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Hysterectomy at a Tertiary Hospital in South Africa:

Indications, pathology and
complications

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BTTJEN003

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University of Cape Town

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Declaration

I, Jennifer Leigh Butt, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being or is to be submitted for another degree in this or any other university.

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Declaration by supervisors

The research which Dr Jennifer Leigh Butt has undertaken and the presentation of this dissertation was supervised by Dr Stephen Jeffery and Professor Zephne van der Spuy. This study was carried out while Dr Butt was a registrar in the Department of Obstetrics and Gynaecology at the University of Cape Town.

We are satisfied that this was Dr Butt's original work and that this dissertation should be submitted in partial fulfilment of the requirements for the degree Master of Medicine in Obstetrics and Gynaecology.

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Abstract

This study is a retrospective audit of women undergoing a hysterectomy at Groote Schuur Hospital, Cape Town between 1 January 2007 and 31 December 2007.

Objectives: To review the relationship between the clinical indication for hysterectomy and the histopathological findings and to assess the rate of complications following hysterectomy.

Results: Three hundred and forty elective hysterectomies were carried out in 2007 at Groote Schuur Hospital. Case notes were obtained for 335 patients. Total abdominal hysterectomy was the most common type of hysterectomy and was performed in 218 out of 335 (65.1%) surgeries. Vaginal hysterectomies accounted for 19.4% (n = 65), subtotal hysterectomies for 9.5% (n = 32), Wertheims hysterectomies for 4.5% (n = 15) and laparoscopic-assisted hysterectomies for 1.5% (n = 5) of all the other surgical procedures for hysterectomy.

The most common indication for hysterectomy was menorrhagia secondary to fibroids (23% of women), followed by abnormal bleeding in 14.9% of the patients. Endometrial cancer was the indication in 13.4%, prolapse in 11.3% and cervical cancer in 10.7% of the women undergoing hysterectomy. Fibroids were found on histopathological assessment in 62.8% of women, but were judged to be the pathology responsible for the symptoms leading to consultation in only 35.3% of the patients. There were significantly more symptomatic fibroids among the black African women than any other population group ($p < 0.001$). In 14.3% of hysterectomies no cause for the symptoms could be identified by histopathological examination. Of the 43 women with abnormal menstrual bleeding, no causative pathology could be identified in 11 of them (23%).

Intra-operative complications occurred in 4.8% of the patients with most occurring during subtotal hysterectomy. Abdominal procedures had more post-operative complications than vaginal or laparoscopic hysterectomies. Wound sepsis was five times more common in women who were 'overweight'.

Conclusions: Compared to audits of hysterectomy in industrialised countries, in our study a lower proportion of women undergoing hysterectomy had no identified organic cause for their symptoms. The indications for surgery were therefore usually supported by the histopathological findings. Intra-operative complications of surgery were comparable to other international studies.

Abbreviations

BSO	Bilateral salpingo-oophorectomy
CVA	Cerebrovascular accident
DVT	Deep vein thrombosis
HSIL	High grade squamous intraepithelial lesion
LAVH	Laparoscopic-assisted vaginal hysterectomy
LNG-IUS	Levonorgestrel-releasing intrauterine system
LLETZ	Large loop excision of the transformation zone
NHS	National Health Services
NICE	National Institute for Clinical Excellence
sTAH	Subtotal hysterectomy
TAH	Total abdominal hysterectomy
TLH	Total laparoscopic hysterectomy
TVT	Transvaginal tape
UK	United Kingdom
USA	United States of America
VH	Vaginal hysterectomy
VALUE study	Vaginal, Abdominal and Laparoscopic Uterine Excision Study

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CHAPTER 1: INTRODUCTION

The term 'hysterectomy' originates from the Greek word *hystera* meaning womb, combined with the suffix *-ectomy*, to cut out. Etymologically it is closely related to the word 'hysteria', originally used to describe a neurotic condition in women and thought to be caused by disturbances in the womb.¹

History

The first description of the surgical procedure of hysterectomy was by Soranus of Ephesus in 120AD, when he advised that if the whole inverted 'uterus has become black, one must cut it off in its entirety'.² In the middle ages most hysterectomies were performed on prolapsed or inverted puerperal uteri, as an emergency procedure. The uterus was probably only partially removed and the mortality rate was high.

The first reported vaginal hysterectomy, where the patient survived, was recorded by Percival Willoughby, a male midwife from Derby, UK, in 1670. The patient, Faith Howard, frustrated by the frequent occurrence of complete prolapse of her uterus, performed the procedure on herself. Mr Willoughby sutured the wound and the patient lived for many years with complete incontinence from a vesicovaginal fistula.² In 1813, the first elective vaginal hysterectomy, where the patient survived, was performed by Conrad Langenbeck in Gottingen, Germany on a 50 year old women with cervical cancer. The patient lived for 26 years after the surgery and it was only after a post mortem examination that Langenbecks' colleagues believed that he had performed the operation.³

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Walter Burnham (Massachusetts, USA) performed the first unplanned total abdominal hysterectomy in 1853.³ The indication for the surgery was a large ovarian cyst, however at laparotomy the patient vomited and expelled a large fibroid uterus through the incision. A subtotal hysterectomy was carried out and the patient survived. In the early 1800's the mortality rate for abdominal hysterectomy was more than 70% mainly due to sepsis and the technique of leaving a long extra-abdominal ligature from the lower part of the incision to drain pus.

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Schauta and Wertheim performed the first radical hysterectomy for cancer of the cervix in 1898; now known as the Wertheim's hysterectomy. For the first 220 radical hysterectomies done by Wertheim, the mortality rate was 18%, and the morbidity rate was 31%.⁴ During the next 100 years, surgical technique was refined, effective anaesthesia became available and the mortality and morbidity rates decreased.

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In 1988 a new concept was introduced, when Reich performed the first total laparoscopic hysterectomy in Pennsylvania, USA.³ This technique was criticised for its lengthy operating time and, as a result, the procedure of laparoscopic-assisted vaginal hysterectomy is more commonly carried out.

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Prevalence and Incidence

Throughout the industrialized world, after caesarean section, hysterectomy is the second most frequently performed major operation on women.⁵⁻⁹

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Approximately 600 000 hysterectomies are performed annually in the USA, and more than one third of US women have had a hysterectomy by the age of 60.⁹ Whiteman et al. used data from the United States National Hospital Discharge Survey to determine trends in hysterectomy rates from 2000 – 2004. Hysterectomy rates per 1000 women were calculated using population statistics, obtained from the US Census Bureau. Their results showed that

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3.1 million hysterectomies were done on women (over 15 yrs) during this 5 year period. The average age at hysterectomy was 46.1 years. There was a small, but statistically significant, decline in the rate, from 5.4/1000 women in 2000 to 5.1/1000 in 2004 (P for trend < 0.05). They ascribe this difference to an increase in outpatient hysterectomy (numbers not included in their data), an increase in alternative surgery for abnormal menstrual bleeding and a desire for women to preserve their fertility, as more women are delaying childbearing.⁹

In the United Kingdom an estimated 20% of women have undergone a hysterectomy by the age of 55 years.¹⁰ The rate in Oxford in 1989 was quoted as 2.7/1000 women over 25 yrs. Using data obtained from a National Health Services (NHS) hospital in Oxford and population estimates from the Office of National Statistics, MacKenzie et al.¹¹ determined the rate of hysterectomies for the period 1997 – 1999. They found the rate to be 2.3/1000 women (over 25 yrs) with an average age at surgery of 51.2 years. With NHS directives to delay non-urgent surgery over that period, as well as the introduction of alternative strategies for managing menstrual symptoms and fibroids, it was expected that the hysterectomy rate would decline more significantly.¹¹ Similar studies have been undertaken in Australia¹², New Zealand¹³, Denmark⁶, Italy¹⁴, Canada and Finland¹², and the results are shown in Table 1.1.

The USA has consistently higher rates of hysterectomy than any other country and the Scandinavian countries have the lowest rates. The rate of hysterectomy varies considerably between countries and may be difficult to compare, as methodologies in different studies vary with regard to age ranges, correcting for those women who have already had a hysterectomy, and obtaining population statistics. In many areas, it is not possible to calculate the hysterectomy rate as population denominators are not available or cannot be calculated, as is the case in South Africa.

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Table 1.1. Comparison of hysterectomy rates in various countries

Country	Rate per 1000 women	Year	Risk
USA	5.5	1990 ¹⁵	33% by age 60
	5.1	2004 ⁹	43% by age 85
UK	2.7	1989 ¹⁰	20% by age 55
	2.3	1997-1999 ¹¹	
Australia	6.6	1981 ¹²	Lifetime risk 35%
	4.8	2003 ¹²	
New Zealand	4.1	1984 ¹³	25% by age 50 39% by age 85
Denmark	1.93	1988 ⁶	Lifetime risk 10.4%
	1.82	1998 ⁶	
Italy	2.27	1997 ¹⁴	
Canada	3.8	2002 ¹²	
Finland	4.1	1992 ¹²	

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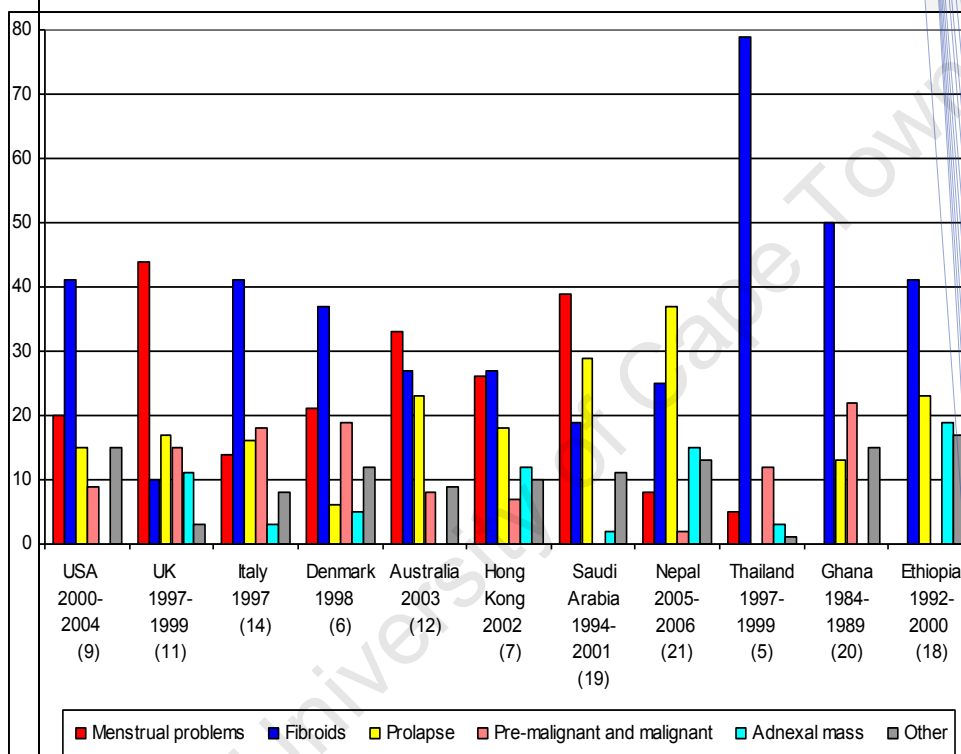
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Indications for hysterectomy

The reported indications for hysterectomy are similar world-wide, with the most common indication being menstrual disturbances, which account for 15 – 45% of hysterectomies. Fibroids (10 – 50%), prolapse (6 – 20%) and malignant conditions (6 – 15%) are the other main indications.

Figure 1.1 is a graphical representation of the reported indications for hysterectomy in different countries.

Figure 1.1. Indications of hysterectomy by country



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An Ethiopian study described indications for elective hysterectomy at a teaching hospital in Addis Ababa. ¹⁸ The most common indication was fibroids, which accounted for 41.1% of hysterectomies. Fibroids were also the most common indication for hysterectomy in a study undertaken in Ghana, and accounted for 50% of hysterectomies. ²⁰

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Fibroids are known to be more prevalent in African women. In the USA, fibroids are the indication for hysterectomy in 41% of cases, however, among African American women, fibroids account for approximately 75% of surgeries. ¹⁵ Seventy eight percent of hysterectomies in Thailand were performed for fibroids in a study undertaken in Srinagarind and Khon Kaen. ⁵ The percentages in Figure 1.1 for Thailand are for abdominal hysterectomy only and therefore the prevalence of fibroids may be exaggerated.

