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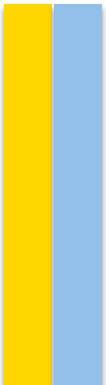
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Same-Day Discharge in Outpatient Gynecological Surgeries: A Narrative Review Focused on Hysterectomy and Adnexectomy

Ana Patrícia Gonçalves Pinto da Costa

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Same-Day Discharge in Outpatient Gynecological Surgeries: A Narrative Review Focused on Hysterectomy and Adnexectomy

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Estudante:

Ana Patrícia Gonçalves Pinto da Costa

Aluna do 6º ano do Mestrado Integrado em Medicina

Afiliação: Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto

Correio eletrónico: anapatriciapintodacosta@gmail.com/up201907699@up.pt

Orientador:

Prof. Doutor Hélder Bruno Carvalho Ferreira

Assistente Graduado de Ginecologia e Obstetrícia do Centro Materno-Infantil do Norte Albino Aroso – Centro Hospitalar e Universitário de Santo António

Professor associado convidado de Ginecologia-Obstetrícia do Mestrado Integrado de Medicina do Instituto de Ciências Biomédicas Abel Salazar – Universidade do Porto

Correio eletrónico: helferreira@hotmail.com

Coorientadora:

Dra. Sandra Cristina Lopes Vilar Aguiar Soares

Assistente Graduado de Ginecologia e Obstetrícia do Centro Materno-Infantil do Norte Albino Aroso – Centro Hospitalar e Universitário de Santo António

Colaboradora Externa de Ginecologia e Obstetrícia do Mestrado Integrado de Medicina do Instituto de Ciências Biomédicas Abel Salazar – Universidade do Porto

Correio eletrónico: sandracristina.soares@gmail.com/u31183@chporto.min-saude.pt

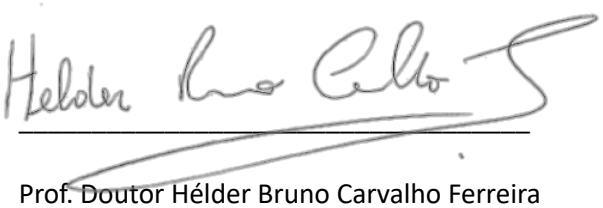
Declaração de Integridade

Assinatura do estudante:

_____

Ana Patrícia Gonçalves Pinto da Costa

Assinatura do orientador:



_____

Prof. Doutor Hélder Bruno Carvalho Ferreira

Assinatura do coorientador:



_____

Dra. Sandra Cristina Lopes Vilar Aguiar Soares

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Dedicatória

À minha família e a todos aqueles que me apoiaram ao longo destes seis anos. Muito obrigada por todos os momentos e memórias que levo para a vida.

Agradecimentos

Agradeço ao Prof. Doutor Hélder Bruno Carvalho Ferreira pela sua orientação prestada ao longo deste trabalho. A sua disponibilidade, o rigor científico e a partilha de conhecimento foram fundamentais para a concretização desta dissertação, contribuindo de forma decisiva para o seu desenvolvimento.

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Resumo

A cirurgia ginecológica em regime ambulatório (ou cirurgia com alta no próprio dia) tem verificado uma expansão significativa nos últimos anos, impulsionada pelos avanços nas técnicas cirúrgicas minimamente invasivas e pela otimização dos cuidados perioperatórios. Procedimentos como a histerectomia e a anexectomia (incluindo ooforectomia e salpingectomia) são cada vez mais realizados em regime de ambulatório, com resultados promissores. Diversos estudos demonstram que a alta no próprio dia é viável e segura em pacientes cuidadosamente selecionadas, apresentando elevados níveis de satisfação e baixas taxas de complicações e reinternamento. Entre os principais fatores para o sucesso desta abordagem destacam-se a seleção criteriosa das doentes, a adesão aos protocolos ERAS (Enhanced Recovery After Surgery) e a aplicação de critérios padronizados de alta. A melhoria contínua dos cuidados perioperatórios e da educação das pacientes, aliada à implementação de protocolos normalizados e ferramentas preditivas (como scores de risco de readmissão), deverá contribuir para um aumento sustentado das taxas de alta no próprio dia em cirurgia ginecológica, mantendo-se os padrões de qualidade e segurança.

Objetivos:

Esta revisão narrativa tem como objetivo apresentar uma visão abrangente e estruturada da evidência científica atual sobre cirurgia ginecológica em regime de ambulatório, com foco na histerectomia e na anexectomia, tendo sempre em consideração a sua aplicabilidade na prática clínica.

Os principais objetivos são:

- Discutir as vantagens da realização de cirurgias ginecológicas em regime de ambulatório;
- Identificar os principais desafios associados a esta abordagem cirúrgica;
- Explorar estratégias que possam otimizar e expandir a implementação das cirurgias ginecológicas em regime de ambulatório.

Metodologia:

A presente revisão narrativa da literatura foi realizada através de uma pesquisa bibliográfica nas bases de dados PubMed®, SCOPUS e UpToDate, utilizando-se as palavras-chave “hysterectomy”, “adnexectomy”, “ambulatory” e “outpatient” em combinação. A seleção dos artigos científicos foi

feita com base na relevância para o tema (através do título), idioma (inglês e português), data de publicação (últimos 15 anos) e acesso ao texto completo. Os artigos resultantes desta primeira seleção foram posteriormente analisados com base no resumo. Adicionalmente, foram incluídos outros artigos considerados pertinentes, mediante a sua relevância científica. Foram ainda consultadas as recomendações da Sociedade Portuguesa de Ginecologia (SPG).

Esta revisão narrativa destaca os avanços recentes na segurança e viabilidade da alta no próprio dia em cirurgias ginecológicas, e discute considerações relevantes para a prática clínica e para a implementação hospitalar.

Palavras-chave: Cirurgia de ambulatório; Alta no próprio dia; Histerectomia; Anexectomia; Ginecologia minimamente invasiva; Protocolos ERAS

Abstract

Outpatient (ambulatory or same-day) gynecological surgery has seen remarkable growth in recent years, driven by advancements in minimally invasive surgical techniques and optimized perioperative care. These procedures, particularly hysterectomies and adnexectomies (including oophorectomy and salpingectomy), are increasingly performed in outpatient settings with promising results. Studies have shown that same-day discharge is feasible and safe in appropriately selected patients, yielding high satisfaction rates and low complication or readmission rates. Key factors for success include proper patient selection, adherence to Enhanced Recovery After Surgery (ERAS) protocols, and the use of standardized discharge criteria. Ongoing improvements in perioperative care and patient education, along with standardized protocols and predictive tools (such as readmission risk scores), are expected to further increase the rates of same-day discharge in gynecologic surgery while maintaining quality and patient safety.

Objectives:

This narrative literature review aims to provide a comprehensive and structured overview of the current scientific evidence on outpatient gynecological surgeries, with a focus on hysterectomy and adnexectomy, always considering its applicability in clinical practice.

The main objectives are:

- To discuss the advantages of performing gynecological surgeries in an outpatient setting;
- To identify the main challenges involved in this surgical approach;
- To explore potential strategies to optimize and expand the implementation of outpatient gynecologic surgeries.

Methodology:

This narrative literature review was conducted through a bibliographic search primarily in the PubMed®, SCOPUS, and UpToDate databases, using the keywords “hysterectomy”, “adnexectomy”, “ambulatory”, and “outpatient” in combination. The scientific articles were selected based on relevance to the topic (based on the title), language (English and Portuguese), publication date (last 15 years), and access to full text. The set of articles resulting from this process will subsequently be subjected to new filtering based on the abstract. Other articles may be incorporated into the review

according to the relevance of the content to the topic. Guidelines from the Portuguese Society of Gynecology (SPG) were also reviewed.

This review highlights recent advances in the safety and feasibility of same-day discharge in gynecological surgeries and discusses relevant considerations for clinical practice and hospital implementation.

