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## Review Article

# Feasibility and safety of same-day discharge after minimally invasive hysterectomy in gynecologic oncology: A systematic review of the literature

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## HIGHLIGHTS

- Compare same-day discharge (SDD) vs. traditional admission to the hospital following minimally invasive hysterectomy (MIS)
- Six studies met eligibility criteria.
- Results suggest that SDD post hysterectomy for gynecologic malignancies with or without staging is safe & feasible.
- Low complication & readmissions rates, few/low rates of unscheduled visits within follow up period of 2–6 weeks after surgery

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## ABSTRACT

**Objective.** To compare same-day discharge (SDD) versus traditional admission to the hospital following minimally invasive hysterectomy (conventional laparoscopy and robotic assisted laparoscopy) for the treatment of gynecologic malignancies.

**Methods.** A systematic review was conducted in which MEDLINE and Cochrane Center Register of Controlled Trials were searched using terms related to same-day discharge, outpatient, and hysterectomy. We reviewed published English language trials and studies that compared safety, feasibility, readmission rate, emergency department (ED) visits, complication rate, and associated risk factors for admission. Studies of any design that included at least 20 patients who underwent minimally invasive hysterectomy (conventional laparoscopy and robotic laparoscopy) for gynecologic oncology indications were included.

**Results.** The literature review yielded 421 citations, of which 27 full-text articles were reviewed. Six comparative studies met eligibility criteria. Study data were abstracted and inputted into structural electronic forms.

**Conclusion.** Our results suggest that in comparison to admission post minimally invasive hysterectomy with or without full staging, SDD in gynecologic oncology procedures is safe, and feasible. It is associated with low complication and readmissions rates, few visits, and low rates of unscheduled visits within the follow up period of two to six weeks after surgery.

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## 1. Introduction

Over the last 20 years, minimally invasive surgery (MIS) has gained popularity replacing open surgery in many surgical specialties, as a result of improved postoperative outcomes including less pain, decreased blood loss, faster recovery, and shorter hospital stays [1–4].

Fifteen years ago, laparoscopic appendectomies and cholecystectomies were routinely admitted for observation; however, current standard practice in many centers is to perform these surgical procedures as a same day discharge [8–10]. Similarly, the safety and feasibility of SDD discharge has been practiced among gynecologic surgeons.

Hysterectomy is the most common gynecologic procedure in the United States, with over 600,000 hysterectomies performed annually [5]. The use of MIS in general gynecology has grown exponentially, and has been rapidly adopted in the treatment and staging for patients with gynecologic malignancies. For example, Walker et al. [6,7] completed a prospective randomized trial—the GOG-LAP 2 trial—comparing the clinical outcome of MIS to laparotomy. The results of this study suggested that laparoscopy is a safe and feasible approach for uterine cancer management, resulting in fewer complications, shorter hospital stay, and a better quality of life for patients.

Since 1985, results from many retrospective studies from different parts of the world comparing SDD to overnight admission post vaginal, laparoscopic, and robotic hysterectomy for benign gynecologic indications, have reported that SDD is safe, feasible, cost effective, and carries a low complication, and readmission rates. [11–19]. Alperin et al. [20] reported similar results when they evaluated SDD after MIS hysterectomy for large uteri > 500 g (ranging from 500 g to 4500 g); SDD was successful in 92.8% of all cases among the 446 patients included in their study, with low complication and readmission rates.

Schiavone et al. [21] studied a large, US prospective cohort of 128,634 women who underwent laparoscopic hysterectomies from 2000 to 2010. SDD was achieved in 26.5% of patients, with the trend increasing from 11.3% of patients in 2000 to 46% of patients in 2010. Of the SDD cases, 2.2% were performed for malignant indications. Schiavone et al. showed that SDD is safe and associated with a decrease in cost compared to admission.

A smaller body of evidence is available to support the safety and feasibility for SDD post hysterectomy, with or without full staging in gynecologic oncology. We conducted a systemic literature review of studies that compared SDD to hospital admission after hysterectomy, with or without staging, for gynecologic malignancies indication. The primary objective of this review was to compare the safety, feasibility, cost, perioperative outcome, adverse events, readmission rate, ED visits and unscheduled visits associated with SDD.