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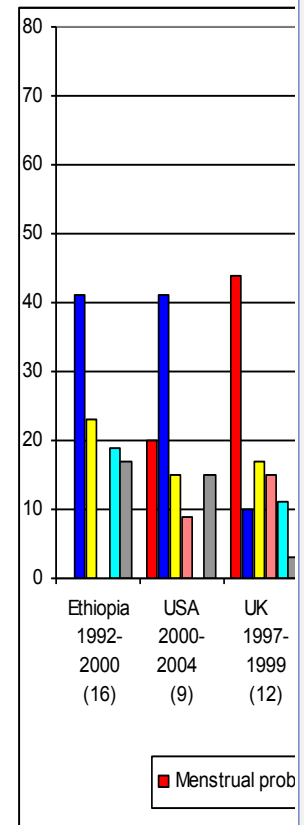
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Materia et al. in a study of hysterectomy in Rome, also reported fibroids as the most common indication (41%). In this study, women of a lower socio-economic status had a 35% higher risk of undergoing a hysterectomy than women in the highest socio-economic group. The authors reasoned that it was unlikely that fibroids were more prevalent in women of a lower socio-economic standing, but that these women were more likely to accept the decision to perform a hysterectomy, whereas women of a higher socio-economic standing were more likely to opt for alternative treatments. ¹⁴

Menstrual problems accounted for 512 (44%) hysterectomies in the Oxford study as seen in Figure 1.1. Fibroids, however, were the indication in only 118 (10%) hysterectomies in this study. Of the women with menstrual problems, fibroids found at histopathology were thought to be cause of the bleeding in 222 (43%) women. ¹¹

Hysterectomy is indicated for uterine fibroids when they cause pelvic pain (such as in torsion or a pedunculated submucosal fibroid), pressure symptoms or substantial menstrual bleeding. ¹⁶ In the case of menorrhagia, secondary to fibroids, the indication for hysterectomy in clinical reports may be described as menstrual abnormalities or as fibroids.

Abnormal uterine bleeding encompasses a wide range of diagnoses including endometriosis, adenomyosis, uterine fibroids and dysfunctional uterine bleeding. Adenomyosis and endometriosis can only be definitively diagnosed at surgery or following histopathological assessment and therefore are often not the pre-operative indications for hysterectomy. The method of determining the indication in different studies affects the results presented. Many studies do not describe the algorithm used for ascribing the primary indication and therefore it is difficult to compare studies with regard to prevalence of indications.

A multicentre prospective study of 1851 women in the USA, examined the relationship between the pre-operative diagnosis and the histopathological diagnosis after hysterectomy. Menstrual bleeding disorders, accounted for approximately 21% of hysterectomies. In about a third of these hysterectomies, there was no histopathological diagnosis that could account for the bleeding.²² The first line treatment for dysfunctional bleeding is medical, and hysterectomy is only indicated when this treatment has failed.²³

Histopathology

In their study, MacKenzie et al. correlated the indication and histopathology in 1170 hysterectomies, between 1997 and 1999.¹¹ In total, they found that 28% of all the uteri removed had no gross abnormalities on histopathological examination. Figure 1.2 is a graphical representation of the correlation between indications for hysterectomy for benign pathology and the resulting histological findings found in this study. No causative pathology was found in 33% (147/445) of the hysterectomies done for menstrual abnormalities and no pathology in 36% (24/67) of those done for pain.¹¹

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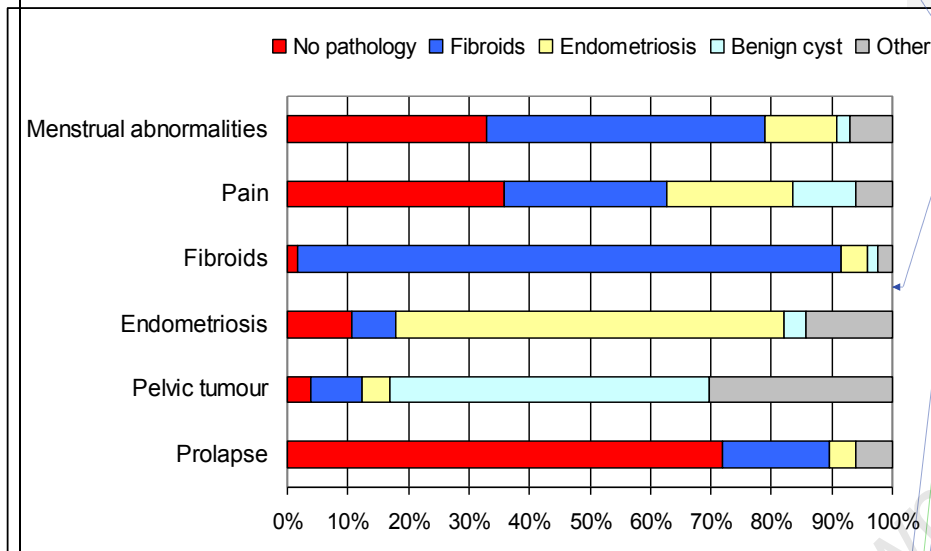
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Figure 1.2 Histological findings and the indications for hysterectomy¹¹



A study in Amritsar, India, of 100 hysterectomy specimens, showed that 30% of uteri removed by hysterectomy for menstrual abnormalities were histologically normal.²⁴ These findings are similar to the Oxford study.

The commonest abnormalities found at histopathological examination are fibroids, but fewer than 25% of women with fibroids have symptoms.²⁵ In the Oxford study, fibroids were found in 54% of the pathology specimens. Reported frequencies vary with 48% of uteri containing fibroids in Nigeria²⁶, 26% in Saudi Arabia¹⁹, 17% in India²⁷ and only 8% in Sweden.²⁸

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Type of Hysterectomy

Total abdominal hysterectomy (TAH) is the most common method of hysterectomy world wide.²⁹ The other methods include subtotal hysterectomy (sTAH), where the cervix is spared, vaginal hysterectomy (VH), laparoscopic-assisted vaginal hysterectomy (LAVH) and total laparoscopic hysterectomy (TLH). The type of hysterectomy depends mainly on the pathology, size of the uterus and the skill and preference of the surgeon. Total abdominal hysterectomy is indicated for cancer, adnexal pathology and large fibroids, while vaginal hysterectomy is generally preferred for prolapse. Table 1.2 shows the variations in methods between different countries.

Table 1.2 International comparison of methods of hysterectomy

Country	% TAH	% sTAH	% VH	% LH ⁺	Year	Reference
UK	64	3	30	3	1994-95	17*
USA	65	1	27	7	1997	15
	68		22	10	2004	9
France	25	-	48	27	2004	30*
Hong Kong	70	-	16	14	2002	7*
Australia	40	-	45	15	2003	12
Denmark	58	23	12	7	1998	6*
Finland	51	7	18	24	1996	31*
	26	-	45	29	2005	32*
South Africa	29	-	71	-	1984	33
Ethiopia	77	-	23	-	1992-00	18
Egypt	54	-	36	10	1995-96	34
Saudi Arabia	52	19	29	-	1994-2001	19

*Hysterectomies for benign diseases only

LH⁺: hysterectomy with any laparoscopic component

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Subtotal hysterectomy is a safer and technically easier operation than a total abdominal hysterectomy. This procedure has the advantages of preserving pelvic floor support, a lower incidence of ureteric damage and decreased vault haematoma.³⁵

A randomized, double blind trial comparing total and subtotal hysterectomy in 279 women in London, reviewed the outcomes of each procedure after 12 months.³⁵ Short term disadvantages in the women who had a total abdominal hysterectomy included a longer duration of surgery, greater blood loss, a longer hospital stay and an increased incidence of vault haematoma.

At 12 months, 7% of women who had undergone a subtotal hysterectomy had cyclical bleeding. In both the TAH and sTAH groups there was a statistically significant improvement in stress incontinence, urgency, urinary frequency, and nocturia compared with their pre-operative urinary function. There was an increased frequency of sexual intercourse in the sexually active women in both groups at 12 months and a significant decrease in deep dyspareunia. The authors concluded that there were no significant differences between subtotal and total hysterectomy with regard to bladder, bowel or sexual function.³⁵

In a retrospective analysis of 150 women in Warwickshire, UK, who underwent a subtotal hysterectomy, 12 women complained of post-operative cyclical bleeding. A subsequent trachelectomy or a LLETZ was required in 10 of these women because of continuous bleeding or intra-epithelial neoplasia.³⁶ Women who have undergone a subtotal hysterectomy must be advised to continue with regular screening for cervical cancer.

A meta-analysis comparing abdominal, vaginal and laparoscopic (including total laparoscopic hysterectomy (TLH) and laparoscopic-assisted vaginal hysterectomy (LAVH)), methods of hysterectomy was undertaken by Johnson et al. to evaluate the most appropriate method of hysterectomy for benign disease.³⁷ These authors included 27 trials in their study. Abdominal hysterectomy (AH) was associated with a longer stay in hospital and a longer

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time to return to normal activities as well as more post-operative pain and more wound infection. There was no significant difference for these outcomes for vaginal or laparoscopic procedures (LH and LAVH). There was a higher incidence of urinary tract injury with laparoscopic methods when compared to AH. There were no important disadvantages found with vaginal hysterectomy, when compared to the other methods, and therefore the authors suggest that a vaginal approach should be used when possible.

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Complications

One of the largest studies looking at complications of hysterectomy is the VALUE (Vaginal, Abdominal and Laparoscopic Uterine Excision) study¹⁷. Patient data was obtained for 37 298 cases, excluding cancer and post partum hysterectomies, in the UK. The mortality rate was reported as 0.38/1000 hysterectomies at 6 weeks. Of the 14 deaths, 8 patients had abdominal hysterectomies and 6 patients had vaginal hysterectomies.

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The overall intra-operative complication rate was 3.5%, with the highest rate for laparoscopic techniques (6%). Complications included visceral damage, major haemorrhage and return to theatre. Post-operative complications were reported in 9% of cases, the most associated with vaginal hysterectomy (9.3%). When post-operative complications were divided into severe and non-severe, then laparoscopic techniques were the highest in the severe group (1.6%) compared to vaginal hysterectomy (1.1%) and abdominal hysterectomy (0.94%). Severe complications included death, DVT, pulmonary embolism, myocardial infarction, septicaemia, fistula formation and ureteric obstruction.

Using the same data, McPherson et al. looked at risk factors for severe intra-operative complications at hysterectomy⁸. Women with fibroids had the highest proportion of intra-operative complications (4.4%). Ureteric damage

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was mostly associated with endometriosis, but the trend did not reach significance. The rate of operative complications decreased with increasing age and the authors attributed this to a more vascular pelvis at a younger age. [The most at-risk group for operative complications overall were young women who underwent laparoscopic hysterectomy for symptomatic fibroids.](#) [Those women who had complications at surgery were also more likely to have post-operative complications.](#)⁸

A cohort of 1346 women took part in a combined study between South Africa and the UK [\(the eVALuate study\)](#).³⁸ Two parallel randomized trials were carried out; the one compared AH with LH and the other compared VH with LH. [All the ureteric injuries \(n=6\) occurred during laparoscopic procedures, and these procedures also had a higher rate of major haemorrhage in both the abdominal trial \(4.6% vs 2.4%\) and the vaginal trial \(5.1% vs 2.9%\).](#) Quality of life scores improved post-operatively for all methods of hysterectomy. [Women who underwent abdominal hysterectomy were not yet able to participate fully in physical activity and were less happy with their body image at 6 weeks](#) compared to those who underwent vaginal or laparoscopic surgery. At 12 months there was no significant difference in quality of life scores in either of the trials.³⁸

The laparoscopic route was rapidly implemented in Finland in the 1990's and the FINHYST study showed that education and training of surgeons reduced the number of complications at laparoscopic hysterectomy and LAVH. Surgeons who had performed over 30 laparoscopic procedures had significantly fewer complications.³¹ [Brummer et al. evaluated the complications of laparoscopic hysterectomy in Finland between 2000 – 2005.](#) and his results, shown in Table 1.3, documented the reduction in complications over the last 10 years in Finland.³²

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Table 1.3 Reduction in complications of LH in Finland³²

Years	1992 - 1999	2000 - 2005
Laparoscopic hysterectomies*	13 885	13 942
Ureteric injury	125 (0.9%)	47 (0.3%)
Bladder injury	68 (0.5%)	45 (0.3%)
Bowel injury	20 (0.14%)	12 (0.09%)
Major vascular injury	2 (0.01%)	0 (0%)
Total complications	245 (1.76%)	134 (0.96%)

* All hysterectomies with a laparoscopic component

The abdominal route has become the least common form of hysterectomy in Finland, with the number of vaginal hysterectomies exceeding abdominal hysterectomies in 2002, and the number of laparoscopic hysterectomies exceeding abdominal hysterectomies in 2005.

