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Bilateral Opportunistic Salpingectomy to Reduce the Incidence of Ovarian Cancer

Key Messages

What Is the Issue?

- Ovarian cancer is a common gynecological malignancy, with the highest mortality rate. Presently, there are no screening tools that can detect ovarian cancer at an early stage. As a result, there is a need for other preventive options.
- Recent research suggests that the most common type of ovarian malignancy may originate in parts of the fallopian tube rather than the ovary itself.
- Bilateral opportunistic salpingectomy involves removal of both fallopian tubes while a person is undergoing abdominal surgery for another indication (e.g., a partial hysterectomy, Caesarean section), while leaving the ovaries intact. This procedure may be a possible prevention strategy for ovarian cancer, and it is therefore important to understand its potential harms and benefits.

What Did We Do?

- To inform decisions about bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer in people at general population risk of the disease, we sought to identify and summarize literature examining the safety and efficacy of bilateral opportunistic salpingectomy compared with other abdominal surgeries without bilateral opportunistic salpingectomy. We also aimed to identify and summarize information on the cost-effectiveness of, and recommendations regarding best practices for, bilateral opportunistic salpingectomy in this population.
- We searched key resources, including journal citation databases, and conducted a focused internet search for relevant evidence published since January 1, 2019.

What Did We Find?

- Outcomes related to the benefits and harms for bilateral opportunistic salpingectomy are mixed, compared with tubal ligation. People who undergo bilateral opportunistic salpingectomy may experience longer surgical times, fill more prescriptions for pain medication, but experience fewer perioperative complications and be less likely to have postoperative ultrasounds and laboratory visits (1 retrospective cohort study). There may not be any statistically significant differences in endocrine function and other postoperative adverse events between the 2 groups (1 systematic review [SR], 1 retrospective cohort study).
- Outcomes related to the benefits and harms for hysterectomy with bilateral opportunistic salpingectomy are mixed, compared with hysterectomy alone. People who undergo bilateral opportunistic salpingectomy may experience longer hospital stays and greater risk of menopausal symptoms 1 year after surgery, but less perioperative bleeding (2 retrospective cohort studies). There may not be any statistically significant differences in blood transfusions, duration of surgery, or other postoperative outcomes (1 retrospective cohort study). There may be no difference in menopause onset 4 weeks

Key Messages

to 6 months after surgery, but a shorter time to menopause in the bilateral opportunistic salpingectomy group when followed up for 5 years (1 SR, 1 retrospective cohort study).

- None of the included studies reported on the incidence of ovarian cancer.
- We did not find any evidence-based guidelines or economic evaluations regarding the use of bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer.

What Does It Mean?

- The available evidence suggests that the benefits and harms of bilateral opportunistic salpingectomy vary, compared with both tubal ligation and hysterectomy alone. To inform future clinical practice, decision-makers may want to consider these potential risks and benefits.
- Findings from the included SRs were rated as low to very low certainty and should be interpreted accordingly. Additional clinical studies would help strengthen the evidence base and provide a better understanding of the benefits and harms of bilateral opportunistic salpingectomy for people at general population risk of ovarian cancer.
- Longitudinal studies that examine the incidence of ovarian cancer in this population would help illustrate the clinical effectiveness of this procedure.

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Abbreviations

GRADE	Grading of Recommendations, Assessment, Development, and Evaluation
HGSC	high-grade serous carcinoma
NRS	nonrandomized study
NSAID	nonsteroidal anti-inflammatory
PICO	population, intervention, comparison, and outcome
RCT	randomized controlled trial
SR	systematic review

Context and Policy Issues

What Is Ovarian Cancer?

Ovarian cancer is 1 of the most common gynecological cancers in Canada.[1,2] It starts in the cells of the ovary and can spread to other parts of the body.[1,2] There are multiple types of ovarian cancers, the most common of which is epithelial ovarian carcinoma, which arises in the epithelial cells.[1,2] The incidence of epithelial cancer increases with age, with most cases found in people who have gone through menopause.[2] Other factors that may increase a person's chance of developing ovarian cancer include family history, *BRCA* gene mutations, endometriosis, and hormone replacement therapy, among others.[1,2] Conversely, pregnancy and the use of oral contraceptives may have protective effects against ovarian cancer.[1,2] The most common subtype of epithelial ovarian carcinoma is high-grade serous carcinoma (HGSC).[1-3] While some HGSC cases are hereditary, most occur sporadically, and these sporadic cases tend to have poorer prognoses and chances of survival.[3]

What Is Bilateral Opportunistic Salpingectomy?

