

# The Decreasing Length of Hospital Stay following Vaginal Hysterectomy: 2011–2012 vs. 1996–1997 vs. 1995–1996

## Rückgang der Aufenthaltsdauer nach vaginaler Hysterektomie: 2011–2012 vs. 1996–1997 vs. 1995–1996

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### Key words

- vaginal
- hysterectomy
- length of hospital stay
- surgery
- recovery rate

### Schlüsselwörter

- vaginal
- Hysterektomie
- Aufenthaltsdauer
- Operation
- Wiederaufnahmerate



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### Abstract

**Background/Definition of the Problem:** In recent years, postoperative management has changed towards rapid mobilisation, early oral feeding and rapid rehabilitation (known as Fast-Track or Enhanced Recovery Concepts). This study analysed the postoperative length of stay after vaginal hysterectomy in 3 different periods of time.

**Material and Methods:** In the period October 2011 – September 2012, 75 patients underwent vaginal hysterectomies ( $\pm$  adnexectomy); another 114 vaginal or laparoscopic hysterectomies with additional operations (e.g. prolapse surgery and incontinence surgery) and malignancies were not included. The time periods August 1995 – July 1996 ( $n=50$ ) and October 1996 – September 1997 ( $n=96$ ) served as a comparison. Reducing the length of stay was not an explicit goal.

**Results:** The median postoperative stay was shortened from 7 (5–9) to 5 (3–15) or 3 (0–5) days ( $p < 0.001$ ). The recovery rate remained unchanged at 2.7% ( $n=2$ ), cf. 2% ( $n=1$ ) and 3.1% ( $n=3$ ). In 40/75 cases (53.3%), the surgery took place on the day of admission.

**Conclusion:** The length of hospital stay after vaginal hysterectomy has more than halved since 1995/1996 and continues to decline. This development occurred without a shortened stay being an explicit goal of the clinic. The shortened length of stay does not appear to have a negative impact on postoperative complications and recovery rate.

### Introduction

Postoperative management has changed over the last few years towards rapid mobilisation, early oral feeding and rapid rehabilitation. So-

### Zusammenfassung

**Hintergrund/Fragestellung:** Postoperatives Management hat sich in den letzten Jahren in Richtung rascher Mobilisierung, frühe orale Nahrungsaufnahme und rascher Rehabilitation gewandelt (sog. Fast-Track- oder Enhanced-Recovery-Konzepte). Diese Studie analysiert die postoperative Aufenthaltsdauer nach vaginaler Hysterektomie in 3 Zeiträumen.

**Material und Methodik:** Im Zeitraum 10/2011–9/2012 wurde bei 75 Patientinnen eine vaginale Hysterektomie ( $\pm$  Adnexektomie) durchgeführt; weitere 114 vaginale oder laparoskopische Hysterektomien mit Zusatzoperationen (z. B. Deszensus-, Inkontinenz-OP) oder Malignomen wurden nicht eingeschlossen. Als Vergleich dienten die Zeiträume 8/1995–7/1996 ( $n=50$ ) und 10/1996–9/1997 ( $n=96$ ). Reduktion der Aufenthaltsdauer war kein explizites Ziel.

**Ergebnisse:** Der mediane postoperative Aufenthalt verkürzte sich von 7 (5–9) auf 5 (3–15) bzw. 3 (0–5) Tage ( $p < 0,001$ ). Die Wiederaufnahmerate blieb unverändert bei 2,7% ( $n=2$ ), vgl. 2% ( $n=1$ ) bzw. 3,1% ( $n=3$ ). In 40/75 Fällen (53,3%) erfolgte die OP am Aufnahmetag.

**Schlussfolgerung:** Die Aufenthaltsdauer nach vaginaler Hysterektomie hat sich seit 1995/1996 mehr als halbiert und ist weiterhin rückläufig. Diese Entwicklung passierte, ohne dass ein verkürzter Aufenthalt ein explizites Ziel der Klinik gewesen wäre. Die verkürzte Aufenthaltsdauer zeigt keine negativen Auswirkungen auf die postoperative Komplikations- bzw. Wiederaufnahmerate.

called Fast-Track [1–4] or Enhanced-Recovery-concepts have now also found their way into gynaecology. The emphasis here is, as well as the cost pressure on public health, above all on the desire of patients to have short hospital stays

and the fastest possible return to their familiar social environment.