As with any new technique, complications decrease with experience and training. In his [article](#), "The future of hysterectomy", Garry³⁹ advises that, where technically feasible, VH should be the method of choice for hysterectomy. [Patients who undergo vaginal hysterectomy have a shorter operating time, a quicker recovery, lower costs and an acceptable rate of complications.](#) [Where vaginal hysterectomy is inappropriate, such as in the presence of adnexal pathology or endometriosis, laparoscopic hysterectomy should be the chosen method.](#) This technique has also been shown to be associated with less pain and quicker recovery and fewer complications when performed by trained surgeons. Abdominal hysterectomy still has a [role to play for most cancer surgery, emergency hysterectomies, such as with post-partum haemorrhage, and in cases where fibroids are extremely large.](#)³⁹

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Alternatives to hysterectomy

Menstrual abnormalities and fibroids are the two main indications for hysterectomy accounting for 50 – 60% of hysterectomies world-wide. Although hysterectomy is the definitive treatment for these disorders, alternatives include antifibrinolytics, hormonal treatments including the progesterone-containing intrauterine system, endometrial ablation, hysteroscopic resection and fibroid embolisation.

According to the guidelines of the National Institute for Clinical Excellence (NICE) the first line treatment for women with heavy menstrual bleeding, once malignancy and structural abnormalities have been ruled out, is the levonorgestrel-releasing intrauterine system (LNG-IUS). If this is not acceptable to the patient, or short term treatment is required, then tranexamic acid, a non-steroidal anti-inflammatory or a combined oral contraceptive can be offered.⁴⁰ There is experimental evidence that menorrhagia is related to increased fibrinolysis in the endometrium⁴¹ and that the anti-fibrinolytic, tranexamic acid, can reduce blood flow by 50%. Mefenamic acid reduces blood loss by 25% by inhibiting cyclo-oxygenase and blocking prostaglandin E₂ receptors, while also acting as an analgesic.⁴²

A small open randomized multicentre study of 56 women, conducted in Finland, reviewed the use of the levonorgestrel intrauterine system as an alternative to hysterectomy.⁴³ Women with abnormal uterine bleeding, on the waiting list for hysterectomy, were randomized into a control group who continued their current medical treatment, and a treatment group who had the LNG-IUS fitted. At 6 months 64% of women who had the LNG-IUS fitted had cancelled their hysterectomy compared to 14% in the group of women on medical treatment. After a mean follow up time of 3 years 48% of women were still using the LNG-IUS. These results were very promising, but the numbers were small and this study needs to be expanded.

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A larger study in Finland randomized 236 women with menorrhagia to treatment with the LNG-IUS (n = 119) or hysterectomy (n = 117).⁴⁴ After 5 years 57 women (48%) still had the IUS in situ and 50 women (42%) in the LNG-IUS group had undergone a hysterectomy. Satisfaction with treatment was similar in both groups. Direct and indirect costs were approximately 40% lower in the LNG-IUS group compared to the hysterectomy group.

An alternative to hysterectomy for abnormal uterine bleeding, is endometrial ablation or resection via hysteroscopy. A study of 51 women on a waiting list for hysterectomy [at the Royal Berkshire Hospital in Reading, UK](#), randomized the subjects to endometrial resection or hysterectomy. [Eighty four percent of women \(n=21\) who had endometrial ablation were satisfied with the outcome: 64% became amenorrhoeic and 20% continued to have light menstrual bleeding. The remaining 16% had a repeat endometrial resection within 6 months. None of the women in the endometrial resection group had a hysterectomy within the 12 month follow up period.](#)⁴⁵

[In a larger study of 202 women in Aberdeen, Scotland, hysterectomy was compared with endometrial laser ablation and endometrial resection.](#)⁴⁶ [Rates of 22% amenorrhoea and 62% hypomenorrhoea at 12 months were achieved with endometrial ablation or resection.](#) Only 14% of women in the endometrial ablation group [had a hysterectomy within 12 months. The second generation ablative devices utilize microwave, thermo-ablation and radiofrequency ablation. These devices are simpler to use, decrease theatre time and appear to be as effective as manual ablative techniques.](#)

Following the introduction of alternative, more conservative treatments for abnormal uterine bleeding, it was expected that the hysterectomy rate in the UK would decrease. [Instead, there has been an increase in conservative surgery for abnormal uterine bleeding and a stabilisation of the hysterectomy rate.](#)⁴⁷ In Denmark, a similar trend has been observed, [with an increasing rate of minimally invasive surgery for abnormal uterine bleeding and a small decline in the hysterectomy rate.](#)⁶

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As these alternative treatments carry less risk than hysterectomy, the threshold for intervention in cases of abnormal uterine bleeding has been lowered, with a resulting increase in the number of procedures done for this indication. Minimally invasive surgery seems to provide an additional form of treatment rather than a replacement of hysterectomy as the mainstay of treatment.

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Hysterectomy in South Africa

In South Africa there are two main options for healthcare. Women with health insurance access specialist gynaecologists in private practice, and women who do not have health insurance and who are usually of a lower socio-economic group, utilise the government-run health care services. Groote Schuur Hospital is a State-run institution that deals with secondary and tertiary level health care. The hospital mainly services the population of the southern and western suburbs of the Cape Town area, but is also a tertiary referral centre for other districts in the Western and Eastern Cape Provinces of South Africa. The population of the Western Cape is also variable, with an influx of many migrant workers and refugees. It is therefore very difficult to calculate a population denominator to determine the rate of hysterectomy.

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Data which report on hysterectomy in South Africa are scarce. A study undertaken in Johannesburg by Naylor was published in 1984.³³ He investigated the indications and complications of 2901 hysterectomies that he had personally performed. It is not clear whether these patients were from private or public sector. In this study 71.4% of hysterectomies were performed vaginally and 28.6% were abdominal hysterectomies. The most common symptom, which resulted in the decision to undergo hysterectomy, was excessive menstrual bleeding in 41.8% of women. Prolapse (29%) and pain (17.8%) were the next two most common symptoms. The author stated that most women had more than one symptom and he could not assign a

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single indication for each hysterectomy. The number of reported indications, therefore, outnumbered the number of hysterectomies in his study. Histopathology was not discussed in this article. There were 4 deaths with a mortality rate of 1.4 per 1000 women. The causes of death were recorded as pulmonary embolism, sepsis, cardiac failure and cortisone therapy. Vaginal hysterectomies were complicated by a 1% incidence of visceral injury and abdominal hysterectomies by a 2.4% incidence.

An analysis of hysterectomy specimens by a private pathology laboratory in Cape Town was undertaken in 2002 (A Alperstein, personal communication). These hysterectomies were performed by specialist gynaecologists in private practice. There were 832 hysterectomies performed of which 59% were TAH, 9% were sTAH, 19% were vaginal hysterectomies and 13% were laparoscopic hysterectomies. Fibroids were the most common histopathological finding observed in 37.3% of samples. The indications for hysterectomy were not described in this study and therefore no conclusions can be drawn with regard to whether the histopathological findings were the cause of the symptoms which led the women to undergo hysterectomy.

Our study aims to review the hysterectomies done in one year at a large tertiary public sector hospital in South Africa (Groote Schuur Hospital). The initial clinical indication for hysterectomy in each case will be correlated with the histopathological findings. Intra-operative and post-operative complications will also be examined in relation to the indication and the type of hysterectomy performed. As hysterectomy should not be the first line treatment for menstrual abnormalities, the case notes will also be assessed to determine whether other medical or surgical techniques had been attempted before hysterectomy.

In contrast to similar studies performed in industrialised countries, we hypothesize that we have a low incidence of surgically removed uteri that show no pathology. It is probable that in a resource-constrained environment, surgery is offered more often to women with defined pathology.

CHAPTER 2: METHODS AND SUBJECTS

Objectives:

- To assess the hysterectomies performed in one year at Groote Schuur Hospital and to review the relationship between the initial clinical indication and the histopathological findings.
- To assess the rate of complications following hysterectomy

Design

A retrospective audit of all elective hysterectomies done at Groote Schuur Hospital from 1 January 2007, to 31 December 2007.

All women undergoing elective hysterectomy were included. Emergency hysterectomies were excluded.

Subjects

Patients were identified by the entry of their surgical procedure into the Groote Schuur theatre register between 1 January 2007 and 31 December 2007. Case notes for each patient were obtained from the Records Department.

Patient characteristics including age, ethnicity and body habitus were documented. The obstetric and gynaecological history of each woman was noted. Previous surgery and pre-existing medical conditions were recorded.

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Indications for hysterectomy

Many patients, especially those with menorrhagia had more than one symptom and the indication for hysterectomy was not always clear.

The primary indication for surgery was assigned as follows:

- Cancer of the cervix or recurrent high-grade squamous intra-epithelial lesions and endometrial cancer or endometrial atypia were assigned as the primary indication if diagnosed prior to surgery.
- Prolapse was routinely described clinically in the patient's notes and at surgery and it was clear when this was a primary indication.
- Abnormal bleeding was the primary indication if this was the patient's main symptom and malignancy had been excluded. If fibroids were diagnosed on ultrasound prior to surgery, then the patients were entered into a separate group of menorrhagia related to fibroids.
- Fibroids were the primary indication if a fibroid uterus was palpable clinically and the diagnosis was confirmed on ultrasound.
- An adnexal mass was regarded as the primary indication if it had been diagnosed by ultrasound and was not palpable abdominally.
- A pelvi-abdominal mass was regarded as the primary indication if it was palpable abdominally and it was not diagnosed as fibroids on ultrasound.
- Pain was the primary indication if this was the main symptom and cancer, prolapse, adnexal mass and pelvi-abdominal mass had been excluded.

Surgery

The type of hysterectomy was divided into total abdominal, sub-total, vaginal, laparoscopic-assisted or Wertheims hysterectomy from the operation notes. The surgeons were classified into registered specialists, registrars (undergoing specialist training) and medical officers and interns. Additional surgical procedures performed at hysterectomy were documented. The operation notes and anaesthetic records were checked for intra-operative complications.

Post-operative complications

Post-operative complications included all complications that occurred following the surgery until 6 weeks after surgery. These were defined as:

- Fever: any recorded temperature over 38°C.
- Haemorrhage: bleeding requiring a blood transfusion.
- Urinary tract infection: symptoms and microbiological evidence.
- Respiratory tract infection: symptoms and radiological evidence.
- Deep vein thrombosis: diagnosed by compression ultrasound.
- Pulmonary embolism: diagnosed by ventilation/perfusion scan.
- Vault haematoma: bleeding from the vault or collection diagnosed on ultrasound.
- Wound dehiscence or wound infection.
- Pain: pain for more than 48 hours post-operatively leading to a prolonged hospital stay.
- Repeat laparotomy.
- Psychological complications: requiring psychiatric intervention.
- Cerebrovascular accident.
- Incontinence.
- Long term catheterisation.
- Death.

All patients were given a post-operative follow up appointment at the gynaecology outpatient clinic on discharge from hospital. This appointment was approximately 6 weeks following surgery and provided an opportunity to discuss the histological findings and assess patient satisfaction and well-being. The outpatient notes were reviewed to ascertain if any complications were present at this visit.

Histopathology

Histopathology reports were obtained from the National Health Laboratory Service reporting system. The main histopathological diagnosis, as well as uterine weight and size, and measurements of fibroids and ovarian masses, were obtained from these reports.

The main histopathological diagnosis was recorded in the database, ie. if the indication was for endometrial cancer and both endometrial cancer and fibroids were found at histopathology, then the diagnosis was recorded as endometrial cancer. If fibroids were present, but were not the primary diagnosis, they were entered separately.

There were two pathologists providing the histopathology reports during the year of our study.

Analysis

The data were entered onto a Microsoft Excel spreadsheet. The statistical calculations were carried out using the Statistical Package for the Social Sciences (SPSS Windows version 17.0). Continuous variables were compared using Student's *t* test or the Wilcoxon rank-sum test, while categorical variables were compared using the chi-square test or Fisher's exact test.