Keywords: Ambulatory surgery; Same-day discharge; Hysterectomy; Adnexectomy; Minimally invasive gynecology; ERAS protocols

List of abbreviations

ACOG - American College of Obstetricians and Gynecologists

ASA - American Society of Anesthesiologists

BMI - Body Mass Index

BSO - Bilateral Salpingo-oophorectomy

EBL - Estimated Blood Loss

ERAS - Enhanced Recovery After Surgery

FDA - Food and Drug Administration

LAVH - Laparoscopic-assisted Vaginal Hysterectomy

OCEBM - Oxford Centre for Evidence-Based Medicine

OSA - Obstructive Sleep Apnea

QoL - Quality of Life

SDD - Same-day discharge

SPG - Portuguese Society of Gynecology

TAP - Transversus Abdominis Plane

TLH - Total Laparoscopic Hysterectomy

U.S. - United States

V-NOTES - Vaginal Natural Orifice Transluminal Endoscopic Surgery

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Introduction

Outpatient surgery – also known as ambulatory, same-day, or day surgery – involves hospital admission for an elective procedure with the expectation of discharge in under 24 hours, avoiding any overnight stay.[1] In contrast, inpatient (overnight or long-stay) surgery requires the patient to remain in the hospital for at least one postoperative night.[2] The growth of ambulatory surgery has been enabled by advances in minimally invasive surgical techniques, improvements in ambulatory care facilities, and new anesthetic agents that facilitate rapid recovery.[1] Over the past several decades, ambulatory surgery has expanded to include a wider range of complex procedures, offering numerous benefits: minimal disruption to patients' lives, reduced risk of hospital-acquired infections, fewer thromboembolic events, faster postoperative mobilization, and cost savings of 25–75% for many procedures. Shorter wait times and the ability to reserve inpatient beds for more severe cases are additional advantages.[3] International research consistently shows ambulatory surgery to be high-quality, safe, and cost-effective, with low complication rates and very rare mortality.[1] For example, a large analysis by Madsen *et al.* found that patients undergoing outpatient surgery had a lower 30-day morbidity and mortality risk than those having the same procedure as inpatients.[4]

In gynecology, minimally invasive techniques (laparoscopy or robot-assisted surgery) are typically employed in the outpatient setting, requiring specialized surgical skills and equipment.[2] While minimally invasive procedures may have higher direct operative costs than open surgery, the avoidance of prolonged hospitalization can offset these costs by reducing length of stay and overall expenditures. Thus, outpatient minimally invasive surgery can be a cost-effective alternative when considering the healthcare system as a whole.[2] Importantly, the expansion of ambulatory surgery allows more patients to access high-quality surgical care even in regions with limited resources.[5]

With the rapid growth of day surgery, patients with comorbidities previously deemed unsuitable for outpatient management are increasingly being considered for ambulatory procedures.[1,3] However, careful patient selection remains paramount. The decision for same-day discharge depends on a complex interplay of factors including the type and extent of surgery, surgical approach, patient health characteristics, anesthetic technique (local, regional, or general anesthesia), and social support at home. Freestanding ambulatory surgery centers, unlike hospital-based facilities, may face limitations in managing high-risk patients due to lack of on-site consult services, advanced imaging, or blood bank access.[6] Social considerations—such as having adequate support at home to assist during the initial recovery—also influence selection for same-day discharge.[3] The American Society of Anesthesiologists (ASA) guidelines recommend that any patient

who undergoes a procedure with sedation or general anesthesia be discharged into the care of a responsible individual who has been educated with postoperative instructions.[7] Low health literacy in patients or caregivers is a concern, as it may hinder adherence to discharge instructions and is associated with increased unplanned healthcare utilization and readmissions.[7]

Several patient-related factors are repeatedly identified as predictors of poorer outcomes after outpatient surgery and thus are important in selection criteria. Common risk factors cited include advanced age, significant comorbidities (especially ASA physical status ≥3), obesity (high body mass index), obstructive sleep apnea (OSA), cardiovascular disease, chronic obstructive pulmonary disease, diabetes mellitus, end-stage renal disease, history of transient ischemic attack or stroke, chronic opioid use or opioid use disorder, and susceptibility to malignant hyperthermia.[7] In particular, Obstructive Sleep Apnea (OSA) has been linked to adverse perioperative events such as reintubation and cardiac complications in hospitalized patients; given that many individuals with OSA are undiagnosed, it is recommended to screen for OSA (e.g., using the STOP-Bang questionnaire) in the ambulatory setting.[7] Proponents of routine overnight observation after laparoscopic gynecologic surgery cite safety concerns including potential hemodynamic instability, oxygen desaturation, unrecognized intraoperative injuries (to the bladder, ureter, or bowel), or postoperative bleeding and pain that might be better managed in the hospital. However, true major complications are uncommon within the initial hours: major hemorrhage is usually evident before discharge, and organ injuries present either intraoperatively or only several days later.[8] Postoperative pain or nausea can often be effectively managed with modern multimodal analgesia and antiemetics, though these symptoms remain considerations in the discharge decision.[9] Unplanned hospital readmission is disruptive and costly, and reducing readmissions has become an important quality metric in healthcare.[10]

Same-day discharge (SDD) following gynecologic surgery is becoming more common. In 2019, three of the five most frequently performed major ambulatory surgeries for women aged 18–44 were gynecologic (hysterectomy; other therapeutic procedures on female organs such as laparoscopy for endometriosis; and oophorectomy). Hysterectomy was also among the top ambulatory procedures for women 45–64.[11] Although standardized criteria for SDD have not been universally established, studies have begun to identify patterns. For example, one multivariate analysis found that younger patients undergoing a simple hysterectomy (for benign indications, with or without lymph node dissection) had a higher likelihood of successful same-day discharge.[9] Overall, the evidence to date suggests that with appropriate patient selection and perioperative management, many gynecologic surgeries can be performed on an outpatient basis without compromising safety or patient satisfaction. The following sections provide a detailed analysis of outpatient hysterectomy and

adnexectomy, including surgical techniques, clinical outcomes, and recommended protocols for same-day discharge.

Hysterectomy

Hysterectomy, the surgical removal of the uterus, is one of the most frequently performed major gynecologic surgeries worldwide, done for both benign and malignant conditions. In developed countries, common indications include symptomatic uterine fibroids (in ~51% of cases), abnormal uterine bleeding (~42%), endometriosis (~30%), and uterine prolapse (~18%).[12] Less frequent indications include placenta accreta spectrum, certain gynecologic tumors, and other severe pathologies.[13] The volume of hysterectomies remains high partly because the procedure carries a relatively low risk of severe intraoperative or postoperative complications in experienced hands.

Hysterectomies can be categorized by extent and technique. A subtotal (supracervical) hysterectomy removes the uterine corpus while preserving the cervix, whereas a total hysterectomy excises both the uterus and cervix.[13] A radical hysterectomy entails removal of the uterus, cervix, parametrium, and upper vagina, often with bilateral salpingo-oophorectomy (BSO) and pelvic lymphadenectomy, and is typically reserved for malignancies.[13] Surgical technique can also involve different tissue planes: for example, an intrafascial hysterectomy preserves the pubovesicocervical fascia (important for innervation and support of the bladder base, cervix, and upper vagina) while an extrafascial hysterectomy does not.[13] Common complications of hysterectomy include bleeding requiring transfusion and injury to adjacent organs such as the urinary tract, though these are relatively uncommon.

The route of hysterectomy is determined by multiple factors, including the patient's anatomy and pathology (uterine size, mobility, presence of adhesions or prolapse), prior surgeries, comorbidities, the surgeon's expertise and preference, and available resources.[13] Three principal surgical approaches are used:

- Abdominal hysterectomy (open surgery)
- Vaginal hysterectomy
- Laparoscopic hysterectomy (including robotic-assisted and laparoscopic-assisted vaginal techniques)

Clinical guidelines (e.g., from the Society of Pelvic Reconstructive Surgeons) have been developed to help select the most appropriate route, considering factors such as uterine size and accessibility.[14] In general, minimally invasive approaches (vaginal or laparoscopic, with or without

robotic assistance)[15] are preferred whenever feasible because they are associated with faster recovery and fewer complications compared to open abdominal surgery.[12] Each approach and its relevance to outpatient surgery are outlined below.