This is in line with the international trend of shortening the length of hospital stay [5]; this leads to vaginal hysterectomies being carried out in outpatient clinics [6–7], which 15 years ago still involved an average of one week of hospitalisation [8]. Beginning in the 1990s, various changes were made in operating as well as in pre- and postoperative management [9]. These changes continue today with the use of bipolar vessel sealing techniques [10] and combined anaesthesia method [11].

We analysed postoperative length of stay and readmission rates at the University Women's Hospital in Graz following vaginal hysterectomy in 2011–2012 and compared these with previously published results from the years 1995–1996 and 1996–1997 [9].

## Materials and Methods

In the period 1/1/2011–1/9/2012, vaginal hysterectomies ( $\pm$  adnexectomy) were performed in 75 patients with benign indications. A further 114 patients who underwent vaginal or laparoscopic hysterectomies with additional operations (e.g. due to prolapse or incontinence) or malignancies were not included. The periods 1/8/1995–1/8/1996 ( $n=50$ ) and 1/10/1996–1/10/1997 ( $n=96$ ) [9] served as a comparison. The Ethics Committee of the Medical University of Graz (IRB00002556) has issued approval for the study.

### Perioperative management 1995–1997

The first two periods differ in terms of management in the sense that the patients in the first period (1995–1996) were given paravenous infusions (2000 ml of electrolyte and glucose solution) on the first 2 postoperative days, were discharged on the second postoperative day and received no antibiotic prophylaxis. In the second period (1996–1997), increasing emphasis has been placed on early mobilisation, early oral feeding, active pain management and a general antibiotic prophylaxis (2 g cefotiam or cefazolin administered once). Infusions were discontinued after oral feeding was tolerated. In both periods, the operations were carried out based on the technique described by Reiffenstühl [12], in which the vaginal tamponing ribbons were removed on the second postoperative day in the first period and on the first or second postoperative day in the second period. The use of indwelling catheters and the administration of thrombosis prophylaxis using low molecular weight heparin were not routine in either time period; furthermore, patients were routinely admitted one day prior to surgery.

### Perioperative management 2011–2012

In the third period, perioperative management included elements of fast-track concepts. Operations were increasingly scheduled for the day of admission. Mobilisation with the aid of physiotherapists began and some intake of food was recommended on the day of surgery. The anaesthetic method of choice was general anaesthesia, supplemented by PONV prophylaxis, and in some cases a spinal anaesthetic was also used. The default schema for PONV prophylaxis consisted of preoperative oral dexamethasone administration and the intraoperative IV administration of droperidol. Increasingly, pre-emptive analgesia (infiltration of the parametrium with Naropin at the beginning of the operation) was used. A significant change in the operating procedure lies in bipolar vessel sealing (LigaSure<sup>®</sup>, Covidien, Boulder,

CO, USA), which was used in the vast majority of cases to cut the parametrium following clamping and ligature suture of the uterosacral ligament. Peritoneal closure was no longer routinely carried out and vaginal tamponing ribbons were no longer routinely used. In the case of general anaesthesia, the indwelling catheter was removed immediately after the operation; in the case of the use of spinal anaesthesia, this was done once the effects of the anaesthesia had worn off. While there was postoperative bacteriological MSU testing of all patients in the first two periods, urine tests were only performed in case of complaints in the current period. The decision to discharge was made jointly with the patient; an early discharge was not an explicit goal of the clinic.