Ethics

Approval to proceed with this audit was obtained from the University of Cape Town Research Ethics Committee. Patient confidentiality was observed. Patients were identified only by their hospital folder numbers for recording information into our database. Their names and folder numbers were not used in the analysis of the data. A copy of the consent from the Research Ethics Committee is included as Annexure A.

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CHAPTER 3: RESULTS

Three hundred and forty hysterectomies were performed between 1 January 2007 and 31 December 2007. Records were obtained for 335 (98.5%) of these patients. The histopathology report could not be located for one patient who had a hysterectomy for menorrhagia associated with fibroids.

Patient characteristics

The mean age at hysterectomy was 50.6 years, with the youngest woman being 20 years and the oldest 88 years. The youngest woman had gender re-assignment surgery which explains her reason for having a hysterectomy at such a young age. The next youngest woman was 25 years old and had surgery for cervical cancer. In this group of patients 128 (38.2%) were post-menopausal and 207 (61.8%) were pre-menopausal.

The population breakdown was black African 71 (21.5%), coloured and Indian 232 (69.2%), white 29 (8.7%) and unknown 2 (0.6%). Only 73 of the 335 women (21.8%) had undergone an HIV test and of these 12 were HIV positive. The surgeon or the anaesthetist recorded in the notes of 97 women (29%) that they were noticeably "overweight".

One hundred and sixty one women had no pre-existing medical conditions. Hypertension was the most common medical problem and 130 women were on medication for elevated blood pressure. Eleven of these women had hypertensive cardiac disease, 27 women had hypertension and diabetes and 17 women had hypertension, diabetes and cardiac disease. The indications and characteristics of women undergoing a hysterectomy are illustrated in Table 3.1.

Table 3.1 Characteristics of women and indications for hysterectomy

Indication	Mean Age	Range (years)	Pre-menopausal women	Total	
Abnormal bleeding	47.1	35-88	43	50	14.9%
Menorrhagia 2° fibroids	46.3	36-57	77	77	23.0%
Fibroids	49.2	32-82	20	29	8.7%
Pelvic Pain	40.4	35-53	14	15	4.5%
Prolapse	59.9	33-82	5	38	11.3%
Cervical cancer / HSIL	44.4	25-65	28	36	10.7%
Endometrial cancer / atypia	61.2	36-82	4	45	13.4%
Pelvi-abdominal mass	52	30-79	13	31	9.3%
Adnexal mass	55	41-65	2	13	3.9%
Gender re-assignment	20	20	1	1	0.3%
Total	50.6	20-88	207	335	100%

As expected, the 38 women with prolapse were mostly post-menopausal (87%). They also had a median gravidity and parity of G5 P4, which was higher than all other groups of women ($p < 0.001$). The 25 women with a clinically palpable fibroid uterus had the lowest gravidity and parity (Median: G1 P1, $p < 0.001$).

Indications and Histopathology

The most common indication for hysterectomy was menorrhagia secondary to fibroids in 77 women (23%) followed by abnormal bleeding of undetermined cause in 50 women (14.9%). Endometrial cancer was the indication in 45 women (13.4%), prolapse in 38 women (11.3%) and cervical cancer in 36 women (10.7%). The indications for hysterectomy and the histological assessment are shown in Table 3.2.

Forty eight women (14.3%) had no significant pathology on histological examination. Thirty two of these women had prolapse and one woman had a hysterectomy for gender re-assignment and therefore normal uteri were expected. In the remaining 15 women the indication for hysterectomy was abnormal bleeding or pain.

Abnormal bleeding, Fibroids and Pelvic Pain

Of the 50 women who had a hysterectomy for abnormal bleeding of unknown cause, 7 were post-menopausal. In these 7 women histopathological analysis attributed the cause of bleeding to fibroids in three, adenomyosis in one, polyps in two and in one woman no cause was identified. Of the 43 pre-menopausal women with abnormal bleeding, 10 were found to have fibroids, 12 had adenomyosis, 5 had polyps and 2 had endometriosis on histopathological examination. One woman had unsuspected endometrial cancer on histopathological examination. Three women had benign ovarian cysts. Dysfunctional uterine bleeding was therefore confirmed in 10 pre-menopausal women where no causative pathology was found.

Except for one woman, fibroids were confirmed on histopathology in all patients who had a hysterectomy for fibroids or menorrhagia secondary to fibroids. In this woman histopathology showed florid adenomyosis and no fibroids. Both fibroids and adenomyosis were found on histology in two women. Fibroids and unsuspected endometrial cancer were recorded in one patient who had a hysterectomy for menorrhagia secondary to fibroids.

Table 3.2 The Indication for hysterectomy and the histopathological assessment

Indication	No pathology	Fibroids	Endometriosis	Adenomyosis	Benign ovarian tumour	Cervical cancer / HSIL	Endometrial cancer / Atypia	Ovarian Cancer	Uterine polyp	Other	Total
Abnormal bleeding	11	13	2	13	3	0	1	0	7	0	50
Menorrhagia 2° fibroids	0	73	0	2 (+1 fibroids)	0	0	1 (+ fibroids)	0	0	0	76
Fibroids	0	28	0	1 (+ fibroids)	0	0	0	0	0	0	29
Pelvic Pain	4	4	0	3	1	1	0	0	0	2	15
Prolapse	32	2	0	1	0	0	0	0	3	0	38
Adnexal mass	0	0	1	0	8	1 +cyst	0	0	0	3	13
Pelvi-abdominal mass	0	0	0	0	21	0	1	9	0	0	31
Cervical cancer / HSIL	0	0	0	0	0	36	0	0	0	0	36
Endometrial cancer / Atypia	0	0	0	0	0	0	42	0	3	0	45
Gender re-assignment	1	0	0	0	0	0	0	0	0	0	1
Total	48	120	3	20	33	38	45	9	13	5	334

Fibroids were identified on histology in 210 specimens (62.8%), but were judged to be the pathology responsible for the patient's symptoms in only 118 (35.3%) hysterectomies. Fibroids were more commonly found to be the reason for hysterectomy in black African women than in any other population group ($p < 0.001$). In 38 out of 71 black African women (53.5%) fibroids were the causative pathology compared with 73 out of 232 (31.5%) coloured and Indian women and 8 out of 29 (27.6%) white women. The median uterine weight of a uterus containing fibroids in our study population was 456g; with a range from 52g to 5300g.

Histopathology explained the pre-operative symptoms of pelvic pain in 8 patients. Three women had adenomyosis, 1 woman had a pedunculated haemorrhagic fibroid and there were single patients ($n=4$) with a hydrosalpinx, a tubo-ovarian abscess, a benign ovarian cyst and cervical cancer. The nulliparous patient, who was diagnosed on histopathology to have cervical cancer, had a previous radical trachelectomy and cerclage for cervical cancer in 2002. Her pre-operative pap smear showed no abnormal cells, however it was an inadequate sample. At surgery she was found to have local metastatic disease. Three women had small fibroids at histology, which were judged to be unlikely to cause pelvic pain. Therefore in 7 women no cause for pain could be found.

Prolapse

Thirty eight hysterectomies (11.3%) were performed for prolapse. A vaginal hysterectomy was done in 37 cases (97.4%). An abdominal hysterectomy was performed in the remaining patient who had a prolapsed uterus and a 10 cm fibroid at the fundus of the uterus. As expected, the uterus was found to be histologically normal in most of the women ($n = 32, 84%$) with prolapse.

Cervical and Endometrial Cancer

Diagnosis of cervical cancer or recurrent high grade squamous intraepithelial lesion (HSIL) was confirmed in all patients prior to surgery. Women with cervical cancer were, on average, one of the youngest groups of women to undergo a hysterectomy. The average age at surgery was 44.4 years with a range from 25 – 65 yrs (Table 3.2).

Forty five hysterectomies (13.4%) were done for endometrial cancer or atypical endometrial hyperplasia. The pre-operative diagnosis was confirmed by histopathology after surgery in 42 (93.3%) women. The remaining 3 patients (6.7%) were found to have non malignant endometrial polyps. Two of these women were on tamoxifen for breast cancer and the third woman had previously had an endometrial polypectomy and fortunately the histology showed that cancer was confined to the previously removed polyp.

Adnexal masses and Pelvi-abdominal masses

Of the 31 patients who had a hysterectomy for a pelvi-abdominal mass, 21 (68%) were diagnosed by histology as having a benign ovarian mass (dermoid, fibroma, cystadenoma). Nine patients (29%) had ovarian cancer and one patient had endometrial cancer. The largest ovarian mass was a adenosarcoma weighing 11.5kg. The largest benign ovarian mass was a mucinous cystadenoma weighing 4.2kg.

Nine of the 13 women who had a hysterectomy for an adnexal mass had a benign ovarian mass. One of these women was also found to have a high grade cervical squamous intraepithelial lesion (HSIL). The remaining 4 women had an endometrioma, a hydrosalpinx, a tubo-ovarian abscess and pelvic tuberculosis. There were no patients with ovarian cancer in this group.

Surgery and Intra-operative complications

Total abdominal hysterectomy was the most common type of hysterectomy performed, accounting for 218 (65.1%) hysterectomies. Vaginal hysterectomy accounted for 65 (19.4%), subtotal hysterectomy for 32 (9.5%), Wertheims hysterectomy for 15 (4.5%) and laparoscopic-assisted hysterectomies for 5 (1.5%). The indications and type of hysterectomy performed are shown in Table 3.3.

Table 3.3 Type of hysterectomy and indications

Indications	TAH	sTAH	VH	LAVH	Total	
Abnormal bleeding	30	7	11	2	50	14.9%
Menorrhagia 2° fibroids	63	9	4	0	77	23%
Fibroids	18	7	0	0	29	8.7%
Pelvic Pain	9	4	1	1	15	4.5%
Prolapse	1	0	37	0	38	11.3%
Cervical cancer / HSIL	10 + 15 Wertheims	0	11	0	36	10.7%
Endometrial cancer / atypia	42	0	1	2	45	13.4%
Pelvi-abdominal mass	28	3	0	0	31	9.3%
Adnexal mass	12	1	0	0	13	3.9%
Gender re- assignment	1	0	0	0	1	0.3%
Total	218	32	65	5	335	100%

The lead surgeon was not specified in most of the theatre notes. In 295 (87.8%) operations a combination of a consultant and registrar performed the surgery. Two registrars were the surgeons in 25 (7.5%) hysterectomies and two consultants in 9 surgeries (2.7%). In six cases a consultant or registrar operated with a medical officer.

A simple hysterectomy, with no additional surgical procedures, was done in 106 (31.6%) women. One hundred and six (31.6%) women had a bilateral salpingo-oophorectomy (BSO), including 46 premenopausal women. In 21 of these pre-menopausal women the reason for a BSO can be explained by the underlying pathology, which included suspected ovarian cancer, endometrial cancer, tubo-ovarian abscess, pelvic tuberculosis and gender re-assignment. More post-menopausal women had a BSO than pre-menopausal women ($p < 0.001$).

In 46 patients (13.7%) the surgical record noted that adhesions were dissected before hysterectomy could be carried out. Lymphadenectomy was carried out in 26 women and omentectomy in 49 women with cervical, endometrial or suspected ovarian cancer. Twenty nine of the thirty eight (76.3%) women who had a hysterectomy for prolapse had additional surgical procedures performed together with the hysterectomy as shown in Table 3.4.

Table 3.4 Additional surgical procedures performed in patients with prolapse

Additional surgical procedures	No of patients	Percentage
Anterior repair	17	45
Posterior repair	2	5
Anterior + Posterior repair	6	16
Anterior repair + TVT	1	2.5
Posterior repair + TVT	1	2.5
Sacro-spinous fixation	1	2.5
Colpocleisis	1	2.5
Total	29	76.3%

The operative complications which occurred in 16 (4.8%) hysterectomies are listed in Table 3.5. No correlation was found between previous abdominal surgery ($p=0.116$) or body mass ($p=0.572$) and operative complications.

Table 3.5 Complications occurring during surgery

Operative Complications	No. of incidents*	Percentage
Haemorrhage	10	3%
Bladder injury	4	1.2%
Bowel injury	4	1.2%
Ureteric injury	3	0.9%
No. of patients	16	4.8%

* Some women had more than 1 complication

Some hysterectomies had more than one operative complication. A TAH for menorrhagia secondary to fibroids was complicated by haemorrhage, a bladder injury and a ureteric injury. Histology showed a massive multifibroid uterus with a weight of 4 kg. A vaginal hysterectomy for cervical cancer was complicated by a bladder injury and a ureteric injury. Two patients had both a bowel injury and haemorrhage; both of these hysterectomies were performed for a pelvi-abdominal mass and both were found to have ovarian carcinoma.