Abdominal Hysterectomy

Abdominal hysterectomy is performed through a laparotomy (open incision). While minimally invasive routes are favored for their quicker recovery, the abdominal approach offers certain advantages in specific situations. One advantage is superior surgical exposure: opening the abdomen provides a wide and direct view of the pelvic anatomy, often better peripheral visualization and depth perception than the view achievable with vaginal surgery or laparoscopy. This panoramic exposure allows the surgeon to handle complex pathology and large uteri with more ease. Another advantage is the ability to utilize a full array of surgical instruments and techniques to achieve hemostasis and address complications. The open approach permits the use of both hands freely for tasks such as suturing and tying pedicles under direct tactile feedback, which can be more challenging in the narrower confines of a vaginal approach or through laparoscopic instruments.[16] For example, controlling bleeding can be easier abdominally; in laparoscopic hysterectomy, management of hemorrhage is recognized as a weak point due to limited instrumentation and visualization.[16]

There are certain scenarios where an abdominal hysterectomy is preferable or required. If a patient specifically desires a supracervical hysterectomy, an abdominal or laparoscopic approach is typically chosen over a vaginal approach (since vaginal hysterectomy usually entails removal of the cervix).[12] Additionally, if a minimally invasive attempt (vaginal or laparoscopic) fails intraoperatively due to unexpected difficulties, or if the facility lacks the equipment or expertise for less invasive methods, converting to an open abdominal hysterectomy is necessary.[12] Thus, abdominal hysterectomy remains an important backup and may be the primary approach in cases of extremely large uteri, extensive adhesions, or other anatomic or resource limitations that preclude vaginal or laparoscopic routes.

In an outpatient surgery context, abdominal hysterectomy is less commonly performed because it is inherently more invasive and painful, generally requiring a longer recovery. Most abdominal hysterectomies are managed with at least an overnight stay. However, as part of Enhanced Recovery protocols, there are reports of selected patients undergoing “outpatient” laparotomy with early discharge, but this is not routine. The abdominal route is typically reserved for cases where minimally invasive approaches are not an option.

Vaginal Hysterectomy

Vaginal hysterectomy involves removing the uterus through the vaginal canal, without any abdominal incisions. Despite being underutilized in some regions, vaginal hysterectomy offers excellent outcomes for appropriate candidates. It has been shown to result in less blood loss and shorter operative time compared to other methods. Shorter surgery means less anesthesia time and often a faster recovery with lower cost, especially in benign conditions.[13] The American College of Obstetricians and Gynecologists (ACOG) recommends the vaginal route as the first choice for hysterectomy for benign disease whenever it is feasible, given its benefits and lower complication rates relative to abdominal or laparoscopic approaches.[12]

Vaginal hysterectomy is traditionally favored in women who have good uterine mobility and sufficient vaginal capacity, such as those who have had vaginal deliveries. However, it can also be safely performed in other scenarios. Studies have demonstrated high success rates for vaginal hysterectomy even in nulliparous women or those with prior cesarean sections. For instance, one study reported 92% success in completing vaginal hysterectomy among women with no previous vaginal delivery.[17] Key facilitating factors are the ability to adequately access and ligate the uterosacral and cardinal ligaments and achieve descent of the uterus, even if initial prolapse is minimal.[12] In a randomized trial where surgical trainees followed specific guidelines for route selection (based on uterine size, mobility, etc.), over 90% of hysterectomies for benign indications were accomplished vaginally; only 11% required morcellation of the uterus to reduce its size, and about 25% of cases with extrauterine pathology needed laparoscopic assistance.[14]

That said, certain conditions are considered relative contraindications to vaginal hysterectomy. These include: a significantly enlarged uterus (e.g. a fibroid uterus over ~280 g), extensive pelvic adhesions (from endometriosis, prior surgeries, or pelvic inflammatory disease) that limit uterine mobility, lack of uterine descent, suspicion of an adnexal mass that might need evaluation, a need to ensure removal of the ovaries when vaginal access to the adnexa is challenging, or simply limited surgeon experience with the vaginal technique.[18] Vaginal hysterectomy is also generally avoided if malignancy is suspected, since it may not allow adequate surgical staging or en bloc removal of cancerous tissue.[12] When performed by experienced surgeons and in proper indications, however, vaginal hysterectomy has the lowest complication profile and quickest recovery of all the approaches.[13]

The emergence of Vaginal Natural Orifice Transluminal Endoscopic Surgery (V-NOTES) is an innovation that combines the vaginal route with endoscopic visualization. In V-NOTES hysterectomy, the surgeon operates through the vagina with the aid of a laparoscope introduced

transvaginally, eliminating any abdominal incisions. This technique attempts to capitalize on the benefits of the vaginal approach (no abdominal wound, less pain) while overcoming some of its limitations by providing enhanced visualization of the pelvic cavity.[19] V-NOTES allows thorough exploration of the abdomen, continuous monitoring of adjacent organs, and improved control of bleeding compared to a conventional blind vaginal approach. It also facilitates access to the ovaries and tubes, enabling concomitant salpingectomy or oophorectomy more easily when indicated. Early studies of V-NOTES hysterectomy have shown reduced postoperative pain and no visible scarring, factors that may further support outpatient management.[20] Additionally, V-NOTES is associated with a significant reduction in operative time and length of hospital stay, as well as improved rates of outpatient management, without substantial differences in intraoperative blood loss or conversion rates when comparing to conventional laparoscopic procedures.[21,22] In comparative studies, V-NOTES hysterectomy has had similar success rates to traditional vaginal hysterectomy for outpatient completion, with no increase in complications; one study noted a higher rate of prophylactic salpingectomy in the V-NOTES group, likely reflecting the ease of adnexal access with this technique.[20] Notably, because V-NOTES uses a lower insufflation pressure (8 mmHg) than standard laparoscopy, it may be better tolerated in patients with cardiopulmonary issues and could result in less post-operative shoulder pain, potentially improving outpatient recovery.[20]

Laparoscopic-assisted vaginal hysterectomy (LAVH) is another technique bridging vaginal and laparoscopic approaches. In LAVH, part of the procedure is done laparoscopically (for example, mobilizing the uterus or dealing with adhesions), and the uterus is then removed through the vagina. This approach is useful when a purely vaginal hysterectomy is challenging (e.g., in patients with a narrow vaginal canal, significant pelvic adhesions, or when concomitant procedures in the abdomen are needed).[23] LAVH can increase the feasibility of a vaginal removal by allowing the surgeon to address issues abdominally first; it essentially extends the indications of the vaginal route. From an outpatient perspective, LAVH is generally classified under minimally invasive hysterectomy and tends to have postoperative recovery similar to straight laparoscopic hysterectomy, with most patients being candidates for early discharge.

Laparoscopic Hysterectomy

Laparoscopic hysterectomy is performed via small abdominal incisions using a camera and specialized instruments. Variants include total laparoscopic hysterectomy (TLH), laparoscopic supracervical hysterectomy, and robotic-assisted laparoscopic hysterectomy. In the United States, laparoscopy has become the most common route for hysterectomy, reflecting a trend away from

open surgery and even surpassing vaginal hysterectomy in frequency.[24] The laparoscopic approach is often preferred because it generally results in less postoperative pain, lower infection rates, smaller scars, and faster return of bowel function compared to open abdominal hysterectomy. For patients in whom a vaginal hysterectomy is not possible (for example, due to lack of uterine descent or need for extensive adhesiolysis or staging), a laparoscopic hysterectomy is usually the next best option.[12]

Outcomes of laparoscopic hysterectomy are excellent, and many patients can be considered for same-day discharge after this procedure. Indeed, minimally invasive hysterectomies (laparoscopic or vaginal) typically have shorter hospital stays, and numerous studies have shown the feasibility of discharging patients on the same day of surgery.[25] In gynecologic oncology, laparoscopic approaches have particular advantages: they are associated with lower overall complication rates and, in the case of cancer surgeries, can yield higher lymph node counts during lymphadenectomy while minimizing delays to adjuvant therapy due to quicker recovery.[26] For instance, laparoscopic staging for endometrial cancer allows patients to start additional treatments (chemotherapy or radiation) sooner than if they had an open surgery, without compromising oncologic outcomes.

