)
Ureteric injury	0 (0.0%)	1 (0.02%)	1 (0.02%)
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%)	0 (0.0%)
Persistent pelvic abscess	1 (0.05%)	0 (0.0%)	0 (0.0%)
Unexpected malignancy	2 (0.09%)	0 (0.0%)	0 (0.0%)
Unspecified	0 (0.0%)	2 (0.05%)	3 (0.05%)
Total	**11 (0.5%)**	**3 (0.07%)**	**4 (0.07%)**

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

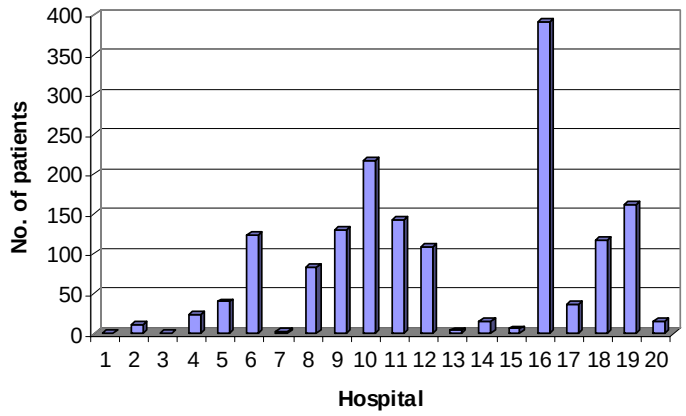
2 LAPAROSCOPIC SURGERY - LEVEL 1 PROCEDURES

Total number of patients 1,634

Level 1 laparoscopic procedures include diagnostic laparoscopy and laparoscopic tubal occlusion/sterilization. In 1997, these procedures were not audited and therefore no data was available for comparison.

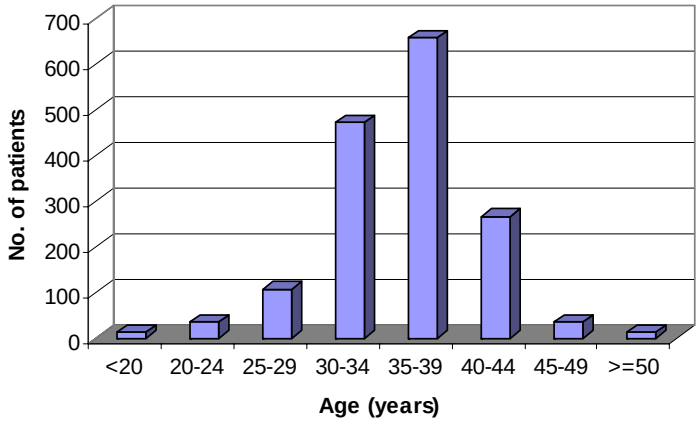
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Most units performed over 100 cases a year, 5 units performed less than 10 and 1 unit performed almost 400 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 35.6 (SD 5.5) years. Twelve (0.8%) patients were younger than 20 and another 12 (0.8%) aged 50 or above.



Distribution of age

< 20 years	12	(0.8%)
20 – 24 years	34	(2.1%)
25 – 29 years	108	(6.8%)
30 – 34 years	473	(29.6%)
35 – 39 years	657	(41.1%)
40 – 44 years	267	(16.7%)
45 – 49 years	36	(2.3%)
≥ 50 years	12	(0.8%)
Total	**1599**	

Number of missing data: 35 (2.1%)

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

Nil	1218	(69.3%)
Laparotomy	240	(23.0%)
Operative laparoscopy	60	(6.4%)
Total	**1518**	

Number of missing data: 116 (7.1%)

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by doctors with MBBS (37.2%) and MRCOG (28.7%); about half were assisted by specialists. The operation was performed by specialists in 34.1% and assisted by nurses in 22.9% of cases.

Surgeon \ Assistant	Assistant				Total
	MBBS	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	47	76	295	64	**482**
MRCOG	76	7	179	110	**372**
FHKAM	165	28	80	66	**339**
FRCOG	18	11	17	57	**103**
Total	**306**	**122**	**571**	**297**	**1296**

Number of missing data: 338 (20.7%)

About 70% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 28% were assisted by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	132	281	91	197	**701**
Intermediate	109	50	22	43	**224**
Advanced	23	7	11	22	**63**
Total	**264**	**338**	**124**	**262**	**988**

Number of missing data: 646 (39.5%)

OPERATIVE DIAGNOSIS

No information was provided in 602 patients and normal pelvis was reported in 746. Of the remaining 286 patients, pelvic adhesion was the most common pathology reported followed by fibroids, endometriosis and ovarian cyst. Two patients were reported to have genital tract malignancy.

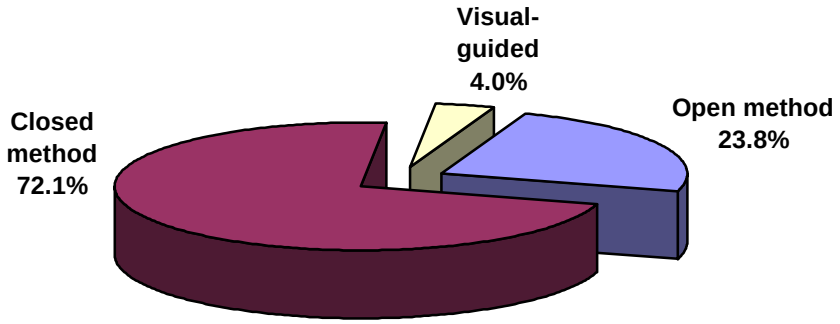
Normal pelvis	746	(45.7%)
Pelvic adhesions	140	(8.6%)
Fibroids	68	(4.2%)
Endometriosis	48	(2.9%)
Ovarian cyst	37	(2.3%)
Hydrosalpinx	15	(0.9%)
Paraovarian cyst	8	(0.5%)
Ectopic pregnancy	8	(0.5%)
Appendicitis	2	(0.1%)
Ca corpus	1	(0.06%)
Ca ovary	1	(0.06%)
Pyosalpinx	1	(0.06%)
Acute PID	1	(0.06%)

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 1111 (72.1%) of cases. Open method was used in 367 (23.8%) and visually guided trocar in 62 (4.0%) cases.



Number of missing data: 94 (5.8%)

	Diagnostic	Sterilisation	Total
Closed method	258	853	111
Open method	169	198	367
Visually-guided	45	17	62
Total	472	1068	1540

Number of missing data: 94 (5.8%)

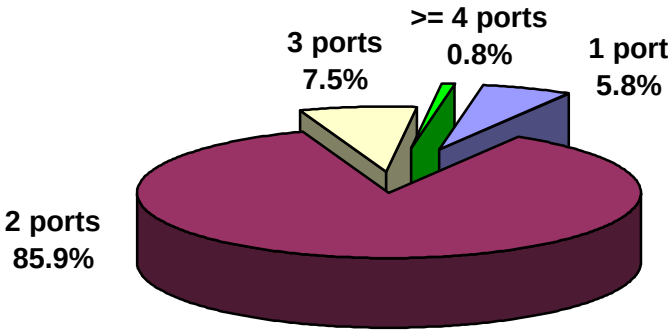
The primary trocar was inserted through the umbilical incision in 1472 (78.8%) cases, supraumbilically in 17 (1.0%) and in the left upper quadrant in 1 (0.1%). Information was not available in 144 (8.8%)

	Diagnostic	Sterilisation	Total
Umbilical	458	1014	1472
Supraumbilical	3	14	17
Left upper quadrant	1	0	1
Total	462	1028	1490

Number of missing data: 144 (8.8%)

Number of ports used

In over 85% of cases, 2 ports were used in performing the surgery. Three ports were used in 7.5% while single port was used in 5.8%.



Number of missing data: 136 (8.3%)

	Diagnostic	Sterilisation	Total
Single port	84	3	87
2 ports	277	1010	1287
3 ports	87	25	112
≥ 4 ports	5	7	12
Total	453	1045	1498

Number of missing data: 136 (8.3%)

Surgical modalities

Clips/rings were commonly used for level 1 procedures, all except 2 were used in laparoscopic sterilization.

	Diagnostic	Sterilisation	Total
No tools reported	454	59	513
Clips/Rings	2	1045	1047
Bipolar cautery	38	40	78
Unipolar cautery	16	4	20
Suture/Endoloop	5	3	8
Use of drain	3	2	5
Total	**513**	**1121**	**1634**

The application of rings was the most commonly used method for laparoscopic sterilization, accounting for 66% of cases.

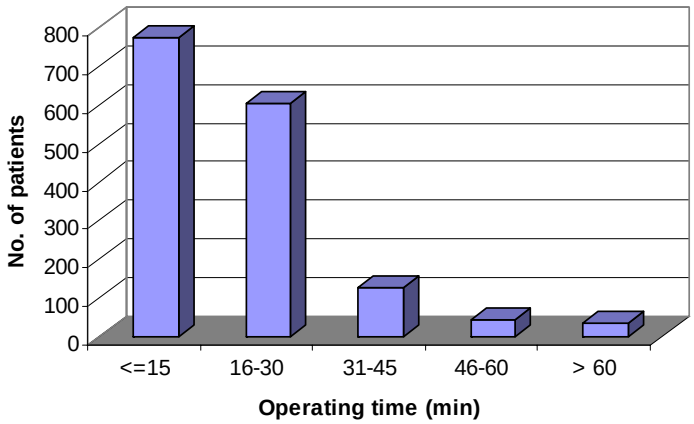
Technique for laparoscopic sterilisation

Rings	692	(65.9%)
Clips	353	(33.6%)
Electrocautery	3	(0.3%)
Partial salpingectomy	2	(0.2%)
Total	1050	

Number of missing data: 71 (6.3%)

OPERATING TIME

The mean operating time was 21.5 (SD 15.6) minutes. The operating time was within 15 minutes in 632 (57.7%) and exceeded 60 minutes in 8 (0.7%) patients.



Number of missing data: 54 (3.3%)

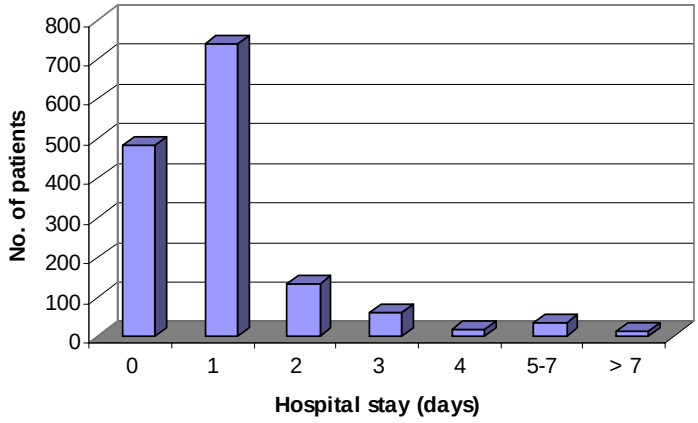
Distribution of operating time

≤ 15 minutes	776	(49.1%)
16 – 30 minutes	603	(38.2%)
31 – 45 minutes	125	(7.9%)
46 – 60 minutes	45	(2.8%)
> 60 minutes	33	(2.1%)
Total	**1580**	

Number of missing data: 54 (3.3%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.8) days. The procedure was performed as a day case in 485 patients (32.7%) and over 80% of patients were discharged within 1 day.



Number of missing data: 153 (9.4%)

Distribution of post-operative hospital stay

0 day	485	(32.7%)
1 day	740	(50.0%)
2 days	132	(8.9%)
3 days	61	(4.1%)
4 days	16	(1.1%)
5-7 days	35	(2.4%)
> 7 days	12	(0.8%)
Total	**1481**	

Number of missing data: 153 (9.4%)

CONVERSION

Twenty-nine (1.8%) patients required a conversion to laparotomy, 10 were due to dense pelvic adhesions, 4 because of cornual or interstitial pregnancy and 2 for malignancy. In 5 cases, the reason for conversion was not apparent; 2 were diagnosed to have ampullary ectopic pregnancy (1 with unstable haemodynamics), 1 paraovarian cyst > 8 cm, 1 fibroid > 6 cm and 1 endometrioma > 8cm. In the remaining 8 cases, there was no other information available.

Dense adhesions	10	(0.6%)
Cornual/interstitial pregnancy	4	(0.2%)
Malignancy	2	(0.1%)
Unspecified	13	(0.8%)
Total	29	(1.8%)

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

COMPLICATIONS

Thirty-seven patients (2.3%) developed complications; 3 quarters were related to conversion to laparotomy. Organ injury occurred in 2 (0.1%); bowel injury occurred in 1 and the other had a perforation of uterus.

Bowel injury	1	(0.06%)
Incisional hernia	1	(0.06%)
Subcutaneous haemorrhage	1	(0.06%)
Febrile morbidity	1	(0.06%)
Urinary tract infection	1	(0.06%)
Retention of urine	1	(0.06%)
Wound infection	4	(0.2%)
Conversion	29	(1.8%)
Re-admission	5	(0.3%)
Uterine perforation	1	(0.06%)
Unspecified	1	(0.06%)
Total	**37**	**(2.3%)**

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

RE-ADMISSION

Five patients (0.3%) required re-admission to hospital; 3 because of wound infection, 1 due to ovarian carcinoma, the reason for the remaining one was not stated.

Wound infection	3	(0.2%)
Carcinoma of ovary	1	(0.06%)
Unspecified	1	(0.06%)

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

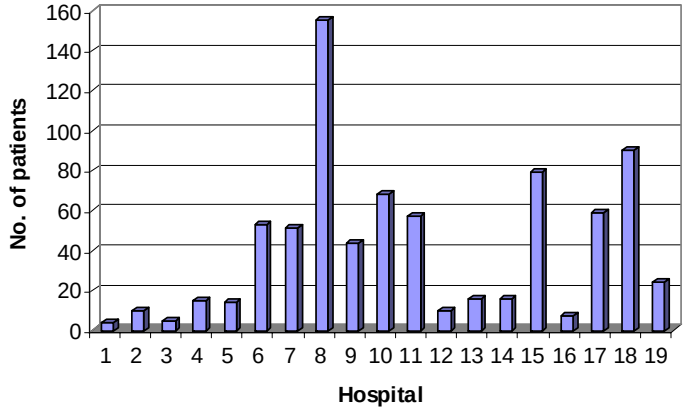
3 LAPAROSCOPIC SURGERY - LEVEL 2 PROCEDURES

Total number of patients 779

Compared to 1997, there was a 2.1 fold increase in the number of level 2 procedures with the actual number increased from 374 to 779.

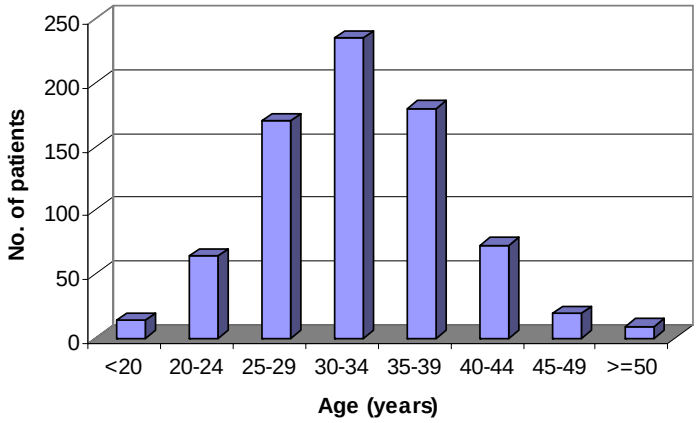
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing level 2 procedures was similar to that in 1997. Half of the units performed more than 40 cases a year, 4 units performed less than 10 and 1 unit performed over 150 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 32.5 (SD 6.6) years, similar to that in 1997 (mean 32.2, SD 6.7). The age distribution was also similar with peak age between 30 and 34. About 2% of patients were younger than 20 and 12% aged 40 or above.



Distribution of age

	1997	2002
< 20 years	15 (4.0%)	14 (1.8%)
20 – 24 years	42 (11.2%)	64 (8.4%)
25 – 29 years	76 (20.3%)	170 (22.3%)
30 – 34 years	117 (31.3%)	235 (30.8%)
35 – 39 years	85 (22.7%)	180 (23.6%)
40 – 44 years	37 (9.9%)	73 (9.6%)
45 – 49 years	8 (2.1%)	19 (2.5%)
≥ 50 years	2 (0.5%)	9 (1.2%)
Total	**374**	**764**

Number of missing data in 2002: 15 (1.9%)

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	259 (69.3%)	495 (73.2%)
Laparotomy	86(23.0%)	108 (15.9%)
Operative laparoscopy	24 (6.4%)	73 (10.8%)
Both	5(1.3%)	-
Total	**374**	**676**

Number of missing data in 2002: 103 (13.2%)

QUALIFICATIONS OF SURGEON AND ASSISTANT

Compared to 1997, the proportion of operations performed by pre-MRCOG doctors increased from 6.9% to 23.8%, of which almost 70% were assisted by specialists. The operation was performed by doctors with MRCOG in 36.4% (45.5% in 1997) and specialists in 39.8% (47.6% in 1997). The operations were assisted by specialists in 51.8% (25.9% in 1997) and by nurses in 8.1% (17.0% in 1997).

Assistant / Surgeon	Assistant				Total
	MBBS	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	6	49	119	0	**174**
MRCOG	66	15	182	3	**266**
FHKAM	112	29	67	26	**234**
FRCOG	9	7	11	30	**57**
Total	**193**	**100**	**379**	**59**	**731**

Number of missing data: 48 (6.2%)

About 60% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 29.0% were assisted by doctors without accreditation and 6.1% were assisted by nurses.

Assistant / Surgeon	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	105	172	63	22	**362**
Intermediate	126	51	20	1	**198**
Advanced	12	8	5	26	**51**
Total	**243**	**231**	**88**	**49**	**611**

Number of missing data: 170 (21.7%)

OPERATIVE DIAGNOSIS

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

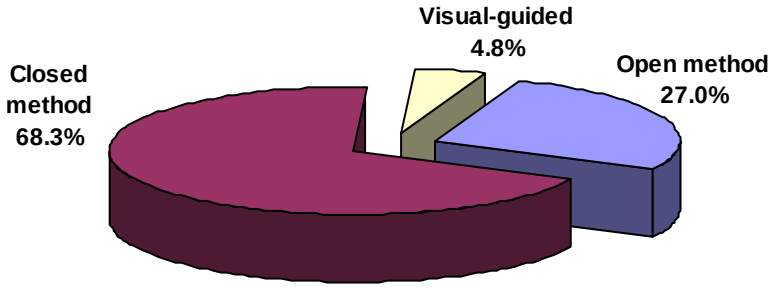
	1997	**2002**
Ectopic pregnancy	221 (59.1%)	456 (58.5%)
Pelvic adhesions	120 (32.1%)	250 (32.1%)
Endometriosis	62 (16.6%)	76 (9.8%)
Hydrosalpinx	18 (4.8%)	50 (6.5%)
Ovarian cyst	16 (4.3%)	21 (2.7%)
Fibroids	15 (4.0%)	18 (2.3%)
Polycystic ovarian disease	13 (3.5%)	20 (2.6%)
Bleeding corpus luteum	8 (2.1%)	1 (0.1%)
Paraovarian cyst	5 (1.3%)	4 (0.5%)
Endometrioma	4 (1.1%)	5 (0.6%)
Pyosalpinx	3 (0.8%)	5 (0.6%)
Infertility	3 (0.8%)	4 (0.5%)
Failed sterilization	3 (0.8%)	0 (0.0%)
Sterilization	0 (0.0%)	49 (6.3%)
Miscellaneous	13 (3.5%)	38 (4.9%)

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 514 (68.3%) of cases. Open method was used in 203 (27.0%) and visually guided trocar in 36 (4.8%) cases.

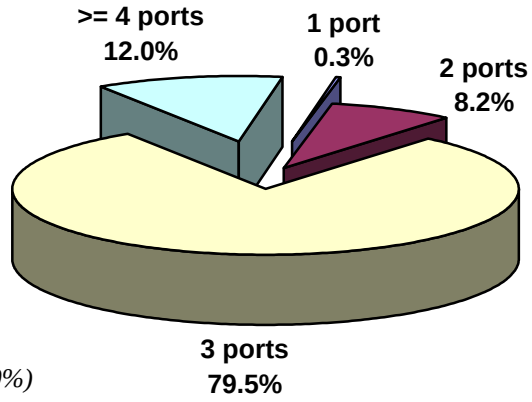


Number of missing data: 26 (3.3%)

The primary trocar was inserted through the umbilical incision in 732 cases, supraumbilically in 4 and in the left upper quadrant in 2. Information was not available in 41 (5.3%)

Number of ports used

Three ports were used in performing the surgery in 80% of cases. Four or more ports were used in 12% while 2 or less port were used in 8.0%.



Number of missing data: 47 (6.0%)

SURGICAL MODALITIES

As in 1997, electrocautery was used in 91% of cases, of which bipolar energy was used in 518 (72.8%), unipolar in 63 (8.8%) and both in 131 (20.5%). Laser and ultracision were used in less than 0.5%.

	1997	2002
Electrocautery	343 (91.7%)	709 (91.0%)
Suture	5 (1.3%)	12 (1.5%)
Endoloop	31 (8.3%)	27 (3.5%)
Laser	6 (1.6%)	4 (0.5%)
Ultracision	0 (0.0%)	3 (0.4%)
Clips/Staples	3 (0.8%)	4 (0.5%)
Use of drain	14 (3.7%)	15 (1.9%)

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

OPERATIVE PROCEDURES

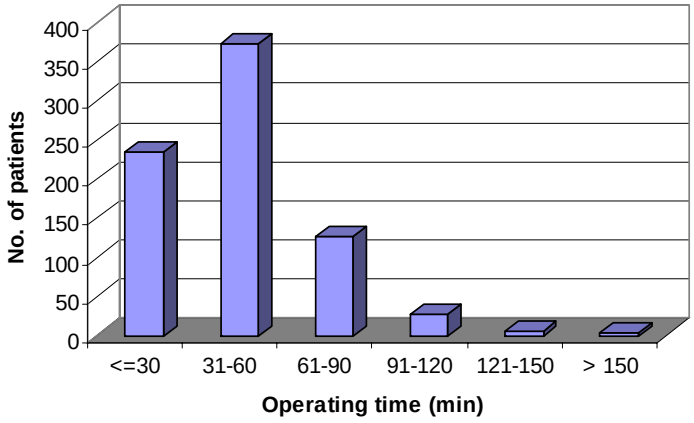
Salpingectomy was the commonest operative procedure performed and accounted for 70%, compared to 62.6% in 1997.

	1997	2002
Salpingectomy	234 (62.6%)	548 (70.3%)
Adhesiolysis	63 (16.8%)	167 (21.4%)
Ablation of endometriosis	34 (9.1%)	90 (11.6%)
Ovarian drilling	11 (2.9%)	48 (6.2%)
Control of bleeding	10 (2.7%)	5 (0.6%)
Fenestration of cyst	7 (1.9%)	0 (0.0%)
Myolysis	6 (1.6%)	0 (0.0%)
Miscellaneous	25 (6.7%)	25 (3.2%)

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

OPERATING TIME

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



Number of missing data: 8 (1.0%)

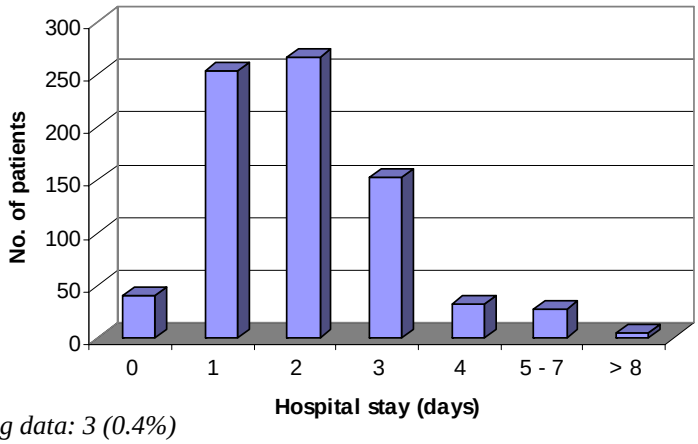
Distribution of operating time

	1997	2002
≤ 30 minutes	75 (20.9%)	235 (30.5%)
31 – 60 minutes	188 (52.5%)	372 (48.2%)
61 – 90 minutes	61 (17.0%)	127 (16.5%)
91 – 120 minutes	27 (7.5%)	28 (3.6%)
121 – 150 minutes	6 (1.7%)	6 (0.8%)
> 150 minutes	1 (0.3%)	3 (0.4%)
Total	**358**	**771**

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

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 2.1 (SD 1.3) days, compared to 2.1 (SD 2.0) in 1997. Forty patients (5.2%) were discharged on the day of operation and 5 (0.6%) stayed longer than 7 days. The corresponding figures in 1997 were 4.1% and 0.5% respectively.



Number of missing data: 3 (0.4%)

Distribution of post-operative hospital stay

	1997	2002
0 day	15 (4.1%)	40 (5.2%)
1 day	121 (32.8%)	254 (32.7%)
2 days	121 (32.8%)	266 (34.3%)
3 days	82 (22.2%)	152 (19.6%)
4 days	17 (4.6%)	32 (4.1%)
5 – 7 days	11 (3.0%)	27 (3.5%)
> 8 days	2(0.6%)	5 (0.6%)
Total	**369**	**776**

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

CONVERSION

Conversion to laparotomy was necessary in 12 (1.5%) patients, compared to 1.1% in 1997. The reasons for conversion were not specified in about 60% of cases.

	1997	2002
Dense adhesions	2 (0.5%)	3 (0.4%)
Bowel injury	0 (0.0%)	1 (0.1%)
Uncontrolled haemorrhage	1 (0.3%)	1 (0.1%)
Failure in maintaining pneumoperitoneum	1 (0.3%)	0 (0.0%)
Unspecified	0 (0.0%)	7 (0.9%)
Total	**4 (1.1%)**	**12 (1.5%)**

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

COMPLICATIONS

Thirty patients (3.9%) developed complications, compared to 6.1% in 1997. Organ injury occurred in 0.4 % compared to 1.6% in 1997.

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

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

RE-OPERATION

No patient required re-operation compared to 0.3% in 1997.

RE-ADMISSION

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

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

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 466 (59.8%) cases and elective operation in 298 (38.3%) cases. Information was not available in 15 cases (1.9%). This information was not captured in 1997 and therefore there was no data for comparison.

Emergency operation was associated with younger age, longer operating time, more blood loss and longer post-operative length of stay. There were however difference no difference in the conversion or complication rate.

	Elective N = 298	Emergency N = 466	P-value
Age (years)	34.5 ± 6.6	31.0 ± 6.2	<0.001
Operating time (min)	41.3 ± 23.3	53.9 ± 24.8	<0.001
Blood loss (ml)	26.0 ± 55.1	101.0 ± 170.1	<0.001
Post-operative hospital stay (days)	1.8 ± 1.3	2.3 ± 1.4	<0.001
Conversion	2 (0.7)	10 (2.1)	NS
Complication	9 (3.0)	21 (4.5)	NS
Re-admission	1 (0.3)	3 (0.6)	NS

Data are presented as mean ± SD or N (%)
NS: Not significant

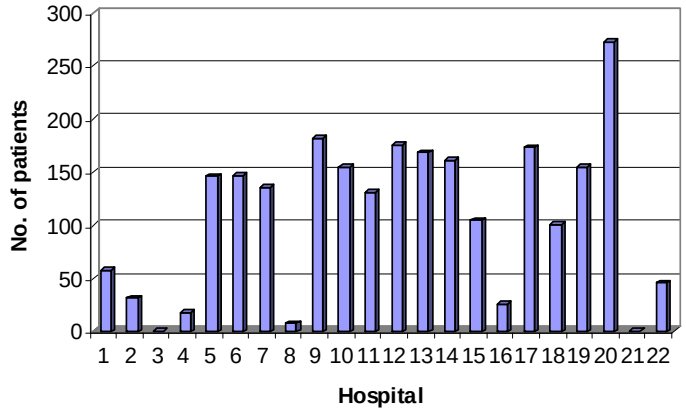
4 LAPAROSCOPIC SURGERY - LEVEL 3 PROCEDURES

Total number of patients 2,399

Compared to 1997, there was a 1.7 fold increase in the number of level 3 procedures with the actual number increased from 1385 to 2399.

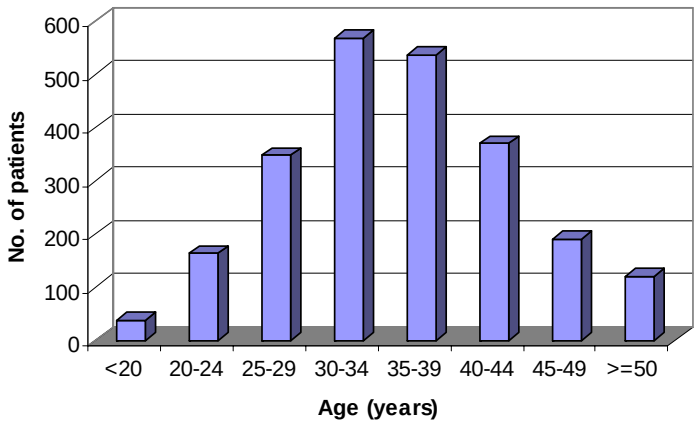
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Fourteen 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 250 cases while 3 units performed less than 10 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 35.5 (SD 8.8) years, compared to 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 13.4% (2.6% in 1997) aged ≥ 45 and 5.2% (0.5% in 1997) aged ≥ 50.