If the complications are examined according to the type of hysterectomy, then subtotal hysterectomy had the highest percentage of complications. The number of subtotal hysterectomies was too few for this to be statistically significant (Table 3.6). In all of the subtotal hysterectomies with complications the histopathological diagnosis was ovarian cancer. The two patients who had complications at vaginal hysterectomy had cervical cancer, as did the patient who had a Wertheims hysterectomy. Among the 10 patients who had complications during a total abdominal hysterectomy, 3 had cervical cancer, one had endometrial cancer, 2 had pelvi-abdominal masses;

one woman was diagnosed with ovarian cancer and the other a benign ovarian mass, and the remaining 4 patients had multifibroid uteri.

Table 3.6 Operative complications according to type of hysterectomy

Complication	TAH	sTAH	VH	Wertheims
Haemorrhage	7	2	0	1
Bladder injury	2	0	2	0
Bowel injury	3	1	0	0
Ureteric injury	1	1	1	0
No. of patients*	10/218	3/32	2/65	1/15

* some patients had more than 1 complication

In total there were 16 women who had operative complications and 11 of these women had a malignancy. Women with a malignancy had a 6 times higher risk of an intra-operative complication compared to women who had a hysterectomy for benign disease ($p=0.001$).

Post-operative complications

The incidence of post-operative complications and the increase in post-operative stay is illustrated in Table 3.7. The 5 women who had laparoscopic-assisted hysterectomies had no post-operative complications. Post-operative complications occurred more often in women undergoing abdominal surgery than vaginal or laparoscopic surgery, but the numbers did not reach significance ($p=0.02$).

Table 3.7 Post-operative complications and average post-operative stay

Post-operative complication	TAH	sTAH	VH	Wertheims	Average post-op stay(days)	Total
None	126	21	46	5	4.18	203
Pyrexia	58	8	8	6	6.85	78
Haemorrhage	8	1	2	4	9.6	15
Wound Sepsis	21	2	0	2	14.6	25
Pain	17	1	3	2	10	23
Urinary complaints	11	1	8	3	9.4	20
2 nd laparotomy	9	0	1	1	16	11
Pulmonary embolism	2	0	1	0	14	3
Death	1	0	1	0	-	2
Total no of patients*	92/218	11/32	19/65	10/15	-	132/335

* some patients had more than 1 complication

Pyrexia

The most common post-operative complication was pyrexia. A temperature of 38°C more than 24 hours post surgery, occurred in 78 (23.3%) patients. In 62 patients no cause for the temperature was identified. In 8 patients the temperature could be attributed to wound infection, 2 women had a respiratory tract infection, 3 had a urinary tract infection and 3 had a vault haematoma. The incidence of pyrexia was twice as common with abdominal surgery, than with either vaginal or laparoscopic surgery ($p=0.007$). Pyrexia was documented most often in patients who had surgery for a pelvi-abdominal mass and least often in patients who had surgery for prolapse.

Haemorrhage

A blood transfusion was required post operatively in 15 patients. Four of these patients required a second laparotomy to investigate and treat the cause of bleeding.

Wound Sepsis and Dehiscence

Twenty five patients had wound sepsis with 21 of these incidents occurring in patients who had a TAH and only 2 cases each in patients who had a sTAH and Wertheims hysterectomy. Sixteen of the women with wound sepsis had been noted to be overweight. The risk of wound sepsis if a patient was "overweight" was 5 times greater than a patient with a normal weight ($p < 0.001$). Seven patients returned to theatre for debridement or resuturing of the wound. One patient was taken back to theatre on 2 occasions.

Post-operative pain

Twenty three women complained of excessive pain in the post-operative period which prolonged their hospital stay. Pain could be attributed to wound infection in 6 women, an infection of unknown origin in 4, a vault haematoma, a vesico-vaginal fistula and a psychiatric problem. In 10 patients no cause for the pain could be found.

Urinary symptoms

A urinary tract infection post surgery was diagnosed in 15 patients. Three women required prolonged catheterisation after operative bladder injuries, one who underwent a TAH for menorrhagia secondary to fibroids and two who had vaginal hysterectomies for cervical cancer. One woman who had urinary retention after a Wertheims hysterectomy stayed in hospital for 15 days post-operatively. Incontinence was observed in one woman after an abdominal hysterectomy for endometrial cancer. She was found to have a vesico-vaginal fistula which was repaired after her 6 week follow-up appointment.

Pulmonary embolism, cerebrovascular accident and death

Three patients were diagnosed with a pulmonary embolism in the post-operative period. The first woman had a TAH for endometrial cancer. She was known to have hypertension and diabetes and weighed 112 kg. She had a pulmonary embolism on her first post-operative day and died as a result. The remaining two women survived. One patient underwent a vaginal hysterectomy for cervical cancer and had complications of a bladder and ureteric injury at surgery. She had a prolonged hospital stay with a catheter in situ and had a pulmonary embolism on the fourth post-operative day. The second surviving patient had an abdominal hysterectomy for abnormal bleeding. She was a known hypertensive and diabetic with cardiac problems and was overweight. She developed wound sepsis and had a prolonged post-operative hospital stay of 27 days. All three of these women had received subcutaneous heparin as thrombo-prophylaxis post-operatively.

One other death occurred in the post-operative period. A 77 year old "overweight", hypertensive woman, who had suffered a CVA in 2002, had a vaginal hysterectomy and anterior repair for prolapse under spinal anaesthetic. She had previously used a ring pessary, but had found this treatment to be inadequate. She was diagnosed with pneumonia post-operatively and died on the 6th day after surgery from a cardiac arrest.

There was one incident of a post-operative cerebrovascular accident, on day 10 after surgery, in a 65 year old hypertensive woman who had a Wertheims hysterectomy for cervical cancer. She had a vault haematoma post-operatively and required a blood transfusion. She stayed in hospital for 17 days after surgery.

Complications at six weeks

Thirty two patients (10.4%) did not attend their 6 weeks post-operative appointment. Of the 303 women who attended for follow-up, 256 (85%) had no complications. Table 3.8 shows the complications occurring at 6 weeks.

Table 3.8 Complications at six weeks

Complications	Number of incidents	Percentage
Pain	18	5.9%
Poor wound healing	16	5.2%
Urinary tract complications*	5	1.6%
Prolapse*	2	0.6%
Bowel complications	1	0.3%
DVT/CVA	3	0.9%
Femoral nerve injury	1	0.3%
Tuberculosis	1	0.3%
Total patients	46/303	15%

* one patient had mixed incontinence and prolapse

Pain

The most frequent complaint was pain which occurred in 18 women (5.9%). There was no correlation between pain at 6 weeks and post-operative pain or post-operative wound complications. None of the women who had pain as their primary indication for hysterectomy had pain at 6 weeks.

Suboptimal wound healing

Fifteen women had poor abdominal wound healing at 6 weeks. Five of these women had wound infections in the post-operative period. Three women had required a repeat laparotomy, 2 for wound complications and one for bleeding. Two women had incisional hernias diagnosed at their follow up visit. One patient was diagnosed with a vault haematoma at 6 weeks.

Urinary tract and bowel complications

Five patients had urinary tract complications at 6 weeks, including incontinence, urinary retention and hydronephrosis. New onset mixed urinary incontinence was reported by 2 women at their 6 week appointment. The first woman had a laparoscopic-assisted hysterectomy for endometrial cancer. On examination she also had a significant rectocele. The second had a vaginal hysterectomy for prolapse with no complications, but reported new onset mixed incontinence at 6 weeks.

One patient was found to have hydronephrosis on ultrasound at 6 weeks. Further investigation showed that she had a ureteric stricture. She had a Wertheims hysterectomy for cervical cancer and her post-operative course was complicated by urinary retention and pain.

Two women were still using a catheter to void urine at 6 weeks. Both had undergone hysterectomies for cervical cancer; one was found to have a neurogenic bladder and the other had suffered from bladder and ureteric injuries at surgery.

A woman, whose surgery was complicated by a bowel injury, still had a colostomy at 6 weeks.

Thrombo-embolism and death

Two women who had undergone TAH, one for endometrial cancer and the other for menorrhagia secondary to fibroids, were diagnosed with deep vein thrombosis at 6 weeks and were started on treatment.

A 75 year old patient, who had a TAH for endometrial cancer, and suffered from hypertension, diabetes, thyroid disease and was on warfarin for a previous pulmonary embolism, had a cerebrovascular accident and was under the care of the physicians. She died shortly after the six weeks post-operative visit.

Treatment prior to surgery.

Menstrual disorders and fibroids

Various forms of treatment were attempted prior to surgery in patients with abnormal menstrual bleeding and fibroids as shown in Table 3.8. Of the 43 patients with abnormal menstrual bleeding of unknown cause, 36 (84%) received medical treatment prior to hysterectomy. The most common combination of treatment in this group was progestagens and tranexamic acid (17 patients).

In the patients with menorrhagia secondary to fibroids, 61 (79.2%) had attempted medical treatment. Tranexamic acid and progestagens were used in 24 patients and 20 patients used tranexamic acid only. Eleven patients with fibroids required a blood transfusion at some point prior to surgery.

Table 3.9 Treatment modalities of women with menstrual disorders

Treatment	Abnormal bleeding	Menorrhagia 2° fibroids	Pelvic pain	Fibroids
Tranexamic acid	29	51	2	2
Combined OCP	6	9	1	0
Progesterone	22	30	2	0
LNG - IUS	2	0	0	0
Hysteroscopic resection	1	3	0	0
Blood transfusion	1	11	1	0
Number of patients*	36/43	61/77	5/15	2/29

* most patients tried more than 1 form of treatment

Prolapse

Thirteen of the 38 women with prolapse had tried conservative treatment with a ring pessary prior to hysterectomy. Surgery was offered because of the failure of conservative therapy and the patients' dissatisfaction with this method of treatment.

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CHAPTER 4: DISCUSSION

Indications and histopathology

Hysterectomy is the second most common surgical procedure performed on women. Menstrual disturbances and fibroids account for approximately 50% of hysterectomies worldwide. Menorrhagia secondary to fibroids (23%) and abnormal menstrual bleeding (14.9%) were the two most common indications for hysterectomy in our study at Groote Schuur Hospital. Menstrual abnormalities, including pain and bleeding, and fibroids together accounted for 170 hysterectomies (50.7%).

Of the 43 pre-menopausal women with abnormal menstrual bleeding of unknown cause, ten (23%) were found to have normal uteri, with no histopathological abnormalities that could explain the bleeding. This figure is lower than the 32% of women with menstrual disturbances and normal uteri found in the Oxford study¹¹ and the 30% found in Amritsar, India.²⁷ The reason for this finding may be that most women attending the Groote Schuur gynaecology services for menstrual disturbances are initially given conservative treatment (84%), as there are severe constraints on operating time in our hospital. Hysterectomy is offered more readily to patients with proven pathology. Histopathology does not demonstrate functional problems in the endometrium causing abnormal uterine bleeding. Although the uterus may be normal in these women, this does not imply that they do not warrant a hysterectomy to cure their disorder. In the future our diagnostic ability may be refined allowing an assessment of local dysfunction.

In a study of women referred to gynaecology outpatient clinics in Oxford, UK, Coulter et al.⁴⁸ noted that 21% (539 / 2513) of the patients were referred for menstrual abnormalities. The authors managed to trace the records of 205 of these patients and reported that after 5 years 82 women (44%) had undergone a hysterectomy. A prospective study of women with menstrual disorders attending the Groote Schuur Hospital gynaecology outpatient

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clinics could provide information on how many of these women, who initially receive conservative treatment, eventually undergo a hysterectomy.

The guidelines for heavy menstrual bleeding developed by NICE recommends the LNG-IUS as the treatment of choice for women with menstrual abnormalities and no known causative pathology.⁴⁰ In less affluent societies medical management, combining a non-steroidal anti-inflammatory, such as mefenamic acid, and the anti-fibrinolytic agent, tranexamic acid is often used as first line treatment as this is cheaper and more readily accessible than other options. In our study 29 of the 43 patients with menstrual abnormalities used tranexamic acid as a treatment for their symptoms, before undergoing hysterectomy. Contrary to the NICE guidelines, few women presenting with abnormal menstrual bleeding at our hospital are treated with the LNG-IUS (2 out of 43 in this study). This very effective therapeutic option is supplied in very limited quantities in the State healthcare facilities in the Western Cape.