## Statistical analysis and data evaluation

The data evaluation was performed using SPSS 20.0 (SPSS Inc., Chicago, IL). Group comparisons were performed using the Wilcoxon-Mann-Whitney test or the Kruskal-Wallis test as the revised time periods did not follow a normal distribution. Categorical variables were performed using Pearson's  $\chi^2$  test (using the exact option in SPSS) or Fisher's exact test for expected values  $<5$ . A significance level of 0.05 was set for all tests. Data are expressed as mean  $\pm$  standard deviation (SD) or median  $\pm$  (minimum – maximum).

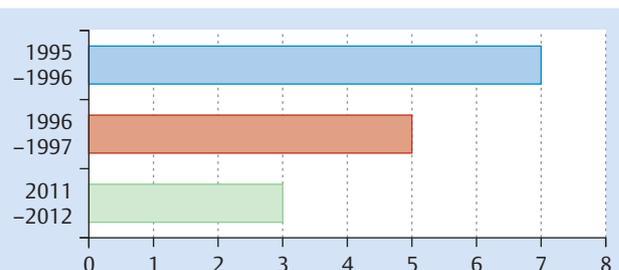
## Results

### Indications for a hysterectomy

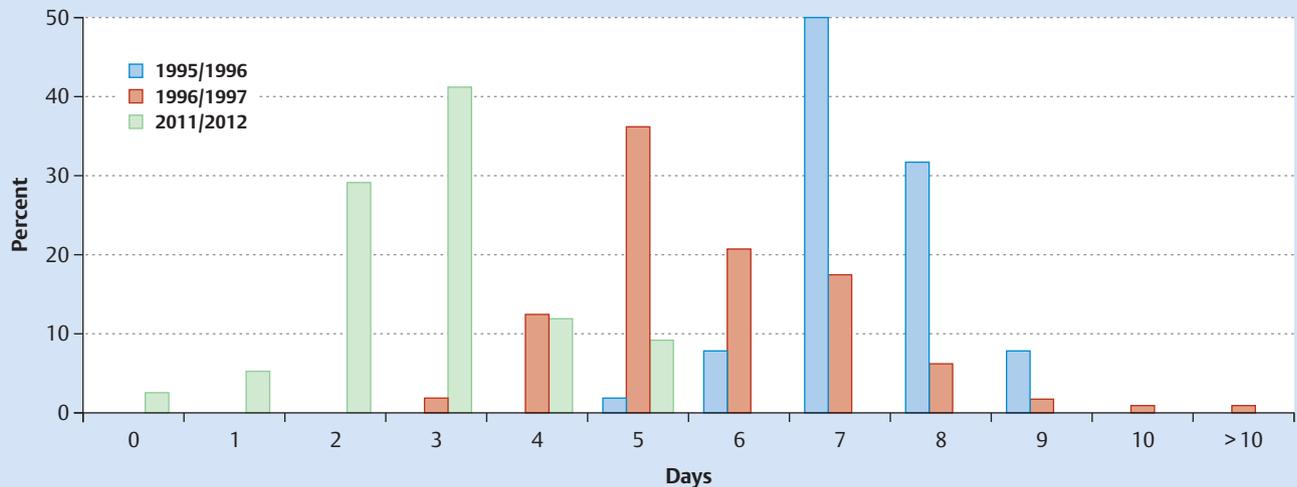
The age of the patients varied insignificantly with median values of 47 (34–74), 46 (32–84) and 48 (34–88) ( $p=0.95$ ). Regarding the indication for hysterectomy, the majority of interventions for uterine fibroids and bleeding disorders were conducted in the years 1995–1997. Even in the current period, 65% ( $n=49$ ) of patients had a uterine leiomyoma and 37% ( $n=28$ ) experienced bleeding disorders. In 8% ( $n=6$ ) the hysterectomy was the result of atypical endometrial hyperplasia and in 5% ( $n=4$ ) it was the result of recurrent CIN III. This is relatively stable with respect to the identified indications for vaginal hysterectomy in the study population, in contrast to e.g. adenomyosis uteri [13], in the case of which increasingly alternative therapeutic approaches are used. In the current study period, 40 patients (53.3%) were admitted on the day of surgery.