A technical consideration unique to laparoscopic hysterectomy is specimen removal. The excised uterus can be removed vaginally if small enough, or it can be morcellated (cut into smaller pieces) to extract through the trocar sites if it is enlarged. Power morcellation—an electrical mechanical morcellation—was commonly used to fragment large uteri but has become controversial after reports that it can spread occult uterine sarcomas within the peritoneal cavity. In 2014, the United States Food and Drug Administration (FDA) issued a warning about power morcellators for fibroid surgery due to this risk, leading to decreased use of the technique. Alternatives include manual (scalpel) morcellation or contained morcellation within a specialized bag, which aim to reduce any potential dissemination of tissue. Surgeons must balance the very low risk of an undiagnosed malignancy against the known benefits of minimally invasive surgery: studies have found that avoiding minimally invasive approaches (and thus resorting to open surgery) leads to higher complication rates and even higher hysterectomy-related mortality than laparoscopic hysterectomy with morcellation. Therefore, current guidance is to discuss the risks of morcellation with patients during informed consent. Patients should understand that if an unexpected malignancy is morcellated, it could adversely affect prognosis, even though the absolute risk of this scenario is very low. Many centers have adopted contained morcellation techniques to mitigate this concern. Importantly, the unavailability of morcellation should not unduly prevent patients from accessing minimally invasive surgery when appropriate, given the clear short-term benefits of laparoscopy. [27]

One challenge of laparoscopic hysterectomy is the technical skill required. To perform complex hysterectomies fully laparoscopically on an outpatient basis, surgeons need a high level of training and experience. High surgical volumes are associated with better outcomes and lower complication rates. In some cases, if unexpected intraoperative complications arise that the surgeon is not able to resolve laparoscopically, conversion to an open hysterectomy is necessary. This underscores the importance of surgeon expertise and adequate training to maximize the benefits of laparoscopic surgery.

In summary, laparoscopic hysterectomy lends itself well to outpatient surgery due to its minimally invasive nature. It has become the dominant approach for hysterectomy in many places and is supported by strong evidence of safety and efficacy. With appropriate protocols, a large proportion of patients undergoing laparoscopic hysterectomy—whether for benign or malignant indications—can be discharged on the same day of surgery, as discussed in later sections.

Outpatient Hysterectomy vs. Inpatient Hysterectomy

Historically, all hysterectomies were managed as inpatient procedures to allow postoperative monitoring of pain, bleeding, and recovery of organ function. However, with advances in minimally invasive techniques and perioperative care, many hospitals have introduced outpatient hysterectomy protocols for benign conditions and even select cancer cases.[15] The enhanced recovery associated with minimally invasive surgery (less pain, minimal blood loss, quicker return of bowel function) is a key driver for same-day discharge.[28]

When planning an outpatient hysterectomy, the choice of surgical approach is critical. In general, vaginal, laparoscopic, or robotic-assisted hysterectomies are more amenable to same-day discharge because of the faster recovery they afford. Robotic-assisted laparoscopic hysterectomy can be performed as an outpatient procedure, but it is usually reserved for complex cases (e.g. extensive endometriosis or oncologic cases) and thus often done inpatient; moreover, evidence for clear advantages of the robot is still being established.[12, 29] Conventional laparoscopy and vaginal hysterectomy remain the mainstays for outpatient settings due to their efficiency and well-demonstrated outcomes.

Studies comparing outpatient and inpatient hysterectomy outcomes have been reassuring. Khavanin *et al.* (Oxford Centre for Evidence-Based Medicine (OCEBM) level of evidence 2b) analyzed laparoscopic hysterectomies and found that patients discharged on the same day had significantly lower 30-day morbidity than those admitted overnight.[30] Outpatients were less likely to experience complications or require unplanned postoperative evaluations. The authors hypothesized that early

mobilization, reduced exposure to hospital pathogens, and less frequent catheterization in outpatients contributed to lower rates of thromboembolism and infection. Inpatients, conversely, underwent more diagnostic interventions, which might lead to detection (or possibly over-detection) of incidental findings and interventions that can inflate complication rates. This suggests that a subset of generally healthier patients benefits most from outpatient hysterectomy, while those with significant comorbidities may still require inpatient care.[30]

Patient-reported outcomes like quality of life (QoL) and satisfaction have also been examined. A randomized trial by Christiansen *et al.* (OCEBM level of evidence 1) found no significant QoL differences between outpatient and inpatient TLH groups over a 28-day follow-up.[31] Another trial by Kisic-Trope *et al.* (OCEBM level of evidence 1), however, noted that outpatient hysterectomy patients reported lower QoL in the first week (particularly on postoperative days 2 and 4) compared to inpatients. By one week after surgery, both groups' QoL had nearly returned to baseline levels.[32] This transient early difference could reflect challenges in managing pain or nausea at home and possibly unmet expectations regarding recovery among outpatient participants. It's important to note that the latter study was conducted 8 years before the study by Christiansen *et al.*; improvements in outpatient pain management protocols in recent years may have narrowed this gap. Both studies confirmed that outpatient management substantially lowers hospital costs.[31,32] In terms of patient satisfaction, most women are equally satisfied with their care whether they stay overnight or not.[33] Kisic-Trope *et al.* reported no difference in satisfaction with length of stay between groups.[32] Another study by Tuschy *et al.* indicated that patients often misremember their hospital stay length and that a greater number felt their stay was "too short" rather than "too long," suggesting that setting proper expectations is key to satisfaction.[34]

Overall, same-day discharge after hysterectomy does not appear to worsen pain control. Gauta *et al.* (OCEBM level of evidence 2b) found no significant differences in postoperative pain levels between outpatient and inpatient laparoscopic hysterectomy patients.[35] Similarly, Donnez *et al.* (OCEBM level of evidence 2b) reported that pain scores remained low in a cohort of women discharged just 5 hours after TLH, with none requesting readmission for pain issues.[36] Effective multimodal analgesia and nausea prophylaxis protocols contribute to these positive outcomes, as discussed later under Enhanced Recovery After Surgery (ERAS) protocols.

Several studies underscore the importance of structured "fast-track" programs to achieve safe outpatient hysterectomy. In one series, 20% of patients who required unplanned admission after an attempted same-day discharge did so for non-medical reasons such as lack of immediate transportation, need for rehab placement, or coordination of home care.[28] In the study by Lee *et*

al. (OCEBM level of evidence 2b), nearly half of these unexpected admissions were attributed to patient preference, late operative scheduling, extended commute distances, and adverse meteorological conditions.[8] This highlights that social logistics (not just medical factors) must be addressed in discharge planning and emphasizes the importance of preoperative counseling and improved scheduling practices. Rivard *et al.* (OCEBM level of evidence 2b) and others observed that age over 70 is a significant risk factor for failing same-day discharge.[25,28,37] These findings reinforce that careful patient selection (e.g., relative youth, robust health status, and good support systems) is critical to successful outpatient outcomes.[15] Indeed, postoperative complications remain the strongest predictor of 30-day readmission after hysterectomy, whether outpatient or inpatient.[38] Thus, minimizing complications through patient optimization and surgical technique is paramount.

Patient selection criteria for outpatient hysterectomy have been proposed by various authors. One example by Maheux-Lacroix *et al.* (OCEBM level of evidence 4) required that candidates for same-day TLH meet all of the following preoperative criteria:[39]

- Motivation and understanding: The patient must be well-informed and willing to participate in early discharge.
- Age < 60 years (relatively younger patients).
- ASA class I or II, with no obstructive sleep apnea.
- Benign disease (presumed benign indication for surgery).
- No anticipated surgical complications (e.g., not expecting difficult dissection).
- Residence within 1 hour of the hospital.
- Continuous home support for 48 hours post-surgery.

In addition to preoperative selection criteria, clear discharge criteria must be met on the day of surgery; otherwise, the patient should be admitted. In the same study, the postoperative discharge criteria (typically assessed ~6 hours after surgery) were:

- The surgery was completed without intraoperative complication and without conversion to open laparotomy.
- After a period of observation, the patient demonstrated:
    - Adequate pain control with oral analgesics.
    - Tolerance of oral intake without significant nausea or vomiting.

- Ambulation (able to walk with minimal assistance).
- Spontaneous voiding.
- Stable vital signs and a soft, non-tender abdomen with unremarkable wound inspection.
- Acceptable hemoglobin drop (less than 2 g/dL decrease from preoperative value, as measured ~6 hours postoperatively).