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A randomized study of 51 women in Reading, UK, evaluated the advantages and disadvantages of endometrial ablation compared with hysterectomy.⁴⁴ Women randomized to endometrial ablation had less requirement for analgesia, a shorter hospital stay, quicker return to work and the hospital cost was 66% less than a hysterectomy. Eighty four percent of women (21/25) in the endometrial ablation group were satisfied with their treatment. Four women required a second endometrial ablation. While financial constraints are the main reason given why sophisticated ablative treatments and the LNG-IUS are not readily available at Groote Schuur Hospital, in reality the cost of these treatments is far less than that of hysterectomy. In addition effective therapy will avoid repeated hospital visits and sometimes the requirement for blood transfusion.

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Fibroids are the most common pathology found at histopathological examination of hysterectomy specimens, but the prevalence varies greatly between countries. In our study fibroids were found in 210 uteri (62.8%) on

histopathological assessment. A retrospective analysis of 330 hysterectomy specimens collected over a 10 year period in Ife Ife, Nigeria, reported that 48% of uteri contained fibroids.²⁶ In Abha, Saudi Arabia, histopathological analysis of 317 uterine specimens found fibroids in 82 uteri (25.8%).¹⁹ Talukder et al.²⁷ examined 328 hysterectomy specimens in Mymensingh, India, and found fibroids in 17%. In Lund, Sweden, the prevalence of fibroids, diagnosed on ultrasound, was only 5.4% in a random sample of 335 asymptomatic women.²⁸ While all fibroids are not necessarily symptomatic, they remain one of the leading indications for hysterectomy in the world. Although fibroids were found in 62.8% of women in our study, they were judged to be the cause of the patient's symptoms in only 118 (35.3%) of them.

Black women have a higher prevalence of fibroids which occur at a younger age and result in hysterectomy more often than in women from other population groups.⁴⁹ Significantly more black African women in our study had symptomatic fibroids (53.3%) than any other group, corroborating this association. Fibroids were the causative pathology for the presenting complaints in 38 out of 71 black African women in our study, compared to 73 out of 232 coloured and Indian women and 8 out of 29 white women. Similar findings were reported by Kjerulff et al. in a study of 53 159 women undergoing hysterectomies in Maryland, USA. In their study 65.4% of the hysterectomies in black women were for symptomatic fibroids compared to 28.5% in white women.⁵⁰

Few studies describe how the primary indication for surgery was determined.⁹ For cancer, prolapse, adnexal masses and large fibroids the indication is clear, but menstrual abnormalities incorporate a large number of pathologies such as endometriosis, adenomyosis, uterine fibroids and dysfunctional uterine bleeding. The method of determining the indication in different studies affects the results presented. For example, Vessey et al.¹⁰ reported that the indication for hysterectomy in 39% of cases in his study was fibroids, however, this was obtained from the post-operative histological

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diagnosis and not from the pre-operative indication. In the analysis by Mackenzie et al.¹¹ of the same population, fibroids were found in 54% (663 / 1170) of the specimens sent for histology, but were the indication for only 10% of the hysterectomies performed. A study undertaken in Thailand⁵, where 78% (252 / 321) of the abdominal hysterectomies were performed for fibroids, reviewed complications and antibiotic prophylaxis. Although the authors report on indications, they do not describe the mechanism of assigning the indications for surgery.

Two studies have correlated the indication for surgery with the histopathology. The first by Lee et al²⁴, in a multicentre trial of 1851 women in the USA, found fibroids to be cause of symptoms leading to hysterectomy in 32% of women. MacKenzie et al¹¹ in Oxford, UK, reported that fibroids were the indication for surgery in 28% of 1170 women. These figures are similar to our findings, with symptomatic fibroids resulting in hysterectomy in 35.3% (118) of the 335 women studied.

Overall 48 (14.3%) women undergoing hysterectomy at Groote Schuur hospital had normal uteri on histopathological assessment. Thirty two of these women had a hysterectomy for prolapse and this finding is not unexpected. Of the remaining 16 women, one had a hysterectomy for gender re-assignment, and the other 15 hysterectomies were for abnormal bleeding (n=11) or pelvic pain (n=4).

Histological examination of hysterectomy specimens at a private pathology laboratory in Cape Town reported normal uteri in 23.2% of women undergoing hysterectomy (A. Alperstein personal communication). In Oxford¹¹ and Abha, Saudi Arabia¹⁹, the rates of normal uteri removed at hysterectomy were 28% and 44% respectively.

If hysterectomies for gender reassignment (n=1) and prolapse (n=38), where the symptoms are not caused by pathology of the uterus, are excluded from the analysis, then pre-operative indications were supported by

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histopathological assessment in 274 out of 296 women (92.5%). Of the 22 women where the histopathology did not correlate with the pre-operative symptoms and diagnosis, 11 of them had abnormal bleeding and no causative pathology identified. One woman with menorrhagia had adenomyosis and not uterine fibroids as was diagnosed pre-operatively. Pain could not be explained in 7 women and 3 women with suspected endometrial cancer had benign endometrial polyps. Lee et al.²⁴ correlated the pre-operative indications with the histopathology in their study and were able to confirm the pre-operative diagnosis in 80% of women (777 out of 971 women).

In contrast to other audits, far fewer women undergoing hysterectomy in our study had no cause found for their symptoms on histopathological examination. It may be that surgery is offered more often to women with defined pathology in our healthcare environment where we have major budgetary constraints and inadequate operating time.

In comparison with industrialised countries, in our study more hysterectomies were undertaken for malignant and pre-malignant conditions (n = 90, 26.8%). Endometrial cancer or endometrial atypia was the indication for hysterectomy in 45 women (13.4%) and cervical cancer or recurrent HSIL in 36 women (10.7%). Ovarian cancer was diagnosed on histopathology in 9 women (2.7%). In contrast in specimens reviewed at a private pathology laboratory in Cape Town pre-malignancy and malignancy was diagnosed in 74 out of 832 women (8.9%) (A. Alperstein personal communication), mirroring more closely the experience of industrialised countries.

MacKenzie et al.¹¹ reported that 15% of the hysterectomies in their study were done for pre-malignant and malignant conditions. Cervical cancer and HSIL were found in 4.9% of uteri (58 / 1170) and endometrial cancer in 7.6% (89 / 1170) in his study. Groote Schuur Hospital, as a tertiary centre, accepts referrals for gynaecological malignancies from the South Cape and the Eastern Cape Province of South Africa, which impacts on the prevalence

of malignancy in women undergoing surgery in our study. We also have an under-utilised and under-implemented screening system for cervical cancer in South Africa, where women are offered a PAP smear every 10 years.

Surgery and Complications

Total abdominal hysterectomy was the most common type of hysterectomy performed accounting for 65.1% of hysterectomies, followed by vaginal hysterectomy (19.4%), subtotal hysterectomy (9.5%), Wertheims (4.5%) and laparoscopic-assisted hysterectomies (1.5%). Most of these procedures were performed by a consultant and a registrar (87.8%). Groote Schuur is an academic teaching hospital and the training for registrars in gynaecological surgery is of paramount importance in our setting. Our colleagues in private practice in Cape Town performed 832 hysterectomies in 2002 of which 59% were TAH, 9% were sTAH, 19% were vaginal hysterectomies and 13% were laparoscopic procedures (Alan Alperstein, personal communication). This is similar to our study, with slightly less TAH and more laparoscopic procedures.

Intra-operative complications occurred in 4.8% of hysterectomies. Most of these complications arose in patients who were undergoing surgery for cancer (11 out of 16 hysterectomies). The risk of an intra-operative complication at hysterectomy was six times higher in patients with malignancies than in those who had surgery for benign indications. The VALUE study¹⁷, which assessed complications occurring at hysterectomy in 37 500 patients with benign indications in the UK, reported an incidence of 3.5% operative complications. Using the same parameters as in the VALUE study our rate of operative complications would be 2.4% in hysterectomies performed for benign indications.

Subtotal hysterectomy had the highest percentage of operative complications (9.3%). This procedure is usually only performed at our hospital if the surgery becomes technically difficult or is complicated by haemorrhage. It is

therefore not surprising that most operative complications occurred during subtotal hysterectomy. Vaginal hysterectomy and laparoscopic hysterectomy had the least number of operative complications. This may be misleading as these methods of hysterectomy are generally used by more senior surgeons and when junior surgeons are performing these operations, cases are carefully selected and are supervised by a senior surgeon. Vaginal hysterectomy has been reported to have less intra-operative complications in many other studies including the VALUE study.¹⁷

The VALUE study reported an incidence of 9% post-operative complications.¹⁷ When post-operative complications in the VALUE study were divided into severe (1%) and non-severe (8%), then laparoscopic techniques were highest in the severe group (1.6%) compared to vaginal hysterectomy (1.1%) and abdominal [hysterectomy](#) (0.94%). Severe complications included death, DVT, pulmonary embolism, myocardial infarction, septicaemia, fistula, ureteric obstruction and visceral damage. Non-severe [complications](#) included wound complications, haematoma, urinary tract infections and incontinence, chest infection, ileus or diarrhoea, psychiatric symptoms and sleeping difficulties.¹⁷

Our rate of severe post-operative complications, as defined in the VALUE study, was 3%, including hysterectomies done for cancer. Malignancy was not associated with the occurrence of post-operative complications ($p=0.532$), however more women with operative complications had post-operative complications.

The rate of post-operative complications in our study was high compared to the VALUE study. Complications such as unexplained pyrexia in 62 of our patients and pain in 23 patients are regarded as "minor" and were not included as complications in the VALUE study. If patients with these complications are omitted from our calculations then non-severe post-operative complications occurred in 44 women (13.1%).

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Leung et al.⁷ carried out an audit on hysterectomy for benign indications in 1330 women in public hospitals in Hong Kong. The criteria for post-operative complications in their study were similar to ours. They reported that 367 women (27.6%) had post-operative complications, which is comparable with the 34.6% described in our study. This audit on hysterectomy should continue prospectively to determine if we are successful in reducing post-operative complications.

Wound sepsis was present in 7.5% of patients, all undergoing abdominal procedures, and prolonged their post-operative stay by an average of 10.5 days. Women who were 'overweight' in our study had a 5 times higher incidence of wound sepsis than those who were of average weight. In a study of 150 women undergoing abdominal hysterectomy, Soper et al (Richmond, USA) found that the depth of subcutaneous tissue was the most significant risk factor associated with wound infection.⁵¹ In their study women with wound infection had an average body mass index of 35.6, compared to an average of 29.7 in women without wound infection. The rate of wound infection in their study was 11.3% (17 out of 150 women). All women undergoing abdominal hysterectomy in our study received prophylactic antibiotics to prevent infection. Overweight women should be counselled about this complication when the hysterectomy is planned and encouraged to lose weight prior to surgery. The surgeon may also consider a vaginal hysterectomy where appropriate and feasible.

In industrialized countries there is a trend towards vaginal and laparoscopic surgery for hysterectomy, because, with appropriate training, these methods have been shown to be associated with fewer complications and a more rapid recovery. In Australia¹², France²⁰ and Finland³⁶ the number of vaginal hysterectomies reported is greater than the number of abdominally performed procedures. The abdominal route has become the least common form of hysterectomy in Finland, with the number of vaginal hysterectomies exceeding abdominal hysterectomies in 2002, and the number of laparoscopic hysterectomies exceeding abdominal hysterectomies in 2005.

In our study most hysterectomies (79%) were carried out abdominally and these surgeries were shown to have a higher incidence of operative and post-operative complications, when compared to vaginal and laparoscopic hysterectomies. Among the 16 women with operative complications in our study 11 patients had malignancy. Of the remaining 5 patients, four had large fibroids and one had a benign ovarian tumour. These surgeries were technically more difficult and those for excision of malignancy often involved additional surgery such as lymphadenectomy.

Women with confirmed malignancy, pelvi-abdominal masses or large fibroids will continue to have abdominal hysterectomies in our setting, as this remains the most appropriate method for these indications. Unfortunately women with these indications also have more complications. Conservative treatment for abnormal menstrual bleeding needs review and the proportion of vaginal hysterectomies may possibly be increased in order to reduce the rate of complications. In addition an increased number of laparoscopic-assisted vaginal hysterectomies undertaken at Groote Schuur Hospital may provide benefit to our patients.