Bilateral opportunistic salpingectomy is a procedure that removes both fallopian tubes while a person is undergoing abdominal surgery for another indication (e.g., a partial hysterectomy, Caesarean section), while leaving the ovaries intact.[3,4] Recent evidence has suggested that most HGSCs arise from the epithelium of the distal fallopian tube, rather than the ovary.[3,4] As such, removal of the fallopian tubes may be an effective intervention to decrease the incidence of ovarian cancer.[4] Conserving the ovaries can also prevent patients from experiencing premature menopause and its associated adverse long-term outcomes, including a higher risk of mortality.[3]

Why Is It Important to Do This Review?

It is estimated that in 2024, there will be 3,000 people in Canada diagnosed with ovarian cancer, and 2,000 people will die from it.[2] Presently, there are no screening tests to detect ovarian cancer at an early stage.[5] As a result, there is a need for other preventive options.[5] Previous research has demonstrated that the removal of fallopian tubes may decrease a person's risk of developing ovarian cancer.[3] Prophylactic removal of both of the ovaries and fallopian tubes is recommended by age 40 for people who are at a high risk of ovarian cancer (e.g., those who have the *BRCA1* or *BRCA2* gene mutation).[6] In more recent years, bilateral opportunistic salpingectomy has been recommended for people at general population risk of ovarian cancer.[6] This review can help inform clinical practice by investigating whether bilateral opportunistic salpingectomy is a safe and cost-effective procedure and whether it is associated with a reduced incidence of ovarian cancer.

Objective

The purpose of this report is to summarize and critically appraise the evidence identified from medical databases and grey literature about the benefits and harms, cost-effectiveness, and practice recommendations about bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer.

Research Questions

1. What are the safety and efficacy of bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer?
2. What is the cost-effectiveness of bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer?
3. What are the evidence-based guidelines regarding the use of bilateral opportunistic salpingectomy to reduce the incidence of ovarian cancer?

Methods

An information specialist conducted a customized literature search, balancing comprehensiveness with relevancy, of multiple sources and a focused internet search on July 8, 2024.

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1, and critically appraised the included publications using established critical appraisal tools.

Appendix 1 presents a detailed description of methods.

Table 1: Selection Criteria

Criteria	Description
Population	People (aged > 15 years) undergoing abdominal surgeries at general population risk[a] for ovarian cancer
Intervention	Bilateral opportunistic salpingectomy during another abdominal surgery
Comparator	**Q1, Q2:** Abdominal surgery without bilateral opportunistic salpingectomy (e.g., partial or full hysterectomy, tubal ligation, and other abdominal surgeries) **Q3:** NA
Outcomes	**Q1:** Benefits (e.g., reduction in the incidence of ovarian cancer) and harms (e.g., adverse events, surgical complications, impact on menopause onset, general surgeon procedural proficiency, and operating room times) **Q2:** Cost-effectiveness (e.g., quality-adjusted life-years) **Q3:** Recommendations regarding best practices
Study designs	Health technology assessments, systematic reviews, randomized controlled trials, nonrandomized studies, economic evaluations, and evidence-based guidelines
Publication date	Since January 1, 2019

NA = not applicable; Q = question.

[a]General population risk refers to people who do not have an elevated risk of ovarian cancer (e.g., those who have a genetic condition or germline mutations).

Summary of Evidence

Quantity of Research Available

This report includes 5 publications that met our inclusion criteria. Of these publications, 2 are SRs[7,8] and 3 are nonrandomized studies (NRSs).[9-11] Appendix 1 presents the PRISMA[12] flow chart of the study selection.

We have also included a brief discussion in Appendix 5 of a committee opinion and 5 economic evaluations that do not meet our inclusion criteria but may still provide useful information to this report.[13-18]

Appendix 6 lists additional references of potential interest that provide information about bilateral opportunistic salpingectomy but did not meet our inclusion criteria, such as studies that included people at high risk of ovarian cancer.

Summary of Study Characteristics

We identified a total of 5 relevant publications that met our inclusion criteria (2 SRs[7,8] and 3 NRSs[9-11]).

Research Question 1

We included 2 SRs in this report.[7,8] There was no overlap in the primary studies included in these reviews and all primary studies were relevant to this report.