These criteria ensure that only patients who are recovering smoothly are allowed home the same day. Using such protocols, Maheux-Lacroix *et al.* were able to discharge 83% of their TLH patients on the same day; about 17% required admission, most commonly due to urinary retention, nausea, or more-than-expected blood loss.[39] Importantly, all serious complications in that series were rare and occurred after discharge (mostly minor issues, with a 4.7% readmission rate for significant complications).[39] Proactive strategies like better prophylaxis for pain and nausea, and even allowing discharge with a catheter if urinary retention occurs, were suggested to further improve success rates.[39]

Several other findings support the safety of outpatient hysterectomy. Melamed *et al.* (OCEBM level of evidence 2b) observed that discharging patients on postoperative day 1 (instead of day 0) did not reduce readmissions, but was associated with more emergency room visits than true same-day discharge. In other words, keeping patients overnight for observation did not necessarily prevent return visits, suggesting that many issues (if they arise) do so after the first 24 hours regardless. Their analysis concluded that true same-day discharge is most appropriate for younger, lower body mass index (BMI) patients undergoing simpler procedures.[40] Alperin *et al.* (OCEBM level of evidence 2b) specifically looked at patients with large uteri (≥500 g) and found that uterine size alone did not increase morbidity or readmissions after laparoscopic hysterectomy. Over 90% of women with uteri ≥500 g (even those with obesity or prior surgeries) could be managed on an outpatient basis without complications.[41]

Enhanced Recovery After Surgery (ERAS) protocols have facilitated same-day discharge by optimizing perioperative care. ERAS is a multidisciplinary, evidence-based approach to reduce the physiologic stress of surgery and accelerate recovery.[42] Key components of ERAS in gynecologic surgery include thorough preoperative counseling (so patients know what to expect and how to manage at home), optimized fluid management to avoid overload or dehydration, multimodal analgesia (using combinations of non-opioid analgesics, regional blocks, etc., to minimize opioid use), early mobilization (getting the patient up and walking soon after surgery), and early oral

intake of nutrition.[43] Studies have shown that applying ERAS pathways can increase same-day discharge rates for both hysterectomy and other gynecologic procedures. In one ERAS study focusing on hysterectomy, Minig *et al.* (OCEBM level of evidence 2b) found that while fast-track laparoscopic hysterectomy is safe and feasible, patient preference can impact discharge timing. Only 27% of women in their cohort went home the same day, largely because about half of the eligible women opted to stay overnight despite meeting medical discharge criteria.[44] This suggests that patients' comfort level with going home needs to be addressed—highlighting the value of preoperative education and expectation management. Indeed, another study by Fountain and Havrilesky attempted to increase SDD rates by providing patients with an educational video before minimally invasive hysterectomy. While the intervention did not significantly increase the proportion of same-day discharges, it did maintain high patient satisfaction and acceptable readmission rates. They also identified that shorter operative times, earlier finish times, lower case complexity, and avoiding robotic assistance were factors that favored same-day discharge.[33]

Tools to predict which patients are likely to succeed with outpatient hysterectomy are emerging. Jennings *et al.* (OCEBM level of evidence 2b) created a laparoscopic hysterectomy readmission score (LHRS) to quantify risk. The LHRS assigns one point each for several risk factors (diabetes, chronic obstructive pulmonary disease, disseminated cancer, chronic steroid use, bleeding disorder, and operative duration ≥2 hours) and two points for any postoperative complication prior to discharge. In their study, higher scores correlated with higher readmission rates (ranging from ~2.4% with a score of 1 to ~9.5% with a score of 4).[45] Such a tool can help identify low-risk patients who are excellent candidates for SDD and flag higher-risk patients who might benefit from overnight observation or additional interventions to mitigate risk.

Importantly, multiple reports confirm that when patients are well selected and managed, outpatient hysterectomy is associated with no increase in adverse outcomes compared to inpatient surgery. Same-day discharge patients have similar or even fewer complications, equivalent readmission rates, and high satisfaction levels.[15, 30, 31, 36, 33, 46, 45, 47, 48, 49, 50, 51] It has also been reported that same-day discharge after laparoscopic hysterectomy is associated with low readmission rates and a minimal number of emergency visits during the immediate postoperative period.[31, 36, 40, 45, 49] Patients often appreciate recovering in the comfort of their home, with better sleep and fewer interruptions, which can translate into high satisfaction.[35] In one study, nearly all women—whether discharged day 0 or day 1—were satisfied with their length of stay, provided it aligned with their expectations.[32]

In summary, the literature strongly supports that outpatient hysterectomy (particularly via minimally invasive routes) is safe and effective for appropriately chosen patients. Attention to detail in perioperative care, from risk stratification to patient education and postoperative support, is essential to achieve outcomes comparable to traditional inpatient surgery. We next turn to adnexal surgeries, which are often performed alongside hysterectomy or independently, and consider their compatibility with same-day discharge.

Adnexectomy

Adnexectomy refers to the removal of the uterine adnexa, which include the ovaries and fallopian tubes. This can involve a unilateral or bilateral oophorectomy (ovary removal), salpingectomy (tube removal), or both (salpingo-oophorectomy). Adnexal surgery may be performed via laparoscopy or laparotomy, depending on the clinical scenario. The management of adnexal masses (one of the common reasons for adnexectomy) depends on factors such as the patient's age, the characteristics of the mass on imaging, tumor marker levels, and the presence of symptoms. Generally, any symptomatic or suspicious ovarian mass warrants surgical intervention.

Minimally invasive surgery has become the preferred approach for most benign adnexal pathologies. In the past, laparotomy (open surgery) was the standard, particularly for large or potentially malignant ovarian masses, to allow safe removal without spillage. Over the last few decades, however, laparoscopy has increasingly been used even for fairly large benign ovarian cysts and other adnexal surgeries. Studies indicate that minimally invasive surgery offers clear benefits over laparotomy, including faster recovery, shorter hospital stay, and reduced perioperative pain.[52] Recent data from the United States show that over 90% of surgeries for benign adnexal disease are now performed laparoscopically.[53]

Adnexectomies can often be done in an outpatient setting. In gynecologic practice, it is routine for patients undergoing uncomplicated laparoscopic oophorectomy or ovarian cystectomy to be discharged home the same day.[8, 9] Indeed, the threshold for outpatient management is even lower for these procedures than for hysterectomy, because adnexal surgeries typically entail less dissection and shorter operative times. Of course, if an adnexal surgery is particularly complex (e.g., very large cyst requiring extensive surgery, or if malignancy is found), an inpatient admission may be indicated. But for the majority of elective adnexal surgeries, overnight hospitalization is not necessary.

It should be noted that the decision to manage a case as outpatient or inpatient also depends on the patient's overall condition and the complexity of surgery. Factors such as significant cardiopulmonary comorbidities or very extensive adhesions could lead a surgeon to plan an

inpatient procedure for caution. In otherwise healthy patients, even relatively advanced laparoscopic procedures on the adnexa can be completed on an outpatient basis.

Below, we briefly discuss oophorectomy and salpingectomy and their considerations.

Oophorectomy

Oophorectomy is the removal of one or both ovaries. It is commonly performed laparoscopically unless contraindicated by extensive disease or other factors. Indications for oophorectomy include ovarian cysts or tumors, adnexal torsion, pelvic pain due to ovarian pathology, and prophylactic removal of ovaries (for example, in women at high genetic risk of ovarian cancer).[54] Sometimes, oophorectomy is done to preserve fertility—paradoxical as that sounds—such as removing one diseased ovary while leaving the other intact, or harvesting ovarian tissue.

Removal of the ovaries in a premenopausal woman causes an immediate "surgical menopause" due to the sudden loss of estrogen production. This can lead to menopausal symptoms like hot flashes, sleep disturbances, mood changes, and loss of libido. Elective oophorectomy has been associated with increased risks of cardiovascular disease, osteoporosis, cognitive decline, and all-cause mortality, especially when done before natural menopause.[55] Additionally, studies have shown that premenopausal women who undergo prophylactic bilateral salpingo-oophorectomy (BSO) may experience greater sexual dysfunction, more psychological distress, and worse overall emotional well-being in the short term compared to women who were already menopausal at the time of surgery.[56] These findings underline the importance of thorough preoperative counseling. Patients should be counseled on what physical and emotional changes to expect after oophorectomy, and when possible (in benign conditions), consideration should be given to ovarian conservation if appropriate. There has been a trend toward performing salpingectomy without oophorectomy in premenopausal women who require hysterectomy or who desire sterilization, in order to reduce ovarian cancer risk while preserving ovarian hormonal function (discussed further below).