The data from this study will aid in pre-operative counselling and decision-making with regard to the type of hysterectomy performed. This study provides a basis for future audit of hysterectomy at Groote Schuur Hospital and a standard for comparing our practice to that of the rest of the world.

CONCLUSIONS

A much lower percentage of histopathologically normal uteri were removed during hysterectomy at Groote Schuur Hospital than in the private sector in Cape Town or in industrialized countries. Only 23% of women (10 /43) with menstrual abnormalities had no cause for their symptoms found on histopathological examination. This is a smaller proportion than reported in other countries. The histopathological assessment could explain the pre-operative symptoms in 92.5% of women. Limitations on theatre time and financial constraints result in hysterectomy being offered more often to women with defined pathology.

In industrialised countries gynaecologists are trained to perform hysterectomies done by vaginal and laparoscopic methods to reduce complications and lessen the disadvantages of the longer hospital stay and the longer recovery in women undergoing abdominal surgery. Women present to our gynaecological service with advanced pathology, such as large fibroids or ovarian masses, and we have a higher proportion of patients with malignancy than in other centres. Abdominal hysterectomy is the most appropriate method of surgery for most of these patients. We could try increase the numbers of laparoscopic and vaginal surgeries in women with benign pathology.

We have a comparable rate of intra-operative complications and severe post-operative complications to other countries. Intra-operative complications were more common with abdominal surgery than with vaginal or laparoscopic surgery. Vaginal hysterectomy has been reported to have less intra-operative complications in many other studies.

A high rate of non-severe post-operative complications occurred in our study. Twenty nine percent of women in this study were noted to be "overweight"

and these women had a significantly higher rate of wound sepsis. We need to continue to audit these complications and to find ways to reduce them in future.

Further studies should be undertaken to evaluate the treatment of menstrual abnormalities in women attending our gynaecology outpatients clinic. Many women with dysfunctional uterine bleeding are not initially offered a hysterectomy at our hospital. Effective alternative treatments, such as the LNG-IUS and ablative techniques, are not readily available in State hospitals and therefore hysterectomy remains the only form of definitive treatment for these women. Due to constraints on theatre time and resources it is unlikely that this situation will change in the near future. If hysterectomy is to be performed on women with benign pathology, the surgeon should be able to offer the procedure with the least risk of complications and shortest recovery time. We need to increase training in vaginal and laparoscopic techniques to decrease complication rates, shorten patients' hospital stay and recovery time and reduce overall costs.

The findings of this study will assist in pre-operative counselling and decision-making with regard to type of hysterectomy performed. These data provide a basis for future audit of gynaecological surgery and complications of hysterectomy at Groote Schuur Hospital.

References

1. <http://en.wikipedia.org/wiki/hysteria#history>
2. Baskett, T. Hysterectomy: evolution and trends. *Bailliere's Best Pract Res Clin Obstet Gynaecol* 2005; **19**:295-305.
3. Sutton C. Hysterectomy: a historical perspective. *Bailliere's Clin Obstet Gynaecol*. 1997; **11**:1-60.
4. Sundborg M, Ellison M. Radical Hysterectomy. [emedicine.medscape.com /article/270723](http://emedicine.medscape.com/article/270723)
5. Chongsomchai C, Lumbiganon P, Thinkhamrop J, Ounchai J, Vudhikamraksa N. Placebo-controlled, double –blind, randomized study of prophylactic antibiotics in elective abdominal hysterectomy. *J Hosp Infect* 2002; **52**:302-306.
6. Gimbel H, Settnes A, Tabor A. Hysterectomy on benign indication in Denmark 1988 – 1998. *Acta Obstet Gynaecol Scand* 2001; **80**: 267-272.
7. Leung PL, Tsang SW, Yeun PM. An audit on hysterectomy for benign diseases in public hospitals in Hong Kong. *Hong Kong Med J* 2007; **13**: 187-193.
8. McPherson K, Metcalfe MA, Herbert A, et al. Severe complications of hysterectomy: the VALUE study. *Br J Obstet Gynaecol* 2004; **111**: 688-694.

Jenny Butt 09/2/9 9:07 PM

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9. Whiteman MK, Hillis SD, Jamieson, DJ et al. Inpatient hysterectomy surveillance in the United States, 2000-2004. *Am J Obstet Gynecol* 2008; **198**:34.e1-e7.
10. Vessey M, Villard-Mackintosh L, McPherson K, Coulter A, Yeates D. The epidemiology of hysterectomy: findings in a large cohort study. *Br J Obstet Gynaecol* 1992; **99**: 402-407.
11. MacKenzie I, Naish C, Rees M, Manek S. 1170 consecutive hysterectomies: indications and pathology. *J Br Menopause Soc* 2004; **10**: 108-112.
12. Spilsbury K, Semmens JB, Hammond I, Bolck A. Persistent high rates of hysterectomy in Western Australia: a population-based study of 83 000 procedures over 23 years. *Br J Obstet Gynaecol* 2006; **113**:804-809.
13. Macintosh MCM. Incidence of hysterectomy in New Zealand. *NZ Med J* 1987; **100**: 345-347.
14. Materia E, Rossi L, Spadea T, et al. Hysterectomy and socioeconomic position in Rome, Italy. *J Epidemiol Community Health* 2002; **56**: 461-465.
15. Farquhar CM, Steiner CA. Hysterectomy rates in the United States 1990-1997. *Obstet Gynaecol* 2002; **99**: 229-234.
16. Carlson KJ, Nichols DH, Schiff I. Indications for Hysterectomy. *N Engl J Med* 1993; **328**: 856-860.
17. Maresh MJ, Metcalfe MA, McPherson K, et al. The VALUE national hysterectomy study: description of patients and their surgery. *Br J Obstet Gynaecol* 2002; **109**: 302-312.

Jenny Butt 09/1/24 11:52 PM

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Jenny Butt 09/2/9 9:07 PM

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18. Gaym A. Elective hysterectomy at Tikur Anbessa Teaching Hospital, Addis Ababa. *Ethiop Med J* 2002; **40**: 217-226.
19. Sobande AA, Eskander M, Archibong EI, Damole IO. Elective hysterectomy: A clinicopathological review from the catchment area of Saudi Arabia. *West Afr J Med* 2005; **24**: 31-35.
20. Gibney EJ, Mock C, Visser LE. Hysterectomy in the rural tropics. *Cent Afr J Med* 1992; **38**: 72-74.
21. Jha R, Pant AD, Jha A, Adhikari RC, Sayami G. Histopathological analysis of hysterectomy specimens. *J Nepal Med Assoc* 2006; **45**: 283-90.
22. Lee NC, Dicker RC, Rubin GL, Ory HW. Confirmation of the preoperative diagnosis for hysterectomy. *Am J Obstet Gynecol* 1984; **150**: 283-287.
23. Reich H, Conti Ribeiro S, Vidali A. Hysterectomy as a treatment for dysfunctional uterine bleeding. *Bailliere's Clin Obstet Gynaecol* 1999; **12**: 251-269.
24. Shergill SK, Shergill HK, Gupta M, Kaur S. Clinicopathological study of hysterectomies. *J Indian Med Assoc* 2002; **100**: 238-239.
25. Merrill RM, Layman AB, Oderda G, Asche C. Risk estimates of hysterectomy and selected conditions commonly treated with hysterectomy. *Ann Epidemiol* 2008; **18**: 253-260.
26. Adelusola KA, Ogunniyi SO. Hysterectomies in Nigerians: histopathological analysis of cases seen in Ile-Ife. *Niger Postgrad Med J* 2001; **8**: 37-40.

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Jenny Butt 09/2/9 9:07 PM

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27. Talukder SI, Haque MA, Huq MH, et al. Histopathological analysis of hysterectomy specimens. *Mymensingh Med J* 2007; **16**:81-84.
28. Borgfeldt C, Andolf E. Transvaginal ultrasonographic findings in the uterus and the endometrium: Low prevalence of leiomyoma in a random sample of women age 25-40. *Acta Obstet Gynecol Scand* 2000; **79**:202-207.
29. Baggish MS. Total and subtotal abdominal hysterectomy. *Bailliere's Best Pract Res Clin Obstet Gynaecol* 2005; **19**: 333-356.
30. David-Montefiore E, Rouzier R, Chapron C, Darai E. Surgical Routes and complications of hysterectomy for benign disorders: a prospective observational study in French university hospitals. *Hum Reprod* 2007; **22**: 260-265.
31. Mäkinen J, Johansson J, Tomás C, et al. Morbidity of 10110 hysterectomies by approach. *Hum Reprod* 2001; **16**:1473-1478.
32. Brummer TH, Seppälä TT, Härkki PS. [National learning curve for laparoscopic hysterectomy and trends in hysterectomy in Finland 2000-2005.](#) *Hum Reprod* 2008; **23**: 840-845.
33. Naylor AC. Hysterectomy – analysis of 2901 personally performed procedures. *S Afr Med J* 1984; **65**: 242-245.
34. Sabbour SM. Epidemiological correlates of hysterectomy, a hospital based study 1995 – 1996 at Ain Shams Maternity Hospital. *J Egypt Public Health Assoc* 2001; **76**: 71-87.

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35. Thakar R, Ayers S, Clarkson P, Stanton S, Manyonda I. Outcomes after total versus subtotal hysterectomy. *N Engl J Med* 2002; **347**: 1318-1325.

Jenny Butt 09/2/9 9:07 PM

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36. Ewies AA, Olah KS. Subtotal abdominal hysterectomy: a surgical advance or a backward step? *Br J Obstet Gynaecol* 2000; **107**: 1376-1379.

Jenny Butt 09/2/9 9:07 PM

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37. Johnson N, Barlow D, Lethaby A, et al. Methods of hysterectomy: systematic review and meta-analysis of randomized controlled trials. *Br Med J* 2005; **330**: 1478-1486.

38. Garry R, Fountain J, Mason S, et al. The eVALuate study: two parallel randomized trials, one comparing laparoscopic with abdominal hysterectomy, the other comparing laparoscopic with vaginal hysterectomy. *Br Med J* 2004; **328**: 129-136.

39. Garry R. The future of hysterectomy. *Br J Obstet Gynaecol* 2005; **112**: 133-139.

40. National Institute for Clinical Excellence. Heavy Menstrual Bleeding. Clinical Guideline no 44. 2007

Jenny Butt 09/1/24 11:52 PM

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41. Ewenstein, B. The pathophysiology of bleeding disorders presenting as abnormal uterine bleeding. *Am J Obstet Gynecol* 1996; **175**: 770-777.

Jenny Butt 09/2/9 9:07 PM

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42. Espindola D, Kennedy KA, Fischer EG. Management of Abnormal Uterine Bleeding and the Pathology of Endometrial Hyperplasia. *Obstet Gynecol Clin North Am* 2007; **34**: 717-737.

Jenny Butt 09/2/9 9:07 PM

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43. Lähteenmäki P, Haukkamaa M, Puolakka J, et al. Open randomized study of use of levonorgestrel releasing intrauterine system as alternative to hysterectomy. *Br Med J* 1998; **316**: 1122-1126.

Jenny Butt 09/2/9 9:07 PM

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44. Gannon MJ, Holt EM, Fairbank J, et al. A randomized trial comparing endometrial resection and abdominal hysterectomy for treatment of menorrhagia. *Br Med J* 1991; **303**: 1362-1364.

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45. Hurskainen R, Teperi J, Rissenen P, et al. Clinical outcomes and costs with the levonorgestrel-releasing intrauterine system or hysterectomy for the treatment of menorrhagia. *JAMA* 2004; **291**: 1456 – 1463.

46. Pinion SB, Parkin DE, Abramovich DR, et al. Randomised trial of hysterectomy, endometrial laser ablation, and transcervical endometrial resection for dysfunctional uterine bleeding. *Br Med J* 1994; **309**: 979-983.

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47. Bridgman SA, Dunn K. Has endometrial ablation replaced hysterectomy for the treatment for dysfunctional uterine bleeding? National figures. *Br J Obstet Gynaecol* 2000; **107**: 531-534.

48. Coulter A, Bradlow J, Agass M, Martin-Bates C, Tulloch A. Outcomes of referrals to gynaecology outpatient clinics for menstrual problems: an audit of general practice records. *Br J Obstet Gynaecol* 1991; **98**: 789-796.

Jenny Butt 09/2/9 9:07 PM

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49. Marshall LM, Spiegelman D, Barbeiri RL, et al. Variation in the incidence of uterine leiomyoma among premenopausal women by age and race. *Obstet Gynecol* 1997; **90**: 967-973.