Number of missing data: 61 (2.5%)

Distribution of age

	1997	2002
< 20 years	36 (1.9%)	38 (1.6%)
20 – 24 years	98 (11.2%)	164 (7.0%)
25 – 29 years	218 (20.3%)	348 (14.9%)
30 – 34 years	362 (31.3%)	569 (24.3%)
35 – 39 years	348 (22.7%)	537 (23.0%)
40 – 44 years	203 (9.9%)	370 (15.8%)
45 – 49 years	78 (2.1%)	191 (8.2%)
≥ 50 years	38 (0.5%)	121 (5.2%)
Total	**1381**	**2339**

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

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	1051 (75.9%)	1478 (73.7%)
Laparotomy	263 (19.0%)	359 (15.0%)
Operative laparoscopy	60 (4.3%)	169 (7.0%)
Both	11 (0.8%)	-
Total	**1385**	**2399**

Number of missing data: 393 (16.4%) in 2002

QUALIFICATIONS OF SURGEON AND ASSISTANT

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

Assistant / Surgeon	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	6	16	208	1	**231**
MRCOG	53	19	502	8	**582**
FHKAM	302	116	337	174	**929**
FRCOG	41	45	90	310	**486**
Total	**402**	**196**	**1137**	**493**	**2228**

Number of missing data: 171 (7.1%)

About 53% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 17.2% were assisted by doctors without accreditation and 24.9% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 30%, half of which were assisted by doctors without accreditation.

Assistant / Surgeon	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	170	261	309	246	**986**
Intermediate	274	124	136	20	**554**
Advanced	85	44	30	159	**318**
Total	**529**	**429**	**475**	**425**	**1858**

Number of missing data: 541 (22.6%)

OPERATIVE DIAGNOSIS

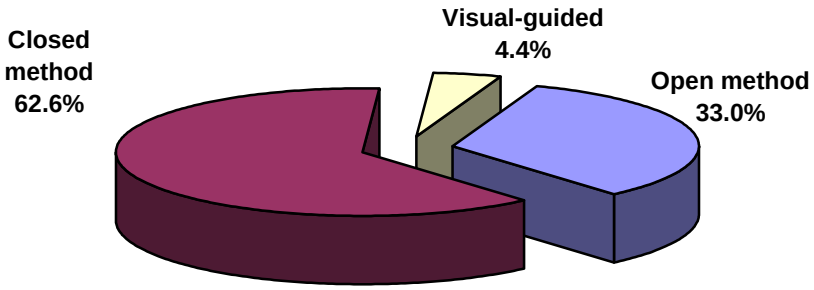
Benign ovarian tumour was the most common diagnosis and accounted for 79.3% (77.0% in 1997) of the cases.

	1997	**2002**
Benign ovarian tumour	1067 (77.0%)	1902 (79.3%)
Endometrioma	*517 (37.3%)*	*908 (37.8%)*
Ovarian cyst	*420 (30.3%)*	*840 (35.0%)*
Dermoid	*130 (9.4%)*	*154 (6.4%)*
Pelvic adhesions	500 (36.1%)	788 (32.8%)
Endometriosis	396 (28.6%)	668 (28.7%)
Ectopic pregnancy	198 (14.3%)	152 (6.3%)
Fibroid	88 (6.4%)	139 (5.8%)
Hydrosalpinx	64 (4.6%)	142 (5.9%)
Paraovarian cyst	35 (2.5%)	191 (8.0%)
Fimbrial cyst	18 (1.3%)	0 (0.0%)
Infertility	6 (0.4%)	2 (0.08%)
Tubo-ovarian abscess	4 (0.3%)	2 (0.08%)
Pyosalpinx	3 (0.2%)	1 (0.04%)
Miscellaneous	20 (1.4%)	8 (0.3%)

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

OPERATIVE TECHNIQUES

Primary trocar entry technique



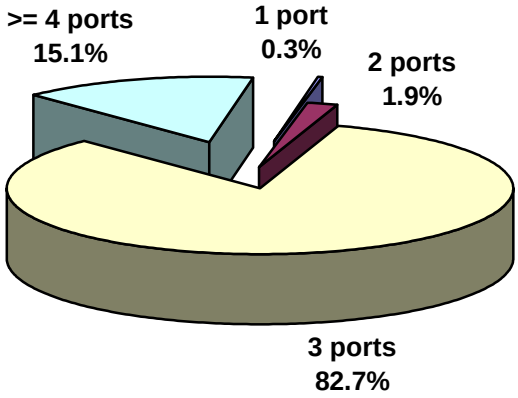
Number of missing data: 67 (2.8%)

Closed method was the most common technique for primary trocar entry and was used in 1460 (62.6%) of cases. Open method was used in 769 (33.0%) and visually guided trocar in 103 (4.4%) cases.

The primary trocar was inserted through the umbilical incision in 2203 cases, supraumbilically in 36 and in the left upper quadrant in 19. Information was not available in 141 (5.9%)

Number of ports used

Three ports were used in performing the surgery in 83% of cases. Four or more ports were used in 15%, of which 5 ports were used in 6 case and 7 ports in 1. Single port was reported to be used in 7 cases.



Number of missing data: 144 (6.0%)

SURGICAL MODALITIES

As in 1997, electrocautery was used in almost 90% of cases, of which bipolar energy alone was used in 1121 (52.4%), unipolar alone in 103 (4.8%) and both in 917 (42.8%). Ultracision was used in 1% while laser was used in 0.7%. Sutures were used in only about 5%.

	1997	2002
Electrocautery	1277 (92.2%)	2141 (89.2%)
Suture	72 (5.2%)	118 (4.9%)
Endoloop	30 (2.2%)	19 (0.8%)
Laser	45 (3.2%)	17 (0.7%)
Ultracision	0 (0.0%)	24 (1.0%)
Clips/Staples	8 (0.6%)	6 (0.3%)
Use of drain	102 (7.4%)	172 (7.2%)

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

OPERATIVE PROCEDURES

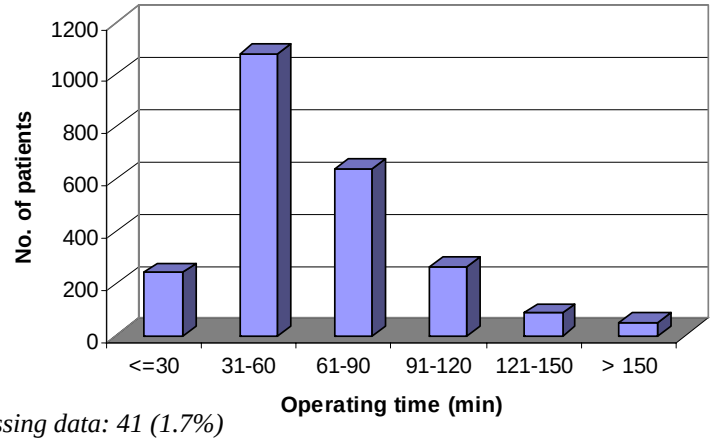
The types and distribution of procedures performed were similar to that in 1997. Cystectomy was the most common procedure performed.

	1997	2002
Cystectomy	897 (64.8%)	1756 (73.3%)
Adhesiolysis	259 (18.7%)	498 (20.8%)
Salpingostomy	161 (11.6%)	163 (6.8%)
Salpingo-oophorectomy	149 (10.8%)	305 (12.7%)
Salpingectomy	102 (7.4%)	121 (5.0%)
Ablation of endometriosis	102 (7.4%)	228 (9.5%)
Myomectomy	43 (3.1%)	66 (2.8%)
Oophorectomy	30 (2.2%)	62 (2.6%)
Miscellaneous	21 (1.5%)	18 (0.8%)

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

OPERATING TIME

The mean operating time was 67.8 (SD 33.4) minutes, compared to 71.5 (SD 36.2) in 1997. The operation was completed within 30 minutes in 241 (10.2% versus 9.3% in 1997) and exceeded 120 minutes in137 (5.8% versus 6.2% in 1997) patients.



Number of missing data: 41 (1.7%)

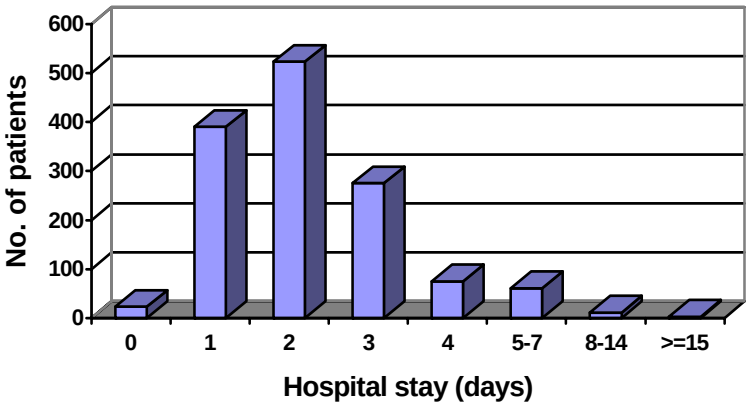
Distribution of operating time

	1997	2002
≤ 30 minutes	127 (9.3%)	241 (10.2%)
31 – 60 minutes	622 (45.7%)	1081 (45.8%)
61 – 90 minutes	364 (26.7%)	637 (27.0%)
91- 120 minutes	163 (12.0%)	262 (11.1%)
121 – 150 minutes	43 (3.2%)	86 (3.6%)
151 – 180 minutes	27 (2.0%)	32 (1.4%)
> 180 minutes	15 (1.1%)	19 (0.8%)
Total	**1361**	**2358**

Number of missing data: 41 (1.7%)

POST-OPERATIVE HOSPITAL STAY

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



Number of missing data: 27 (1.1%)

Distribution of post-operative hospital stay

	1997	2002
0 day	23 (1.7%)	40 (1.7%)
1 day	390 (28.7%)	624 (26.3%)
2 days	523 (38.4%)	926 (39.0%)
3 days	275 (20.2%)	479 (20.2%)
4 days	75 (5.5%)	156 (6.6%)
5 – 7 days	61 (4.5%)	124 (5.2%)
8 – 14 days	11 (0.8%)	17 (0.7%)
≥ 15 days	3 (0.2%)	6 (0.5%)
Total	**1361**	**2372**

Number of missing data: 27 (1.1%)

CONVERSION

Conversion to laparotomy was necessary in 44 (1.8%) patients, compared to 0.9% in 1997. Dense adhesions accounted for most of the conversion (56.8% versus 53.8% in 1997). Organ injury was the reason for conversion in 2 cases, one due to an ureteric injury and the other was suspected to have a bowel perforation. Both were associated with ovarian endometrioma.

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

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

COMPLICATIONS

Eighty-five (3.5%) patients developed complications, compared to 5.7% in 1997. The incidence of febrile morbidity dropped from 1.4% to 0.5% but that of organ injury remained about 0.3%.

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

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

RE-OPERATION

One patient required re-operation with an incidence of 0.04%, compared to 0.3% in 1997. The patient underwent laparoscopic salpingostomy for unilateral hydrosalpinx which was complicated by post-operative fever and ileus. The exact reason for the second operation was not specified and the patient stayed for 12 days.

RE-ADMISSION

Ten patient required re-admission to hospital with an incidence of 0.4% which was the same as in 1997.

	1997	2002
Pelvic infection	2 (0.4%)	1 (0.04%)
Persistent ectopic pregnancy	2 (0.4%)	2 (0.08%)
Unrelated problems	2 (0.4%)	3 (0.1%)
Wound infection	0 (0.0%)	2 (0.08%)
Pelvic haematoma	0 (0.0%)	1 (0.04%)
Unspecified	0 (0.0%)	1 (0.04%)
Total	**6 (0.4%)**	**10 (0.4%)**

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 386 (16.1%) cases and elective operation in 1943 (80.9%) cases. Information was not available in 70 (2.9%). This information was not captured in 1997 and therefore there was no data for comparison.

Emergency operation was associated with younger age and increased post-operative length of stay, conversion rate and operative morbidity.

	Elective N = 1943	**Emergency N = 386**	**P-value**
Age (years)	36.4 ± 8.8	31.0 ± 7.4	<0.001
Operating time (min)	68.8 ± 34.1	63.2 ± 30.0	0.001
Blood loss (ml)	75 ± 109	108 ± 183	0.001
Post-operative hospital stay (days)	2.2 ± 1.6	2.9 ± 2.1	<0.001
Conversion	30 (1.5)	13 (3.4)	0.02
Complication	59 (3.0)	24 (6.2)	0.02
Re-admission	4 (0.2)	5 (1.3)	<0.01

Data are presented as mean ± SD or N (%)
NS: Not significant

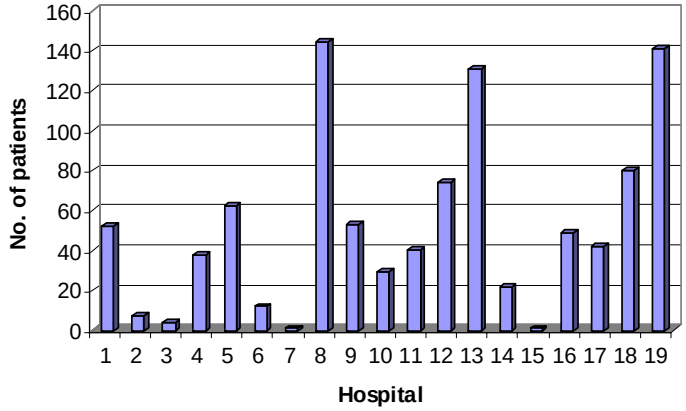
5 LAPAROSCOPIC SURGERY – LEVEL 4 PROCEDURES

Total number of patients 982

Compared to 1997, there was a 2.4 fold increase in the number of level 4 procedures with the actual number increased from 417 to 982.

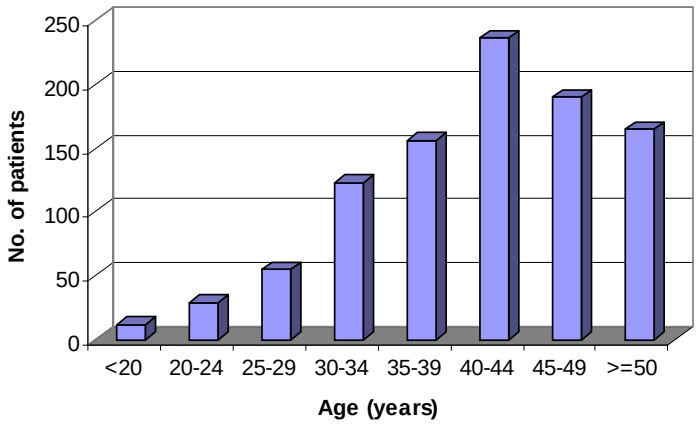
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Ten units (52.6%) performed more than 40 Level 4 procedures a year compared to 31.3% in 1997. Three units performed over 120 cases a year while 5 units performed less than 12.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 41.8 (SD 10.3) years, compared to 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. One hundred sixty-five (17.1% versus 15.8% in 1997) patients aged 50 or above and 9.9% (12.8% in 1997) were younger than 30.



Number of missing data: 16 (1.6%)

Distribution of age

	1997	2002
< 20 years	8 (1.9%)	12 (1.2%)
20 – 24 years	11 (2.6%)	29 (3.0%)
25 – 29 years	34 (8.2%)	55 (5.7%)
30 – 34 years	53 (12.7%)	123 (12.7%)
35 – 39 years	75 (18.0%)	156 (16.1%)
40 – 44 years	91 (21.8%)	236 (24.4%)
45 – 49 years	75 (18.0%)	190 (19.7%)
≥ 50 years	66 (15.8%)	165 (17.1%)
Total	**413**	**966**

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

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	288 (69.1%)	571 (58.1%)
Laparotomy	109 (26.1%)	211 (21.5%)
Operative laparoscopy	17 (4.1%)	50 (5.1%)
Both	3 (0.7%)	-
Total	**417**	**982**

Number of missing data: 150 (15.3%) in 2002

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to 1997, the operation was mainly performed by specialists (85.4% versus 83.5% in 1997). Pre-MRCOG doctors performed only 30 procedures (3.2% versus 2.2% in 1997) of which over 80% were assisted by specialists. The operations were assisted by specialists in 48.1% (42.0% in 1997) and by nurses in 26.4% (20.2% in 1997) of cases.

Assistant / Surgeon	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	1	4	25	0	**30**
MRCOG	12	2	91	0	**105**
FHKAM	51	100	255	46	**452**
FRCOG	14	52	74	198	**338**
Total	**78**	**158**	**445**	**244**	**925**

Number of missing data: 57 (5.8%)

About 30% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 10% were assisted by doctors without accreditation and 41.2% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 25%, half of which were assisted by doctors without advanced accreditation. For those procedures performed by doctors with advanced accreditation, 27.4% were assisted by doctors without accreditation and 32.2% by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	24	30	90	101	**245**
Intermediate	56	47	99	2	**204**
Advanced	107	73	85	126	**391**
Total	**187**	**150**	**274**	**229**	**840**

Number of missing data: 142 (14.5%)

OPERATIVE DIAGNOSIS

The types and distributions of pathologies were similar to that in 1997. Fibroid was the most common diagnosis and accounted for 42.2% (36.0% in 1997) of the cases.

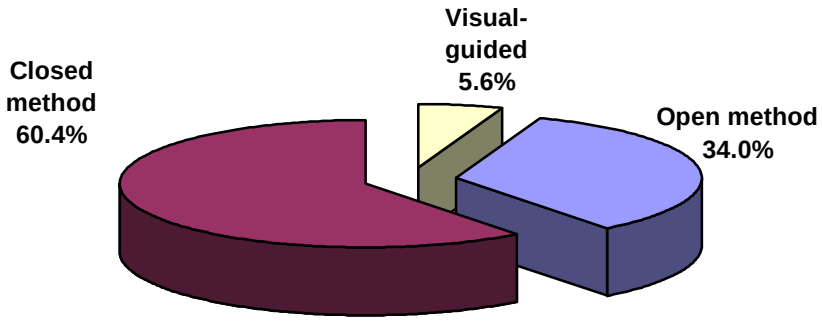
	1997	2002
Fibroid	150 (36.0%)	414 (42.2%)
Adhesions	110 (26.4%)	236 (24.0%)
Endometriosis	71 (17.0%)	153 (15.6%)
Endometrioma	63 (15.1%)	139 (14.2%)
Ovarian cyst	53 (12.7%)	153 (15.6%)
Dermoid	27 (6.5%)	43 (4.4%)
Adenomyosis	21 (5.0%)	69 (7.0%)
Dysfunctional uterine bleeding	14 (3.4%)	17 (1.7%)
Hydrosalpinx	11 (2.6%)	22 (2.2%)
Tubo-ovarian abscess	9 (2.2%)	33 (3.4%)
Paraovarian cyst	5 (1.2%)	53 (5.4%)
Genuine stress incontinence	5 (1.2%)	20 (2.0%)
Pyosalpinx	1 (0.2%)	22 (2.2%)
Carcinoma of corpus	4 (1.0%)	5 (0.5%)
Carcinoma of cervix	5 (1.2%)	3 (0.3%)
Endometrial hyperplasia	6 (1.4%)	4 (0.4%)
Genital prolapse	15 (3.6%)	4 (0.4%)
CIN	15 (3.6%)	4 (0.4%)
Miscellaneous	23 (5.5%)	5 (0.5%)

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 568 (64.4%) of cases. Open method was used in 320 (34.0%) and visually guided trocar in 53 (5.4%) cases.

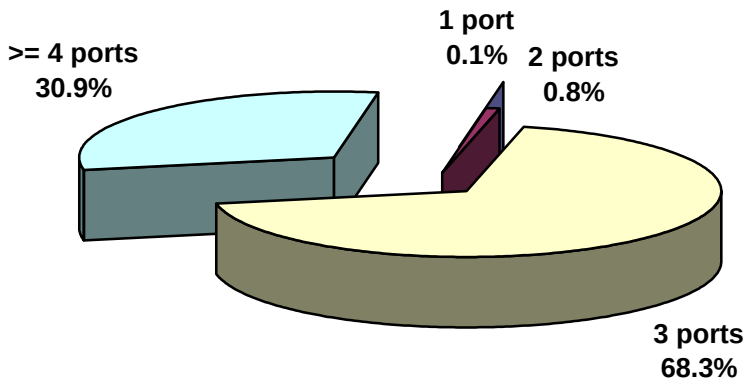


Number of missing data: 41 (4.2%)

The primary trocar was inserted through the umbilical incision in 898 cases, and supraumbilically in 5. The left upper quadrant insertion was used in 11 cases, 5 were associated with previous laparotomy, 2 with previous operative laparoscopy, 1 in a virgin abdomen and 3 were not stated. Information on site of primary trocar entry was not available in 68 (6.9%)

Number of ports used

Three ports were used in performing the surgery in 68.3% of cases. Four or more ports were used in 28.9%, of which 5 ports were used in 1 case. Two or less ports were reported to be used in 8 cases.



Number of missing data: 59 (6.0%)

SURGICAL MODALITIES

Similar to 1997, electrocautery was used in about 90% of cases (92.8% in 1997); of which bipolar energy alone was used in 345 (39.0%), unipolar alone in 15 (1.7%) and both in 524 (59.3%). Suture was used in 21.2% compared to 12.5% in 1997. Ultracision, which was not used in 1997, was used in 12.9%. There was also an increased use of pelvic drain from 7.4% to 20.3%.

	1997	2002
Electrocautery	387 (92.8%)	884 (90.0%)
Ultracision	0 (0.0%)	127 (12.9%)
Suture	52 (12.5%)	208 (21.2%)
Endoloop	19 (4.6%)	19 (1.9%)
Laser	22 (5.3%)	3 (0.3%)
Clips/Staples	24 (5.8%)	7 (0.7%)
Use of drain	102 (7.4%)	199 (20.3%)

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

OPERATIVE PROCEDURES

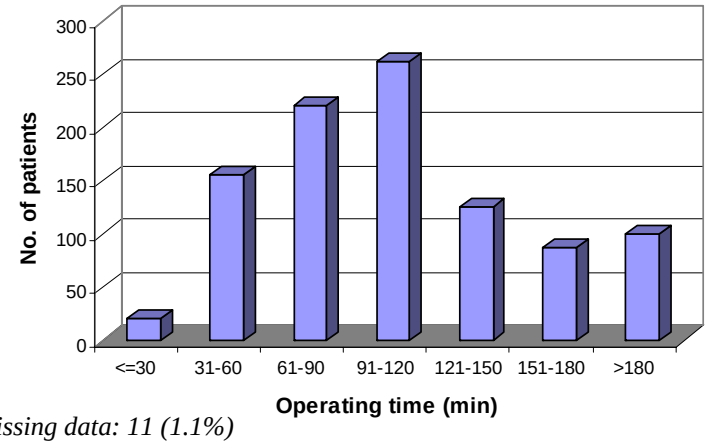
Hysterectomy was the commonest procedure followed by complicated adnexal surgery.

	1997	2002
Hysterectomy	208 (49.9%)	479 (48.8%)
Adnexal surgery	199 (47.7%)	331 (33.7%)
Adhesiolysis	71 (17.0%)	130 (13.2%)
Myomectomy	39 (9.4%)	127 (12.9%)
Ablation of endometriosis	11 (2.6%)	44 (4.5%)
Laparoscopic utero-sacral nerve ablation	6 (1.4%)	10 (1.0%)
Colposuspension	5 (1.2%)	22 (2.2%)
Drainage of abscess	5 (1.2%)	20 (2.0%)
Miscellaneous	1 (0.2%)	3 (0.3%)

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

OPERATING TIME

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



Number of missing data: 11 (1.1%)

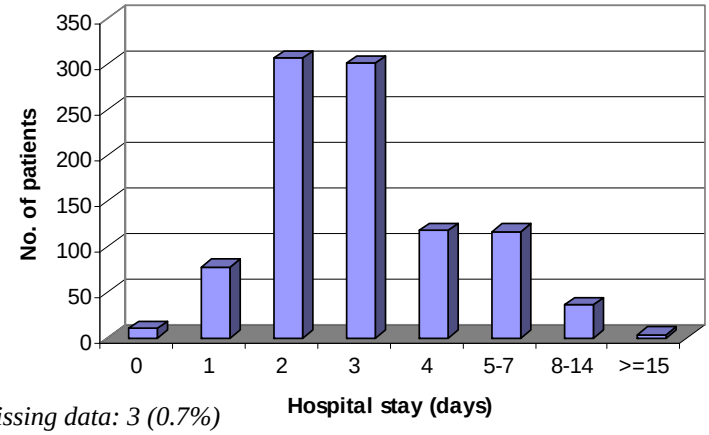
Distribution of operating time

	1997	2002
≤ 30 minutes	14 (3.4%)	21 (2.2%)
31 – 60 minutes	80 (19.3%)	155 (16.0%)
61 – 90 minutes	118 (28.5%)	221 (22.8%)
91- 120 minutes	104 (25.1%)	262 (27.0%)
121 – 150 minutes	35 (8.5%)	125 (12.9%)
151 – 180 minutes	33 (8.0%)	87 (9.0%)
> 180 minutes	30 (7.2%)	100 (10.3%)
Total	**414**	**971**

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

POST-OPERATIVE HOSPITAL STAY

The distribution of post-operative hospital stay was similar to that in 1997. The mean post-operative hospital stay was 3.3 (SD 2.3) days, compared to 3.6 (SD 3.0) in 1997. Ten patients (1.0% versus 0.5% in 1997) were discharged on the day of operation and 23 (4.1% versus 5.5% in 1997) stayed longer than 7 days.



Number of missing data: 3 (0.7%)

Distribution of post-operative hospital stay

	1997	2002
0 day	2 (0.5%)	10 (1.0%)
1 day	52 (12.7%)	78 (8.0%)
2 days	100 (24.2%)	307 (31.6%)
3 days	125 (30.2%)	301 (31.0%)
4 days	44 (10.6%)	118 (12.2%)
5 – 7 days	68 (16.4%)	117 (12.0%)
8 – 14 days	17 (4.1%)	36 (3.7%)
≥ 15 days	6 (1.4%)	4 (0.4%)
Total	**414**	**971**

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

COMPLICATIONS

Ninety-three patients had complications, giving an incidence of 9.5%, compared to 18.0% in 1997. The incidence of febrile morbidity decreased from 5.8% to 1.9% and that of organ injury decreased from 2.2% to 1.2%.

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

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

CONVERSION

Conversion to laparotomy was necessary in 25 (2.5%) cases, compared to 4.6% in 1997. The main reasons for conversion were due to the presence of dense adhesions (40% versus 52.6% in 1997) and large pelvic mass (32% versus 0% in 1997).

	1997	2002
Dense adhesions	10 (2.4%)	10 (1.0%)
Large pelvic mass*	0 (0.0%)	8 (0.8%)
Uncontrolled haemorrhage	2 (0.5%)	2 (0.2%)
Bladder injury	2 (0.5%)	1 (0.1%)
Ureteric injury	1 (0.2%)	0 (0.0%)
Bowel injury	1 (0.2%)	1 (0.1%)
Poor pelvic access	1 (0.2%)	1 (0.1%)
Unexpected malignancy	1 (0.2%)	0 (0.0%)
Broken needle	0 (0.0%)	1 (0.1%)
Unspecified	0 (0.0%)	1 (0.1%)
Total	**19 (4.6%)**	**25 (2.5%)**

Data are presented as number and percentage of total number of patients
**3 fibroids and 4 ovarian cysts; 3 were complicated by torsion including 1 pedunculated fibroid*

RE-OPERATION

One patient (0.1%) required re-operation for the repair of ureteric fistula following a laparoscopic hysterectomy. The re-operation rate in 1997 was 0.3%.

	1997	2002
Intraperitoneal haemorrhage	1 (0.2%)	0 (0.0%)
Incomplete drainage of tubo-ovarian abscess	1 (0.2%)	0 (0.0%)
Repair of ureteric fistula	0 (0.0%)	1 (0.1%)
Total	**2 (0.3%)**	**1 (0.1%)**

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

RE-ADMISSION

Compared to 1997, the re-admission rate increased from 0.4% to 1.5%. Secondary haemorrhage was the most common reason for re-admission to hospital; all from the vaginal vault after laparoscopic hysterectomy.

	1997	2002
Secondary haemorrhage	2 (0.5%)	5 (0.5%)
Acute pelvic infection	0 (0.0%)	2 (0.2%)
Repair of ureteric fistula	0 (0.0%)	1 (0.1%)
Wound pain	1 (0.2%)	1 (0.1%)
Unrelated problems	1 (0.2%)	0 (0.0%)
Unspecified	0 (0.0%)	6 (0.6%)
Total	**4 (0.4%)**	**15 (1.5%)**

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 83 (8.5%) cases and elective operation in 874 (89.0%) cases. Information was not available in 25 (2.5%). This information was not captured in 1997 and therefore there was no data for comparison.