- One SR was conducted in Sweden, published in 2022, and included both cohort studies and randomized controlled trials (RCTs).[7] The review included 17 total studies, 12 of which were included in the meta-analysis. This review examined the efficacy and safety of bilateral opportunistic salpingectomy compared with tubal ligation procedures to reduce the risk of ovarian cancer.[7] The study population consisted of adults who underwent planned sterilization procedures.[7] Outcomes of interest included ovarian cancer, ovarian endocrine function, complications, duration of surgery, and length of hospital stay.[7]
- The second SR was conducted in the Netherlands, published in 2019, and included 7 RCTs. NRSs were also eligible for inclusion; however, none were identified.[8] The review examined people in premenopause who underwent a hysterectomy for benign gynecological indications in secondary and tertiary care centres.[8] They compared outcomes for those who received a hysterectomy with bilateral opportunistic salpingectomy to those who received a hysterectomy without bilateral opportunistic salpingectomy.[8] The outcomes of interest included incidence of ovarian cancer, intraoperative complications, short-term postoperative complications, and postoperative hormonal status.[8]

We also included 3 NRSs that were retrospective cohort studies in this report.[9-11] One study was conducted at hospitals in British Columbia in 2024, and included people older than 15 years who had a live birth by Caesarean section.[9] The second study was conducted at hospitals in Taiwan in 2022 and included people aged 20 to 50 years who had a hysterectomy for benign reasons.[10] The third study was conducted in hospitals across Sweden in 2019 and included people younger than 55 years who had a hysterectomy for benign reasons.[11] One study[9] compared bilateral opportunistic salpingectomy with tubal ligation, and the other 2 studies[9-11] compared hysterectomy with bilateral opportunistic salpingectomy to hysterectomy without bilateral opportunistic salpingectomy. The outcomes examined in these 3 studies varied. Chen et al. (2022)[10]

examined time to menopause and menopausal symptoms, whereas the other 2 studies assessed multiple outcomes, listed as follows:

- Rufin et al.[9] examined:
  - total operating room time
  - length of hospital stay
  - surgical complications
  - postoperative complications
  - likelihood of filling a prescription for antibiotics or analgesics.
- Collins et al.[11] examined:
  - surgical complications
  - menopausal symptoms
  - time in surgery
  - perioperative blood loss or blood transfusion
  - length of hospital stay
  - days to return to normal activities of daily living
  - days out of work
  - uptake of opportunistic salpingectomy (i.e., the change in the rates of bilateral opportunistic salpingectomies performed over a period of years).

Summary of Critical Appraisal

Additional details are provided in Appendix 3.

Systematic Reviews

Both SRs included all population, intervention, comparison, and outcome (PICO) components in their research question, published protocols with key components, and explained their choice of included study designs.[7,8] Both SRs also reported that multiple authors performed study selection and data extraction and provided a list of excluded studies with justification for exclusion.[7,8] Both SRs used appropriate methods for their meta-analyses.[7,8] The study by van Lieshout et al. used a fixed-effects model, stating that the study characteristics were similar enough for this type of statistical combination.[8] The study by Magarakis et al. (2022) used a random-effects model owing to differences in the included primary studies.[7] Both studies used the I^2 statistic to examine heterogeneity[7,8] and used Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) to help determine the certainty of evidence, accounting for risk of bias of the individual studies when discussing results.[7,8] Additionally, both SRs reported on potential sources of conflict of interest and funding.[7,8] Magarakis et al. (2022) reported no conflict of interest and van Lieshout et al. described steps taken to avoid conflict of interest.[7,8]

The SR by van Lieshout et al. used a comprehensive search strategy, including all necessary components.[8] Magarakis et al. (2022) searched multiple databases, provided search strategies, and justified publication

restrictions, but did not search trial registries, consult with content experts, or mention grey literature searches.[7] The SR by van Lieshout et al. described all PICO and study design, settings, and time frame for follow up in detail, used a satisfactory technique for assessing the risk of bias, and reported on the sources of funding for included primary studies.[8] Magarakis et al. (2022) described the included studies but were missing some details and did not report the sources of funding for the included primary studies.[7] As well, Magarakis et al. (2022) described assessing risk of bias but the reporting did not provide clarity on the exact aspects of bias that were assessed.[7] Magarakis et al. (2022) used inverse variance-weighted statistics in their meta-analysis to help minimize imprecision, whereas van Lieshout et al. did not assess the potential impact of the risk of bias in individual studies on the results of the meta-analysis.[7,8] Both SRs provided minimal discussion and explanation for heterogeneity observed in the results of the studies.[7,8]