### Duration of postoperative stay

The median postoperative stay was shortened from 7 (5–9) to 5 (3–15) or 3 (0–5) days ( $p<0.001$ , Kruskal-Wallis test; **Fig. 1**). While not a single patient in 1995–1996, and only one patient



**Fig. 1** Median duration of postoperative stay (d) following vaginal hysterectomy in the study periods 1995–1996, 1996–1997 and 2011–2012.



**Fig. 2** Percentage distribution of days of postoperative stay (d) in patients following vaginal hysterectomy in the study periods 1995–1996, 1996–1997 and 2011–2012.

(2.0%) in 1996–1997 was released before the fourth postoperative day, 79% (n=59) of patients in 2011–2012 could be sent home by the third postoperative day and 91% (n=68) by the fourth postoperative day. Furthermore, two vaginal hysterectomies were performed on an outpatient basis [6]. **Fig. 2** shows the percent distribution of postoperative days.

### Complication-related readmission

The recovery rates (up to the 30th postoperative day) remained virtually unchanged at 2.0% (n=1), 3.1% (n=3) and 2.7% (n=2). In the first period, one patient was readmitted on the 26th postoperative day due to infiltration of the vaginal cuff. In the second period, two patients were readmitted due to postoperative bleeding (on the 11th and 15th postoperative days) and one patient was readmitted due to infiltration of the vaginal cuff (20th postoperative day). In the current period, one patient was readmitted on the 30th postoperative day for IV antibiotic due to suspected pelveoperitonitis. Subsequently, a laparotomy was carried out in this patient due to persistent chronic pelvic pain, in which adhesiolysis and a fistula exclusion were performed. In another patient, a laparoscopy was carried out on the 12th postoperative day due to endometrial growth; the patient also underwent bilateral salpingectomy.

In the years 1995–1996, the administration of packed red blood cells was required in one patient (2.0%). In the 1996–1997 period,

the transfusion rate was 1% (n=1). In the period 2011–2012, two patients (2.7%) received pre-interventional packed red blood cells on the basis of data collected within the framework of the laboratory parameters determined during preoperative presentation in the gynaecological outpatient clinic, in the sense of the best possible surgical preparation. In a further two (2.7%), packed red blood cells were administered perioperatively.

The rate of postoperative urinary tract infections (UTI) which were detected and treated was 44% in the period 1995–1996 (n=22) and decreased significantly to 27% in 1996–1997 (n=26),  $p=0.043$ . In the current period there was a significant further reduction in the UTI rate to 1.3% (n=1,  $p<0.001$ ). **Table 1** shows a summary of the parameters studied.

### Discussion

The length of hospital stay following vaginal hysterectomy has more than halved since 1995–1996. This corresponds to the international trend towards the shortening of postoperative stays, which has begun to affect not only gynaecology, but all other surgical disciplines as well. No change has been made by the clinic in terms of patient management with the explicit goal of reducing the length of hospital stays. The health economic impact of reduced hospital stays is currently reflected in many areas of every-

**Table 1** Patient data, length of hospital stay and complication rate in patients following vaginal hysterectomy in the study periods 1995–1996, 1996–1997 and 2011–2012.

	1995–1996		1996–1997		2011–2012	
Number of patients (n)	50		96		75	
Age (min – max)	47	(37–74)	46	(32–84)	48	(34–88)
Duration of postoperative stay (min – max)	7	(5–9)	5	(3–15)	3	(0–5)
Readmission rate up to 30 d postoperatively	1	2.0%	3	3.1%	2	2.7%
UTI	22	44.0%	26	27.1%	1	1.3%
Intraoperative/postoperative administration of packed red blood cells	1	2.0%	1	1.0%	2	2.7%
TVT/PAE	0	0.0%	0	0.0%	0	0.0%
Operative review	1	2.0%	2	2.1%	2	2.7%