Emergency operation was associated with a younger age, shorter operating time, less operative blood loss, but longer pot-operative length of stay. Conversion rate was significantly higher for emergency operation but there was no difference in the overall complication or re-admission rate.

	Elective N = 874	**Emergency N = 83**	**P-value**
Age (years)	42.5 ± 10.3	35.5 ± 9.2	<0.001
Operating time (min)	118.1 ± 23.3	84.4 ± 43.2	<0.001
Blood loss (ml)	231 ± 304	78 ± 90	<0.001
Post-operative hospital stay (days)	3.2 ± 2.1	4.3 ± 3.7	<0.001
Conversion	18 (2.1)	7 (8.4)	0.004
Complication	85 (9.7)	7 (8.4)	NS
Re-admission	14 (1.6)	1 (1.2)	NS

Data are presented as mean ± SD or N (%)
NS: Not significant

6 LAPAROSCOPIC SURGERY - LEVEL 5 PROCEDURES

Total number of patients 14

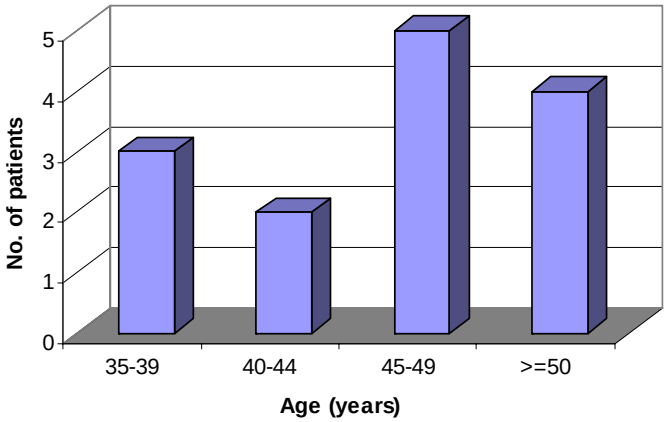
Compared to 1997, the number of level 5 procedures increased from 6 to 14. The number remained small and all except 1 were related to gynaecological malignancy.

CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Of the 14 cases reported, 12 were performed in one single unit while the other 2 were performed in 2 different hospitals.

AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 47.4 (SD 8.9) years. No patients were younger than 35 and 28.6% aged 50 or above.



Distribution of age

35 – 39 years	3	(21.4%)
40 – 44 years	2	(14.3%)
45 – 49 years	5	(35.7%)
≥ 50 years	4	(28.6%)
Total	**14**	

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

Four patients had previous laparotomy before, the other did not have any operation done.

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operations were all performed by doctors with advanced level of accreditation. The operations were assisted by doctors with advanced accreditation except in 2 operations where the assistant did not have the accreditation.

Both the surgeon and assistant were specialists except in one case where the assistant was a doctor with MRCOG.

OPERATIVE DIAGNOSIS

All except one patient were diagnosed to have carcinoma of corpus, the remaining one had uterine fibroid and pelvic endometriosis.

SURGICAL MODALITIES

Both bipolar and unipolar electrocautery were used in virtually all patients, while ultracision was used in 3 cases. Suture was used in one undergoing high McCall repair.

Uipolar electrocautery	13	(92.9%)
Bipolar electrocautery	14	(100%)
Suture	1	(7.1%)
Ultracision	3	(21.4%)
Clips/Staples	0	(0.0%)
Use of drain	12	(85.7%)

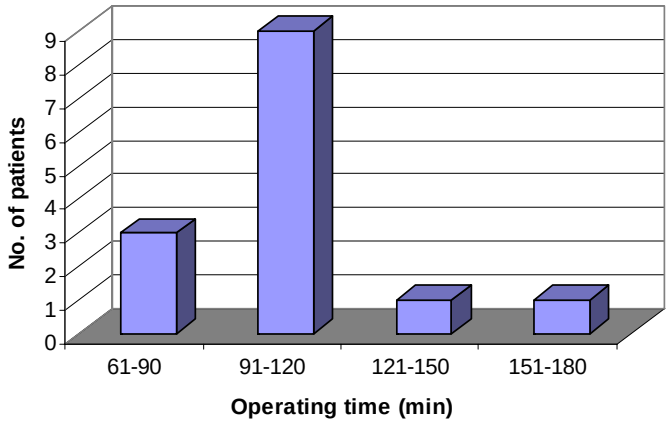
Data are presented as number and percentage of total number of patients

OPERATIVE PROCEDURES

Of the 13 patients with carcinoma of corpus, all underwent laparoscopic hysterectomy with pelvic lymphadenectomy, except one who had a pelvic lymphadenectomy only. The remaining patient underwent laparoscopic hysterectomy together with a high McCall repair.

OPERATING TIME

The mean operating time was 110 (SD 25.6) minutes. 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.

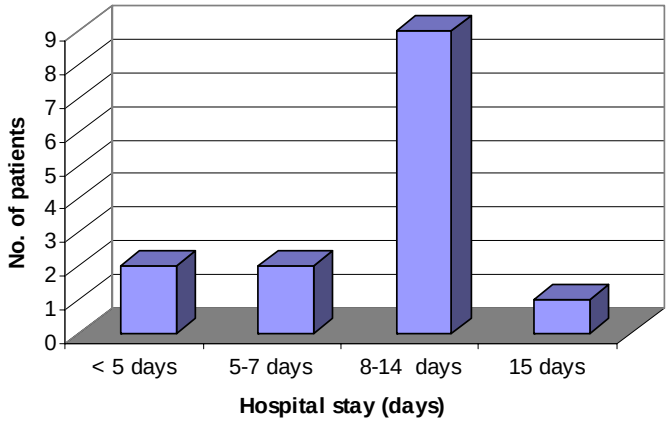


Distribution of operating time

61 – 90 minutes	3	(21.4%)
91 – 120 minutes	9	(64.3%)
121 – 150 minutes	1	(7.1%)
151 – 180 minutes	1	(7.1%)
Total	**14**	

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 9.3 (SD 4.0) days. The patient with high McCall repair stayed for 2 days while the one with pelvic lymphadenectomy only stayed for 4 days. The rest of the patients stayed between 5 and 15 days.



Number of missing data: 5 (1.3%)

Distribution of post-operative hospital stay

< 5 days	2	(14.3%)
5 – 7 days	2	(14.3%)
8 – 14 days	9	(64.3%)
≥ 15 days	1	(7.1%)
Total	**14**	

COMPLICATIONS

Two patients required a conversion to laparotomy, one was associated with haemorrhage and the other was not specified. There were no other complications reported. No patients required re-operation or re-admission to hospital.

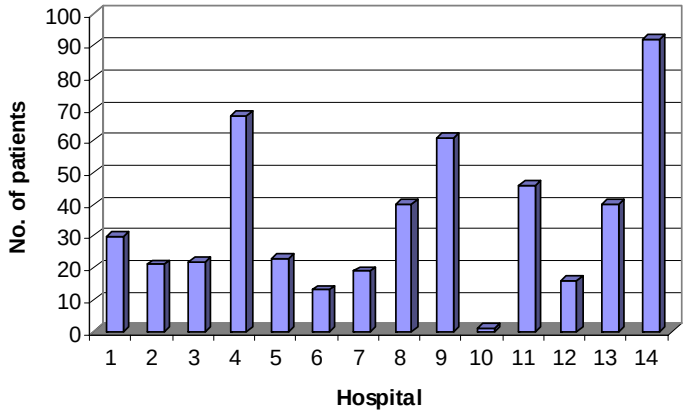
7 LAPAROSCOPIC HYSTERECTOMY

Total number of patients 492

Compared to 1997, there was a 2.4 fold increase in the number of level 4 procedures with the actual number increased from 209 to 492.

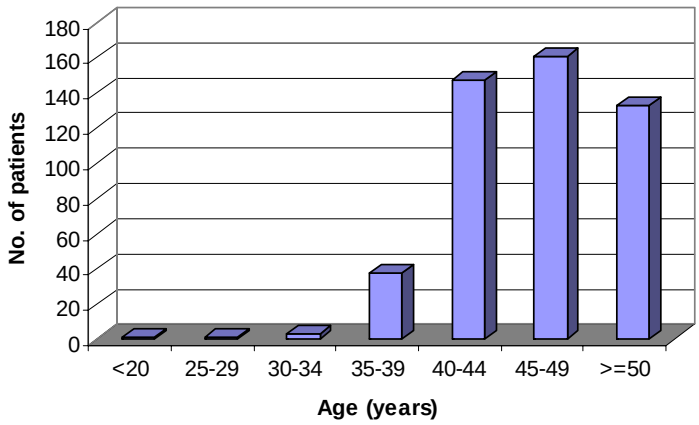
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Laparoscopic hysterectomy was performed in 14 hospitals, compared to 12 in 1997. All except 2 units performed more than 20 cases a year and 3 units performed more than 60 a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 47.6 (SD 8.4), similar to that of 47.5 (SD 9.0) in 1997. Over 85% of patients were 40 or older and 1% of patients was younger than 35.



Distribution of age

	1997	2002
< 30 years	0 (0.0%)	2 (0.4%)
30 – 34 years	2 (1.0%)	3 (0.6%)
35 – 39 years	25 (12.0%)	38 (7.9%)
40 – 44 years	61 (29.1%)	147 (30.4%)
45 – 49 years	65 (31.1%)	161 (33.3%)
≥ 50 years	56 (26.8%)	133 (27.5%)
Total	**209**	**484**

No. of missing data: 8 (1.6%))

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	142 (67.9%)	266 (61.3%)
Laparotomy	61 (29.2%)	145 (33.4%)
Operative laparoscopy	6 (2.9%)	23 (5.3%)
Total	**209**	**434**

No. of missing data: 58 (11.8%)

QUALIFICATIONS OF SURGEON AND ASSISTANT

Similar to 1997, the operation was mainly performed by specialists (92.9% versus 94.6% in 1997). Pre-membership doctors performed only 4 procedures (0.9%), compared to none in 1997; of which half was assisted by specialists and the other half by doctors with MRCOG. The operations were assisted by specialists in 54.1% (51.5% in 1997) and by nurses in 23.5% (8.8% in 1997) of cases.

Assistant / Surgeon	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	0	2	2	0	**4**
MRCOG	0	0	29	0	**29**
FHKAM	14	55	175	12	**256**
FRCOG	8	26	47	98	**179**
Total	**22**	**83**	**253**	**110**	**468**

Number of missing data: 24 (4.9%)

About 20% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 8.4% were assisted by doctors without accreditation and 48.2% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 20%, of which 25% were assisted by doctors without advanced accreditation. For those procedures performed by doctors with advanced accreditation, 18.5% were assisted by doctors without accreditation and 24.8% by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	7	3	33	40	**83**
Intermediate	6	17	63	0	**86**
Advanced	67	50	79	67	**263**
Total	**80**	**70**	**175**	**107**	**432**

Number of missing data: 60 (12.2%)

OPERATIVE DIAGNOSIS

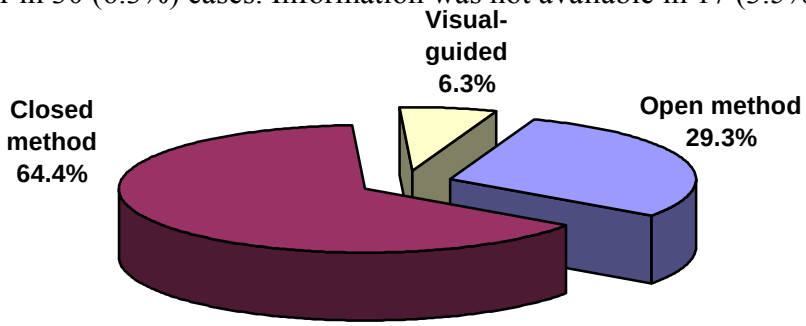
Some patients could have more than one diagnosis. Fibromyoma was the most common diagnosis and accounted for 52.6%. Laparoscopic hysterectomy was performed in 15 patients (7.2%) in the presence of genital prolapse.

	1997	**2002**
Fibromyoma	110 (52.6%)	279 (56.7%)
Adnexal masses	36 (17.2%)	60 (12.2%)
Adhesions	30 (14.4%)	71 (14.4%)
Carcinoma of corpus	0 (0.0%)	16 (3.3%)
CIN/Microinvasive carcinoma of cervix	20 (9.6%)	5 (1.0%)
Carcinoma of cervix	0 (0.0%)	3 (0.6%)
Endometriosis	19 (9.1%)	47 (9.6%)
Adenomyosis	18 (8.6%)	60 (12.2%)
Dysfunctional uterine bleeding	15 (7.2%)	15 (3.0%)
Genital prolapse	15 (7.2%)	4 (0.8%)
Endometrial hyperplasia/polyps	14 (6.7%)	4 (0.8%)
Post-menopausal bleeding	5 (2.4%)	4 (0.8%)
Myohyperplasia	4 (1.9%)	0 (0.0%)
Others	3 (1.4%)	17 (3.5%)

OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 306 (64.4%) of cases. Open method was used in 139 (29.2%) and visually guided trocar in 30 (6.3%) cases. Information was not available in 17 (3.5%).

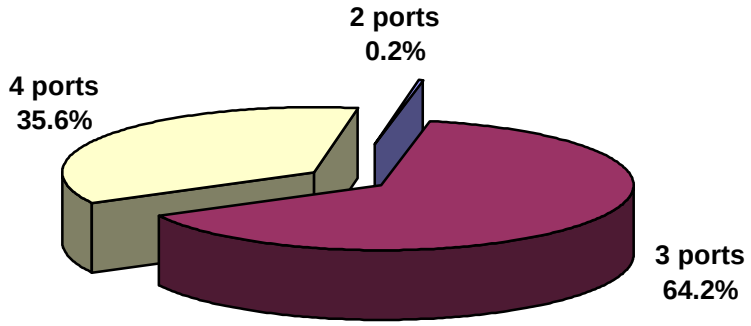


Number of missing data: 17 (3.5%)

The primary trocar was inserted through the umbilical incision in 456 cases, and supraumbilically in 2. The left upper quadrant insertion was used in 4 cases, 3 were associated with previous laparotomy. Information on site of primary trocar entry was not available in 30 (6.1%)

Number of ports used

The procedures were performed using 3 ports in 64.2% of cases, 4 ports in 35.6% and 2 ports in 0.2%.



Number of missing data: 20 (4.0%)

SURGICAL MODALITIES

Similar to 1997, electrocautery was used in over 95% of cases (97.1% in 1997); of which bipolar energy alone was used in 166 (35.3%), unipolar alone in 2 (0.4%) and both in 302 (64.3%). Suture was used in 16.3% compared to 11.0% in 1997. Ultracision, which was not used in 1997, was used in 17.9%. There was also an increase use of pelvic drain from 7.7% to 20.3%.

	1997	2002
Electrocautery	203 (97.1%)	470 (95.5%)
Ultracision	0 (0.0%)	88 (17.9%)
Suture	23 (11.0%)	80 (16.3%)
Endoloop	8 (3.8%)	7 (1.4%)
Laser	4 (1.9%)	0 (0.0%)
Clips/Staples	20(9.6%)	4 (0.8%)
Use of drain	16 (7.7%)	100 (20.3%)

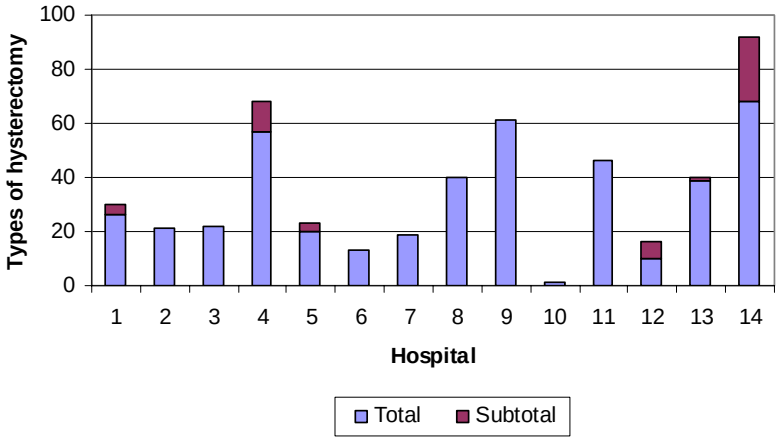
Number of missing data: 5 (2.4%)

TYPES OF HYSTERECTOMY

There was an increase in the incidence of subtotal hysterectomy and the ratio of subtotal to total hysterectomy was 1 in 10, compared to 1 in 200 in 1997.

	1997	2002
Total hysterectomy	201 (96.1%)	443 (90%)
Subtotal hysterectomy	1 (0.5%)	49 (10%)
Not specified	7 (3.3%)	0 (0%)
Total	**209**	**492**

Only 5 of the 14 units performed laparoscopic subtotal hysterectomy with the ratio ranging from 1 in 3 to 1 in 39.

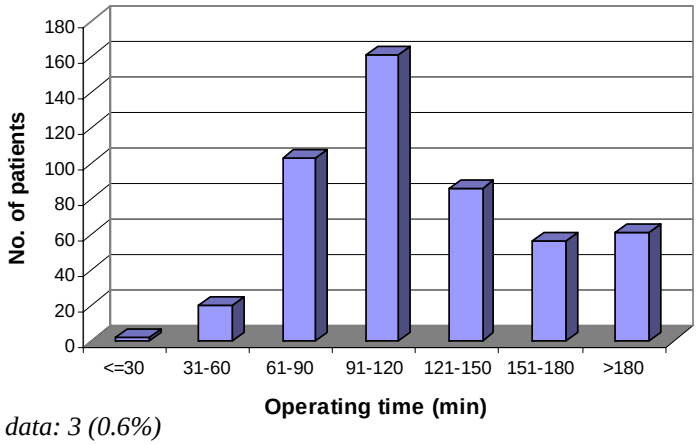


CONCURRENT OPERATION

	1997	2002
Salpingo-oophorectomy	78 (37.3%)	154 (31.3%)
Cystectomy	3 (1.4%)	4 (0.8%)
Pelvic floor repair (vaginal)	5 (2.4%)	1 (0.2%)
Pelvic lymphadenectomy	1 (0.5%)	10 (2.0%)
Colposuspension	1 (0.5%)	12 (2.4%)

OPERATING TIME

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



Number of missing data: 3 (0.6%)

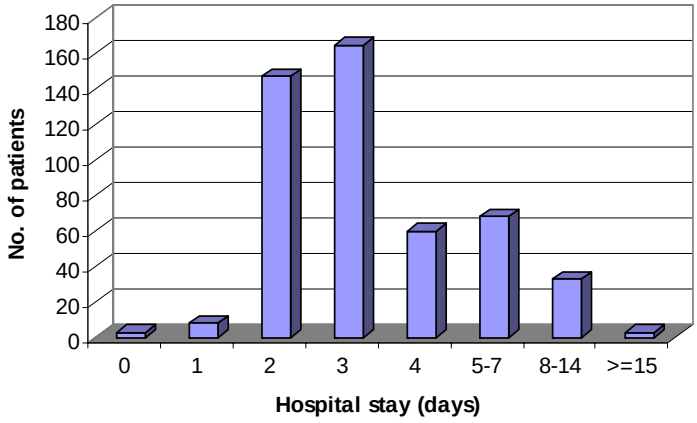
Distribution of operating time

	1997	2002
≤ 30 minutes	1 (0.5%)	2 (0.4%)
31 – 60 minutes	17 (8.2%)	20 (4.0%)
61 – 90 minutes	62 (30.0%)	103 (21.1%)
91- 120 minutes	70 (33.8%)	161 (32.9%)
121 – 150 minutes	24 (11.6%)	86 (17.6%)
151 – 180 minutes	12 (5.8%)	56 (11.5%)
> 180 minutes	21 (10.1%)	61 (12.5%)
Total	**207**	**489**

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

POST-OPERATIVE HOSPITAL STAY

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



Number of missing data: 2 (1.0%)

Distribution of post-operative hospital stay

	1997	2002
0 day	0 (0.0%)	3 (0.6%)
1 day	2 (1.0%)	8 (1.6%)
2 days	40 (19.1%)	147 (30.2%)
3 days	69 (33.0%)	165 (33.9%)
4 days	29 (13.9%)	60 (12.3%)
5 – 7 days	49 (23.4%)	68 (14.0%)
8 – 14 days	17 (8.1%)	33 (6.8%)
≥ 15 days	3 (1.4%)	3 (0.6%)
Total	**209**	**487**

No. of missing data: 5 (1.0%)

CONVERSION

Conversion to laparotomy was necessary in 10 patients (2.0%), 4 because of dense adhesions, 2 due to uncontrolled haemorrhage and 1 because of bladder injury. Compared to 1997, the incidence was reduced by 2.4 fold.

	1997	2002
Dense adhesions	6 (2.9%)	4 (0.8%)
Ureteric injury	1 (0.5%)	0 (0.0%)
Bladder injury	1 (0.5%)	1 (0.2%)
Bowel injury	1 (0.5%)	0 (0.0%)
Uncontrolled haemorrhage	1 (0.5%)	2 (0.4%)
Unspecified	0 (0.0%)	3 (0.6%)
Total	**10 (4.8%)**	**10 (2.0%)**

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

COMPLICATIONS

Compared to 1997, the overall complication rate of laparoscopic hysterectomy reduced from 24.4% to 12.6%. The incidence of organ injury reduced from 3.3% to 1.8% and significant haemorrhage from 4.3% to 2.0%. The incidence of febrile morbidity reduced from 8.1% to 3.3%. There was however an increase in the incidence of vault haematoma from 1.4% to 2.8%.

	1997	**2002**
Bladder injury	4 (1.9%)	4 (0.8%)
Ureteric injury	2 (1.0%)	3 (0.6%)
Bowel injury	1 (0.5%)	1 (0.2%)
Haemorrhage requiring transfusion	9 (4.3%)	10 (2.0%)
Surgical emphysema	0 (0.0%)	2 (0.4%)
Febrile morbidity	17(8.1%)	16 (3.3%)
Urinary tract infection	7 (3.3%)	5 (1.0%)
Retention of urine	6 (2.9%)	2 (0.4%)
Wound complication	5(2.4%)	1 (0.2%)
Vault haematoma	3 (1.4%)	14 (2.8%)
Ileus	0 (0.0%)	1 (0.2%)
Deep vein thrombosis	1 (0.5%)	2 (0.4%)
Omental herniation through umbilicus	1 (0.5%)	0 (0.0%)
Conversion	10 (4.8%)	10 (2.0%)
Re-operation	3 (1.4%)	1 (0.2%)
Re-admission	3 (1.4%)	12 (2.4%)
Lost needle tip	0 (0.0%)	1 (0.2%)
Total	**51 (24.4%)**	**62 (12.6%)**

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

RE-OPERATION

One patient required re-operation because of ureteric fistula, giving the re-operation rate of 0.2%, compared to 1.2%.

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

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

RE-ADMISSION

Twelve patients required re-admission to hospital and the incidence was double that in 1997 (2.4% versus 1.2% in 1997). The main reason for re-admission was vault haemorrhage.

	1997	2002
Vault/secondary haemorrhage	2 (1.0%)	5 (1.0%)
Acute pelvic infection	0 (0.0%)	1 (0.2%)
Repair of ureteric fistula	0 (0.0%)	1 (0.2%)
Wound pain	1 (0.5%)	0 (0.0%)
Unspecified	0 (0.0%)	5 (1.0%)
Total	**3 (1.2%)**	**12 (2.4%)**

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 difference in the conversion rate, complication rate and re-admission rate, but the sample size may not be large enough.

	Total N = 442	Subtotal N = 49	P-value
Age (years)	48.2 ± 8.6	42.4 ± 3.3	<0.001
Operating time (min)	130 ± 53	113 ± 36	0.003
Blood loss (ml)	301 ± 268	209 ± 230	0.02
Post-operative hospital stay (days)	3.8 ± 2.8	2.9 ± 1.2	<0.001
Conversion	9 (2.0)	1 (2.0)	NS
Complication	57 (12.9)	5 (10.2%)	NS
Ureteric injury	*3 (0.7)*	*0 (0.0*	*NS*
Bladder injury	*3 (0.7)*	*1 (2.0)*	*NS*
Bowel injury	*1 (0.2)*	*0 (0.0)*	*NS*
Febrile	*15 (3.4)*	*1 (2.0)*	*NS*
Pelvic/vault haematoma	*14 (3.2)*	*0 (0.0)*	*NS*
Re-admission	11 (2.5)	1 (0.6)	NS

Data are presented as mean ± SD or N (%)
NS: Not significant

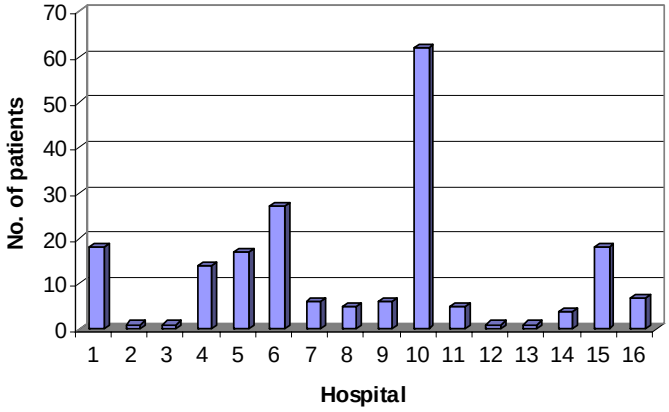
8 LAPAROSCOPIC MYOMECTOMY

Total number of patients 193

Compared to 1997, there was a 2.2 fold increase in the number of level 4 procedures with the actual number increased from 86 to 492. As no separate analysis was performed for this procedure in 1997, there was no data for comparison.

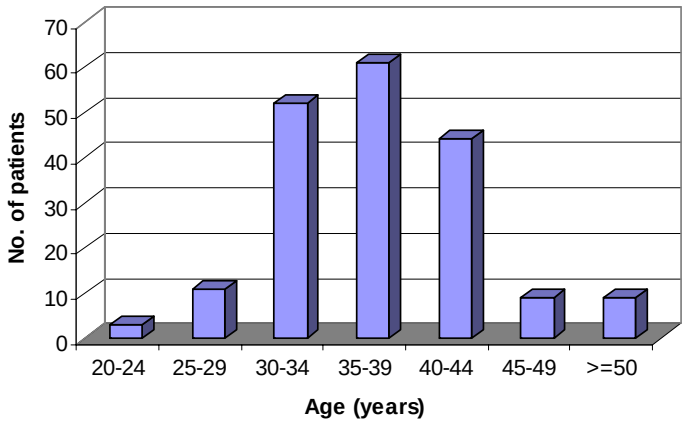
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Laparoscopic myomectomy was performed in 16 hospitals. The number performed in each unit was small except one which performed over 60 cases a year.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 37.5 (SD 6.3). Over 30% of patients aged 40 or above and about 5% aged 50 or above.



No. of missing data: 4 (2.1%)

Distribution of age

20 – 24 years	3 (1.6%)
25 – 29 years	11 (5.8%)
30 – 34 years	52 (27.5%)
35 – 39 years	61 (32.3%)
40 – 44 years	44 (32.2%)
45 – 49 years	9 (4.8%)
≥ 50 years	9 (4.8%)
Total	**189**

No. of missing data: 4 (2.1%)

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

Nil	121 (73.8%)
Laparotomy	29 (17.7%)
Operative laparoscopy	14 (8.5%)
Total	**164**

No. of missing data: 29 (15.0%)

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by specialists (91.0%). Pre-membership doctors performed only 3 procedures (1.7%), of which all were assisted by specialists. Almost half of the operations were assisted by nurses and a third by specialists.