Nonrandomized Studies

All 3 studies clearly described the aims, interventions, comparators, and main outcomes.[9-11] Additionally, they provided estimates of variability and reported P values for most of the main outcomes.[9-11] Rufin et al. and Collins et al. both investigated adverse events as some of the primary outcomes, whereas Chen et al. (2022) did not examine adverse events.[9-11] Rufin et al. listed potential confounders and the methods used to control for them, whereas the other studies noted that they accounted for confounders but the details around these variables were not clear.[9-11] Additionally, Rufin et al. reported missing data, which was similar between the intervention and comparator groups.[9] The other studies did not note missing data or details surrounding any losses to follow up.[10,11]

All 3 studies took steps to help ensure internal validity; for instance, all studies used appropriate statistical tests to assess the main outcomes, such as t tests for continuous variables and chi-square or Fisher exact tests for categorical variables.[9-11] All 3 studies also recruited patients in both intervention and comparator groups from the same populations and over the same periods of time.[9-11] In terms of external validity, the participants and the staff, and the places and facilities from which they were recruited in the studies by Rufin et al. and Collins et al. were all likely to be representative of the broader population and the treatment most patients received.[9,11] The participants in the study by Chen et al. (2022) were recruited from a single centre and it is not clear if the procedures or participants were representative of other hospitals as well.[10]

Each of the studies used a retrospective cohort design, which have inherent limitations including missing randomization and blinding.[9-11] The studies by Rufin et al. and Collins et al. had large, population-based cohorts; however, they were missing details on their methods of sampling.[9,11] For example, the studies did not indicate whether patients were consecutively enrolled or randomly sampled.[9,11] The study by Chen et al. (2022) was also limited by a relatively small sample size.[10] All 3 studies did not specify the risk level of ovarian cancer for patients included in the study.[9-11] As a result, some of the included patients may be at elevated risk of ovarian cancer. This is unlikely to impact the relevance of overall findings, because none of the studies reported on the incidence of ovarian cancer.[9-11]

All 3 studies listed their sources of funding and potential conflicts of interest.[9-11]

Summary of Findings

The main study findings are presented in Appendix 4.

None of the included studies reported findings on the incidence of ovarian cancer.[9-11] The findings about evidence certainty discussed in this section are based on the study author's critical appraisal.

Benefits and Harms: Bilateral Opportunistic Salpingectomy Versus Tubal Ligation

One SR and 1 NRS compared bilateral opportunistic salpingectomy with tubal ligation.[7,9]

Endocrine Function

No statistically significant differences were found in endocrine function between patients who underwent bilateral opportunistic salpingectomy compared with tubal ligation.[7] The certainty of these findings was very low (3 studies in 1 SR).[7]

Duration of Surgery

Overall, the surgical times were longer for bilateral opportunistic salpingectomy than for tubal ligation.[7,9] These findings were statistically significant (1 SR and 1 NRS) and the certainty of these findings was low (16 studies in 1 SR).[7,9]

Length of Hospital Stay

In 1 study, the length of hospital stay was significantly lower in the bilateral opportunistic salpingectomy group than the tubal ligation group; however, authors reported that the difference was not clinically meaningful (1 NRS).[9] In the other study, there was no statistically significant difference between the bilateral opportunistic salpingectomy group and the tubal ligation group, and the certainty of these findings was low (8 studies in 1 SR).[7]

Blood Loss

The difference between blood loss in patients who underwent bilateral opportunistic salpingectomy compared with tubal ligation was unclear owing to mixed findings and underpowered primary studies.[7] The certainty of these findings was very low (15 studies in 1 SR).[7]

Other Complications and Adverse Events

Magarakis et al. (2022) were unable to provide any pooled results for other complications or adverse events owing to inconsistency in reporting among the included primary studies.[7]

After adjusting for potential confounding variables, Rufin et al. found that people who underwent bilateral opportunistic salpingectomy, compared with tubal ligation, were:[9]

- less likely to experience perioperative complications (a composite outcome of surgical infection, anemia, incision complications, pelvic organ injury, operating room returns, other complications during hospital stay)
- less likely to have ultrasound visits
- less likely to have laboratory visits
- more likely to fill prescriptions for NSAIDs

- more likely to fill prescriptions for opioids.