day hospital life. These include the reduction in bed numbers in gynaecological departments which are contained in many structure plans and cost savings, particularly in the nursing field. This trend was driven by the introduction of the DRG in Germany and the LKF system in Austria [14] and was accompanied by massive budget cuts. There exists no cost analysis for gynaecological procedures which, in addition to in-patient savings, also takes into account the costs of effective outpatient follow-up – this would however be desirable for the economic analysis of the subject. Even in the 1990s the model of the outpatient vaginal hysterectomy [15–17] was highly propagated, especially in the USA where it now often represents the standard protocol [6]. Approaches to the implementation of short in-patient concepts with durations of up to 24 hours are also becoming increasingly important in Europe [7, 18]. In addition to coordinated perioperative management, other framework parameters must also be ensured. This represents less a purely medical, and more of an organisational challenge for both the hospital and the patient. It is the broad consensus that ensuring postoperative home care is a cornerstone for the expansion of the operating offering in the outpatient setting.

With regard to the rate of urinary tract infections in the two periods under review, a significant decrease was observed in terms of frequency, whereby the rate of 1.3% in the period 2011–2012 corresponds to international comparison data, which indicates an incidence of 0–13% [19]. This probably has several causes. Firstly, postoperative management is moving away from routine postoperative laboratory and urinary testing towards symptom-oriented clarification [20]. This led to discontinuing the antibiotic treatment of asymptomatic urinary tract infections and false-positive (contaminated) findings. For comparison, a meta-analysis reveals that this type of perioperative urinary testing shows abnormalities in 1–34.1% of cases, but a change in postoperative management in the sense of a specific treatment only occurs in 0.1–2.8% of cases. Furthermore, a reduction in symptomatic urinary tract infections can also be achieved through the sparing use of indwelling catheters, the immediate return of spontaneous urination and the use of aseptic techniques when handling catheters [21].

In postoperative care, significant changes were encountered mainly in terms of food intake. In the prior periods fasting was the dominating dogma which was abandoned in favor of early food intake in 2011–2012. This procedure, which demonstrates good results in colorectal surgery [4], among others, leads to the prevention of catabolic metabolic situations, thus reducing morbidity [22], and contributes to a reduction in the length of hospital stay [23].

In addition to economic and social causes, medical innovations and changes in perioperative and postoperative management have led to a reduction in the duration of hospital stays. With regard to operational management, the use of bipolar vessel sealing techniques [10] and pre-emptive analgesia play a role in this, especially in regard to the immediate postoperative pain load [24]. Discontinuing the use of vaginal tamponing ribbons leads to a reduction of the pressure feeling in the lower abdomen and is thus likely to contribute to rapid mobilisation and better spontaneous micturition. Although the present study results come from a retrospective study with a limited number of cases, it can be clearly seen that the gradual shortening of the duration of hospital stays for vaginal hysterectomies has no overall negative impact on postoperative complication or readmission rates. A prerequisite for a short stay is sufficient preoperative preparation, carried

out in advance on an outpatient basis where appropriate, as well as processing which corresponds to today's fast-track concepts during the hospitalisation phase. This means organisational groundwork in the intramural and extramural fields. In terms of patient-centred surgical planning and the prevention of complications-related readmissions, the outpatient vaginal hysterectomy should primarily be made available to a targeted and selected group of patients.

## Ethical Approval



The Ethics Committee of the Medical University of Graz (IRB00002556) has issued approval for the study.

## Conflict of Interest



There exists no conflict of interest for any of the authors. The authors received no financial contribution within the framework of the study. Within the framework of training events, financial assistance was provided to the Department of Gynaecology at the Medical University of Graz from the company Covidien.