## 2. Materials and methods

A systemic review of literature was conducted to identify studies with SDD in gynecologic oncology. MED-LINE and Cochrane Central Register of Controlled Trials were searched for published English language trials and studies, using the search terms “outpatient,” “same-day discharge,” “laparoscopic,” “robotic,” “hysterectomy,” “gynecologic oncology,” “gynecologic malignancy,” “surgery,” as well as “surgical procedures”.

Abstracts were screened for the following eligibility criteria: studies about women who underwent minimally invasive hysterectomy (conventional laparoscopy and robotic laparoscopy) with or without staging procedures for gynecologic oncology indications, and were discharged home the same day. Studies with at least 20 procedures were included to insure adequate power. Relevant full text articles were retrieved and analyzed for outcomes consistent with our primary objectives—to assess safety, feasibility, cost, rate of complications, adverse outcomes, readmission rate, and unscheduled ED and clinic visits or contact.

## 3. Results

The systemic literature review yielded 421 citations, of which 27 full-text articles were identified and reviewed. Of the 27 articles, the six comparative studies that met eligibility criteria were included in this review.

Clinical and associated outcomes from comparative studies were categorized according to inclusion criteria and outcome from SDD including: preoperative diagnosis, procedure, SDD rate, predictors of successful SDD, risk factors associated with admission, complication rates, readmission rates, rate of ED visits, and rates of unscheduled visits or contact.

Six nonrandomized retrospective studies were identified that compared SDD with admission post MIS hysterectomy, with or without staging for gynecologic malignancy indications [22–27]. Two studies included only conventional laparoscopic surgeries [22,23], two included only robotic surgeries [24,25], and two studies were mixed laparoscopic and robotic surgeries [26,27].

The six studies included a total of 1212 minimally invasive procedures for gynecologic malignancy indications; 956 cases included staging with e pelvic lymphadenectomy; and/or omentectomy, and/or para aortic lymphadenectomy. [Table 1]

Gien et al. [22] were the first to evaluate the safety and feasibility of SDD after laparoscopic surgery in gynecologic oncology. They studied 303 patients who underwent laparoscopic surgery for malignant indication, including 21 patients (6.9%) who were converted to laparotomy. Gien found the success rate for SDD to be 48.5% in procedures that included at least a hysterectomy or trachelectomy with omentectomy and/or pelvic ± para aortic lymphadenectomy. Out of the 303 study patients, 268 had a cancer diagnosis, including 150 endometrial cancers, 78 cervical cancers, and 40 ovarian cancers.

Another study of 28 patients with stage 1 endometrial cancer treated with laparoscopic hysterectomy and pelvic lymphadenectomy by Rettenmaier, et al. had a 75% SDD [23]. Lee et al. [24] studied 200 robotic assisted hysterectomies; 47% had a cancer diagnosis, and 45% had complex surgery with at least pelvic lymphadenectomy. The authors reported an overall SDD success rate of 78%.

Penner et al. [25] reviewed records of 141 fully staged (pelvic and para aortic lymphadenectomy) patients with endometrial cancer and cervical cancer. They excluded 12 (7.8%) patients who were converted to laparotomy. Penner's study showed the highest SDD rate of 83.7%. Rivard et al. [26] included 140 patients post robotic surgeries; however, only 87 patients had a cancer diagnosis, and only 66 of these patients underwent staging; overall SDD success rate was 64.3%.

A large study published by Melamed et al. [27] of 696 laparoscopic and robotic hysterectomies were evaluated, with 593 endometrial cancer cases and excluding all converted cases. Approximately 37% of these cases had at least pelvic lymphadenectomy performed. They found a SDD rate of 42.4% with a time dependent trend from the first year of this study showed a SDD rate of 3.9% compared to 69.6% in the third year of study.

The six studies discussed above were inconsistent with regard to pre-operative planning for SDD. Two studies included all MIS cases in

**Table 1**  
Eligibility criteria and success rate for SDD.

Source	Sample size (n)	Cases with cancer diagnosis (n)	Cases with staging procedure (at least pelvic lymphadenectomy or omentectomy) (n)	SDD rate %
Gien et al. [22]	303	268	286	48.5
Rettenmaier et al. [23]	28	28	28	75
Lee et al. [24]	200	95	91	78
Penner et al. [25]	141	141	141	83.7
Rivard et al. [26]	140	87	66	64.3
Melamed et al. [27]	696	593	344	42.4

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