Assistant / Surgeon	Assistant				Total
	MBBS	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	0	0	3	0	**3**
MRCOG	1	0	12	0	**13**
FHKAM	5	10	29	13	**57**
FRCOG	4	12	15	73	**104**
Total	**10**	**22**	**59**	**86**	**177**

Number of missing data: 16 (8.3%)

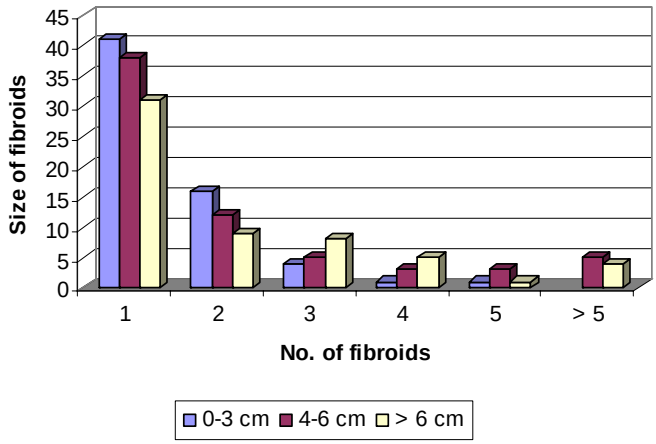
About 35% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 7.1% were assisted by doctors without accreditation and 58.9% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 12%, of which 68.4% were assisted by doctors without advanced accreditation. For those procedures performed by doctors with advanced accreditation, 17.3% were assisted by doctors without accreditation and 50% by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	Intermediate	Advanced	Nurse	
Nil	4	3	16	33	**56**
Intermediate	3	10	6	0	**19**
Advanced	21	7	11	48	**87**
Total	**28**	**20**	**33**	**81**	**162**

Number of missing data: 31 (16.1%)

OPERATIVE DIAGNOSIS

Information on the number and size of the fibroids were not available in 5 (2.6%) patients. The mean number of fibroids was 2 (range 1-10). About 60% of patients had solitary fibroid and another 20% with 2 fibroids. Size of the fibroids were distributed evenly with a third of 3 cm or less, a third between 4-6 cm and another third greater than 6 cm



No. of fibroids	Size of fibroids			Total
	<= 3 cm	4-6 cm	> 6 cm	
1	41	38	31	110
2	16	12	9	37
3	4	5	8	17
4	1	3	5	9
5	1	3	1	5
> 5	0	5	4	9
Total	**63**	**66**	**58**	**187**

Number of missing data: 6 (3.1%)

CONCURRENT PATHOLOGY

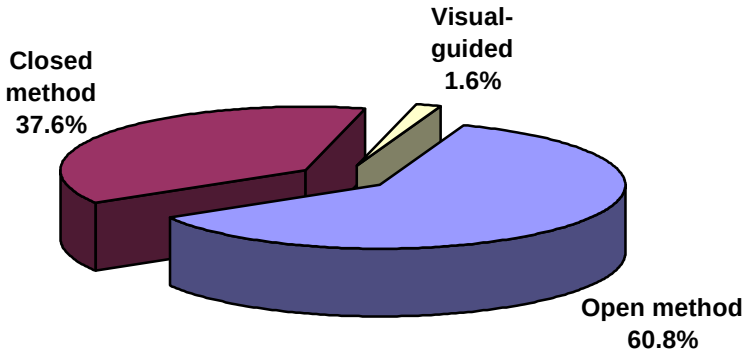
Ovarian cyst was the most common concurrent pathology encountered during laparoscopic myomectomy.

Ovarian cyst	54 (28.0%)
Adhesions	35 (18.1%)
Endometriosis	29 (15.0%)
Paraovarian cyst	10 (5.2%)
Hydrosalpinx	5 (2.6%)
Tubal pregnancy	2 (1.0%)
Tubo-ovarian abscess/pyosalpinx	2 (1.0%)

OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 113 (60.8%) of cases. Open method was used in 70 (37.6%) and visually guided trocar in 3 (1.6%) cases. Information was not available in 7 (3.6%).

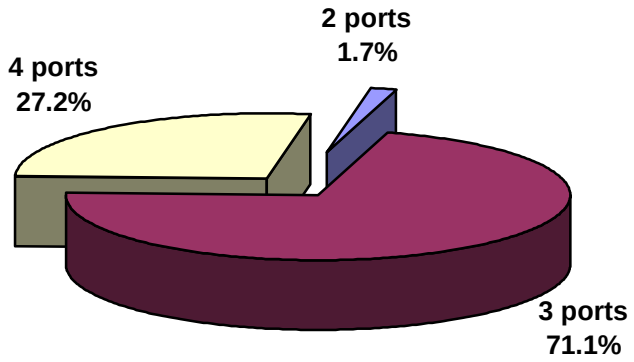


Number of missing data: 7 (3.6%)

The primary trocar was inserted through the umbilical incision in 183 cases and supraumbilically in 2. The left upper quadrant insertion was not used. Information on site of primary trocar entry was not available in 8 (4.1%).

Number of ports used

The procedures were performed using 3 ports in 71.1% of cases, 4 ports in 27.2% and 2 ports in 1.7%.



Number of missing data: 13 (6.7%)

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%.

Electrocautery	171 (88.6%)
Ultracision	33 (17.1%)
Suture	120 (62.2%)
Endoloop	1 (0.5%)
Laser	0 (0.0%)
Clips/Staples	4 (2.1%)
Use of drain	55 (28.5%)

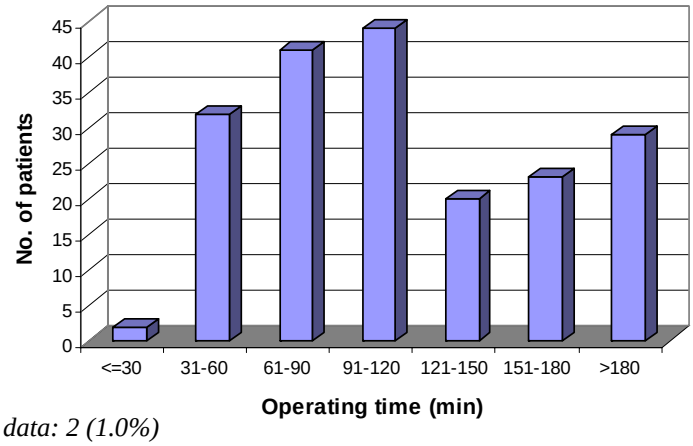
CONCURRENT OPERATION

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

Cystectomy	54 (28.0%)
Salpingo-oophorectomy	10 (5.2%)
Salpingectomy	4 (2.1%)
Salpingostomy	3 (1.6%)
Adhesiolysis	26 (13.5%)
Ablation of endometriosis	12 (6.2%)
LUNA	1 (0.5)

OPERATING TIME

The mean operating time was 125.6 (SD 71.8) minutes. The operating time was 60 minutes or less in 17.6% and exceeded 180 minutes in 15.0%.



Number of missing data: 2 (1.0%)

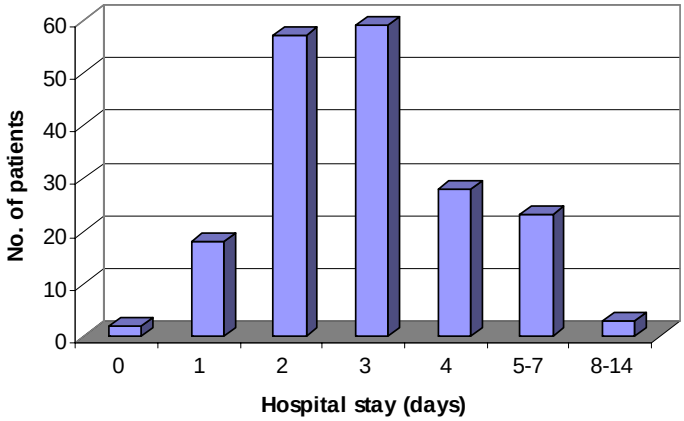
Distribution of operating time

≤ 30 minutes	2 (1.0%)
31 – 60 minutes	32 (16.6%)
61 – 90 minutes	41 (21.2%)
91- 120 minutes	44 (22.8%)
121 – 150 minutes	20 (10.4%)
151 – 180 minutes	23 (11.9%)
> 180 minutes	29 (15.0%)
Total	**191**

Number of missing data: 2 (1.0%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 3.0 (SD 1.5) days. The patients were discharged within the first days in 10.3% and 1.6% stayed longer than 7 days.



Number of missing data: 3 (1.6%)

Distribution of post-operative hospital stay

0 day	2 (1.0%)
1 day	18 (9.3%)
2 days	57 (29.5%)
3 days	59 (30.6%)
4 days	28 (14.5%)
5 – 7 days	23 (11.9%)
8 – 14 days	3 (1.6%)
Total	**190**

No. of missing data: 3 (1.6%)

CONVERSION

Conversion to laparotomy was required in 5 patients (2.6%), 1 because of uncontrolled haemorrhage, 1 due to broken needle and the other 3 were not specified.

Uncontrolled haemorrhage	1 (0.5%)
Broken needle	1 (0.5%)
Unspecified	3 (1.6%)
Total	**5 (2.6%)**

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

COMPLICATIONS

Ten patients had complication, giving an incidence of 5.2%. Significant haemorrhage occurred in 2 (1.0%). The incidence of febrile morbidity was low (0.5%). No patients required re-operation or re-admission to hospitals.

Haemorrhage requiring transfusion	2 (1.0%)
Febrile morbidity	1 (0.5%)
Retention of urine	1 (0.5%)
Wound complication	1 (0.5%)
Deep vein thrombosis	1 (0.5%)
Conversion	5 (2.6%)
Total	**10 (5.2%)**

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

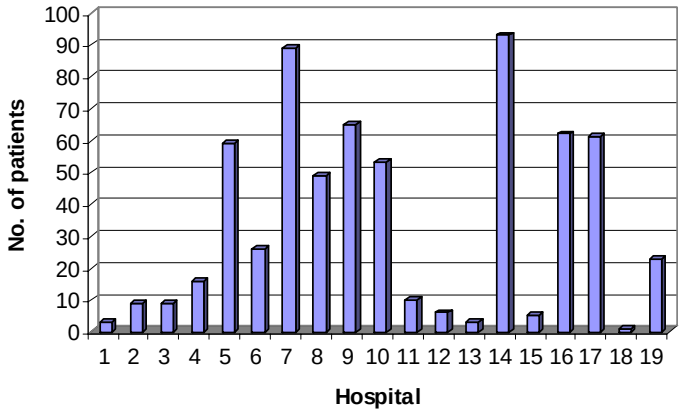
9 LAPAROSCOPIC MANAGEMENT OF ECTOPIC PREGNANCY

Total number of patients 643

Compared to 1997, there was a 1.5 fold increase in the number of level 4 procedures with the actual number increased from 420 to 643.

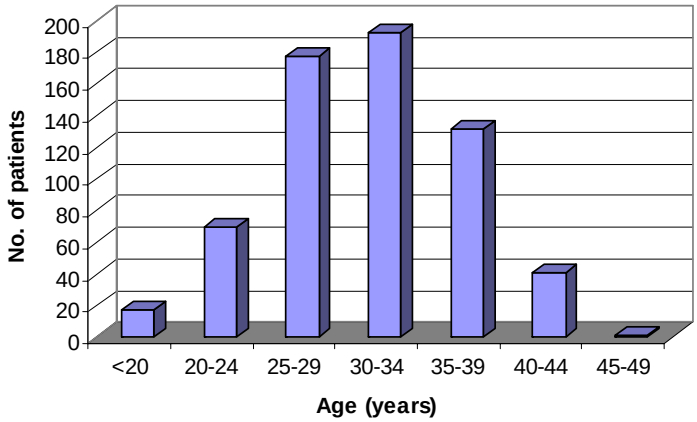
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Half of the units still performed less than 30 cases a year while 7 units performed more than 50 a year.



AGE DISTRIBUTION OF PATIENTS

The distribution of age was similar to that in 1997. The mean age of the patients was 30.8 (SD 5.9) years, similar to 30.1 (SD 5.8) in 1997. Seventeen patients (2.7% versus 4.1% in 1997) were younger than 20 and 42 (6.7% versus 5.5% in 1997) aged 40 or above.



Number of missing data: 14 (2.2%)

Distribution of age

	1997	2002
< 20 years	17 (4.1%)	17 (2.7%)
20 – 24 years	58 (13.8%)	70 (11.1%)
25 – 29 years	114 (27.2%)	177 (28.1%)
30 – 34 years	129 (30.8%)	192 (30.5%)
35 – 39 years	78 (18.6%)	131 (20.8%)
40 – 44 years	22 (5.3%)	41 (6.5%)
45 – 49 years	1 (0.2%)	1 (0.2%)
Total	**419**	**629**

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

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	310 (73.8%)	427 (75.3%)
Laparotomy	78 (18.6%)	83 (14.6%)
Operative laparoscopy	27 (6.4%)	57 (10.1%)
Both	5 (1.2%)	-
Total	**420**	**567**

Number of missing data: 76 (11.8%) in 2002

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by doctors with MRCOG (36.4% versus 57.9% in 1997) and specialists (39.7% versus 35.0% in 1997). Pre-membership doctors performed 147 procedures (23.9% versus 7.1% in 1997), of which 6 (8.8%) were assisted by pre-membership doctors. Almost half of the operations were assisted by specialists (22.9% in 1997) and only 5.8% were assisted by nurses (11.1% in 1997).

Surgeon \ Assistant	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	6	35	106	0	**147**
MRCOG	60	16	145	3	**224**
FHKAM	129	29	40	13	**211**
FRCOG	3	1	9	20	**33**
Total	**198**	**81**	**300**	**36**	**615**

Number of missing data: 28 (4.4%)

About 64% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 33.6% were assisted by doctors without accreditation and 5.6% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 32%, of which 29% were assisted by doctors with accreditation. Only 4% of the procedures were performed by doctors with advanced accreditation, 30% were assisted by doctors without accreditation and 55% by nurses.

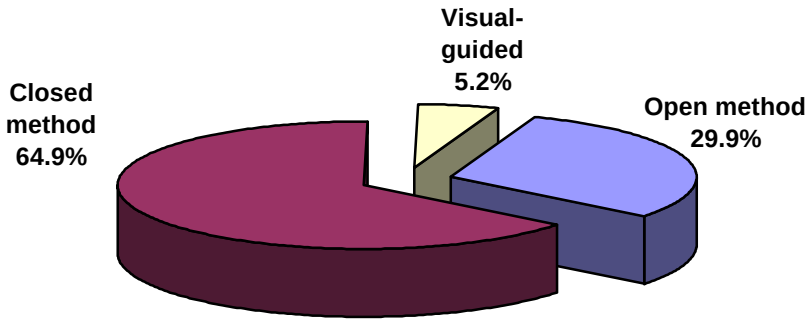
Surgeon \ Assistant	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	108	155	40	18	**321**
Intermediate	111	38	9	2	**160**
Advanced	6	2	1	11	**20**
Total	**225**	**195**	**50**	**31**	**501**

Number of missing data: 142 (22.1%)

OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 408 (64.9%) of cases. Open method was used in 188 (29.9%) and visually guided trocar in 33 (5.2%) cases. Information was not available in 14 (2.2%).

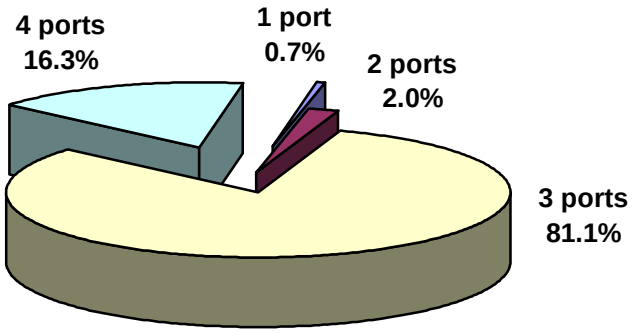


Number of missing data: 14 (2.2%)

The primary trocar was inserted through the umbilical incision in 616 cases. The supraumbilical and left upper quadrant was used for trocar insertion in 1 patient each; both of them had a previous laparotomy. Information on site of primary trocar entry was not available in 25 (3.9%)

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%.



Number of missing data: 29 (4.5%)

SURGICAL MODALITIES

Similar to 1997, electrocautery was used in over 90% of cases (91.7% in 1997); of which bipolar energy alone was used in 432 (73.0%), unipolar alone in 19 (3.2%) and both in 141 (23.8%). Endoloop was used in 5.8% (8.8% in 1997).

	1997	2002
Electrocautery	385 (91.7%)	592 (92.1%)
Suture	5 (1.2%)	13 (2.0%)
Endoloop	37 (8.8%)	37 (5.8%)
Ultracision	0 (0.0%)	5 (0.8%)
Laser	0 (0.0%)	0 (0.0%)
Clips/Staples	2 (0.5%)	1 (0.2%)
Use of drain	26 (6.2%)	17 (2.6%)

Number of missing data: 5 (2.4%)

TYPES OF ECTOPIC PREGNANCY

Ectopic pregnancy occurred on the right side in 349 (54.3%) patients, left side in 291 (45.2%) and was not specified in 3 (0.5%). The corresponding figures in 1997 were 49.8%, 46.9% and 3.3% respectively. The incidence of cornual/interstitial pregnancy appeared to increased from 1.7% to 3.6%.

	1997	2002
Tubal pregnancy	409 (97.3%)	*532 (82.7%)*
Fimbrial	*20 (4.9%)*	*7 (1.3%)*
Ampullary	*230 (56.2%)*	*450 (84.6%)*
Isthmus	*29 (7.1%)*	*34 (6.4%)*
Interstitial	*4 (1.0%)*	*9 (1.7%)*
Cornual	*3 (0.7%)*	*10 (1.9%)*
Whole tube involved	*11 (2.7%)*	*14 (2.6%)*
Not specified	*112 (27.4%)*	8 (1.5%)
Ovarian pregnancy	2 (0.5%)	2 (0.3%)
Abdominal pregnancy	2 (0.5%)	0 (0.0%)
Not specified	7 (1.7%)	109 (17.0%)
Total	**420**	**643**

The ectopic pregnancy was ruptured in 182 patients (28.7% versus 28.6%). Haemoperitoneum was present in 526 patients (81.8% versus 71.9% in 1997) and 88 patients (13.7%) were haemodynamically unstable. The mean volume of haemoperitoneum was 211 (SD 206) ml compared to 360 (SD 485) ml in 1997.

OPERATIVE PROCEDURES

Salpingectomy was performed in 513 patients (85.6%), 14 of which had an attempt of salpingostomy. Salpingostomy was performed successfully in 74 patients (12.4%), compared to 26.5%. Although there were 10 cornual pregnancies reported, cornual resection was reported in only 2 cases. The 2 ovarian ectopic pregnancies were treated by ovarian cystectomy.

	1997	**2002**
Salpingectomy	285 (69.2%)	513 (85.6%)
Salpingostomy	109 (26.5%)	74 (12.4%)
Removal of products of gestation	9 (2.2%)	1 (0.2%)
Salpingo-oophorectomy	3 (0.7%)	6 (1.0%)
Cornual resection	2 (0.5%)	2 (0.3%)
Ovarian cystectomy	2 (0.3%)	2 (0.3%)
Control of bleeding	2 (0.5%)	1 (1.0%)
Miscellaneous	2 (0.4%)	0 (0.0%)
Total	**412**	**599**

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

CONCURRENT OPERATIVE PROCEDURES

	1997	**2002**
Adhesiolysis	40 (9.5%)	79 (12.3%)
Cystectomy	17 (4.0%)	28 (4.4%)
Sterilization	6 (1.4%)	24 (3.7%)
Ablation of endometriosis	4 (1.0%)	6 (0.9%)
Oophorectomy	0 (0.0%)	2 (0.3%)
Myomectomy	0 (0.0%)	2 (0.3%)
Miscellaneous	2 (0.4%)	0 (0.0%)

SALPINGOSTOMY RATE

Including the 14 failed cases, salpingostomy was performed in a total of 88 cases of all tubal pregnancies (16.5%). Excluding those units that had performed a few cases only, the rate of salpingostomy varied between 4.3% and 66.7%.

Hospital	Number of tubal pregnancy	Salpingostomy rate (%)
1	2	100.0
2	7	42.9
3	8	25.0
4	15	40.0
5	54	22.2
6	20	5.0
7	70	12.9
8	34	29.4
9	61	11.5
10	50	0.0
11	8	25.0
12	3	0.0
13	1	0.0
14	77	20.8
15	3	66.7
16	58	17.2
17	37	8.1
18	1	100.0
19	23	4.3
Overall	**532**	**16.4**

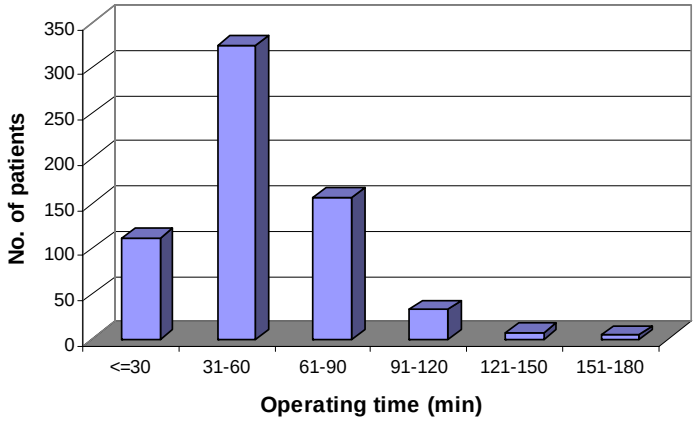
Comparison between salpingectomy and salpingostomy

	Salpingectomy N = 501	Salpingostomy N = 88
Mean operating time (min)	54.7	59.3
Mean post-operative hospital stay (days)	2.4	2.2
Complication rate (%)	4.4	2.3

No significant difference between the 2 groups

OPERATING TIME

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



Number of missing data: 9 (1.4%)

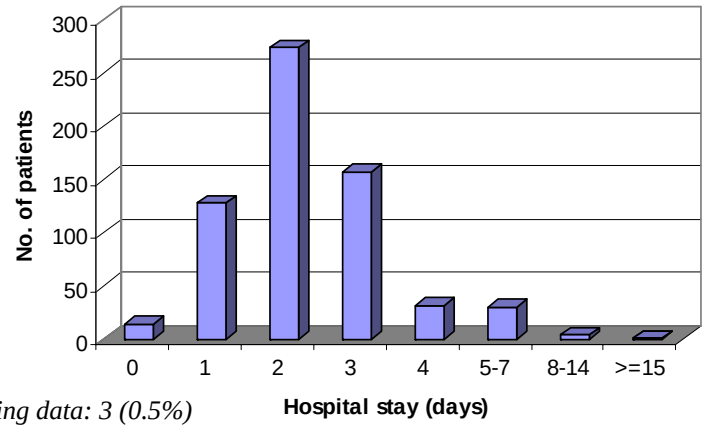
Distribution of operating time

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

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

POST-OPERATIVE HOSPITAL STAY

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



Number of missing data: 3 (0.5%)

Distribution of post-operative hospital stay

	1997	2002
0 day	3 (0.7%)	14 (2.2%)
1 day	88 (21.2%)	128 (20.0%)
2 days	168 (40.5%)	274 (42.8%)
3 days	108 (26.0%)	157 (24.5%)
4 days	29 (7.0%)	32 (5.0%)
5 – 7 days	15 (3.6%)	30 (4.7%)
8 – 14 days	2 (0.5%)	4 (0.6%)
≥ 15 days	2 (0.5%)	1 (0.2%)
Total	**415**	**640**

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

CONVERSION

Conversion to laparotomy was necessary in 22 patients and the incidence increased by 3 folds (3.4% versus 1.2% in 1997). The presence of dense pelvic adhesions and cornual/interstitial pregnancy accounted for most of the reasons for conversion.

	1997	2002
Dense adhesions	1 (0.2%)	6 (0.9%)
Cornual/Interstitial pregnancy	0 (0.0%)	6 (0.9%)
Unstable haemodynamics	0 (0.0%)	2 (0.3%)
Uncontrolled bleeding	2 (0.5%)	1 (0.2%)
Bowel injury	0 (0.0%)	1 (0.2%)
Failure in maintaining pneumoperitoneum	1 (0.2%)	0 (0.0%)
Severe haemoperitoneum	1 (0.2%)	0 (0.0%)
Unspecified	0 (0.0%)	6 (0.9%)
Total	**5 (1.2%)**	**22 (3.4%)**

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 5.8% (7.6% in 1997). As in 1997, there was one case of bowel injury. No case of persistent ectopic pregnancy was reported in this audit exercise, but 2 of the 5 cases of re-admission were associated with salpingostomy and 1 was reported to be due to failed salpingostomy.

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

Data are presented as number and percentage of total number of patients
** The percentage was based on the 109 cases of salpingostomy and 1 case of glucose injection*

RE-ADMISSION

Five patients (0.8%) required re-admission to hospital after laparoscopic surgery for ectopic pregnancy, 3 had undergone salpingectomy and 2 salpingostomy. This compared to 1.2% in 1997. No persistent ectopic pregnancy was reported in this audit exercise. However, failed salpingostomy was reported to be the reason for re-admission in 1 of the 2 patients undergoing salpingostomy.

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

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

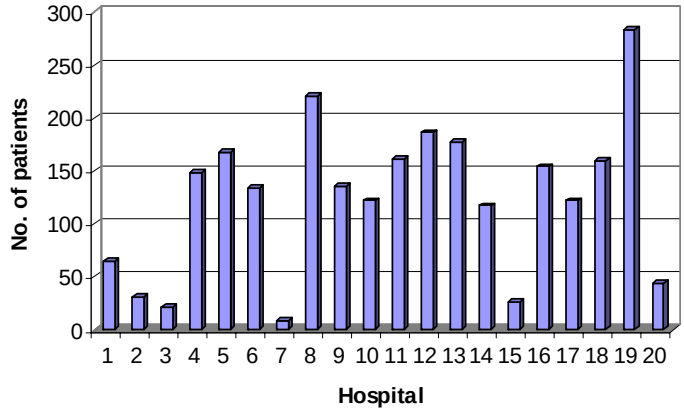
10 LAPAROSCOPIC MANAGEMENT OF ADNEXAL MASSES

Total number of patients 2,485

Compared to 1997, there was a 2.1 fold increase in the number of laparoscopic management of adnexal masess from 1,186 to 2,485,

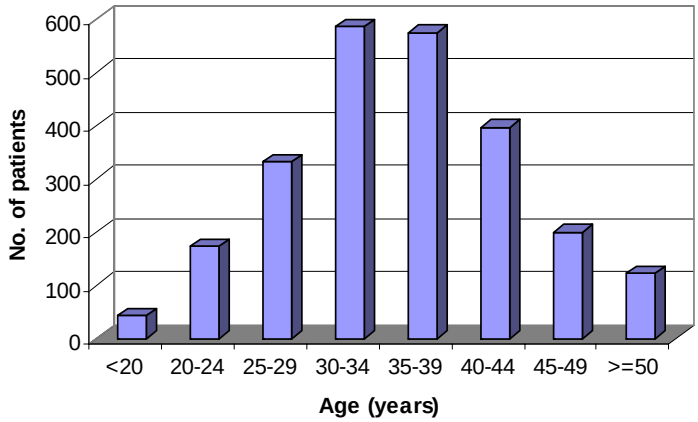
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

There was a general increase in the number of laparoscopic management of adnexal masses. Most units performed more than 100 cases a year. While 5 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 1997. The mean age of the patients was 35.6 (SD 8.8) years, compared to 35.4 (SD 8.6) in 1997. The age was less than 20 in 1.8% (2.5% in 1997) of patients and 50 or above in 5.1% (3.6% in 1997).



Number of missing data: 5 (0.4%)

Distribution of age

	1997	2002
< 20 years	30 (2.5%)	43 (1.8%)
20 – 24 years	69 (5.8%)	173 (7.1%)
25 – 29 years	166 (14.1%)	332 (13.7%)
30 – 34 years	291 (24.6%)	586 (24.1%)
35 – 39 years	299 (25.3%)	576 (23.8%)
40 – 44 years	205 (17.4%)	397 (16.3%)
45 – 49 years	78 (6.6%)	200 (8.2%)
≥ 50 years	43 (3.6%)	123 (5.1%)
Total	**1181**	**2429**

Number of missing data: 5 (0.4%) in 1997 and 56 (234%)

HISTORY OF PREVIOUS ABDOMINAL/PELVIC SURGERY

	1997	2002
Nil	913 (77.0%)	1540 (74.9%)
Laparotomy	227 (19.1%)	351 (17.1%)
Operative laparoscopy	39 (3.3%)	166 (8.1%)
Both	7 (0.6%)	-
Total	**1186**	**2057**

Number of missing data: 428 (17.2%) in 2002)

QUALIFICATIONS OF SURGEON AND ASSISTANT

The operation was mainly performed by specialists (64.5% versus 63.3% in 1997) and MRCOG (25.2% versus 30.8% in 1997). Pre-membership doctors performed 239 procedures (10.3% versus 5.9% in 1997), of which 4 (1.7%) were assisted by pre-membership doctors. About half of the operations were assisted by specialists (36.6% in 1997) and only 23.5% by nurses (23.5% in 1997).

Assistant / Surgeon	Assistant				Total
	MBBS	MRCOG	FHKAM	Nurse	
MBBS	4	17	217	1	**239**
MRCOG	41	20	513	6	**580**
FHKAM	270	134	349	192	**945**
FRCOG	44	55	100	343	**542**
Total	**359**	**226**	**1179**	**542**	**2306**

Number of missing data: 179 (7.2%)

Slightly over 50% of the procedures were performed by doctors without accreditation in gynaecological laparoscopy, of which 16.5% were assisted by doctors without accreditation and 25.6% were assisted by nurses. The procedures were performed by doctors with intermediate accreditation in about 28.3%, of which 46.0% were assisted by doctors without accreditation. About 18% of the procedures were performed by doctors with advanced accreditation, 28.7% were assisted by doctors without accreditation and 49.4% by nurses.