From an outpatient surgery perspective, laparoscopic oophorectomy is very amenable to same-day discharge. The procedure is often shorter and less painful than a hysterectomy. Unless there are complications, patients generally recover quickly and can go home a few hours after surgery. Postoperative hormonal symptoms (if bilateral oophorectomy was done) typically develop over days to weeks, so they do not in themselves necessitate hospital stay but do require outpatient follow-up and management.

Salpingectomy

Salpingectomy is the removal of one or both fallopian tubes. It is one of the most common gynecologic procedures, frequently performed for sterilization or in conjunction with other surgeries. Indications for salpingectomy include ectopic pregnancy (where the tube is the site of implantation), hydrosalpinx (especially prior to in vitro fertilization to improve outcomes), and pyosalpinx (tubal abscess), as well as risk-reducing removal of tubes during hysterectomy to prevent ovarian cancer.[57] In recent years, opportunistic salpingectomy at the time of hysterectomy for benign disease has become routine, based on evidence that many high-grade ovarian cancers originate in the distal fallopian tube. By removing the tubes, the risk of later ovarian/peritoneal cancer is thought to be reduced.

As minimally invasive surgery has expanded, most salpingo-oophorectomies are now performed laparoscopically. Adnexal surgeries are often combined with hysterectomy. Notably, adnexal removal is more likely during a laparoscopic hysterectomy than during an abdominal or vaginal hysterectomy.[58] This is because the laparoscopic approach provides easy access to the ovaries and tubes, whereas vaginal hysterectomy can make removal of the ovaries technically difficult. However, the decision to perform a salpingectomy or oophorectomy should not dictate the route of hysterectomy. Even during a vaginal hysterectomy, many surgeons will attempt a salpingectomy for prophylaxis if possible, since studies show it can often be done safely. Reported success rates for completing a BSO during vaginal hysterectomy range widely (65% to 97.5%) depending on patient factors and surgeon skill.[12] In some cases, adding laparoscopic assistance to a vaginal hysterectomy can facilitate ovary removal, though at the cost of converting to a more complex procedure. One randomized trial found that adding laparoscopic assistance to perform BSO increased complications and operative time compared to doing it vaginally (when feasible).[12] Overall, an attempted salpingo-oophorectomy at the time of vaginal hysterectomy is often worthwhile and is successful in the majority of cases (one study noted an 88% success rate in planned salpingo-oophorectomy during vaginal hysterectomy).[59]

Prophylactic bilateral salpingo-oophorectomy in high-risk women (such as BRCA mutation carriers) is a different scenario from elective salpingo-oophorectomy for benign disease. Prophylactic BSO is usually done laparoscopically or via laparotomy (not vaginally) to allow thorough inspection of the peritoneal cavity and obtain additional biopsies, as this has oncologic implications. Those cases often involve staging and are managed inpatient.

An important modern shift in gynecologic surgery is the emphasis on ovarian conservation when possible in premenopausal women. In the past, many surgeons would remove apparently normal ovaries in a woman in her late 40s or early 50s undergoing hysterectomy, to prevent future ovarian

pathology and theoretically reduce cancer risk.[60] However, growing evidence of the long-term health costs of losing ovarian hormones has led to a change in practice.[55] Therefore, current guidelines often recommend salpingectomy with ovarian preservation for women not at high risk of ovarian cancer who are premenopausal and undergoing hysterectomy for benign indications. By removing the tubes, one gains cancer prevention benefits while avoiding the adverse effects of immediate menopause.[60] This change in approach is significant and reflects our evolving understanding of the balance between cancer prevention and overall health outcomes.

From an ambulatory surgery standpoint, standalone salpingectomy is usually a short laparoscopic procedure with same-day discharge. Opportunistic salpingectomy added to a hysterectomy does not appear to significantly increase recovery time or complication rates in experienced hands, so it has not impeded the move toward outpatient hysterectomy.

Outpatient Adnexectomy

The trend toward outpatient management is evident for adnexectomy as well. A study by Doll *et al.* (OCEBM level of evidence 2b) highlighted a significant increase in the proportion of outpatient oophorectomies in the United States, from 57% in 2000 to 84% in 2014.[61] This reflects technological and procedural advancements that make it easier and safer to treat adnexal conditions without hospital admission.

Patient experience and education are particularly important in prophylactic surgeries. Trister *et al.* surveyed women undergoing laparoscopic prophylactic BSO or salpingectomy in an ambulatory setting and found that while many experienced expected post-operative symptoms (pain, nausea, vaginal bleeding), nearly half felt they were not adequately informed about what to expect. This was despite standard preoperative counseling and shared decision-making. The gap in perceived preparedness suggests a need for improved patient education materials to ensure women undergoing outpatient adnexal surgery (especially prophylactic procedures that may have emotional and physical ramifications) have realistic expectations and understanding of recovery.[56]

Implementing ERAS protocols has been beneficial for outpatient adnexal surgeries as well. As noted, Peters *et al.* (OCEBM level of evidence 2b) found that ERAS implementation in non-hysterectomy laparoscopic gynecologic surgeries increased same-day discharge rates and did not compromise 30-day outcomes. Better pain control and nausea management under ERAS are likely contributors to this success. Furthermore, widespread adoption of ERAS can result in substantial cost savings and is recommended for all laparoscopic gynecologic procedures, benign or malignant.[42]

In summary, nearly all benign adnexal surgeries and many oncologic staging procedures on the adnexa can be performed in an outpatient setting today. The key elements are meticulous surgical technique (preferably minimally invasive), rigorous adherence to recovery protocols, and ensuring the patient has the support and information needed for a safe transition home on the day of surgery.

Outpatient Hysterectomy and Adnexectomy

Shifting major gynecologic surgeries to the outpatient setting has been one of the significant trends in gynecology. The combination of minimally invasive surgery and ERAS protocols has made same-day discharge increasingly attainable for both hysterectomies and adnexectomies.[61]

Below we discuss outcomes and considerations for same-day discharge in cases with benign vs. malignant indications, as these contexts have some distinct challenges and data.

Benign Conditions

For benign gynecological conditions, same-day discharge after hysterectomy has become more common over time, though overall rates remain moderate. A 2022 analysis observed that only about 21.9% of minimally invasive hysterectomies for benign indications were performed with same-day discharge, although this represented an increase compared to prior years. Projections suggest that even by 2030, SDD rates for benign hysterectomy may remain under 50%, indicating room for further adoption. Interestingly, the lowest SDD rates have been noted in vaginal hysterectomies and hysterectomies performed for pelvic organ prolapse. This could be because vaginal hysterectomy patients are often older or have prolapse-related health issues, or perhaps surgeons are more accustomed to observing those patients overnight. However, evidence indicates that even vaginal hysterectomy can be done as outpatient in many cases without increased risk.[37]

Studies consistently show that, in appropriately selected patients, same-day discharge after hysterectomy for benign disease is safe. For instance, a systematic review by Korsholm *et al.* concluded that outpatient hysterectomy is not associated with higher rates of perioperative complications compared to inpatient surgery for benign indications.[15] Nensi *et al.* (OCEBM level of evidence 2b) similarly found that implementing a structured same-day discharge protocol significantly increased the proportion of outpatient TLH cases with no compromise in patient safety.[62]

Criteria for selecting benign cases for outpatient surgery often echo those described earlier: healthy patients (low ASA class, few comorbidities), not too old, with good support and not too far from

the hospital. One study by de Lapasse *et al.* (OCEBM level of evidence 4) reported on a series of early-discharge laparoscopic hysterectomies with excellent outcomes. Their informal criteria were: benign pathology (most commonly fibroids or adenomyosis), relatively young age (average ~46 years), low comorbidity (nearly all patients ASA 1 or 2), and residence within about one hour of the hospital. Retrospectively, it was noted that those who underwent early discharge in that study also tended to be from a higher socioeconomic and educational background, likely reflecting patient selection bias by the surgeons (choosing patients who they felt would manage well at home). Despite this somewhat selective criteria, the outcomes were excellent, and the authors suggested they could probably broaden selection without issue. Notably, even a prolonged operative time (up to 3 hours) or a large uterine size (~500 g) did not preclude successful same-day discharge in their experience. Patient satisfaction in this group was very high at follow-ups on day 7 and day 30 postoperatively.[47]