These findings were all statistically significant.[9] There were no statistically significant differences between the groups about the likelihood of hospital admission, infection, antibiotic use, and other combined complications.[9]

Benefits and Harms: Hysterectomy With Opportunistic Salpingectomy Versus Hysterectomy Without Opportunistic Salpingectomy

One SR and 2 NRSs compared hysterectomy with bilateral opportunistic salpingectomy to hysterectomy without bilateral opportunistic salpingectomy.[8,10,11]

Menopausal Symptoms and Time to Menopause

- Findings about time from surgery to onset of menopause differed by follow-up time.
  - Pooled results from 1 study found that from 4 weeks to 6 months after surgery, there was no statistically significant difference in the onset of menopause between the group with opportunistic salpingectomy and the group without opportunistic salpingectomy. The certainty of evidence was low (5 RCTs in 1 SR).[8]
  - Another study found that 5 years after surgery, time from surgery to menopause was shorter in the group with opportunistic salpingectomy than the group without opportunistic salpingectomy group, and this association remained after adjusting for age, body mass index, and parity.[10] This result was statistically significant (1 NRS).[10]
- There were no statistically significant differences between age groups for the time from surgery to menopause (1 NRS).[10]
- Collins et al. found that the group with opportunistic salpingectomy had a greater risk of menopausal symptoms than the group without opportunistic salpingectomy 1 year after surgery, and these results were statistically significant.[11] Chen et al. (2022) also found that sleep problems associated with menopause were higher in the group with opportunistic salpingectomy than the group without opportunistic salpingectomy , and these results were statistically significant.[10] However, they found no statistically significant differences in other menopause characteristics.[10]

Duration of Surgery

There was no statistically significant difference in the duration of surgery between the group with opportunistic salpingectomy and the group without opportunistic salpingectomy (1 NRS).[11]

Length of Hospital Stay

Hospital stay was longer in the group with opportunistic salpingectomy by about 2 hours and 24 minutes compared with the group without opportunistic salpingectomy group, and this result was statistically significant (1 NRS).[11]

Perioperative and Intraoperative Outcomes

- One study reported insufficient data to determine a difference in intraoperative complication rates between the group with opportunistic salpingectomy and the group without opportunistic salpingectomy owing to a low number of surgery-related adverse events.[8]
- There was less perioperative bleeding in the group with opportunistic salpingectomy than the group without opportunistic salpingectomy, and this result was statistically significant (1 NRS).[11]
- There was no statistically significant difference in blood transfusion between the groups (1 NRS).[11]

Postoperative Outcomes

- One study reported insufficient data to determine differences in short-term postoperative complication rates between the group with opportunistic salpingectomy and the group without opportunistic salpingectomy owing to a low number of surgery-related adverse events.[8]
- Another study[11] reported no statistically significant differences between the group with opportunistic salpingectomy and the group without opportunistic salpingectomy for:
  - days to normal activities of daily living
  - days out of work
  - complications at discharge
  - complications after 8 weeks
  - minor complications 1 year postoperatively, although there was a tendency toward a high risk among the opportunistic salpingectomy group
  - severe complications 1 year postoperatively.

Uptake of Bilateral Opportunistic Salpingectomy

Rates of hysterectomy with bilateral opportunistic salpingectomy have increased from 1.9% in 2012 to 37.8% in 2016.[11] This finding was specific to Sweden.[11]

Cost-Effectiveness Regarding Bilateral Opportunistic Salpingectomy

We did not identify any economic evaluations that met our inclusion criteria. Appendix 5 presents a brief summary of 5 economic evaluations that used theoretical cohorts to project the cost-effectiveness of bilateral opportunistic salpingectomy.[13-15,17,18]

Guidelines Regarding Bilateral Opportunistic Salpingectomy

We did not identify any evidence-based guidelines that met methodological requirements for inclusion. Appendix 5 provides a brief summary of 1 committee opinion paper published by the American College of Obstetricians and Gynecologists about opportunistic salpingectomy as strategy for epithelial ovarian cancer prevention.[16]

Limitations

External Validity

Our ability to generalize the findings from the included studies is limited. The NRS by Rufin et al. was conducted in Canada, as well as 2 of the primary studies included in the SR by Magarakis et al. (2022); however, the setting for all other studies were elsewhere, which may affect generalizability to Canadian settings.[7,9] Because most studies provided few details surrounding the interventions and comparators, it is possible that these procedures differ depending on the setting in which they were performed.