Surgeon \ Assistant	Assistant				Total
	Nil	**Intermediate**	**Advanced**	**Nurse**	
Nil	172	255	347	267	**1041**
Intermediate	253	125	151	21	**550**
Advanced	102	52	26	176	**356**
Total	**527**	**432**	**524**	**464**	**1947**

Number of missing data: 538 (21.6%)

TYPES OF ADNEXAL MASSES

Some patients could have more than one type of adnexal mass. Endometriotic cyst was the most common pathology encountered. Two of the ovarian cysts turned out to be malignant, 1 diagnosed on frozen section and the other on subsequent histology.

	1997	**2002**
Endometriotic cyst	563 (47.2%)	1362 (54.8%)
Ovarian cyst	463 (38.8%)	1185 (47.7%)
Dermoid cyst	154 (12.9%)	340 (13.7%)
Paraovarian cyst	41 (3.4%)	152 (6.1%)
Fimbrial cyst	18 (1.5%)	0 (0.0%)
Tubo-ovarian abscess	4 (0.3%)	4 (0.2%)

Bilateral disease occurred in 490 (19.7% versus 14.8% in 1997); of which 104 were of different pathology. As in 1997, endometriotic cyst was the most common bilateral disease (22.4% versus 20.8% in 1997). The incidence of bilateral disease for dermoid cyst was 10.7% (11.0% in 1997) and paraovarian cyst was 9.4% (7.3% in 1997).

	Unilateral	**Bilateral**
Ovarian cyst	1003 (91.7%)	91 (8.3%)
Endometriotic cyst	864 (77.6%)	249 (22.4%)
Dermoid cyst	274 (89.3%)	33 (10.7%)
Paraovarian cyst	126 (90.6%)	13 (9.4%)

The size of the adnexal mass was less than 5 cm in 50% of cases, between 5 and 8 cm in 40% and greater than 8 cm in 10%. The corresponding figures in 1997 were 48%, 44% and 8% respectively.

	< 5 cm	5 – 8 cm	> 8 cm
Ovarian cyst	666	404	115
Endometriotic cyst	643	611	108
Dermoid cyst	121	155	64
Paraovarian cyst	113	30	9
Total	**1543**	**1200**	**296**

LEVEL OF PROCEDURES

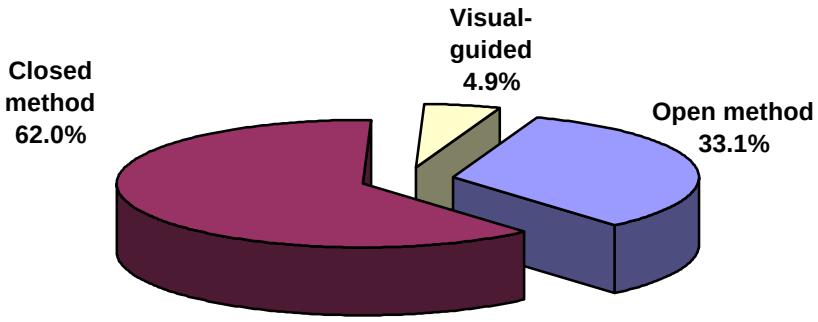
Most of the procedures performed were Level 3 (81.7% versus 89.1% in 1997). Forty-five (1.8%) cases were reported as a diagnostic procedure and so were classified as level 1.

	1997	2002
Level 1	0 (0.0%)	45 (1.8%)
Level 2	18 (1.5%)	31 (1.2%)
Level 3	1057 (89.1%)	2031 (81.7%)
Level 4	106 (8.9%)	300 (12.1%)
Unclassified	5 (0.4%)	78 (3.1%)
Total	**1186**	**2485**

OPERATIVE TECHNIQUES

Primary trocar entry technique

Closed method was the most common technique for primary trocar entry and was used in 1491 (62.0%) of cases. Open method was used in 796 (33.1%) and visually guided trocar in 119 (4.9%) cases. Information was not available in 79 (3.2%).

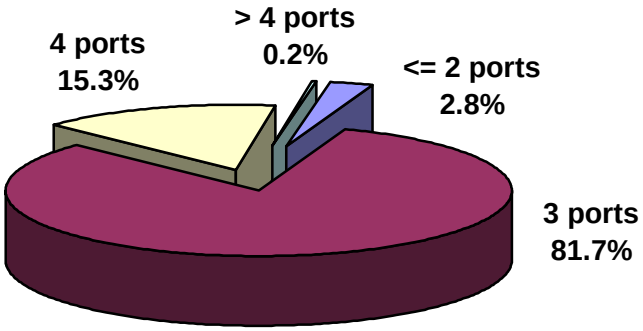


Number of missing data: 14 (2.2%)

The primary trocar was inserted through the umbilical incision in 2274 cases. The supraumbilical and left upper quadrant was used for trocar insertion in 33 (1.4%) and 24 (1.0%) respectively. Information on site of primary trocar entry was not available in 154 (6.2%)

Number of ports used

The procedures were performed using 3 ports in 81.7% of cases, 4 or more ports in 15.5% and 2 or less port in 2.8%.



Number of missing data: 160 (6.4%)

SURGICAL MODALITIES

Electrocautery was used in 87.4% (93.2% in 1997); of which bipolar energy alone was used in 1139 (52.4%), unipolar alone in 80 (3.7%) and both in 953 (43.8%). The use of laser decreased from 3.5% to 0.6%. Ultracision was used in 1.2% and suture in 5.6% (5.1% in 1997).

	1997	2002
Electrocautery	1105 (93.2%)	2172 (87.4%)
Ultracision	0 (0.0%)	29 (1.2%)
Suture	61 (5.1%)	140 (5.6%)
Endoloop	22 (1.9%)	23 (0.9%)
Laser	42 (3.5%)	15 (0.6%)
Clips/Staples	7 (0.6%)	5 (0.2%)
Use of drain	93 (7.8%)	204 (7.8%)

OPERATIVE PROCEDURES

Some patients could have more than one operative procedure performed. Cystectomy was the most common procedure performed and aspiration or fenestration of cyst was performed in only 5 cases. In 45 cases (1.8%), the laparoscopy was reported as a diagnostic procedure only.

	1997	2002
Cystectomy	968 (82.0%)	1910 (76.9%)
Salpingo-oophorectomy	168 (14.2%)	344 (13.8%)
Oophorectomy	37 (3.1%)	81 (3.3%)
Fenestration of cyst	7 (0.6%)	4 (0.2%)
Aspiration of cyst	5 (0.4%)	1 (0.04%)
Ablation of cyst wall	1 (0.1%)	0 (0.0%)
Diagnostic only	-	45 (1.8%)

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

CONCURRENT OPERATIVE PROCEDURES

	1997	2002
Adhesiolysis	177 (14.9%)	424 (17.1%)
Ablation/resection of endometriosis	93 (7.8%)	234 (9.4%)
Salpingectomy	32 (2.7%)	78 (3.1%)
Salpingostomy	8 (0.6%)	31 (1.2%)
Myomectomy	25 (2.2%)	64 (2.6%)
Miscellaneous	25 (2.1%)	12 (0.5%)

PATHOLOGY IN THOSE CASES LABELLED AS DIAGNOSTIC PROCEDURE

Two patients had bilateral disease, one had carcinomatosis and the other had bilateral paraovarian cyst. Six patients had severe pelvic adhesions, 3 were associated with severe endometriosis.

	< 5 cm	5 – 8 cm	> 8 cm
Ovarian cyst	27	1	0
Endometriotic cyst	2	2	3
Dermoid cyst	0	1	0
Paraovarian cyst	7	1	1
Carcinoma	1	1	0
Total	**37**	**6**	**4**

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 and lowest in para-ovarian cyst. The overall rupture rate in laparoscopic management of adnexal cyst was 46.7%

	Rupture rate							
	< 5 cm		5 – 8 cm		> 8 cm		Total	
	N	%	N	%	N	%	N	%
Ovarian cyst	666	40.8	404	40.6	115	41.7	1185	40.8
Endometriotic cyst	643	56.5	611	62.0	108	56.5	1362	59.0
Dermoid cyst	121	30.6	155	34.8	64	17.2	340	30.0
Paraovarian cyst	113	18.6	30	23.3	9	11.1	152	19.1
Total	**1543**	**44.9**	**1200**	**50.3**	**296**	**40.9**	**3039**	**46.7**

N: Total number of cases

The risk of operative rupture of the cyst was also related to the type of surgery performed. Cystectomy (50.1%) was associated with a higher risk of cyst rupture when compared to oophorectomy (31.8%). 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	462	44.5	289	45.3	40	65.0	791	45.9
Endometriotic cyst	317	71.6	312	59.9	51	60.8	680	65.4
Dermoid cyst	93	31.2	108	36.1	39	20.5	240	31.7
Paraovarian cyst	76	25.0	19	21.1	7	14.3	102	23.5
Total	**948**	**50.7**	**728**	**49.6**	**137**	**48.2**	**1813**	**50.1**

N: Total number of cases

	Rupture rate during oophorectomy							
	< 5 cm		**5 – 8 cm**		**> 8 cm**		**Total**	
	N	%	N	%	N	%	N	%
Ovarian cyst	73	17.8	88	22.7	66	27.3	227	22.5
Endometriotic cyst	37	54.0	71	63.3	14	42.9	122	58.2
Dermoid cyst	17	23.5	35	28.6	23	8.7	75	21.3
Paraovarian cyst	11	9.1	5	20.0	0	0	16	12.5
Total	**138**	**27.5**	**199**	**38.2**	**103**	**25.2**	**440**	**31.8**

N: Total number of cases

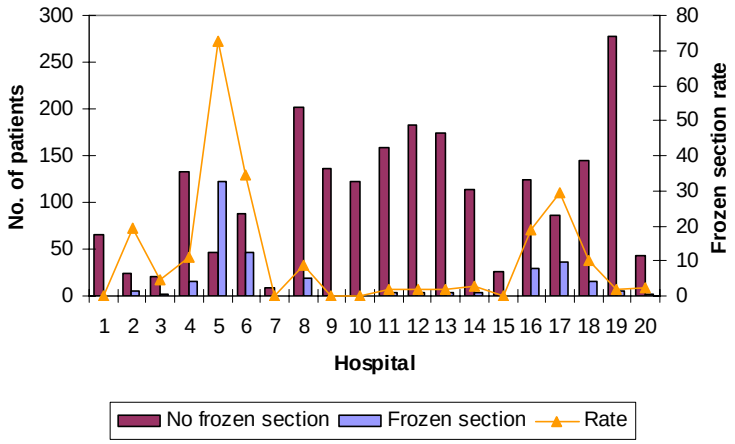
Rupture rate was lowest when the surgeon had acquired advanced accreditation in laparoscopic surgery and highest for surgeon with intermediate accreditation.

	Rupture rate					
	Nil		**Intermediate**		**Advanced**	
	N	%	N	%	N	%
Ovarian cyst	516	39.5	293	48.1	163	37.4
Endometriotic cyst	577	61.7	300	64.0	265	49.1
Dermoid cyst	156	25.0	86	34.9	46	28.3
Paraovarian cyst	70	31.4	61	23.0	4	25.0
Total	**1319**	**46.9**	**740**	**50.9**	**491**	**42.0**

N: Total number of cases

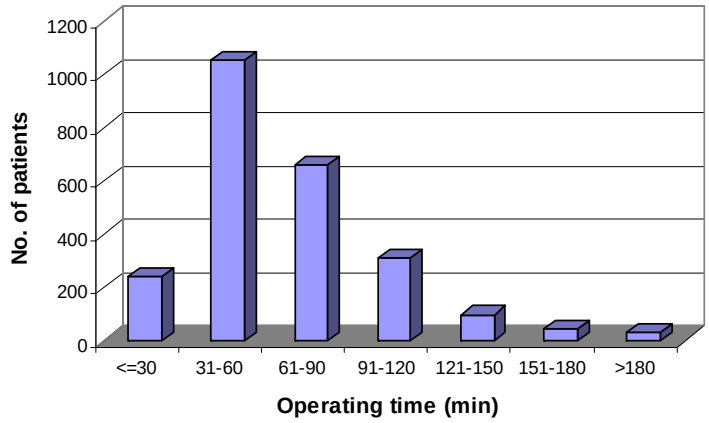
FROZEN SECTION

Fifteen hospitals (75%) performed frozen section during laparoscopic management of ovarian cyst compared to 11 (61.1%) in 1997. The frequency ranged from 1.6% to 72.6% with an average of 14.7% (9.4% in 1997). Of the 309 cases with frozen section performed, the pathological finding was only reported in 12 cases and one of them was a mucinous cystadenocarcinoma.



OPERATING TIME

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



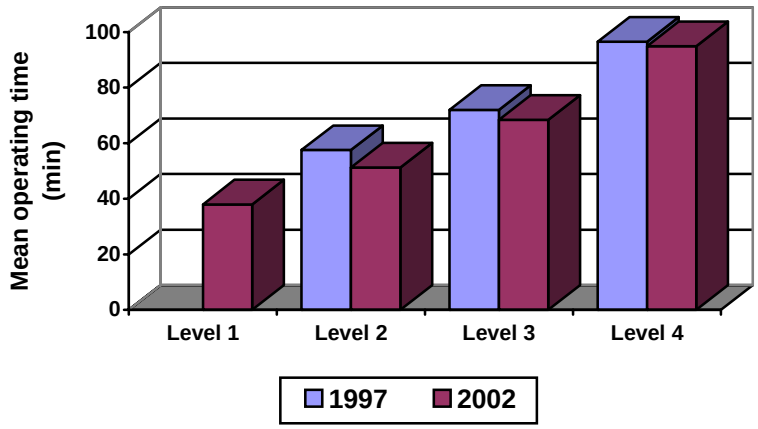
Number of missing data: 42 (1.7%)

Distribution of operating time

	1997	2002
≤ 30 minutes	108 (9.2%)	242 (9.9%)
31 – 60 minutes	498 (42.5%)	1054 (43.1%)
61 – 90 minutes	324 (27.7%)	660 (27.0%)
91- 120 minutes	153 (13.1%)	313 (12.8%)
121 – 150 minutes	38 (3.2%)	99 (4.1%)
151 – 180 minutes	36 (3.1%)	43 (1.8%)
> 180 minutes	14 (1.2%)	32 (1.3%))
Total	**1171**	**2443**

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

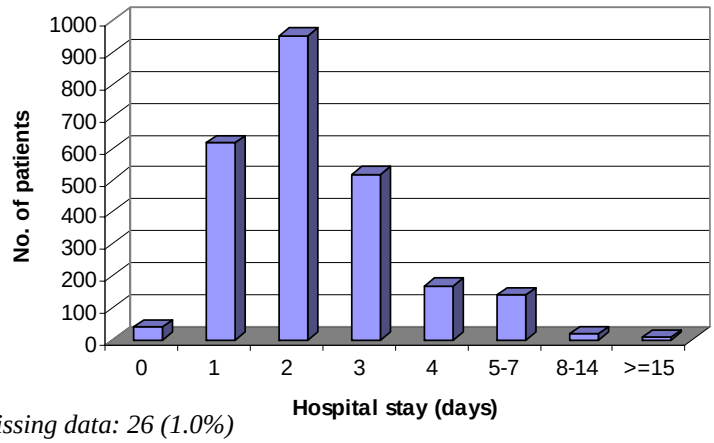
Similar to that in 1997, operating time increased with the level of the procedure and the mean for Level 4 procedures (94.9 min) was significantly longer than that for Level 3 (68.4 min), 2 (51.2 min) and 1 (37.9 min) procedures ($p < 0.001$). The corresponding figures for level 2-4 procedures in 1997 were 57.5, 72.0 and 96.5 minutes.



Number of missing data: 118 (4.7%)

POST-OPERATIVE HOSPITAL STAY

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



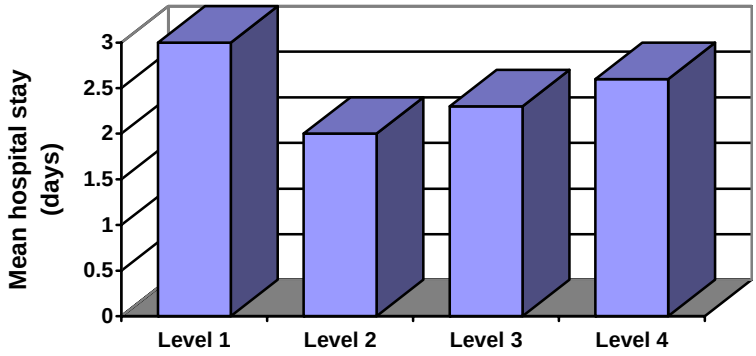
Number of missing data: 26 (1.0%)

Distribution of post-operative hospital stay

	1997	2002
0 day	10 (0.9%)	38 (1.5%)
1 day	300 (25.8%)	616 (25.1%)
2 days	461 (39.6%)	953 (38.8%)
3 days	263 (22.6%)	518 (21.1%)
4 days	67 (5.8%)	168 (6.8%)
5 – 7 days	55 (4.7%)	140 (5.7%)
8 – 14 days	6 (0.5%)	19 (0.8%)
≥ 15 days	3 (0.3%)	7 (0.3%)
Total	**1165**	**2459**

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

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 (22.2%).



CONVERSION

There was a 3 fold increase in the overall conversion rate from 1.0% to 2.9%. The conversion was associated with severe pelvic adhesions in 38 cases and endometriotic cyst in 32 cases.

	1997	2002
Dense adhesions	7 (0.6%)	38 (1.5%)
Large pelvic tumour	0 (0.0%)	3 (0.1%)
Uncontrolled bleeding	3 (0.3%)	1 (0.04%)
Unexpected malignancy	1 (0.08%)	2 (0.08%)
Poor pelvic access	0 (0.0%)	3 (0.1%)
Suspected bowel perforation	0 (0.0%)	1 (0.04%)
Failure in specimen removal	1 (0.08%)	1 (0.04%)
Total	**12 (1.0%)**	**72 (2.9%)**

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

COMPLICATIONS

The overall complication rate (4.8%) was lower than that in 1997 (6.6%). Although there was no difference in the incidence of bowel injury, 2 patients had urinary tract injury, 1 bladder and 1 ureter, and both were associated with severe adhesions. There were 2 major vascular injury reported, one had concurrent inferior epigastric artery injury. However, there were no conversion and both patients were discharged on the second post-operative day. The overall organ injury rate was 0.4% compared to 0.3% in 1997.

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

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

Complication and conversion rate stratified according to level of procedures

All the complications reported in level 1 procedures were due to conversion and the reasons for conversion were severe pelvic adhesions in 6, carcinomatosis in 1, large pelvic tumour in 1 and unspecified in the remaining 2. Half of the complications in level 3 and 4 procedures were associated with a conversion to laparotomy. Level 4 procedures were associated with a 2 fold increase in the risk of organ injury than level 3 procedures (0.67% versus 0.34%).

	1997		2002	
	Complication	**Conversion**	**Complication**	**Conversion**
Level 1	-	-	22.2%	22.2%
Level 2	4.5%	0	0%	0%
Level 3	6.2%	0.9%	3.6%	1.9%
Level 4	12.3%	2.8%	6.3%	3.3%
Total	**6.6%**	**1.0%**	**4.2%**	**2.5%**

Level 1 procedures were not audited in the 1997 exercise

RE-ADMISSION

Nine patients required re-admission to hospital and the incidence was 0.4% (0.3% in 1997). Two patients developed pelvic infection and one had a pelvic haematoma.

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

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

RE-OPERATION

No patient required re-operation, compared to 0.3% in 1997.

Hysteroscopic Surgery Audit

2002

11 HYSTEROSCOPIC SURGERY OVERALL DATA

BACKGROUND INFORMATION ON HYSTEROSCOPIC SURGERY DATA

A total of 24 hospitals agreed to participate in the audit exercise, 18 provided their total number of patients who had undergone hysteroscopic surgery in 2002.

The total number of cases audited increased from 199 to 8,652. The significant increase was largely related to the inclusion of Level 1 procedure (diagnostic hysteroscopy) in this exercise, thought there was also a general increase in the performance of hysteroscopic surgery in Hong Kong. Excluding the audited case from the 3 hospitals which had not provided their annual data, this exercise had audited 98.0% of all the cases undergoing laparoscopic surgery. The percentage was much higher than the 63.4% in 1997.

Total number of cases audited	8,652
Total number of patients undergone hysteroscopic surgery*	8,607
Adjusted total	8443
Percentage of cases audited	98.0%

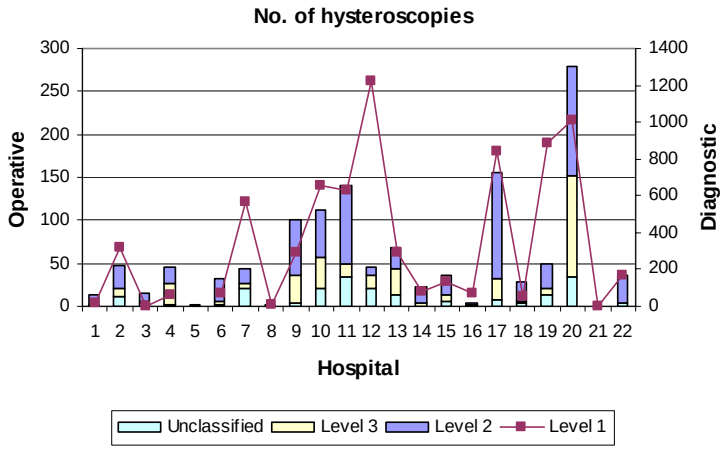
** Three hospitals had not provided their annual statistics*

Of the 8,652 casers audited, 6996 (80.9%) were diagnostic procedures, 1044 (12.1%) were operative procedures and 589 (6.8%) were of unknown nature. Compared to 1997 audit which did not include Level 1 or diagnostic procedure, there was a 5 fold increase in the total number of operative hysteroscopies.

Majority of the procedures performed were level 1 procedure (7374 or 85.2%). Level 2 procedures were performed in 734 or 8.5% (74 or 37.2% in 1997) while level 3 procedures were performed in 342 or 4.0% (125 or 62.8% in 1997) patients. Information was not available in 202 cases.

CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

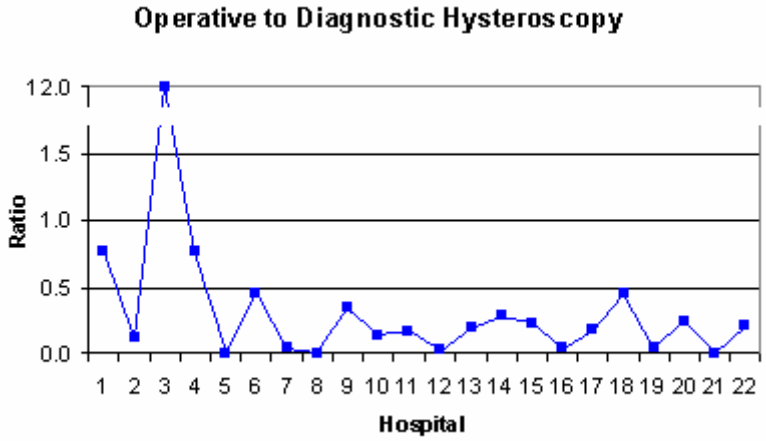
Compared to 1997, the number of hospitals performing hysteroscopy increased from 14 to 22. There were wide variations in the number of hysteroscopies performed in different hospitals.



Diagnostic hysteroscopy was commonly practiced and half of the units performed over 200 procedures a year.

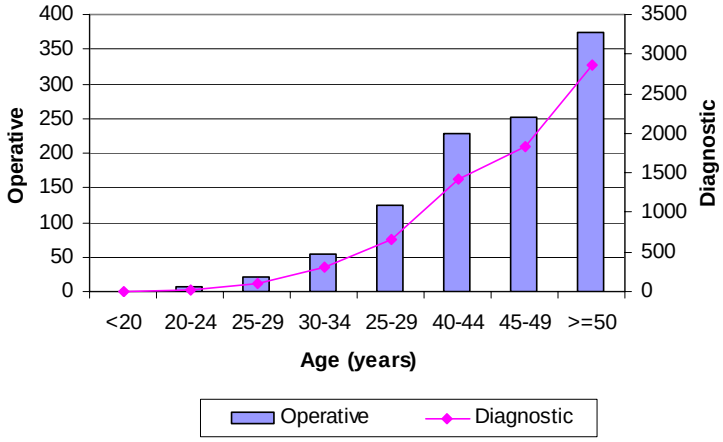
There was also a general increase in the number of operative hysteroscopies. However, most units performed less than 50 cases a year and only 4 units performed over 100 cases a year.

In general, the ratio of operative to diagnostic hysteroscopy was about 1:4 except in one hospital where the ratio was 12:1. However the number of procedures performed in that hospital was very small.



AGE DISTRIBUTION OF PATIENTS

Overall, the mean age of the patients was 48.8 (SD 30.8) years. For those who had undergone operative hysteroscopy, the mean age was 47.4 (SD 10.4) years compared to 43.7 (SD 8.7) in 1997. The number of both diagnostic and operative hysteroscopies increased with increasing age. Compared to 1997, a higher proportion of women aged 50 or above underwent operative hysteroscopy (35.1% versus 15.2%).



Distribution of age

	1997	2002	
		Operative	All
< 20 years	0 (0.0%)	0 (0.0%)	5 (0.06%)
20 – 24 years	2(1.0%)	8 (0.8%)	33 (0.4%)
25 – 29 years	6(3.0%)	22 (2.1%)	132 (1.6%)
30 – 34 years	13(6.6%)	54 (5.1%)	385 (4.5%)
35 – 39 years	36(18.2%)	125 (11.8%)	793 (9.3%)
40 – 44 years	56(28.3%)	228 (21.5%)	1683 (19.8%)
45 – 49 years	55(27.8%)	252 (23.7%)	2139 (25.2%)
≥ 50 years	30(15.2%)	373 (35.1)	3312 (39.0%)
Total	**198**	**1062**	**8482**

Number of missing data: 1(0.5%), 14 (1.3%) and 170 (2.0%) respectively

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Overall normal uterine cavity accounted for almost 60% of the cases and but it constituted only 19.4% in all operative hysteroscopies (29.1% in 1997). Endometrial polyp (58.8% versus 28.1% in 1997) was the most common diagnosis in those undergoing operative hysteroscopy, followed by submucosal fibroid (16.5% versus 21.0% in 1997).

	1997	2002	
		Operative	**All**
Normal uterine cavity	58 (29.1%)	193 (19.4%)	4982 (57.6%)
Endometrial polyp	56 (28.1%)	584 (58.8%)	1213 (14.0%)
Fibroid polyp	43 (21.6%)	132 (13.3%)	234 (2.7%)
Submucosal fibroid	40 (20.1%)	164 (16.5%)	466 (5.4%)
Uterine synechiae	8 (4.0%)	15 (1.5%)	69 (0.8%)
Uterine septum	1 (0.5%)	5 (0.5)	34 (0.4%)
Retained IUCD	1 (0.5%)	-	51 (0.6%)
Others	11 (5.5%)	45 (4.5%)	230 (2.6%)
Total	**198**	**993**	**8642**

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

QUALIFICATIONS OF SURGEON AND ASSISTANT

About 48% (64.3% in 1997) of the procedures were performed by specialists, and 22% (30% in 1997) were performed by those with MRCOG. Pre-membership doctors performed 30% (5.7% in 1997) of the procedures and most of them were level 1 or diagnostic procedure.

About 60% of the procedures were performed by doctors without an assistant and 19.2% with nurses being the assistant.

Assistant / Surgeon	Assistant					Total
	Nil	**MBBS**	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	1496	73	355	340	281	**2545**
MRCOG	1343	94	53	252	141	**1883**
FHKAM	2002	191	102	154	969	**3418**
FRCOG	226	39	39	33	219	**556**
Total	**5067**	**397**	**549**	**779**	**1610**	**8402**

Number of missing data: 250 (2.9%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Information on endometrial preparation was missing in 1423 (16.4%) cases. Of the remaining 7229 cases, 7070 (97.8%) were performed without endometrial preparation and they were mainly diagnostic hysteroscopy. Only 159 patients underwent endometrial preparation; 103 received GnRH analogue, 29 danazol and 27 progestogen.

Information on cervical priming was missing in 1342 (15.5%) cases. Of the remaining 7310 cases, 6732 (94.1%) did not undergo cervical priming. Cervical priming was carried out in 578 patients; misoprostol was used in 500, cervagem in 72, laminia tent in 1 and the agent was not specified in 5. Prophylactic antibiotic was only used in 351 (4.1%) patients. These data were not captured in the 1997 audit.

Anaesthetic methods

Information on the anaesthetic method was not recorded in 798 (9.2%) cases. Most of the procedures (4517 or 57.5%) was performed without any form of anaesthesia or analgesia. General anaesthesia was used in 2700 (34.4%) and paracervical block in 475 (6.0%). This data was not captured in the 1997 audit.