The work by Moawad *et al.* (OCEBM level of evidence 2b) reinforces that age and surgical duration are important factors. Moawad *et al.* identified that advanced age, lower preoperative hematocrit (possibly a proxy for anemia), late finishing times, and longer operations all predicted the need for admission after minimally invasive hysterectomy. Conversely, a history of prior laparotomy (excluding C-section) was associated with a lower likelihood of same-day discharge, which might seem counterintuitive but perhaps reflects surgeon caution in such cases or patient/family preference. Crucially, in Moawad's analysis, the rates of postoperative complications, readmissions, and reoperations were similar between those who went home the same day and those who stayed overnight. This further supports the notion that with proper precautions, outpatient hysterectomy is just as safe as an overnight stay for benign conditions.[63]

Specifically regarding BMI, Rettenmaier *et al.* (OCEBM level of evidence 2b) found no evidence that obesity interferes with same-day discharge, despite the common belief that non-obese patients are generally more suitable for early discharge.[64] However, Liberati *et al.* showed that the rate of SDD decreases with increasing BMI. This study also concluded that the risk of hospitalization increased for every 30-minute increase in surgical time and every 1-hour delay in surgical completion time.[65]

In summary, for benign gynecologic surgeries, same-day discharge is increasingly recognized as feasible and safe. The main barriers are often logistical or perceptual, rather than medical. As both patients and providers become more comfortable with outpatient management and as protocols continue to improve, it is likely that a larger share of benign hysterectomies and adnexectomies will be done outpatient in the coming years.

Malignant Conditions

Applying same-day discharge to gynecologic oncology patients has traditionally been met with more hesitation. Patients undergoing surgery for malignancies (such as endometrial cancer) are often older and have more comorbidities, and the surgical procedures (e.g., lymph node dissection) are more extensive, potentially increasing the risk of complications that could require observation.[28, 66] Indeed, having a malignant indication has been associated with a decreased likelihood of same-day discharge in multiple analyses.[67]

That said, recent evidence suggests that even many oncologic surgery patients can be managed as outpatients if carefully selected. The keys are the use of minimally invasive techniques and stringent criteria similar to those for benign cases. Many endometrial cancer surgeries, for instance, are now done via laparoscopy or robot-assisted laparoscopy, which dramatically reduces recovery time compared to traditional open surgery.[25]

Even though robotic surgery is not widely utilized in gynecological ambulatory surgeries, Madden *et al.* (OCEBM level of evidence 2b) found that robotic-assisted gynecologic surgery and early hospital discharge were safe in elderly patients, despite the higher risk of malignancy, the increased preoperative and perioperative risk factors and longer hospital stays among these patients.[29]

Several studies have looked at predictors of readmission or problems in cancer patients after minimally invasive surgery. Cory *et al.* (OCEBM level of evidence 2b) found that, aside from surgical complications, factors like higher ASA class, insulin-dependent diabetes, congestive heart failure, significant preoperative weight loss, tobacco use, chronic corticosteroid use, and preexisting renal failure were associated with increased 30-day readmission after gynecologic cancer surgery.[66] These factors can be considered red flags when deciding on outpatient vs inpatient care. Giannini *et al.* (OCEBM level of evidence 4) documented a remarkable increase in SDD rates for minimally invasive hysterectomy for endometrial cancer in the United States (U.S.), from 13.8% in 2012 to 88% in 2021. This reflects how practice has evolved with experience and ERAS. They also identified predictors of failed SDD (i.e., needing admission or extended stay) in cancer patients: early in the institutional learning curve (first 5 years of adopting SDD protocols), age >75, certain comorbidities (cardiac disease, anemia, need for anticoagulation), extensive procedures like full lymphadenectomy, long operative duration (>3 hours), and late completion times (discharge from Post-Anesthetic Care Unit after 2 PM).[68] Many of these mirror factors seen in benign cohorts, underlining that scheduling and patient health status are crucial.

Despite the higher complexity, outcomes for outpatient cancer surgery have been very encouraging. In Dessources *et al.*'s analysis, a perioperative complication was the strongest factor associated with readmission, which is intuitive. They noted that even among patients who had

inpatient hysterectomy, those with complications or advanced disease would be readmitted at similar rates, suggesting that the outpatient setting per se was not a risk factor for readmission.[38] Readmission rates within 4 weeks of minimally invasive hysterectomy for cancer can be under 4% in centers with well-developed pathways.[45]

Interestingly, one systematic review by Liu *et al.* found that the overall rates of SDD were not significantly different between malignant and non-malignant cases when controlling for other variables. However, as noted, the factors influencing SDD might differ in weight—surgery start time and BMI had a larger impact on SDD in cancer cases, likely because cancer surgeries can be longer and more complex.[5]

Clinical studies from high-volume cancer centers have shown that with ERAS and minimally invasive techniques, same-day discharge after oncology operations is feasible. Lee *et al.* reported successful same-day discharges after laparoscopic hysterectomy for endometrial cancer with no increase in postoperative complications compared to those who stayed longer.[69] Wield *et al.* similarly demonstrated that in a gynecologic oncology practice, most patients could go home the day of surgery safely.[70] Another study (Praiss *et al.*) specifically focusing on endometrial cancer found no compromise in safety with SDD in a cohort of minimally invasive surgeries.[25]

All these findings point toward a paradigm shift: even gynecologic oncology patients can often be treated on an outpatient basis. The advantages of same-day discharge in cancer care include improved patient comfort and potentially lower exposure to hospital pathogens, and it might even serve as a quality indicator. One paper suggested that day-of-surgery discharge could be considered a quality metric for endometrial cancer surgery, given the evidence of its safety and patient satisfaction.[26]

Of course, caution is warranted. Not every cancer patient is a candidate for outpatient surgery. Particularly frail patients, those undergoing very extensive debulking surgeries (which are usually open and inpatient by necessity), or those without adequate home support should be admitted. But for early-stage cancers handled with minimally invasive approaches, outpatient management is increasingly standard.

In conclusion, while malignant indications historically implied an inpatient stay, the landscape is changing. With appropriate case selection and perioperative care, many women with gynecologic cancers (especially endometrial cancer) can safely go home the same day after surgery, without adversely affecting oncologic outcomes or postoperative complication rates.

Discussion

The expansion of ambulatory gynecologic surgery has prompted the development of strategies to maintain safety while increasing efficiency. Recent efforts have focused on identifying predictive factors for successful same-day discharge, allowing clinicians to stratify patient risk and optimize preoperative planning. For example, the Laparoscopic Hysterectomy Readmission Score (LHRS) developed by Jennings *et al.* is one such tool that could help stratify patients by their likelihood of readmission, thereby aiding in patient selection for same-day discharge.[45]

A challenge in the literature is the lack of uniform criteria for same-day discharge eligibility across studies. Some investigations list numerous preoperative factors as contraindications to outpatient surgery (e.g., insulin-dependent diabetes, congestive heart failure, recent significant weight loss, active smoking, chronic steroid use, renal failure, history of VTE, or anemia), whereas others have found that factors like ASA status, BMI, intraoperative blood loss or even previous abdominal surgery did *not* independently predict failure of SDD when modern perioperative protocols are applied.[5, 9, 28, 47, 63, 66, 68] For instance, some studies flagged high BMI as a reason to admit patients, but others did not find obesity to be a barrier in practice (as long as the surgery could be done minimally invasively).[64, 65] Similarly, longer operative times and starting surgery late in the day have been associated with higher admission rates, which is something that can be managed by scheduling adjustments.[5, 65]

Synthesizing the available data, most authors agree on a core set of criteria for safely proceeding with same-day discharge after gynecologic surgery. In general, an ideal candidate for outpatient hysterectomy/adnexectomy would have the following characteristics (many of which align with ERAS and fast-track principles):

- Generally healthy and relatively young. Most programs use an age cutoff (often 70 years or younger) and prefer ASA class I–II patients without severe cardiopulmonary disease or untreated obstructive sleep apnea.
- Well-controlled comorbidities. Significant conditions like diabetes or hypertension should be optimized preoperatively. Unstable cardiac disease or other high-risk conditions are usually excluded from outpatient pathways.
- No known major anesthesia risks. Patients with conditions like OSA should be carefully evaluated; if OSA is present but well-managed (or mild), they might still qualify, but severe OSA could be a reason for observation. No history of adverse anesthetic reactions (e.g., malignant hyperthermia susceptibility) is preferable.