50. Kjerulff KH, Guzinski GM, Langenberg PW, et al. Hysterectomy and race. *Obstet Gynecol* 1993; **82**: 757-764.

51. Soper DE, Bump RC, Hurt WG. Wound infection after abdominal hysterectomy: effect of the depth of subcutaneous tissue. *Am J Obstet Gynecol* 1995; **173**: 465-469.

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Annexure A

The Research Ethics Committee affirms the approval of the application for the following research project:
 Research of Clinical Practice (GCP)/ICH (14/25) and ICH Good Practice



UNIVERSITY OF CAPE TOWN

Health Sciences Faculty
 Research Ethics Committee
 Room E52-24 Groote Schuur Hospital Old Main Building
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24 June 2008

REC REF: 271/2008

Prof Z Van Der Spuy
 Obstets & Gynae
 H Floor
 OMB

Dear Prof Van Der Spuy

PROJECT TITLE: AUDIT OF HYSTERECTOMIES PERFORMED AT GROOTE SCHUUR HOSPITAL OVER THE PAST FEW YEARS

Thank you for submitting your study to the Research Ethics Committee for review.

It is a pleasure to inform you that the Ethics Committee has **formally approved** the above-mentioned study.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the REC. REF in all your correspondence.

Yours sincerely

Lesley H. Riley

PROFESSOR M BLOCKMAN
CHAIRPERSON, HSF HUMAN ETHICS

Federal Wide Assurance Number: FWA00001637.
 Institutional Review Board (IRB) number: IRB00001938

This serves to confirm that the University of Cape Town Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

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Hippocrates believed that madness arose in women whose uteri had become too light and dry from lack of sexual intercourse and, as a result, had wandered upward compressing the heart, lung and diaphragm (2). There are many indications for performing a hysterectomy and some might argue that when it comes to indications such as menorrhagia and abnormal bleeding, that the procedure does in fact 'cut out the hysteria'.

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). It is not known if the patient survived. In the 18th century, it was the opinion of the medical community that it was unlikely that a woman could survive a hysterectomy, with the mortality rate being 90%.

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In the United Kingdom, 20% of women have undergone a hysterectomy by the age of 55 years (11). Mac Kenzie et al. determined the rate of hysterectomies in the UK using data obtained from an NHS hospital in Oxford and population estimates from the Office of National Statistics. For the period 1997 – 1999 they found the rate to be 2.3/1000 women over 25yrs. The average age was 51.2 years. The authors expressed disappointment that they had not observed a significant decline in the rate over the previous decade. The rate in 1989 was quoted as 2.7/1000 women (11). With NHS funding issues and directives to delay non-urgent surgery over that period, as well as the introduction of alternative strategies for managing menstrual symptoms and fibroids, it was expected that the hysterectomy rate would decline significantly (12). Similar studies have been undertaken in Australia (13), New Zealand (14), Denmark (6), Italy (15), Canada and Finland (13) and the results are shown in Table 1 below.

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	2.7	1989 (11)	
UK	2.3	1997-1999 (12)	20% by age 55
	6.6	1981 (13)	Lifetime risk

Australia	4.8	2003	35%
New Zealand	4.1	1984 (14)	25% by age 50 39% by age 85
Denmark	1.93 1.82	1988 (6) 1998	Lifetime risk 10.4%
Italy	2.27	1997 (15)	

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25% by age 50
39% by age 85

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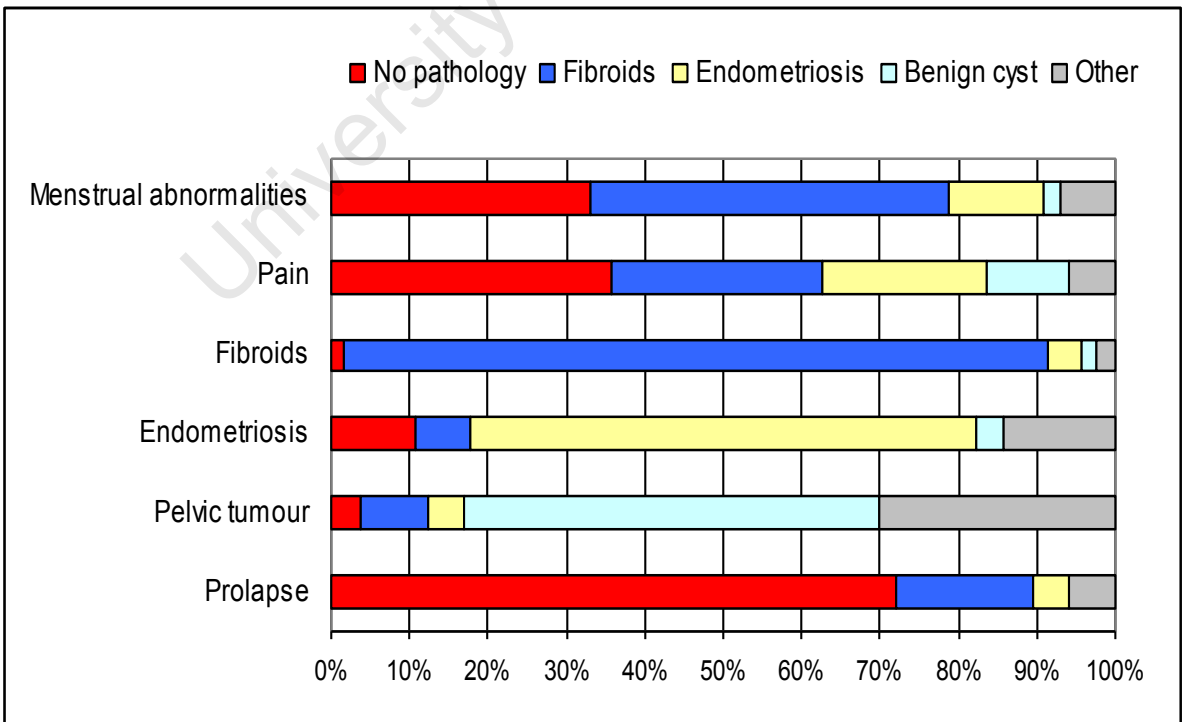
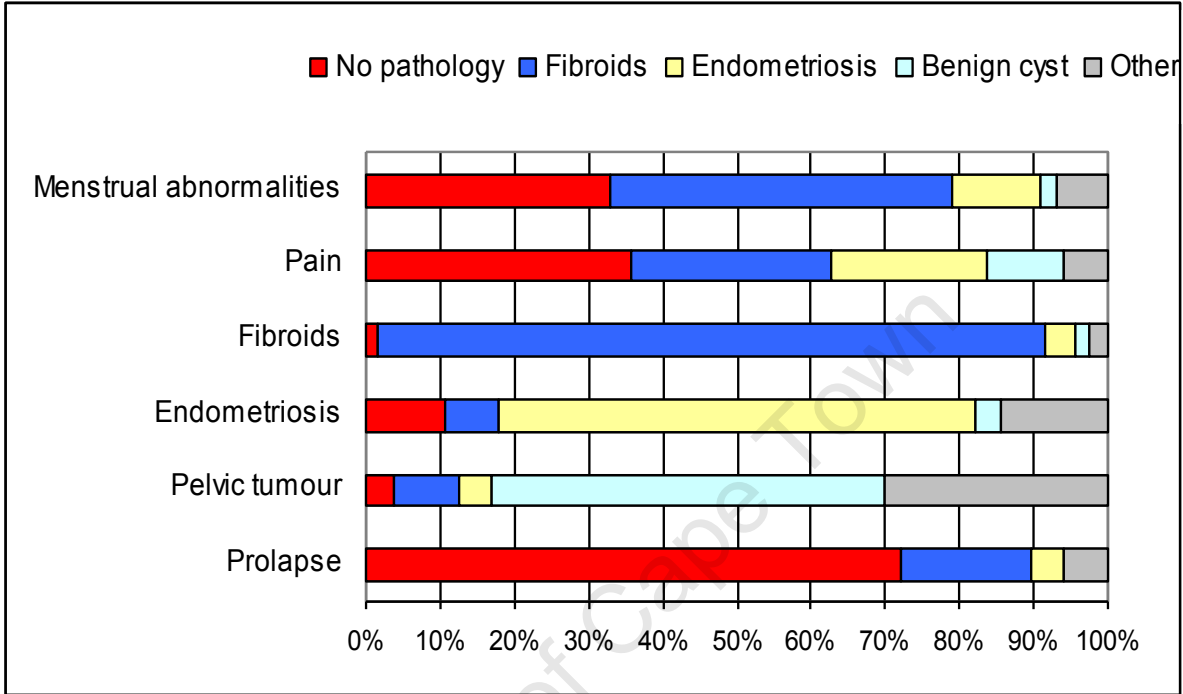
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	No pathology	Fibroids	Endometriosis	Benign cyst	Other	Total
Menstrual abnormalities	147	204	53	10	31	445
Pain	24	18	14	7	4	67
Fibroids	2	106	5	2	3	118
Endometriosis	3	2	18	1	4	28
Pelvic tumour	5	11	6	68	30	129
Prolapse	144	35	9	0	12	200

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There was no causative pathology found in 33% of the hysterectomies done for menstrual abnormalities and no pathology in 36% of those done for

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There was no pathology found in 33% of the hysterectomies done for menstrual abnormalities and no pathology in 36% of those done for pain. The authors do not comment on whether less invasive, alternative treatment was offered before hysterectomy.

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Subtotal hysterectomy is a safer and technically easier operation than a total abdominal hysterectomy. The procedure has the advantages of preserving pelvic floor support, a lower incidence of ureteric damage, decreased vault haematoma and some studies claim less post-operative sexual dysfunction (25). A randomized, double blind trial comparing total and subtotal hysterectomy in 279 women looked at the outcomes of each procedure after 12 months (28). Short term disadvantages in the women who had a total abdominal hysterectomy were: a longer duration of surgery, greater blood loss, a longer hospital stay and an increased incidence of vault haematoma. At 12 months, 7% of women who had undergone a subtotal hysterectomy had cyclical bleeding. There was no difference in bladder or bowel function at 12 months and no difference in sexual function.

In a retrospective analysis of 150 women who underwent a subtotal hysterectomy, 8% of women complained of post-operative cyclical bleeding. A subsequent trachelectomy or a LLETZ was required in 7% of women because of continuous bleeding or intraepithelial neoplasia (29). Women who have undergone a subtotal hysterectomy must be advised to continue with regular screening for cervical cancer.

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Study Proposal

This study will determine the number and indications for hysterectomies done in one year at a large public sector hospital in South Africa (Groote Schuur).

The initial clinical indication for hysterectomy in each case will be correlated with the histopathological findings. Post-operative complications will also be examined in relation to indication for and the type of hysterectomy performed. As hysterectomy should not be the first line treatment for menstrual abnormalities, the case notes will also be assessed to determine whether other medical or surgical techniques had been attempted before hysterectomy.

This study will elucidate important demographic data and may aid in determining ways of reducing the number of surgeries and surgical complications in women undergoing hysterectomy. The data will also provide information that will be valuable in pre-operative patient counseling.

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Methods:

Subjects will be identified by the entry of the procedure into the official theatre case register. The histology will be obtained from the DISA laboratory reporting system. Demographic details, indications for surgery, complications and management will be obtained directly from patient files. Ethics approval has been granted by the Research Ethics Committee. Statistical analysis will be carried out using.....

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Farquhar CM, Steiner CA. Hysterectomy rates in the United States 1990-1997. *Obstet. Gynecol.* 2002; 99: 229-234.

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Brummer TH, Seppälä TT, Härkki PS. National learning curve for laparoscopic hysterectomy and trends in hysterectomy in Finland 2000-2005. *Human Reproduction* 2008; 23: 840-845.

Grant JM. An audit of abdominal hysterectomy over a decade in a district hospital. *BJOG* 1984; 91: 73-77.

Clarke A, Black N, et al. Indications for and outcome of total abdominal hysterectomy for benign disease: a prospective cohort study. *BJOG* 1995; 102: 611-620.

Crosignani MD, Vercellini P, Apolone G, et al. Endometrial resection versus vaginal hysterectomy for menorrhagia: Long-term clinical and quality of life outcomes. *American Journal of Obstet and Gynaecol* 1997; 177: 95-101.

Ottosen C, Lingman G, et al. Three Methods for hysterectomy: a randomized prospective study of short term outcome. *BJOG* 2000; 107:1380-1385.