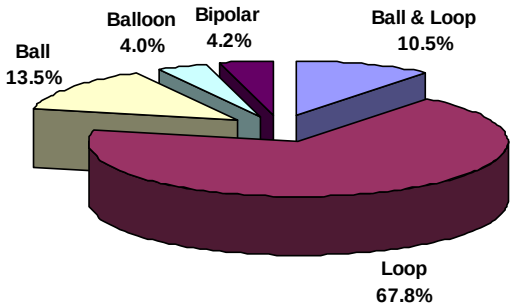
No anaesthesia	4517 (57.5%)
General anaesthesia	2700 (34.4%)
Paracervical block	475 (6.0%)
Regional anaesthesia	81 (1.0%)
Intravenous sedation	64 (0.8%)
NSAID	11 (0.1%)
Others	6 (0.08%)
Total	**7854**

Number of missing data: 798 (9.2%)

Surgical tools

As in 1997, electrical energy was the only energy source used in hysteroscopic surgery. There was an increase in the use of bipolar system though conventional unipolar system remained the main system used.

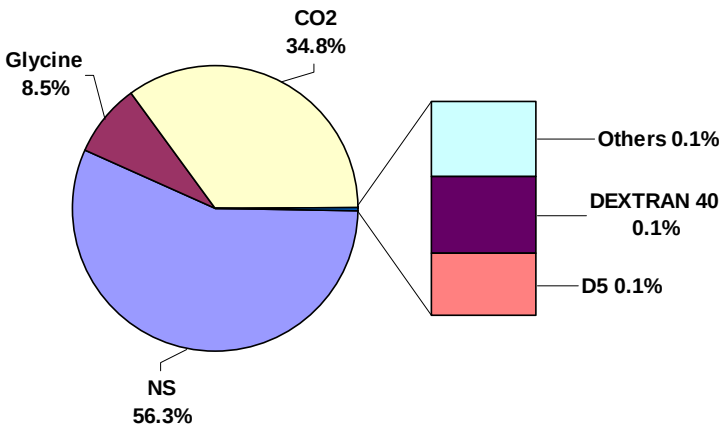
For those operative hysteroscopy, roller ball alone was used in 7.5% (21.6% in 1997), cutting loop alone in 37.7% (46.2% in 1997) and both were used in 5.9% (16.6% in 1997). Bipolar system was used in 2.3% and thermal balloon was used in 2.2%.



Number of missing data: 33 (3.0%)

Distension fluid

Overall, normal saline (56.3%) was the most common distension fluid used in hysteroscopy followed by CO_2 (34.8%). For operative procedure, glycine (58.9% vs 89% in 1997) remained the most common distension fluid used. Normal saline was reported to have been used in 36.8% (7% in 1997), the increase however did not match up with the number of bipolar system used.



Number of missing data: 812 (9.4%)

Fluid balance

Excessive fluid absorption (> 1500 ml) occurred in 12 patients undergoing operative hysteroscopy; 4 absorbed more than 2000 ml. The incidence was reduced compared with the 1997 figure. Twenty patients had a negative fluid balance which ranged from 100 ml to 1000 ml.

	1997	2002	
		Operative	All
Positive Balance			
> 1500 ml	6 (3.2%)	12 (1.8%)	12 (0.8%)
1001 – 1500 ml	2 (1.1%)	3 (0.5%)	3 (0.2%)
501 – 1000 ml	15 (8.0%)	30 (4.5%)	32 (2.1%)
≤ 500 ml	160 (85.1%)	602 (90.5%)	1474 (95.7%)
Negative Balance			
≤ 500 ml	3 (1.6%)	14 (2.1%)	16 (1.0%)
> 500 ml	2 (1.1%)	4 (0.6%)	4 (0.3%)
Total	**188**	**665**	**1541**

Number of missing data: 11 (5.5%), 411(38.2%) and 7111 (82.2%) respectively
Fluid balance = Fluid in – Fluid out

OPERATIVE PROCEDURES

Some patients could have more than one operative procedure performed. Diagnostic hysteroscopy accounted for 90% of all the hysteroscopic procedures. For operative hysteroscopy, polypectomy was the most common procedure. Although the incidence of resection of fibroid remained unchanged, that of endometrial ablation/resection reduced from 41.2% to 18.3%.

	1997	2002	
		Operative	All
Diagnostic hysteroscopy	-	-	7253 (90.0%)
Endometrial ablation	53 (26.6%)	138 (13.2%)	138 (1.7%)
Endometrial resection	20 (10.1%)	37 (3.5%)	37 (0.5%)
Resection and ablation	9 (4.5%)	17 (1.6%)	17 (0.2%)
Polypectomy	79 (39.7%)	635 (60.8%)	635 (7.9%)
Resection of fibroid	47 (23.6%)	251 (24.0%)	251 (3.1%)
Adhesiolysis	8 (4.0%)	11 (1.1%)	11 (0.1%)
Division of septum	1 (0.5%)	8 (0.8%)	8 (0.1)
Proximal tubal cannulation	1 (2.0%)	7 (0.7%)	7 (0.09%)
Total	**199**	**1044**	**8063**

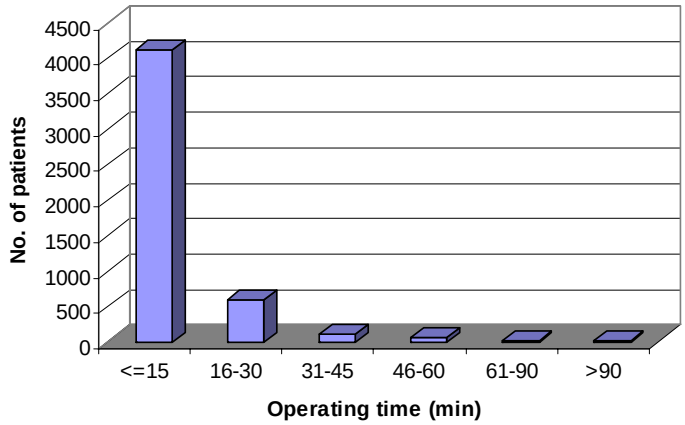
Number of missing data in 2002: 32 (3.0%) and 589 (6.8%) respectively
Data are presented as number and percentage of total number of patients

OPERATING TIME

Overall, the mean operating time was 12.1 (SD 11.4) minutes. For diagnostic hysteroscopy, the mean operating time was 9.6 (SD 7.0) minutes and over 80% were completed within 15 minutes.

For operative hysteroscopy, the mean operating time was 22.7 (SD 18.1) minutes, compared to 39.5 (SD 23.6) minutes in 1997, and 80% were completed within 30 minutes. Prolonged procedures (> 60 minutes) constituted only 0.8% of all diagnostic and 3.2% (9.9% in 1997) of operative procedures.

The mean operating time for Level 2 procedures was 17.6 (SD 13.1) minutes and that for Level 3 was 32.3 (SD 21.9) minutes. The corresponding figures in 1997 were 37.3 (SD 26.9) and 40.6 (SD 21.5) minutes.



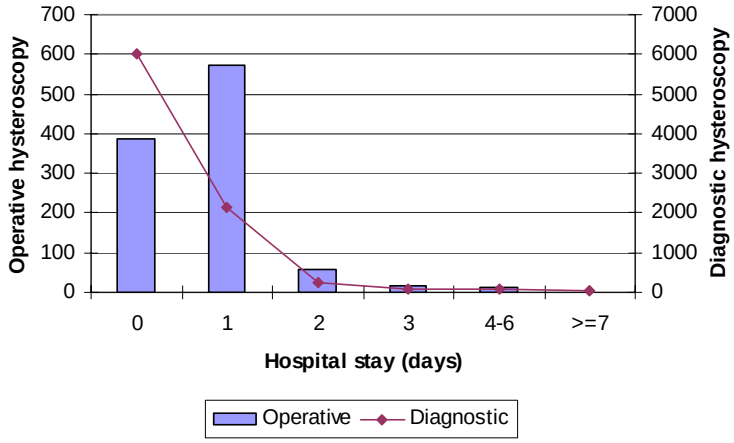
Distribution of operating time

	1997	2002	
		Operative	All
≤ 15 minutes	15(7.8%)	453 (48.8%)	4110 (83.7%)
16 – 30 minutes	91(47.4%)	300 (32.3%)	588 (12.0%)
31 – 45 minutes	37(19.3%)	95 (10.2%)	114 (2.3%)
46 – 60 minutes	30(15.6%)	50 (5.4%)	60 (1.2%)
61 – 90 minutes	14(7.3%)	17 (1.8%)	21 (0.4%)
> 90 minutes	5(2.6%)	13 (1.4)	17 (0.3%)
Total	**192**	**928**	**8652**

Number of missing data: 7 (3.5%), 148 (13.8%) and 3742 (43.3%) respectively

POST-OPERATIVE HOSPITAL STAY

The mean hospital stay after operation was 0.4 (SD 0.9) days. For diagnostic hysteroscopy, the mean hospital stay was 0.3 (SD 0.9) days. For operative hysteroscopy, the mean hospital stay was 0.8 (SD 0.8) days, compared to 1.6 (SD 1.4) days in 1997. Seventy percent of all diagnostic hysteroscopy and 37% (5.5% in 1997) of operative hysteroscopy were discharged on the day of operation. Prolonged hospital stay (≥ 4 days) occurred in about 1 % in both the diagnostic and operative hysteroscopy (8.2% in 1997).



Distribution of post-operative hospital stays

	1997	2002	
		Operative	All
0 day	10 (5.5%)	388 (37.0%)	6009 (70.3%)
1 day	108 (59.0%)	573 (54.7%)	2137 (25.0%)
2 days	39 (21.3%)	59 (5.6%)	229 (2.7%)
3 days	11 (6.0%)	17 (1.6%)	80 (0.9%)
4 – 6 days	11 (6.0%)	11 (1.0%)	66 (0.8%)
≥ 7 days	4 (2.2%)	0 (0.0%)	23 (0.3%)
Total	**183**	**1048**	**8544**

Number of missing data: 16 (8.0%), 28 (2.6%) and 108 (1.2%) respectively

COMPLICATIONS

Overall, complications occurred in 131 patients and the incidence was 1.5%. The overall failure rate of the procedure was 0.9% and this was mostly attributed to diagnostic hysteroscopy performed under no anaesthesia. Uterine perforation was the most common complication (0.2%). Two patients were reported to have fluid overload despite a fluid absorption of less than 1000 ml.

	1997	2002	
		Operative	All
Failed surgery	0 (0.0%)	2 (0.2%)	80 (0.9%)
Uterine perforation	3 (1.5%)	6 (0.6%)	20 (0.2%)
Fluid absorption > 1.5 L	6 (3.0%)	14 (1.3%)	14 (0.2%)
Cervical laceration	3 (1.5%)	8 (0.8%)	11 (0.1%)
Incomplete surgery	4 (2.0%)	4 (0.4%)	8 (0.09%)
Haemorrhage	0 (0.0%)	1 (0.09%)	1 (0.01%)
Pelvic infection	1 (0.5%)	0 (0.0%)	1 (0.01%)
Others	2 (1.0%)	0 (0.0%)	2 (0.02%)
Incidence	**17 (8.5%)**	**30 (2.8%)**	**131 (1.5%)**

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

For operative hysteroscopy, the complication rate was 2.8% (8.5% in 1997). Excessive fluid absorption (> 1.5 L) was the most common complication and occurred in 1.1% (3.0% in 1997); 5 underwent resection of submucosal fibroid, 4 resection of fibroid polyp, 1 resection of endometrial polyp and 1 rollerball endometrial ablation. Incomplete surgery occurred in 4 patients. Two underwent resection for type 2 submucosal fibroid with significant intramural extension. Two underwent resection of endometrial polyp; one was complicated with uterine perforation and the other was due to instrument failure.

Complications with regard to surgical tools

The use of cutting loop was associated with a higher complication rate. All uterine perforation was associated with the use of cutting loop. Excessive fluid absorption (> 1.5 L) occurred in 14 patients, cutting loop was used in 11, roller ball alone was used in 1 and the tool was not specified in the remaining 2 patients.

	Level 2	Level 3	Overall
Ball	0	0.3%	0.09%
Ball & Loop	0	0.6%	0.2%
Loop	3.9%	2.6%	1.8%
Unknown	1.4%	0.9%	0.7
Total	**2.0%**	**4.4%**	**2.8%**

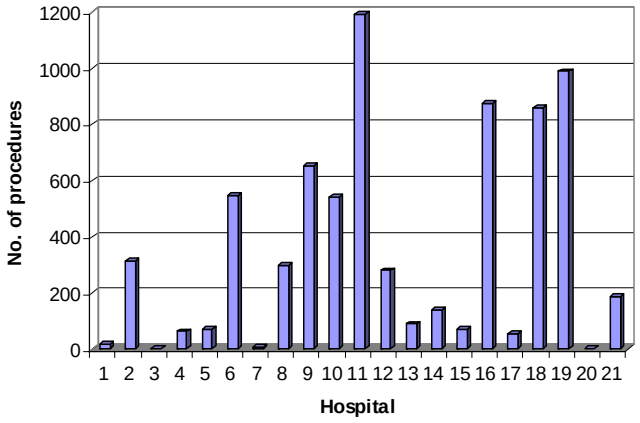
12 HYSTEROSCOPIC SURGERY – LEVEL 1 PROCEDURES

Total number of patient episodes 7,376

Level 1 hysteroscopic procedure is essentially diagnostic hysteroscopy. In 1997, this procedure was not audited and therefore no data was available for comparison.

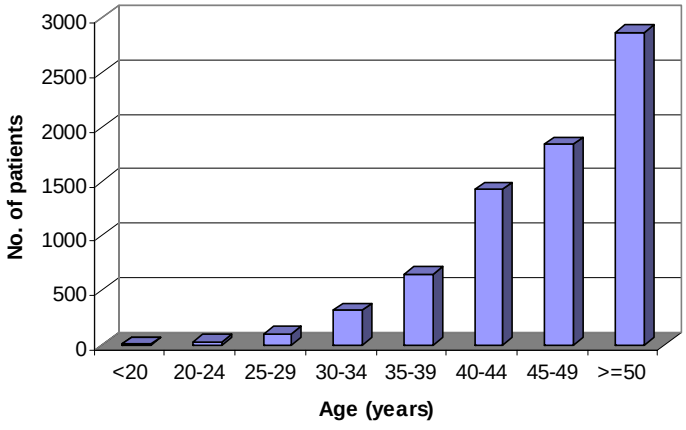
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Half of the units performed over 200 procedures a year while the other half performed less than 100 procedures. Two units performed over 1,000 procedures.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 49.0 (SD 33.1) years. The frequency of the procedure increased with age. Most of the patients (93.8%) aged 35 or above, and 39.6% aged 50 or above.



Distribution of age

< 20 years	4 (0.06%)
20 – 24 years	24 (0.3%)
25 – 29 years	102 (1.4%)
30 – 34 years	318 (4.4%)
35 – 39 years	650 (9.0%)
40 – 44 years	1424 (19.7%)
45 – 49 years	1843 (25.5%)
≥ 50 years	2866 (39.6%)
Total	**7231**

Number of missing data: 145 (2.0%)

OPERATIVE DIAGNOSIS

The diagnoses were based on hysteroscopic findings and there might not be histological confirmation. Diagnosis was unavailable in a significant proportion of cases (1428 or 19.4%). Some patients could have more than one diagnosis. Most of the patients were diagnosed to have a normal uterine cavity. Endometrial polyp and submucosal fibroid were the two most common pathologies identified. Carcinoma of corpus was diagnosed in 48 cases and carcinoma of cervix in 3 cases.

Normal cavity	4684 (78.7%)
Endometrial polyp	606 (10.2%)
Submucosal fibroid	295 (5.0%)
Fibroid polyp	99 (1.7%)
Hyperplastic/polypoid endometrium	98 (1.6%)
Uterine synechiae	54 (0.9%)
Retained IUCD	49 (0.8%)
Carcinoma of corpus	48 (0.8%)
Uterine septum	26 (0.4%)
Endocervical/Cervical polyp	26 (0.4%)
Abnormal growth	18 (0.3%)
Haemato/pyo/hydrometra	7 (0.1%)
Retained product of gestation	7 (0.1%)
Double uterus	5 (0.08%)
Carcinoma of cervix	3 (0.05%)
Vaginal septum	3 (0.05%)
Bicornuate uterus	3 (0.05%)
Total	**5948**

Number of missing data: 1428 (19.4%)
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 (45.2%), pre-membership doctors (32.3%) and MRCOG (22.5%). The procedures were performed without an assistant in 64.7% and with a nurse being the assistant in 18.6%.

Surgeon \ Assistant	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	1397	65	338	255	261	**2316**
MRCOG	1241	82	44	125	118	**1610**
FHKAM	1810	119	55	60	823	**2867**
FRCOG	183	28	14	13	132	**370**
Total	**4631**	**294**	**451**	**453**	**1334**	**7163**

Number of missing data: 213 (2.9%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Information on endometrial preparation was missing in 1266 (17.2%) cases. Of the remaining 6110 cases, almost all (99.6%) were performed without endometrial preparation. Only 26 patients had undergone endometrial preparation; 19 received progestogen, 6 GnRH analogue and 1 danazol.

Information on cervical priming was missing in 1204 (16.3%) cases. Of the remaining 6172 cases, most of them (5810 or 94.1%) did not undergo cervical priming. Misoprostol was the most commonly agent used. Of the 362 patients with cervical priming, misoprostol was used in 314, cervagem in 45, laminia tent in 1 and the agent was not specified in 2. Prophylactic antibiotic was only used in 187 (2.5%) patients.

Anaesthetic methods

Information was not recorded in the 731 cases. Most of the procedures (4168 or 62.7%) was performed without any form of anaesthesia or analgesia. General anaesthesia was used in 1960 (29.5%) and paracervical block in 410 (6.2%).

No anaesthesia	4168 (62.7%)
General anaesthesia	1960 (29.5%)
Paracervical block	410 (6.2%)
Regional anaesthesia	54 (0.8%)
Intravenous sedation	39 (0.6%)
NSAID	11 (0.2%)
Other unspecified	3 (0.05%)
Total	**6645**

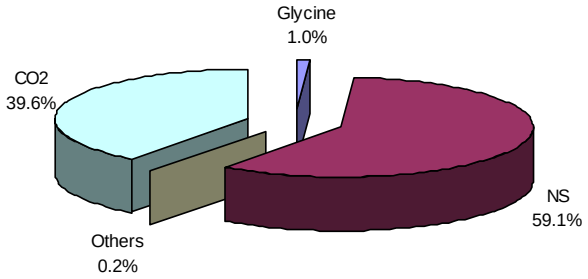
Number of missing data: 731 (9.9%)

Surgical tools

As most of the procedures were for diagnostic purpose, surgical instruments were seldom used. The frequency of performing endometrial biopsy/sampling was not recorded. Roller ball was reported to have been used in 7 cases, cutting loop in 2 and hysteroscopic scissors in 2.

Distension fluid

Normal saline was the most common distension fluid used (59.1%), followed by CO_2 (39.6%).



Number of missing data: 695 (9.4%)

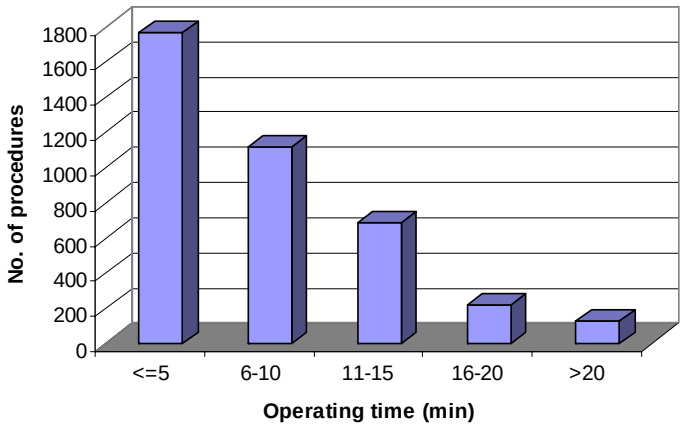
OPERATIVE PROCEDURES

Information was missing in 380 (5.2%) patients. Other procedures were coded in 99 (1.3%) patients, the details of which were not available.

OPERATING TIME

Operating time for diagnostic hysteroscopy was expected to be short and it was not recorded in a significant proportion of cases (3473 or 47.1%).

The mean operating time was 9.6 (SD 7.0) minutes. The operating time was within 5 minutes in 45.3% of cases and exceeded 15 minutes in 8.6%.



Number of missing data: 3473 (47.1%)

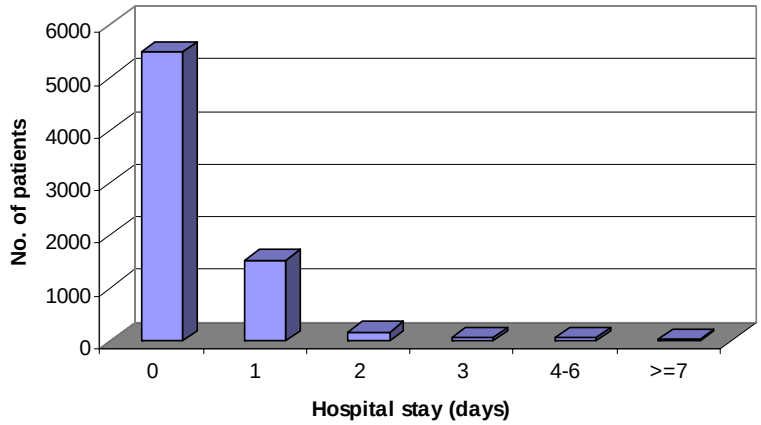
Distribution of operating time

≤ 5 minutes	1768 (45.3%)
6 – 10 minutes	1112 (28.5%)
11 – 15 minutes	684 (17.5%)
16 – 20 minutes	216 (5.5%)
> 20 minutes	123 (3.2%)
Total	**3903**

Number of missing data: 3473 (47.1%)

POST-OPERATIVE HOSPITAL STAY

The mean hospital stay after operation was 0.3 (SD 0.9) days. Three quarters of the cases were performed as a day procedure and another fifth was discharged on the first post-operative day. Twenty-three patients were reported to have stayed for 7 days or more; 1 was diagnosed to have carcinoma of corpus, 1 pyometra and the remaining 21 were unknown. None of them were reported to have any complication related to the hysteroscopy.



Number of missing data: 77 (1.0%)

Distribution of post-operative hospital stay

0 day	5473 (75.0%)
1 day	1524 (20.9%)
2 days	163 (2.2%)
3 days	61 (0.8%)
4 – 6 days	55 (0.8%)
≥ 7 days	23 (0.4%)
Total	**7299**

Number of missing data: 77 (1.0%)

COMPLICATIONS

The procedure was failed in 75 patients, giving an overall incidence of 1.0%. Ninety-seven patients (1.3%) developed complications. Perforation of uterus was the most common complication and the incidence was 0.18%. Incomplete procedure occurred in 4 and the reasons were false tract, prolonged operation, heavy bleeding and unspecified respectively.

Failed procedure	75 (1.02%)
Uterine perforation	13 (0.18%)
Incomplete procedure	4 (0.05%)
Cervical laceration	3 (0.04%)
Vasovagal attack	2 (0.03%)
Pelvic infection	1 (0.01%)
Incidence	**97 (1.3%)**

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

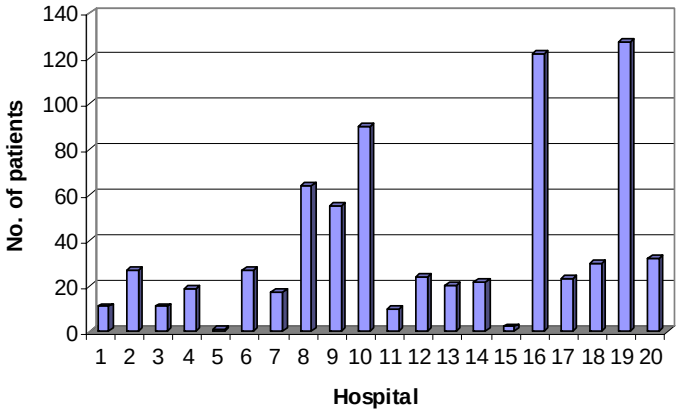
13 HYSTEROSCOPIC SURGERY – LEVEL 2 PROCEDURES

Total number of patients 734

Compared to 1997, there was a 10 fold increase in the total number of level 2 procedures which increased from 74 to 734.

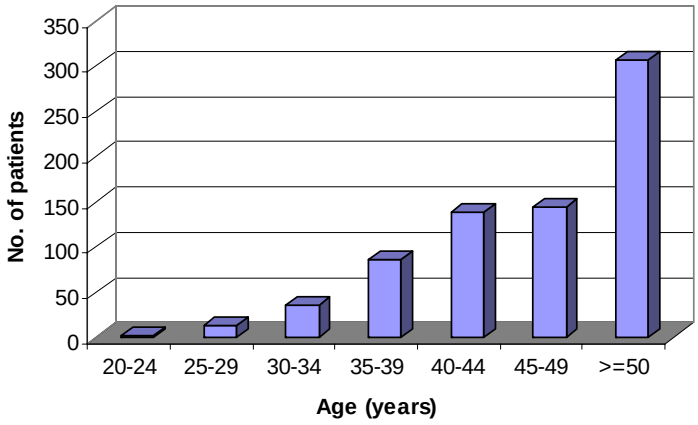
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing level 2 procedures increased from 12 to 20. In general, there was an increase in the number of procedures performed in all units. Most units performed less than 30 procedures a year and 2 units performed over 120 procedures.



AGE DISTRIBUTION OF PATIENTS

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



Distribution of age

	1997	2002
20 – 24 years	2 (2.7%)	3 (0.4%)
25 – 29 years	3 (4.1%)	13 (1.8%)
30 – 34 years	6 (8.1%)	36 (5.0%)
35 – 39 years	14 (18.9%)	86 (11.8%)
40 – 44 years	12 (16.2%)	139 (19.1%)
45 – 49 years	17 (23.0%)	144 (19.8%)
≥ 50 years	20 (27.0%)	306 (42.1%)
Total	**74**	**727**

Number of missing data: 7 (1.0%)

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Endometrial polyp and fibroid polyp were the two commonest diagnoses.

	1997	2002
Endometrial polyp	42 (56.8%)	537 (77.2%)
Fibroid polyp	26 (35.1%)	104 (15.0%)
Normal uterine cavity	1 (1.4%)	101 (14.5%)
Endocervical polyp	4 (5.4%)	15 (2.2%)
Submucosal fibroid	1 (1.4%)	16 (2.3%)
Uterine synechiae	3 (4.1%)	7 (1.0%)
Retained IUCD	1 (1.4%)	0 (0.0%)
Others	4 (5.4%)	4 (0.6%)
Total	**74**	**695**

Number of missing data: 39 (5.3%)
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 (59.5% versus 58.9% in 1997) and MRCOG (21.5% versus 37.0% in 1997). A total of 137 (19.1% versus 4.1% in 1997) cases were performed by pre-membership doctors.

Assistant / Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	59	6	7	55	10	**137**
MRCOG	57	7	5	70	15	**154**
FHKAM	99	36	23	36	106	**300**
FRCOG	26	6	14	7	72	**125**
Total	**241**	**55**	**49**	**168**	**203**	**716**

Number of missing data: 18 (2.5%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 17 (2.7%) patients compared to 8.1% in 1997. GnRH analogue was used in 11, danazol in 3 and progestogen in 3.

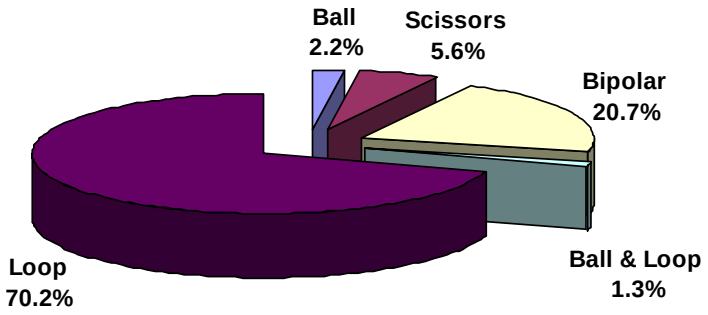
Cervical priming was carried out in 115 patients (17.6%). Misoprostol was used in 98, cervagem in 15 and the agent was not specified in 2. Prophylactic antibiotic was used in 72 (9.8%) patients.

Anaesthetic methods

General anaesthesia was used in 451 (65.2%), regional anaesthesia in 9 (1.3%), paracervical block in 44 (6.4%), intravenous sedation in 5 (0.7%), narcotic injection in 1 and unspecified in 1. No anaesthesia was used in 181 (26.2%). Information was not recorded in the remaining 42 patients.

Surgical tools

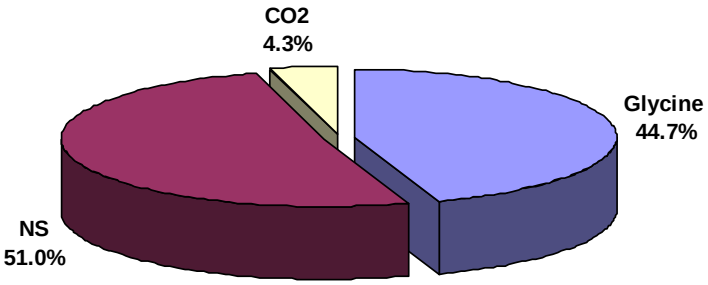
Cutting loop alone was used in 70.2% (94.1% in 1997), roller ball alone in 2.2% (2.0% in 1997), and both were used in 1.3% (3.9% in 1997). Bipolar system was used in 20.7%.