- No anticipated surgical complexities. The planned procedure should be one expected to be completed minimally invasively and without difficulty. For example, cases anticipated to require large transfusions or with a high chance of conversion to open surgery would be scheduled as inpatient.
- Independent mobility and self-care. Patients should be physically able to mobilize and care for themselves (with some assistance) soon after surgery. Frail patients or those who have baseline difficulties in ambulation might not cope well at home immediately.
- Adequate home support and proximity. The patient needs a responsible adult with them on the first night and ideally for the first 24–48 hours to help if needed. They should also reside within a reasonable distance (commonly ≤1 hour) from the hospital in case they need to return for any issue.

Additionally, stringent postoperative discharge criteria should be met. These include stable medical status, adequate pain control, tolerating oral intake, ambulation, spontaneous voiding, soft abdomen, unremarkable wounds, and an acceptable hemoglobin drop. If any one of these is not achieved, the patient should be admitted for further care.

Effective preoperative counseling cannot be overstated. Setting appropriate expectations about pain, activity, and recovery timeline helps reduce anxiety and increase adherence to discharge instructions.[8, 9, 28] Prescriptions for postoperative analgesics should be given ahead of time so that patients have the medications with them upon discharge. Many ERAS protocols administer long-acting analgesics (like NSAID suppositories or acetaminophen) intraoperatively and employ regional anesthesia blocks or local anesthetic wound infiltration to minimize pain in the immediate postoperative period. As a result, patients might not even require oral opioid medication after discharge, thus avoiding the side effects of opioids (sedation, nausea, constipation) that could otherwise interfere with recovery.

Proper scheduling is another practical factor: to maximize the likelihood of same-day discharge, longer cases should be booked early in the day. A general recommendation is to start any case expected to last >2 hours early in the day or before 14h.[5, 9] Finishing surgeries by 18h provides enough time for recovery milestones to be met before typical evening discharge times.[5, 8, 28] Studies have found that cases finishing earlier in the day are indeed more likely to achieve discharge that same day.[8]

In our institution (hypothetically combining the literature insights), a potential pathway for an outpatient hysterectomy patient might be: the patient drinks carbohydrate fluids up to 2 hours

before surgery (ERAS protocol), undergoes a TLH under general anesthesia with multimodal analgesia, spends a couple of hours in the recovery unit where she is mobilized and assessed, and if by 6 to 8 hours postoperative she meets all criteria, she goes home with a friend or family member. The patient would receive a follow-up call the next day and have clear instructions regarding any warning signs. A routine postoperative visit would be scheduled for around 1 to 2 weeks. This type of pathway has been highly successful in many centers.

However, implementation of outpatient gynecologic surgery remains challenging in resource-limited settings. Barriers such as limited access to ERAS-related medications, reduced availability of highly trained surgical teams, and inadequate postoperative follow-up infrastructure can compromise the feasibility of same-day discharge. Addressing these limitations requires flexible, context-specific adaptations, such as simplified ERAS bundles, targeted staff training, and mobile or telehealth-based follow-up.

In conclusion, careful patient selection, standardized protocols (ERAS), and comprehensive education are the pillars of safe outpatient gynecologic surgery. Ongoing refinements in these areas will likely expand the proportion of patients who can enjoy the benefits of same-day discharge.

Conclusion

The growing body of evidence supports that same-day discharge after gynecologic surgery is both safe and beneficial for many patients. Simple interventions—such as developing institutional protocols and setting appropriate patient expectations—can significantly increase day-of-surgery discharges without compromising outcomes.[25] Effective communication with healthcare providers regarding the same-day discharge initiative is essential: educating the surgical and anesthesia teams about the safety of outpatient management and standardizing postoperative care (for example, through preoperative classes or videos for patients) have been shown to improve discharge rates.[33]

It is worth noting that the first studies confirming the safety of outpatient gynecologic oncology surgery only appeared a little over a decade ago (around 2011).[9] This underscores that the field is still evolving, with significant potential for further expansion. Continued research and innovation are needed to refine patient selection tools, optimize pain control techniques, and address any remaining barriers to same-day discharge in gynecology.

In summary, laparoscopic and other minimally invasive gynecologic procedures have demonstrated low morbidity, low readmission rates, and high patient satisfaction, even among oncology patients, when performed in an outpatient setting.[56] Same-day discharge protocols for hysterectomy and

adnexectomy can be implemented successfully with careful planning and multidisciplinary collaboration. These protocols offer substantial advantages to patients (quicker recovery in the comfort of home) and healthcare systems (cost savings and resource optimization) without sacrificing the quality of care.[1] As experience grows, same-day discharge is likely to become the standard of care for an increasing proportion of gynecological surgeries.

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Table List

		Preoperative Criteria								Intraoperative Criteria			Postoperative Criteria		
Author (Year)	**Article Type**	**Age <65–70 years**	**BMI <35–40**	**ASA I–II**	**Absence of OSA**	**Benign pathology**	**Patient motivation**	**Social support**	**Surgery starting before 14h/ ending before 18h**	**Operative time <90–120 min**	**EBL <150–200 mL**	**No conversion/ complications**	**Early ambulation, oral intake, voiding, vitals stable**	**Close proximity (<1h) to hospital**	**Nausea and pain controlled**
Liu *et al.* (2023)	Systematic review	✓	✓	✗	✓	✗	-	-	✓	✓	✗	✓	✓	✓	✓
Giannini *et al.* (2023)	Original article	✓	✓	✓	-	✗	-	-	✓	✓	✗	✓	✓	-	✓
Wield *et al.* (2022)	Original article	✓	-	-	✓	✗	✓	✓	✓	✓	-	✓	✓	✓	✓
Madden *et al.* (2019)	Original article	✓	✗	✓	-	✗	-	-	-	✓	-	-	✓	-	✓
Moawad *et al.* (2019)	Original article	✓	✗	-	-	✓	-	-	✓	✓	✓	✓	✓	-	✓
Praiss *et al.* (2019)	Original article	✓	-	-	-	✗	✓	✓	✓	✓	✓	✓	✓	-	✓
Fountain *et al.* (2017)	Original article	✗	✗	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓
Korsholm *et al.* (2017)	Systematic review	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓
Melamed *et al.* (2016)	Original article	✓	✓	-	-	-	-	-	✓	✓	✗	✓	✓	-	-
Jennings *et al.* (2015)	Original article	✓	✓	-	-	-	-	-	-	✓	-	✓	✓	-	✓

Maheux-Lacroix *et al.* (2015)	Original article	✓	✗	✓	✓	✓	✓	✓	-	✗	✗	✓	✓	✓	✓
Rivard *et al.* (2015)	Original article	✓	✗	-	-	✗	✓	✓	✓	✓	✗	✓	✓	✗	✓
Dessources *et al.* (2015)	Original article	✗	-	✓	-	✓	-	-	-	-	-	✓	✓	-	✓
Lee *et al.* (2014)	Original article	✗	✗	✗	✗	✗	✓	-	✓	✓	✓	✓	✓	✗	✓
Rettenmaier *et al.* (2012)	Original article	✓	✗	-	-	✗	✓	-	✓	✓	✓	✓	✓	-	✓
Alperin *et al.* (2012)	Original article	✗	✗	-	-	-	✓	-	-	✗	✗	✓	✓	-	✓
Gien *et al.* (2011)	Original article	✓	✗	✗	-	✗	✓	-	✓	✓	✓	✓	✓	-	✓
Perron-Burdick *et al.* (2011)	Original article	✗	✗	-	-	-	-	-	-	✗	✓	✓	✓	-	✓

Table I. Positive predictors for same-day discharge

✓: A criterion identified by the author as a statistically significant positive predictor for same-day discharge.

- : A criterion not mentioned by the author.

✗: A criterion not identified by the author as a statistically significant positive predictor for same-day discharge.

ASA - American Society of Anesthesiologists. BMI - Body Mass Index. EBL - Estimated Blood Loss. OSA - Obstructive Sleep Apnea**.**

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