## References

- Møller C, Kehlet H, Friland SG *et al.* Fast track hysterectomy. *Eur J Obstet Gynecol Reprod Biol* 2001; 98: 18–22
- Ottesen M, Sørensen M, Rasmussen Y *et al.* Fast track vaginal surgery. *Acta Obstet Gynecol Scand* 2002; 81: 138–146
- Kehlet H, Dahl JB. Anaesthesia, surgery, and challenges in postoperative recovery. *Lancet* 2003; 362: 1921–1928
- Kehlet H. Fast-track colorectal surgery. *Lancet* 2008; 371: 791–793
- Lykke R, Blaakær J, Ottesen B *et al.* Hysterectomy in Denmark 1977–2011: changes in rate, indications, and hospitalization. *Eur J Obstet Gynecol Reprod Biol* 2013; 171: 333–338
- Zakaria MA, Levy BS. Outpatient vaginal hysterectomy: optimizing perioperative management for same-day discharge. *Obstet Gynecol* 2012; 120: 1355–1361
- Ulrich D, Bader A, Bjelic-Radisic V *et al.* Fast-Track-Hysterektomie: Ein Pilotprojekt. *Geburtsh Frauenheilk* 2010; 70: 716–718
- Tobre H. A renaissance for vaginal hysterectomy. *Acta Obstet Gynecol Scand* 1997; 164 (Suppl.): 85–87
- Tamussino K, Giuliani A, Gücer F *et al.* Verkürzung des stationären Aufenthaltes nach vaginaler Hysterektomie. *Geburtsh Frauenheilk* 1998; 58: 605–608
- Ghirardini G, Mohamed M, Bartolamasi A *et al.* Minimally invasive vaginal hysterectomy using bipolar vessel sealing: preliminary experience with 500 cases. *J Obstet Gynaecol* 2013; 33: 79–81
- Kroon U-B, Rådström M, Hjelthe C *et al.* Fast-track hysterectomy: a randomised, controlled study. *Eur J Obstet Gynecol Reprod Biol* 2010; 151: 203–207
- Reiffenstuhl G, Platzer W, Knapstein P-G. *Die vaginalen Operationen. Chirurgische Anatomie und Operationslehre. 2. Aufl.* Wien: Urban & Schwarzenberg; 1994
- Taran FA, Stewart EA, Brucker S. Adenomyosis: epidemiology, risk factors, clinical phenotype and surgical and interventional alternatives to hysterectomy. *Geburtsh Frauenheilk* 2013; 73: 924–931
- Bartolomeyczik S. Short hospital stay – the role of nurse. *Pflege & Gesellschaft* 2007; 12: H.2
- Stovall TG, Summitt jr. RL, Bran DF *et al.* Outpatient vaginal hysterectomy: a pilot study. *Obstet Gynecol* 1992; 80: 145–149
- Summitt jr. RL, Stovall TG, Lipscomb GH *et al.* Outpatient hysterectomy: determinants of discharge and rehospitalization in 133 patients. *Am J Obstet Gynecol* 1994; 171: 1480–1484; discussion 1484–1487
- Reiner JJ. Early discharge after vaginal hysterectomy. *Obstet Gynecol* 1988; 71 (3 Pt 1): 416–418
- Penketh R, Griffiths A, Chawathe S. A prospective observational study of the safety and acceptability of vaginal hysterectomy performed in a 24-hour day case surgery setting. *BJOG* 2007; 114: 430–436

- 19 Nieboer TE, Johnson N, Lethaby A et al. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2009; 3: CD003677
- 20 Clarke-Pearson DL, Geller EJ. Complications of hysterectomy. *Obstet Gynecol* 2013; 121: 654–673
- 21 Centers for Disease Control and Prevention. Healthcare associated Infections (HAI). Atlanta, GA: Centers for Disease Control and Prevention; 2012
- 22 Andersen HK, Lewis SJ, Thomas S. Early enteral nutrition within 24 h of colorectal surgery versus later commencement of feeding for post-operative complications. *Cochrane Database Syst Rev* 2006; 4: CD004080
- 23 Charoenkwan K, Phillipson G, Vutyavanich T. Early versus delayed (traditional) oral fluids and food for reducing complications after major abdominal gynaecologic surgery. *Cochrane Database Syst Rev* 2007; 4: CD004508
- 24 Lakeman MM, The S, Schellart RP et al. Electrosurgical bipolar vessel sealing versus conventional clamping and suturing for vaginal hysterectomy: a randomised controlled trial. *BJOG* 2012; 119: 1473–1482