Number of missing data: 23 (31.1%)

Distension fluid

Normal saline was the most common distension fluid used and constituted 51.8% of the cases (13.5% in 1997). Glycine was used in only 44.7% compared to 79% in 1997. CO_2 was used in 4.3%.



Number of missing data: 36 (4.9%)

OPERATIVE PROCEDURES

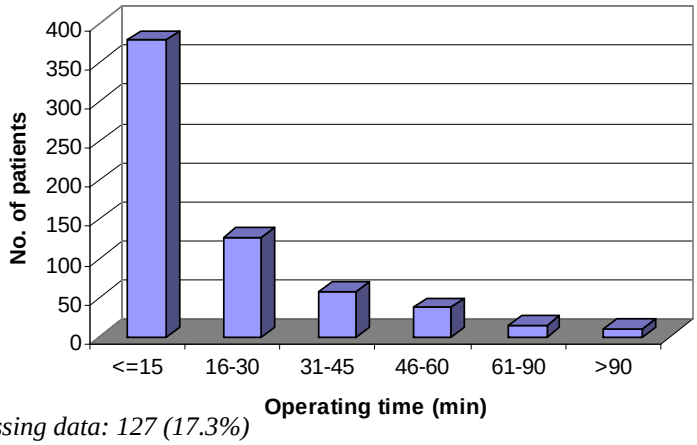
Some patients could have more than one operative procedure performed. As in 1997, resection of endometrial polyp was the most common procedure, followed by resection of fibroid polyp.

	1997	2002
Resection of endometrial polyp	42 (56.8%)	611 (85.1%)
Resection of fibroid polyp	26 (35.1%)	93 (13.0%)
Proximal tubal cannulation	4 (5.4%)	6 (0.8%)
Simple adhesiolysis	3 (4.1%)	4 (0.6%)
Total	**74**	**718**

Number of missing data: 16 (2.2%)
Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 17.6 (SD 13.1) minutes, compared to 37.3 (SD 26.9) in 1997. The operating time was within 30 minutes in 83.0% of cases and exceeded 60 minutes in 3.9%. The corresponding figures in 1997 were 63.2% and 8.8% respectively.



Number of missing data: 127 (17.3%)

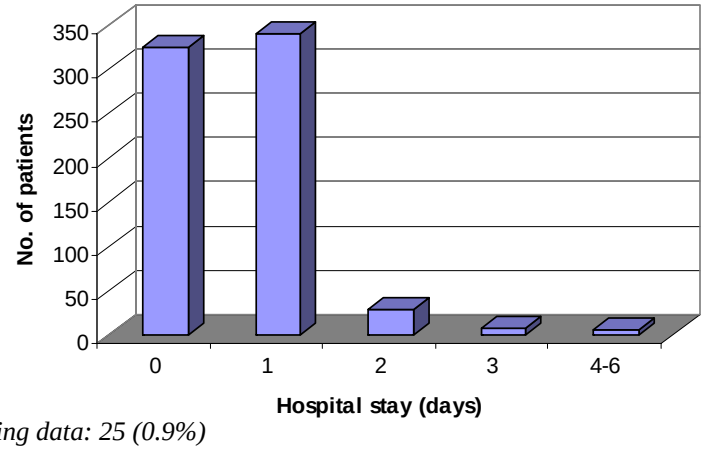
Distribution of operating time

	1997	2002
≤ 15 minutes	11 (16.2%)	378 (62.3%)
16 – 30 minutes	32 (47.1%)	126 (20.8%)
31 – 45 minutes	9 (13.2%)	58 (9.6%)
46 – 60 minutes	10 (14.7%)	37 (6.1%)
61 – 90 minutes	4 (5.9%)	14 (2.3%)
> 90 minutes	2 (2.9%)	10 (1.6%)
Total	**68**	**607**

Number of missing data: 6 (8.1%) and 127 (17.3%) respectively

POST-OPERATIVE HOSPITAL STAY

The mean hospital stay after operation was 0.6 (SD 0.7) days, compared to 1.7 (SD 1.6) in 1997. A total of 326 patients (46.0%) were discharged on the day of operation and 3 (0.8%) stayed for 4 days or longer. The corresponding figures in 1997 were 9.1% and 10.6% respectively.



Number of missing data: 25 (0.9%)

Distribution of post-operative hospital stay

	1997	2002
0 day	6 (9.1%)	326 (46.0%)
1 day	38 (57.6%)	340 (48.0%)
2 days	11 (16.7%)	29 (4.1%)
3 days	4 (6.1%)	8 (1.1%)
4 – 6 days	4 (6.1%)	3 (0.8%)
7 – 9 days	3 (4.5%)	0 (0.0%)
Total of patients	**66**	**709**

Number of missing data: 8 (10.8%) and 25 (0.9%) respectively

COMPLICATIONS

Fifteen patients developed complications and the incidence was 2.0%, compared to 4.1% in 1997. Cervical laceration was the most common complication followed by excessive fluid absorption. Of the 3 patients with uterine perforation, 2 were associated with the use of cutting loop and 1 was not specified. One patient had a failed procedure due to excessive bleeding obscuring the view. Incomplete surgery occurred in 2 patients; one was necessitated because of uterine perforation and the other was due to instrument failure.

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

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

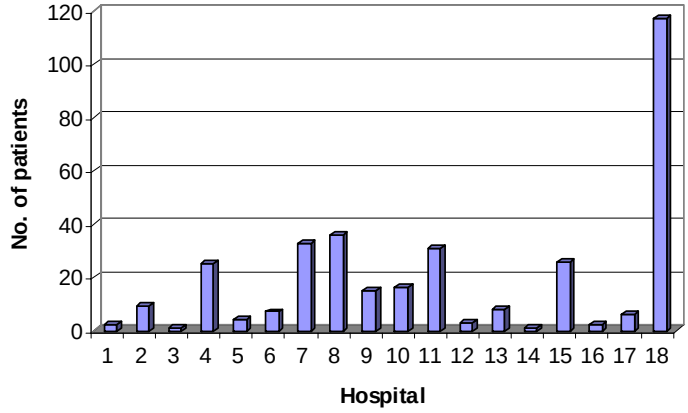
14 HYTSEROSCOPIC SURGERY – LEVEL 3 PROCEDURES

Total number of patients 342

Compared to 1997, there was a 2.7 fold increase in the number of level 3 procedures with the actual number increased from 125 to 342.

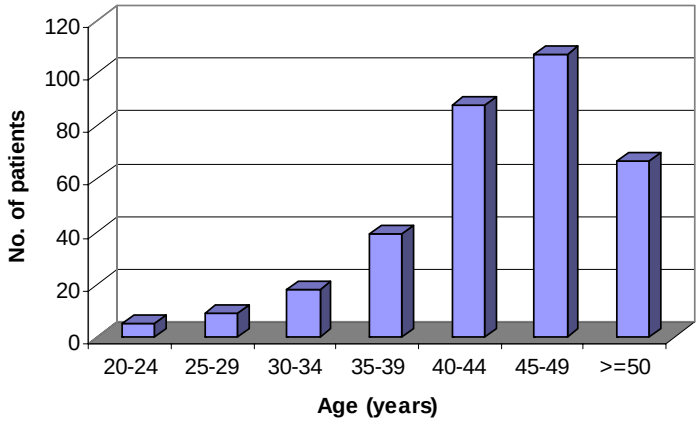
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing level 3 procedures increased from 13 to 18. Most units performed less than 20 cases a year and almost 35% of the cases were performed in one single unit.



AGE DISTRIBUTION OF PATIENTS

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



Number of missing data: 7 (2.0%)

Distribution of age

	1997	2002
20 – 24 years	0 (0.0%)	5 (1.5%)
25 – 29 years	3 (2.4%)	9 (2.7%)
30 – 34 years	7 (5.6%)	18 (5.4%)
35 – 39 years	22 (17.7%)	39 (11.6%)
40 – 44 years	44 (35.5%)	88 (26.6%)
45 – 49 years	38 (30.6%)	108 (32.2%)
≥ 50 years	10 (8.1%)	67 (20.0%)
Total	**124**	**335**

Number of missing data: 1 (0.8%) and 7 (2.0%) respectively

OPERATIVE DIAGNOSIS

Some patients could have more than one diagnosis. Submucosal fibroid was the most common diagnosis followed by normal uterine cavity. The order was reversed in 1997.

	1997	2002
Submucosal fibroid	37 (29.6%)	148 (49.7%)
Normal uterine cavity	56 (44.8%)	92 (30.9%)
Endometrial polyp	10 (8.0%)	47 (15.8%)
Fibroid polyp	17 (13.6%)	28 (9.4%)
Uterine synechiae	4 (3.2%)	8 (2.7%)
Uterine septum	1 (0.8%)	5 (1.7%)
Endocervical polyp	2 (1.6%)	0 (0.0%)
Total	**125**	**298**

Number of missing data: 44 (12.9%)
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 (69.6% versus 67.7% in 1997) and doctors with MRCOG (19.9%vs 25.6% in 1997). The procedures were performed by pre-membership doctors in 9.9% (6.6% in 1997).

Assistant / Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	3	2	2	26	1	**34**
MRCOG	11	1	3	53	0	**68**
FHKAM	47	36	24	56	22	**185**
FRCOG	12	4	11	11	11	**49**
Total	**73**	**43**	**40**	**145**	**34**	**336**

Number of missing data: 6 (1.8%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 116 (37.2%) patients, compared to 64.0% in 1997. GnRH analogue was the most common agent used in contrast to danazol in 1997. GnRH analogue was used in 86, danazol in 25 and progestogen in 5.

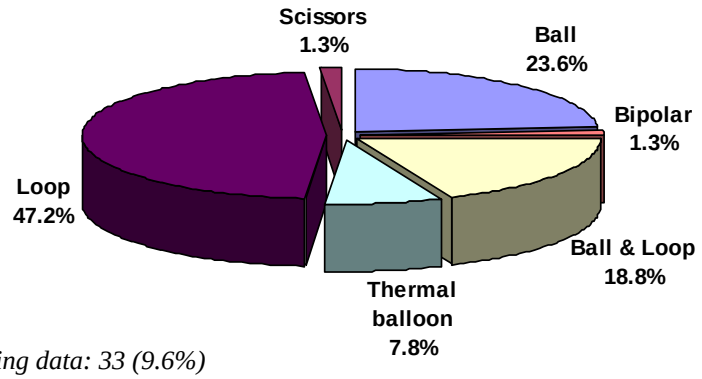
Cervical priming was carried out in 92 patients (29.0%). Misoprostol was used in 81 and cervagem in 11. Prophylactic antibiotic was used in 86 (25.1%) patients.

Anaesthetic methods

General anaesthesia was used in 245 (72.7%), regional anaesthesia in 17 (5.0%), intravenous sedation in 16 (4.7%) and no anaesthesia in 59 (17.5%). Information was not recorded in the remaining 5 patients.

Surgical tools

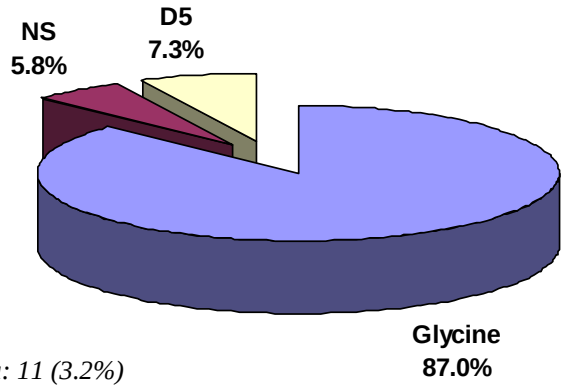
Cutting loop alone was used in 47.2% (35.9% in 1997), roller ball alone in 23.6% (37.6% in 1997), and both were used in 18.8% (26.5% in 1997). Thermal balloon endometrial ablation was performed in 7.8%.



Number of missing data: 33 (9.6%)

Distension fluid

Glycine was the most common distension fluid used and constituted 287 or 87.0% of the cases, compared to 96.8% in 1997. Normal saline was used in 5.8% compared to 2.4% in 1997. Dextrose 5% was mainly used in thermal balloon endometrial ablation.



Number of missing data: 11 (3.2%)

OPERATIVE PROCEDURES

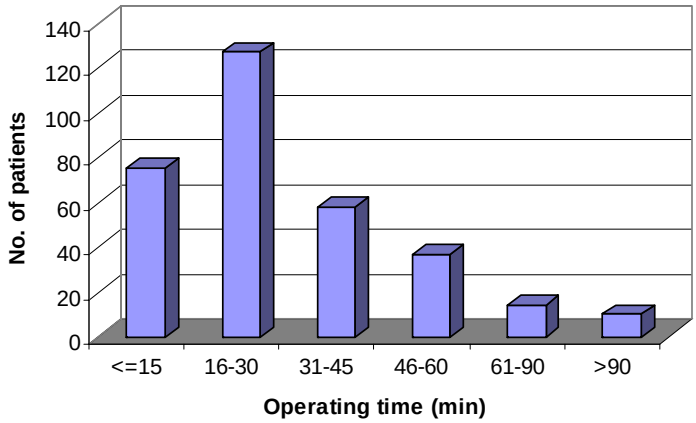
Some patients could have more than one operative procedure performed. On the whole, endometrial ablation/resection was the still the most commonly performed procedure. The incidence of resection of submucosal fibroid increased from 37.6% to 48.8%.

	1997	2002
Endometrial ablation	53 (42.4%)	138 (42.6%)
Endometrial resection	20 (16.0%)	37 (11.4%)
Resection and ablation	9 (7.2%)	17 (5.2%)
Resection of submucosal fibroid	47 (37.6%)	158 (48.8%)
Resection of endometrial polyp	13 (10.4%)	24 (7.4%)
Adhesiolysis	5 (4.0%)	7 (2.2%)
Division of uterine septum	1 (0.8%)	7 (2.2%)
Total	**125**	**326**

Number of missing data: 16 (4.7%)
Data are presented as number and percentage of total number of patients

OPERATING TIME

The mean operating time was 32.3 (SD 21.9) minutes, compared to 40.6 (SD 21.5) in 1997. The operating time was 30 minutes or less in 62.9% and exceeded 60 minutes in 7.5%. The corresponding figures in 1997 were 50.8% and 10.5% respectively.



Number of missing data: 21 (6.1%)

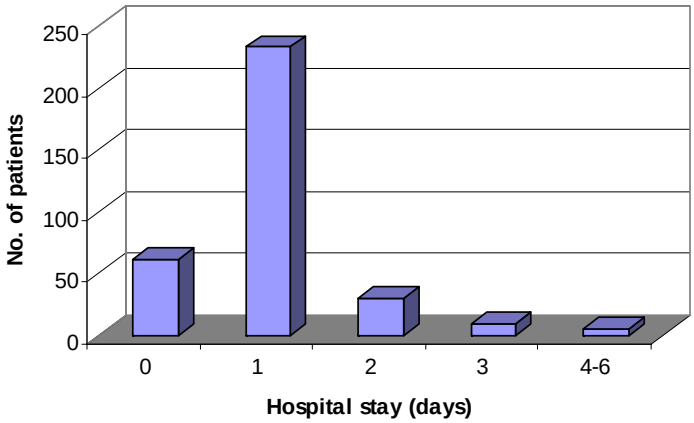
Distribution of operating time

	1997	2002
≤ 15 minutes	4 (3.2%)	75 (23.4%)
16 – 30 minutes	59 (47.6%)	127 (39.6%)
31 – 45 minutes	28 (22.6%)	58 (18.1%)
46 – 60 minutes	20 (16.1%)	37 (11.5%)
61 – 90 minutes	10 (8.1%)	14 (4.4%)
> 90 minutes	3 (2.4%)	10 (3.1%)
Total	**124**	**321**

Number of missing data: 1 (0.8%) and 21 (6.2%) respectively

POST-OPERATIVE HOSPITAL STAY

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



Number of missing data: 3 (0.9%)

Distribution of post-operative hospital stay

	1997	2002
0 day	4 (3.4%)	62 (18.3%)
1 day	70 (59.8%)	233 (68.7%)
2 days	28 (23.9%)	30 (8.8%)
3 days	7 (6.0%)	9 (2.7%)
4 – 6 days	7 (6.0%)	5 (1.5%)
≥ 7 days	1 (0.9%)	0 (0.0%)
Total	**117**	**339**

Number of missing data: 8 (6.4%) and 3 (0.9%) respectively

COMPLICATIONS

Fifteen patients developed complications and the incidence was 4.4% compared to 9.6% in 1997. Ten patients had excessive fluid absorption (>1.5L); 6 were associated with the use of cutting loops, 2 with both loop and rollerball, 1 with rollerball alone and the remaining one was not specified. The 3 cases of uterine perforations were associated with resection of submucosal fibroid. The procedure was failed in 1 patient due to instrument failure. Incomplete surgery occurred in 2 patients; one due to fluid overload and the other due to significant intramural portion of the fibroid. Compared to 1997, the incidence of incomplete surgery reduced from 3.2% to 0.3%.

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

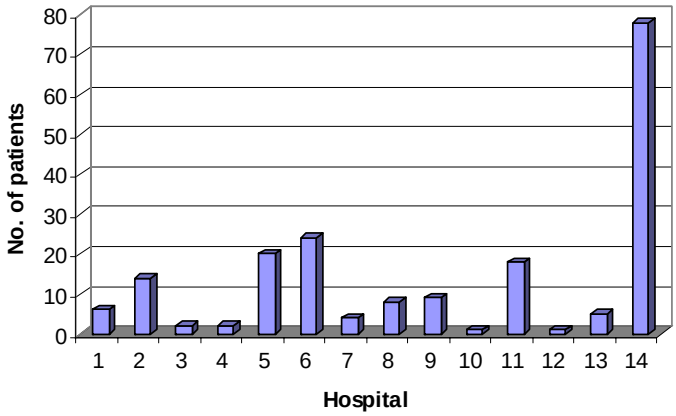
15 ENDOMETRIAL ABLATION / RESECTION

Total number of patients 192

Compared to 1997, there was a 2.3 fold increase in the number of endometrial ablation/resection performed which increased from 82 to 192.

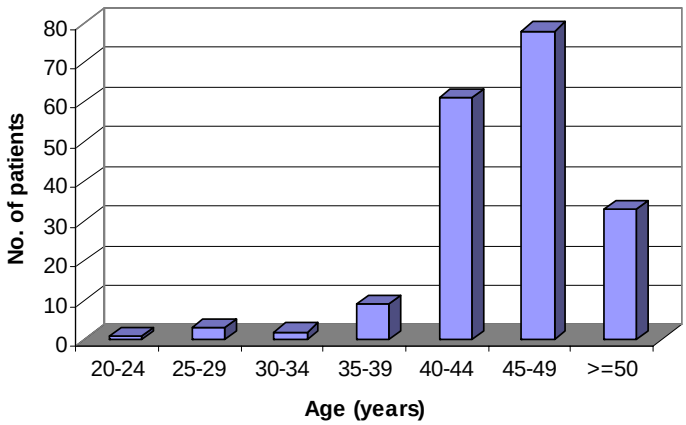
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing endometrial ablation/resection increased from 11 to 14. Similar to 1997, the total number of procedures performed in most units was small. One hospital performed 77 procedures which accounted for 40% of the total number of cases.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 45.7 (SD 5.7) years, compared to was 43.3 (SD 4.3) in 1997. Six patients (3.2%) were younger than 35 and 33 (17.6%) aged 50 or above. The corresponding figures in 1997 were 2.4% and 7.3% respectively.



Distribution of age

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

Number of missing data: 5 (2.6%)

OPERATIVE DIAGNOSIS

The information was not available in 29 patients (15.1%). Some patients could have more than one diagnosis. Normal uterine cavity was the commonest diagnosis.

	1997	2002
Normal uterine cavity	57 (69.5%)	81 (49.7%)
Submucosal fibroid	15 (18.3%)	36 (22.1%)
Endometrial polyp	11 (13.4%)	37 (22.7%)
Fibroid polyp	4 (4.9%)	20 (12.3%)
Uterine septum	0 (0.0%)	1 (0.6%)
Endocervical polyp	2 (2.4%)	0 (0.0%)
Total	**82**	**163**

Number of missing data: 29 (15.1%)
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 (61.8% versus 63.3% in 1997) and MRCOG (24.6% vs 31.6% in 1997). The procedure was preformed by pre-membership doctors in 25 (13.2% versus 5.1% in 1997) cases.

Assistant / Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	3	2	1	18	1	**25**
MRCOG	6	1	2	38	0	**47**
FHKAM	20	27	12	25	11	**95**
FRCOG	5	3	5	8	2	**23**
Total	**34**	**33**	**20**	**89**	**14**	**190**

Number of missing data: 2 (1.0%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 79 (44.9%) patients, compared to 85.4% in 1997. GnRH analogue was the most common agent used in contrast to danazol in 1997. It analogue was used in 56 cases while danazol and progestogen were used in 19 and 4 cases respectively. Information was not available in 16 (8.3%) cases.

Cervical priming was carried out in 39 (21.9%) patients. Misoprostol was used in 34 and cervagem in 5. Prophylatic antibiotic was used in 40 (20.8%) patients.

Effects of endometrial preparation on endometrial ablation/resection

For those with endometrial preparation, the operating time was significantly shorter. However, they were associated with a significantly higher complication rate; 3 with fluid overload and 1 with uterine perforation. Two of such complication were associated with concurrent resection of submucosal fibroid, 1 resection of fibroid polyp and 1 endometrial resection.

	Prepared N = 79	**Not prepared N = 112**	**P value**
Operating time (min)	14.7 ± 17.0	31.1 ± 19.6	<0.05
Fluid balance (ml)	212 ± 413	131 ± 220	NS
Hospital stay (days)	0.9 ± 0.9	1.0 ± 0.7	NS
Concurrent operation (%)	16 (20.3%)	38 (33.9%)	0.05
Complication rate (%)	4 (5.1%)	0	<0.05

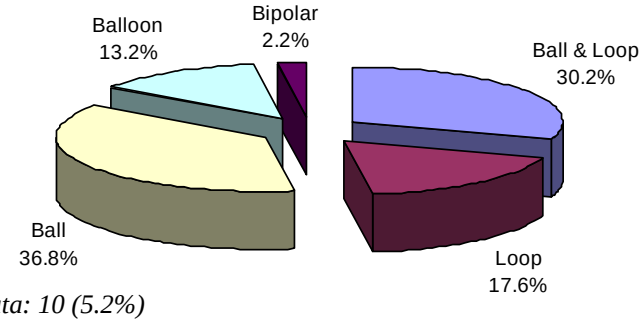
NS – No Significance
Data are presented as number and percentage of total number of patients

Anaesthetic methods

Anaesthetic method was not recorded in 39 patients. Of the 153 patients, general anaesthesia was used in 126, regional anaesthesia in 11 and intravenous sedation in 16.

Surgical tools

Twenty-four patients underwent endometrial ablation using the second generation ablation tools - the thermal balloon endometrial ablation. Of the remaining 168 patients, roller ball alone was used in 67 or 39.9% (51.3% in 1997), cutting loop in 32 or 19.0% (13.8% in 1997), both electrodes were used in 55 or 32.7% (35.0% in 1997) and bipolar system in 4 or 2.4%.



Number of missing data: 10 (5.2%)

Distension fluid

Of the 168 cases who had undergone conventional endometrial ablation/resection, glycine was used as the distending medium in 153 (91.1%) cases, compared to 97.6% in 1997. Normal saline was used more frequently and the incidence from 1.2% to 5.4%. Dextrose 5% was used in 6 and the remaining 6 was not specified. Of the 9 cases using normal saline as the distending medium, bipolar system was used in 3 and the instrument used in the other 6 was not specified. CO_2 was reported as the distending medium in 1 patient, but the type of instrument used was not specified. The possibility of wrong coding could not be excluded.

	1997	**2002**
Glycine 1.5%	80 (97.6%)	153 (91.1%)
Normal saline	1 (1.2%)	9 (5.4%)
Dextrose 5%	0	6 (3.6%)
CO_2	0	1 (0.6%)
Unknown	1 (1.2%)	6 (3.6%)
Total	**82**	**168**

OPERATIVE PROCEDURES

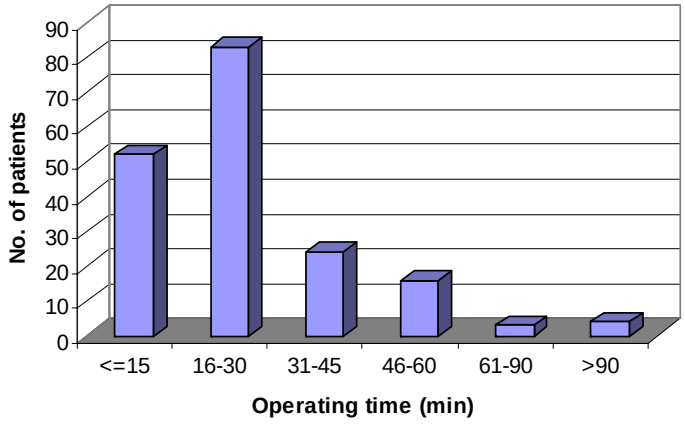
Some patients could have more than one operative procedure. Thermal balloon endometrial ablation was performed in 24 (12.5%) cases. Conventional endometrial ablation was performed in 59.4% (64.4% in 1997), endometrial resection in 19.3% (24.4% in 1997) and a combination of both in 19.3% (11.0% in 1997). Concurrent myomectomy and polypectomy were performed in 17.2% and 10.9% respectively. The corresponding figures in 1997 were 13.4% and 12.2% respectively.

	1997	2002
Thermal Balloon Ablation	0 (0.0%)	24 (12.5%)
Endometrial ablation	53 (64.6%)	114 (59.4%)
Endometrial resection	20 (24.4%)	37 (19.3%)
Resection and ablation	9 (11.0%)	17 (8.9%)
Resection of submucosal fibroid	11 (13.4%)	33 (17.2%)
Polypectomy	10 (12.2%)	21 (10.9%)
Total	**82**	**192**

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

Operating Time

The mean operating time was 28.2 (SD 19.3) minutes, compared to 38.4 (SD 18.5) in 1997. Most of the operations were completed within 30 minutes (70.1% vs 54.9% in 1997) and 7 (3.9% vs 6.1% in 1997) exceeded 60 minutes.



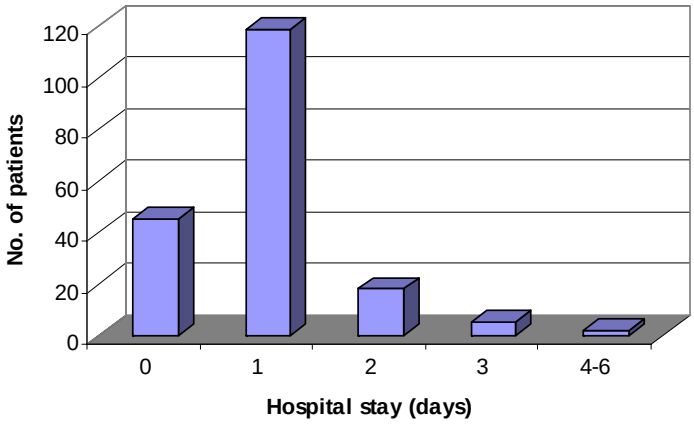
Distribution of operating time

	1997	2002
≤ 15 minutes	0 (0.0%)	52 (28.6%)
16-30 minutes	45 (54.9%)	83 (45.6%)
31-45 minutes	20 (24.4%)	24 (13.2%)
46-60 minutes	12 (14.6%)	16 (8.8%)
61-90 minutes	4 (4.9%)	3 (1.6%)
> 90 minutes	1 (1.2%)	4 (2.2%)
Total	**82**	**182**

Number of missing data: 10 (5.2%)

POST-OPERATIVE HOSPITAL STAY

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



Distribution of post-operative hospital stays

	1997	2002
0 day	1 (1.3%)	45 (23.8%)
1 day	50 (63.3%)	119 (63.0%)
2 days	18 (22.8%)	18 (9.5%)
3 days	4 (5.1%)	5 (2.7%)
4-6 days	5 (6.1%)	2 (1.0%)
7-9 days	1 (1.3%)	0 (0.0%)
Total of patients	**79**	**189**

Number of missing data: 3 (3.7%) and 3 (1.6%) respectively

COMPLICATIONS

Four patients developed complications and the incidence was 2.1%, compared to 6.1% in 1997. Excessive fluid absorption (>1.5L) occurred in 3 patients; all received endometrial preparation and 2 had a concurrent resection of submucosal fibroid and fibroid polyp respectively. Perforation of uterus occurred in 1 who had a submucosal fibroid and had received cervical priming with misoprostol.

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

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

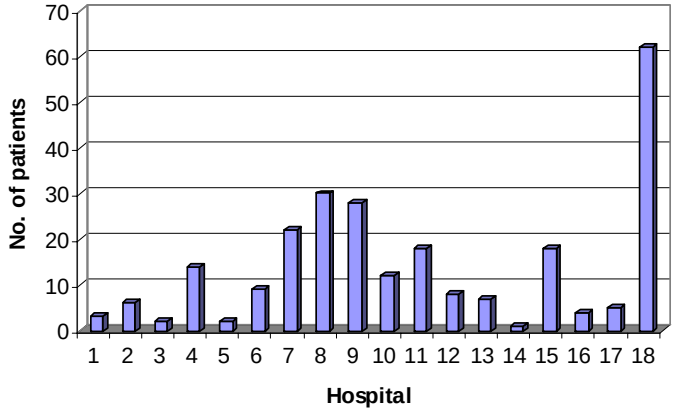
16 HYSTEROSCOPIC RESECTION OF FIBROID

Total number of patients 251

Compared to 1997, there was a 5.3 fold in crease in the number of hysteroscopic resection of fibroid and the actual number increased from 47 to 251.

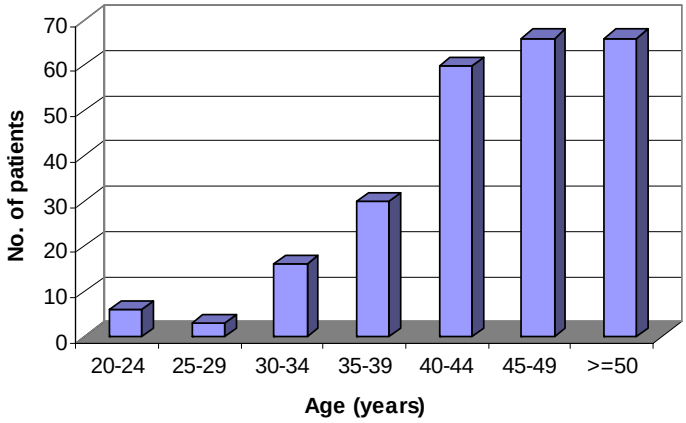
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

The number of units performing resection of fibroid increased from 10 to 18. Similar to 1997, most units performed less than 20 cases a year. One unit performed 62 cases which accounted for almost 25% of the total number of cases.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 44.9 (SD 8.6) years, compared to 41.6 (SD 6.4) in 1997. Twenty-five (10.1%) patients were younger than 35 and 66 (26.7%) were 50 or older. The corresponding figures in 1997 were 13.0% and 8.7% respectively.



Distribution of age

	1997	2002
20 – 24 years	0 (0.0%)	6 (2.4%)
25 – 29 years	1 (2.2%)	3 (1.2%)
30 – 34 years	5 (10.9%)	16 (6.5%)
35 – 39 years	12 (26.1%)	30 (12.1%)
40 – 44 years	12 (26.1%)	60 (24.3%)
45 – 49 years	12 (26.1%)	66 (26.7%)
≥ 50 years	4 (8.7%)	66 (26.7%)
Total	**46**	**247**

Number of missing date: 1 (2.1%) and 4 (1.6%) respectively

OPERATIVE DIAGNOSES

Information was not available in 14 (5.6%) cases. Of the remaining 237 patients, 131 (55.3%) had submucosal fibroid and 111 (46.8%) had fibroid polyp; 6 of them had co-existing pathology. Eleven patients had co-existing endometrial polyp.

	1997	2002
Submucosal fibroid	35 (74.5%)	131 (55.3%)
Fibroid polyp	12 (25.5%)	111 (46.8%)
Endometrial polyp	0 (0.0%)	11 (4.6%)
Uterine septum	0	2 (0.8%)
Total	**47**	**237**

Number of missing date: 14 (5.6%)
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 (72.8% versus 59.6% in 1997) and MRCOG (20.2% versus 25.5% in 1997). The procedure was performed by pre-membership doctors in 10.3% (10.6% in 1997).

Assistant / Surgeon	Assistant					Total
	Nil	MBBS	MRCOG	FHKAM	Nurse	
MBBS	4	3	2	19	1	**29**
MRCOG	5	1	2	35	2	**45**
FHKAM	38	19	19	36	15	**127**
FRCOG	10	1	13	5	14	**43**
Total	**57**	**24**	**36**	**95**	**32**	**244**

Number of missing date: 7(2.8%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 43 (18.9%) patients compared to 40.4% in 1997. GnRH analogue was the most common agent used in contrast to danazol in 1997. GnRH analogue was used in 34**,** danazol in 8 and progestogen in 1. Information was not available in 24 (9.6%) cases.

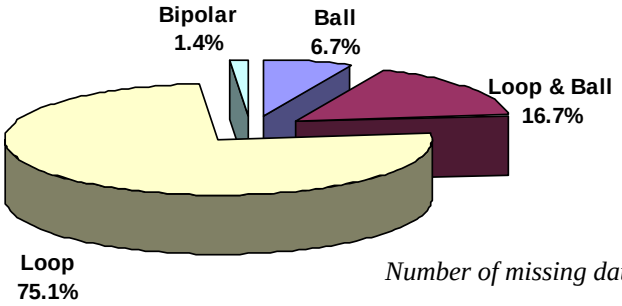
Cervical priming was carried out in 63 patients (27.6%). Misoprostol was used in 54 and cervagem in 9. Prophylactic antibiotic was used in 55 (21.9%) patients.

Anaesthetic methods

General anaesthesia was used in 206 and regional anaesthesia in 5. Information was not recorded in the remaining 38 patients.

Surgical tools

Cutting loop alone was used in 75.1% (68.2% in 1997). Both cutting loop and roller ball were used in 16.7% (25.0% in 1997). Roller ball alone was reported to have been used in 14 (6.7%) patients (6.8% in 1997). Bipolar system was used in 3 patients.



Number of missing data: 42 (16.7%)

Distension fluid

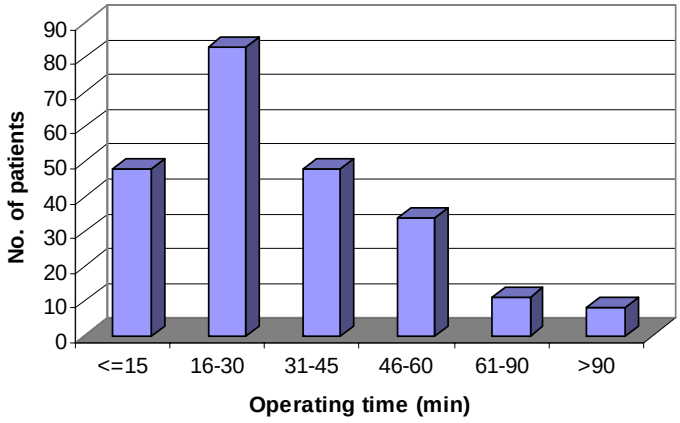
Glycine was used as the distending medium in 214 (85.3%) cases, compared to 95.7% in 1997. Normal saline was used in 27 (10.8%) in contrast to only 2.1% in 1997. CO_2 was reported to have been used in 1 patient and the distending medium was not specified in 9 patients.

OPERATIVE PROCEDURES

Endometrial ablation was performed at the same operation in 35 (13.9 vs 4.2% in 1997), endometrial resection in 10 (4.0% vs 19.1% in 1997) and hysteroscopic polypectomy in 12 (4.8% vs 0% in 1997) patients.

OPERATING TIME

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



Number of missing data: 19 (7.6%)

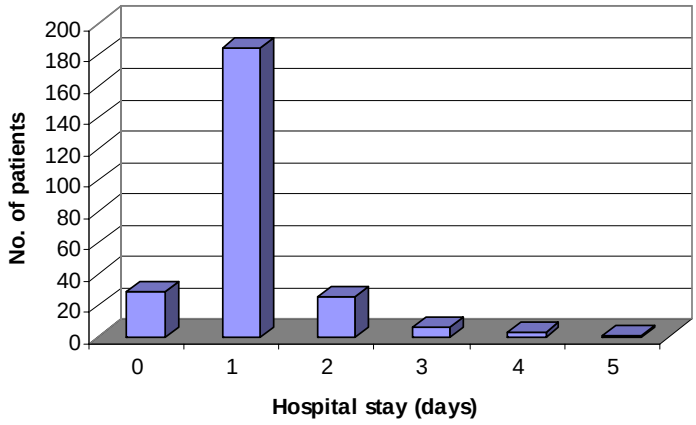
Distribution of operating time

	1997	2002
≤ 15 minutes	4 (8.7%)	48 (20.7%)
16 – 30 minutes	16 (34.8%)	68 (35.8%)
31 – 45 minutes	9 (19.6%)	48 (20.7%)
46 – 60 minutes	9 (19.6%)	34 (14.7%)
61 – 90 minutes	6 (13.0%)	11 (4.7%)
> 90 minutes	2 (4.3%)	8 (3.4%)
Total	**46**	**232**

Number of missing data: 1 (2.1%) and 19 (7.6%) respectively

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.7) days, compared to 1.6 (SD 0.9) in 1997. Majority of the patients were discharged within the first day (85.6%) and 4 (1.6%) stayed 4 days or longer. The corresponding figures in 1997 were 59.6% and 4.8% respectively.



Number of missing data: 2 (0.8%)

Distribution of post-operative hospital stays

	1997	2002
0 day	1 (2.4%)	29 (11.7%)
1 day	24 (57.1%)	184 (73.9%)
2 days	12 (28.6%)	26 (10.4%)
3 days	3 (7.1%)	6 (2.4%)
4 days	1 (2.4%)	3 (1.2%)
5 days	1 (2.4%)	1 (0.4%)
Total	**42**	**249**

Number of missing data: 5 (10.6%) and 2 (0.8%) respectively

COMPLICATIONS

Sixteen patients developed complications and the incidence was 6.4%, compared to 12.8% in 1997. Excessive fluid absorption (>1.5L) occurred in 11 patients and the incidence remained unchanged. Uterine perforation occurred in 2 and 1 surgery was failed due to instrument failure. One (0.5%) patient had an incomplete surgery due to fluid overload and significant intramural portion of the fibroid. The incidence of incomplete surgery was much reduced when compared to 6.4% in 1997.

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

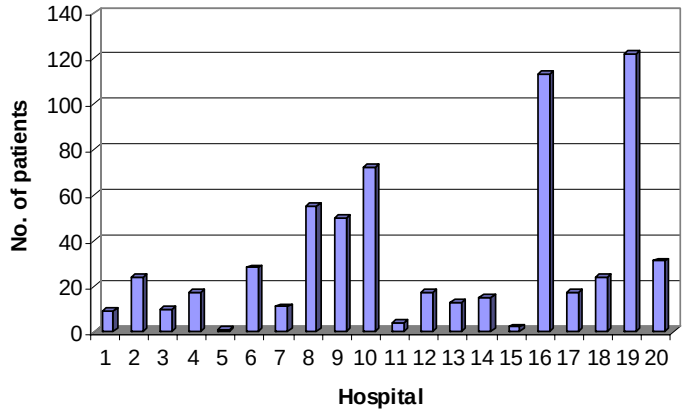
17 HYSTEROSCOPIC RESECTION OF ENDOMETRIAL POLYP

Total number of patients 635

Compared to 1997, there was an 11.5 fold increase in the number of hysteroscopic resection of endometrial polyps and the actual number increased from 55 to 635. As no separate analysis was performed for this procedure in 1997, there was no data for comparison.

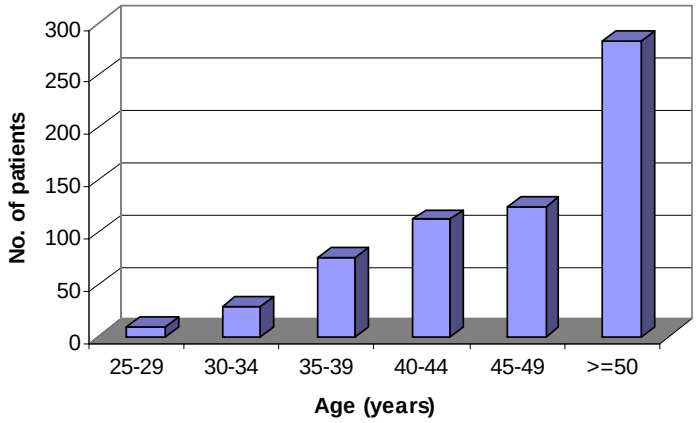
CASE DISTRIBUTION BY INDIVIDUAL HOSPITALS

Most units performed less than 20-30 cases a year. Two units performed over 100 cases which accounted for 37% of the total number of cases.



AGE DISTRIBUTION OF PATIENTS

The mean age of the patients was 49.4 (SD 11.1) years. 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.



Distribution of age

25 – 29 years	9 (1.4%)
30 – 34 years	29 (4.6%)
35 – 39 years	75 (11.8%)
40 – 44 years	112 (17.6%)
45 – 49 years	124 (19.5%)
≥ 50 years	282 (44.4%)
Total	**631**

Number of missing date: 4 (0.6%)

OPERATIVE DIAGNOSES

Information was not available in 29 (4.6%) cases. Of the remaining 237 patients, 25 (3.9%) had concurrent submucosal fibroid and 14 (2.2%) had fibroid polyp; 1 of them had both pathology present. Fourteen patients had co-existing endocervical or cervical polyp.

Submucosal fibroid	25 (4.1%)
Fibroid polyp	14 (2.3%)
Endocervical/Cervical polyp	14 (2.3%)
Uterine septum	2 (0.3%)
Total	**606**

Number of missing date: 14 (4.6%)
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 (56.5%) and MRCOG (23.5%). The procedure was performed by pre-membership doctors in 20.0%, of which 51.6% were not assisted by doctors.

Assistant / Surgeon	Assistant					Total
	Nil	**MBBS**	**MRCOG**	**FHKAM**	**Nurse**	
MBBS	55	4	7	49	9	**124**
MRCOG	53	7	4	69	13	**146**
FHKAM	81	28	20	30	97	**256**
FRCOG	21	4	9	6	55	**95**
Total	**210**	**43**	**40**	**154**	**174**	**621**

Number of missing date: 14(2.2%)

OPERATIVE TECHNIQUES

Pre-operative preparation

Endometrial preparation was carried out in 15 (2.7%) patients; 7 underwent concurrent endometrial ablation and 1 resection of fibroid. GnRH analogue was used in 10**,** danazol in 3 and progestogen in 2. Information was not available in 87 (13.7%) cases.

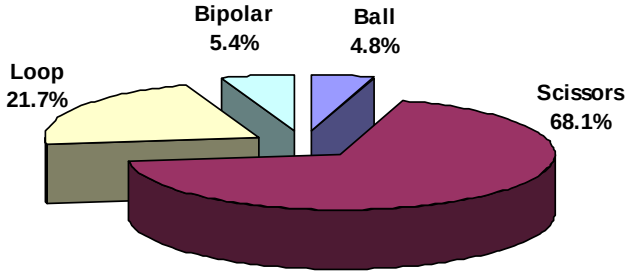
Cervical priming was carried out in 94 patients (16.6%). Misoprostol was used in 78, cervagem in 14 and unspecified in 2. Prophylactic antibiotic was used in 54 (8.5%) patients.

Anaesthetic methods

General anaesthesia was used in 363 (57.1%), paracervical block in 43 (6.8%) and regional anaesthesia in 10 (1.6%). The procedures were performed under no anaesthesia in 172 (27.1%) patients. Information was not recorded in the remaining 41 (6.5%) patients.

Surgical tools

Cutting loop alone was used in 226 (68.1%), hysteroscopic scissors in 72 (21.7%) and bipolar system in 18 (5.4%). Roller ball alone was used in 16 (4.8%).



Number of missing data: 293 (46.1%)

Distension fluid

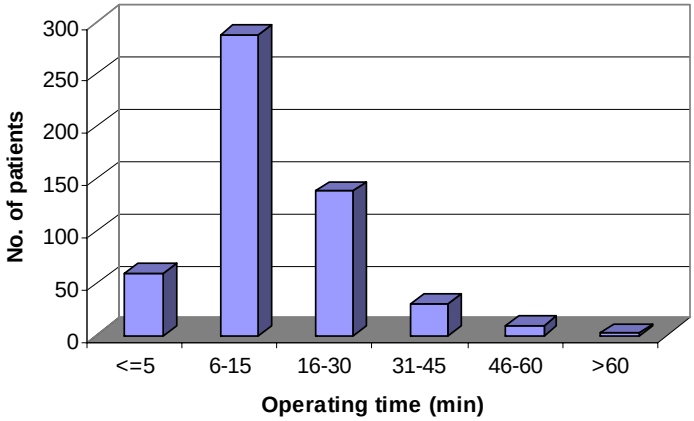
Normal saline was in 321 (50.6%) cases and was the most common distending medium used. Glycine was used in 257 (40.5%) cases and CO_2 in 26 (4.1) patients. Information was not available in 31 (4.9%) cases.

OPERATIVE PROCEDURES

Endometrial ablation was performed at the same operation in 14 (2.2%), endometrial resection in 2 (0.3%) and resection of fibroid in 12 (1.9%) patients.

OPERATING TIME

The mean operating time was 16.4 (SD 11.8) minutes. The procedure was completed within 15 minutes in 65.9% of cases and exceeded 60 minutes in 0.4%.



Number of missing data: 110 (11.3%)

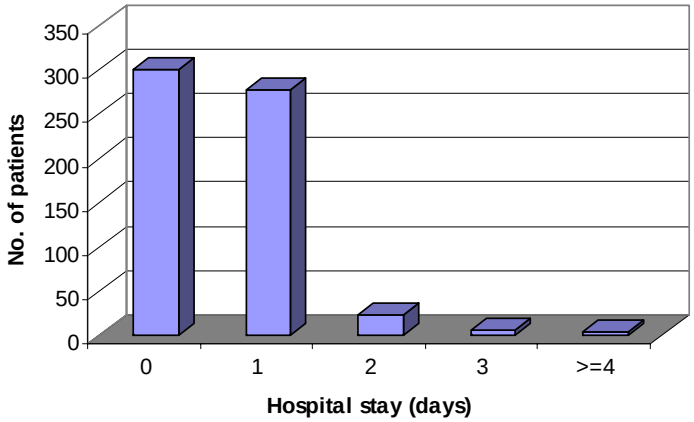
Distribution of operating time

≤ 5minutes	59 (11.2%)
6 – 15 minutes	287 (54.7%)
16 – 30 minutes	138 (26.3%)
31 – 45 minutes	30 (5.7%)
46 – 60 minutes	9 (1.7%)
> 60 minutes	2 (0.4%)
Total	**525**

Number of missing data: 110 (11.3%)

POST-OPERATIVE HOSPITAL STAY

The mean post-operative hospital stay was 1.1 (SD 0.4) days. Majority of the patients were discharged within the first day (85.6%) and 4 (1.6%) stayed 4 days or longer. The corresponding figures in 1997 were 59.6% and 4.8% respectively.



Number of missing data: 24 (3.8%)

Distribution of post-operative hospital stays

0 day	301 (49.3%)
1 day	277 (45.3%)
2 days	23 (3.8%)
3 days	6 (1.0%)
≥ 4 days	4 (0.7%)
Total	**611**

Number of missing data: 24 (3.8%)

COMPLICATIONS

Eight patients developed complications and the incidence was 1.3%. Uterine perforation occurred in 3 (0.5%) patients, all were associated with the use of cutting loop. Two (0.5%) patients had an incomplete surgery because of uterine perforation and instrument failure respectively.

Cervical laceration	4 (0.6%)
Perforation of uterus	3 (0.5%)
Incomplete surgery	2 (0.3%)
Total	**8 (1.3%)**

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

_____(optional)

Patient's Particulars
Initial only (Surname first)
Name : _____
Age: _____ HKID: (☐☐☐☐☐☐☐☐)
at least 4 digit

Qualification (circle the highest level only)

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) **Discharge on day: _____(Post-operative day)**

Emergency operation: Yes / No

Type of procedure: Diagnostic / Sterilization / Operative (HKCOG Level: 2 / 3 / 4 / 5)

Previous abdominal surgery: Previous laparotomy / Previous laparoscopy / Nil

Operative Diagnosis	**(R) Size (cm)**	**(L) Size (cm)**	**Ruptured (R)**	**Ruptured (L)**
1. Ovarian cyst/tumour	0-4 5-8 > 8	0-4 5-8 > 8	Yes / No	Yes / No
2. Endometriotic cyst	0-4 5-8 > 8	0-4 5-8 > 8	Yes / No	Yes / No
3. Dermoid cyst	0-4 5-8 > 8	0-4 5-8 > 8	Yes / No	Yes / No
4. Paraovarian cyst	0-4 5-8 > 8	0-4 5-8 > 8	Yes / No	Yes / No
5. Hydrosalpinx	0-4 5-8 > 8	0-4 5-8 > 8		
6. Pyosalpinx	0-4 5-8 > 8	0-4 5-8 > 8		
7. Tubo-ovarian abscess	0-4 5-8 > 8	0-4 5-8 > 8		
8. Ectopic pregnancy ①	L / R **Site** _____ **Size** _____ (cm) **Ruptured**: Yes / No **Haemoperitoneum**_____cc **Attempted salpingostomy:** Yes / No **Haemodynamic instability**: Yes / No			
9. Endometriosis	minimal / mild / moderate / severe			
10. Pelvic adhesion	minimal / mild / moderate / severe			
11. Fibroid	number:____ Largest size: 0-3/ 4-6/ >6 cm			
12. Adenomyosis				
13. Genuine stress incontinence				
14. DUB				
15. Normal pelvis				
16. Others② _____				
* Frozen Section	☐ sent Dx _____ ☐ not sent			

Operative Procedure (please circle)

1. Cystectomy R / L / B
2. Oophorectomy R / L / B
3. Salpingoophorectomy R / L / B
4. Salpingectomy R / L / B
5. Salpingostomy R / L / B
6. Adhesiolysis
7. Ablation of endometriosis
8. Hysterectomy Total/Subtotal
9. Colposuspension Pre/Transperitoneal
10. Myomectomy _____
11. Ovarian drilling
12. Sterilization: Clips/ Ring/Electrocautery/ Partial salpingectomy
13. Others③: _____

Operative details

Primary entry:
Open/Close/ Optic view
Site:
Umbilical/Supraumbilical/LUQ

Total no. of ports⑥ _____

Monopolar	Yes / No
Bipolar	Yes / No
Suture	Yes / No
Endoloop	Yes / No
Laser	Yes / No
Ultrasonic incision	Yes / No
Clip / stapler	Yes / No
Drain	Yes / No

Complication

1. Injury to epigastric vessels	Yes / No
2. Injury to other major vessel	Yes / No
3#. Haemorrhage requiring transfusion	Yes / No
4. Subcutaneous haemorrhage	Yes / No
5. Significant emphysema	Yes / No
6. Bladder injury	Yes / No
7. Ureter injury	Yes / No
8. Bowel injury	Yes / No
9*. Febrile morbidity	Yes / No
10. UTI	Yes / No
11. Retention of urine	Yes / No
12. Wound infection	Yes / No
13. Ileus	Yes / No
14. Pelvic/Vault haematoma	Yes / No
15. Incisional hernia	Yes / No
16. Gas embolism	Yes / No
17. Deep vein thrombosis	Yes / No
18. Readmission④	Yes / No
Reason: _____	
19. Conversion to Laparotomy⑤	Yes / No
Reason: _____	
20. Subsequent Laparotomy	Yes / No
Reason: _____	
21. Death _____	
22. Others _____	

Intra-operative blood loss _____ ml
Surgery time _____ min. (skin to skin)

①-⑤ Please refer to appendix on the back of the page ⑥ Including primary port for laparoscope
Haemorrhage due to operation * Fever > 38°C on 2 occasion 4 hours apart excluding 1st 24 hrs

- **For unplanned readmission due to complication resulting from laparoscopic surgery done after January 2002**
  - **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**

Appendix

1. Site of tubal pregnancy
- a) Fimbrial
- b) Ampullary
- c) Isthmus
- d) Interstitial
- e) Cornual
- f) Tubal (if whole tube involved)
- g) Ovarian
- h) Abdominal
- i) Cervical

2. Other operative diagnosis
- a) Bleeding corpus luteum
- b) Ca Cervix
- c) Ca Corpus
- d) Ca Ovary
- e) CIN
- f) Chronic pelvic pain
- g) Cystocele
- h) Endometrial hyperplasia
- i) Enterocele
- j) Failed sterilization
- k) Infertility
- l) Ovarian entrapment
- m) PMB
- n) Rectocele
- o) Translocated IUCD
- p) Failed sterilization
- q) Genital prolapse
- r) Vault prolapse
- s) PCO
- t) Micro-invasive carcinoma of cervix
- u) Fimbrial cyst
- v) Unwanted fertility

3. Other Operative Procedures
- a) Control of bleeding
- b) LUNA
- c) Presacral neurectomy
- d) Moschowitz procedure
- e) High McCall culdoplasty
- f) Sacral colpopexy
- g) Sacrospinous fixation
- h) Pelvic lymphadenectomy
- i) Paraaortic lymphadenectomy
- j) Staging laparoscopy
- k) Second look laparoscopy
- l) Radical hysterectomy
- m) Ovarian biopsy

4. Reason for Readmission
- a) Bowel obstruction
- b) Intraperitoneal bleeding
- c) Repair of fistula/injury
- d) Repair of incisional hernia
- e) Pelvic sepsis
- f) Vault haemorrhage
- g) Unexpected malignancy
- h) Other unrelated problems

5. **Reason for Conversion**
- a) Bladder injury
- b) Bowel injury
- c) Dense pelvic adhesion
- d) Fail to maintain pneumoperitoneum
- e) Failure in specimen removal
- f) Instrument failure
- g) Poor pelvic access
- h) Poor vaginal access
- i) Uncontrolled bleeding
- j) Unexpected malignancy
- k) Ureteric injury

HKCOG Levels of Training in Laparoscopic Surgery

LEVEL I BASIC PROCEDURES

1. Diagnostic laparoscopy
2. Laparoscopic sterilisation

LEVEL 2 MINOR PROCEDURES

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)
5. Myolysis
6. Ovarian drilling
7. Aspiration / fenestration of cyst

LEVEL 3 INTERMEDIATE PROCEDURES

1. Oophorectomy or cystectomy for benign ovarian cysts of less than 8 cm
2. Laparoscopic management of moderate endometriosis (AFS Stage III)
3. Salpingostomy
4. Myomectomy for pedunculated fibroid

LEVEL 4 MAJOR PROCEDURES

1. Hysterectomy
2. Myomcctomy for non-pedunculated fibroid > 3 cm.
3. Laparoscopic management of large benign ovarian tumours (>8cm.)
4. Laparoscopic management of severe endometriosis (AFS Stage IV)
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

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

_____ Hospital (Optional) Qualification

Patient's Particulars
Initial only (Surname first)

Name : _____

Age: _____ HKID: (☐☐☐☐☐☐☐☐)
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) **Discharge on day: _____(Post-operative day)**

Endometrial Preparation: **Agent :** None / Progestogen / Danazol / GnRHa
Dose / Duration: _____

Cervical priming: Agent: None / Cervagem / Misoprostol / Others_____

Prophylactic antibiotics: Yes / No

Anaesthetics: None / Paracervical block / Conscious Sedation / GA / Regional / Others: _____

Operative Finding

Uterine size_____ week

- ☐ Normal cavity
- ☐ Endometrial polyp _____ cm
- ☐ Uterine septum _____
- ☐ Others _____

Cavity length _____ cm

- ☐ Submucosal fibroid _____ cm _____ gm
- ☐ Fibroid polyp _____ cm _____ gm
- ☐ Uterine synechiae* mild / moderate / severe

(*refer to appendix)

Procedure **HKCOG Level: 1/ 2 / 3 (refer to appendix)**

- ☐ Diagnostic
- ☐ Endometrial ablation
- ☐ Endometrial resection
- ☐ Myomectomy
- ☐ Polypectomy
- ☐ Division of adhesion
- ☐ Division of septum
- ☐ Proximal tubal cannulation
- ☐ Others

Device

- ☐ Roller Ball ☐ Thermal Balloon ☐ Scissors
- ☐ Cutting loop ☐ VersaPoint
- ☐ Laser _____ ☐ Others_____

Distension medium: Glycine / NS / CO_2 / Others _____
Fluid in _____ ml
Fluid out: _____ ml

Procedure time _____ min (*optional for diagnostic procedure*)

Hysteroscopic Complication

1. Cervical laceration Yes / No
2. Perforation of uterus Yes / No
3. Injury of adjacent organs Yes / No
   specify _____
4. Fluid overload Yes / No
5. Haemorrhage requiring management Yes / No
   specify _____
6. Failed surgery Yes / No
   reason _____
7. Incomplete surgery Yes / No
   reason _____
8. Further surgery Yes / No
   specify _____
9. 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 (by March 1978)

Mild: <1/4 of uterine cavity involved;
Filmy adhesions;
Ostial areas and upper fundus minimally involved or clear

Moderate: ¼ - ¾ 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 polypectomy
2. Proximal fallopian tube cannulation
3. Division of mild synechiae

4. **Level 3 Major Procedures**

1. Endometrial ablation/resection
2. Division of uterine septum
3. Resection of submucosal fibroid
4. Division of significant synechiae