Certainty of Evidence

We included 2 SRs in this report.[7,8] The certainty of evidence for their main findings were assessed using the GRADE approach and the certainty for each of the findings was either low or very low.[7,8] One SR used a random-effects model and found low to moderate heterogeneity among primary studies (i.e., I^2 ranged from 15% to 63%).[7] Authors found higher heterogeneity in the pooled analyses of the NRSs than the RCTs, which is expected.[7] They discussed possible sources of this heterogeneity and noted that the moderate to high risk of bias in the primary studies resulted in decreased certainty in the evidence.[7] The other SR used a fixed-effects model and did not detect heterogeneity in their results; however, they downgraded the certainty of evidence of their findings owing to imprecision, limitations in primary study design risk of bias, and inconsistency.[8] The low certainty of evidence in both reviews suggests knowledge gaps and implies that future research is very likely to have a notable influence on the findings.[7,8] As a result, the findings from these studies must be interpreted with caution.

Lack of Reporting on the Incidence of Ovarian Cancer and Cancer Risk Level

None of the included studies reported on outcomes about the incidence of ovarian cancer following bilateral opportunistic salpingectomy or the comparators.[7-11] The SR by van Lieshout et al. set out to investigate this outcome; however, none of the primary studies included in their review reported on it.[8] As a result, we are unable to draw conclusions about the effect of bilateral opportunistic salpingectomy on the incidence of ovarian cancer in people at general population risk of the disease.

Additionally, only 1 of the included studies reported that they specifically included people at general population risk of ovarian cancer and excluded people at high risk.[8] The other included studies did not report the cancer risk level of participants, nor did they report it as a potential confounding variable.[7-11] This may be because they only reported outcomes related to safety and adverse events and therefore cancer risk level was not perceived to be as relevant to these outcomes. We cannot distinguish if the safety profile of bilateral opportunistic salpingectomy differs between people at general population risk and people with an elevated risk of developing ovarian cancer, because these characteristics were not reported.

Conclusions and Implications for Decision- or Policy-Making

Summary of Evidence

This report aimed to summarize evidence about the benefits and harms of bilateral opportunistic salpingectomy compared with tubal ligation or no bilateral opportunistic salpingectomy during another abdominal surgery in people at general population risk of ovarian cancer. We included 1 retrospective cohort study and 1 SR that compared bilateral opportunistic salpingectomy with tubal ligation.[7,9] We also included 2 retrospective cohort studies and 1 SR that compared hysterectomy with bilateral opportunistic salpingectomy to hysterectomy without bilateral opportunistic salpingectomy.[8,10,11] The retrospective cohort studies had methodological limitations inherent to their study design.[9-11] The SRs were moderate to high reporting and methodological quality; however, their results were based on very low to low certainty evidence, implying that they should be interpreted with caution.[7,8] This report also aimed to investigate the cost-effectiveness of, and practice recommendations about, bilateral opportunistic salpingectomy; however, we did not identify any economic evaluations or evidence-based guidelines that met our inclusion criteria.

The findings of this report suggest that people who undergo bilateral opportunistic salpingectomy may experience slightly longer surgical times, fewer perioperative complications, and have fewer ultrasound and laboratory visits, when compared with tubal ligation.[7,9] They may fill more prescriptions for NSAIDs and opioids.[9] The difference in outcomes such as endocrine function, length of hospital stay, blood loss, and other postoperative complications are likely to be similar between the 2 groups.[7,9]

People who undergo hysterectomy with bilateral opportunistic salpingectomy are likely to have similar durations of surgery, and other intraoperative and postoperative outcomes, when compared with hysterectomy without bilateral opportunistic salpingectomy.[8,11] They may experience slightly less perioperative blood loss and slightly longer hospital length of stay.[11] The findings around time from surgery to menopause are mixed, with some results indicating an earlier onset of menopause for the group with bilateral opportunistic salpingectomy, while other results indicate no difference.[8,10]

Considerations for Future Research

This is an area of research that would benefit from additional high-quality clinical studies, specifically for outcomes about the incidence of ovarian cancer. For instance, longitudinal cohort studies that follow people who have undergone bilateral opportunistic salpingectomy compared with those who have not undergone bilateral opportunistic salpingectomy during other abdominal surgeries are more likely to provide data on how the procedures can affect incidence of ovarian cancer. There are currently ongoing clinical trials such as the HOPPSA and SALSTER trials that aim to investigate this.[19,20] The findings of these trials will be crucial to bettering the understanding around associations between bilateral opportunistic salpingectomy and incidence of ovarian cancer in people at general population risk. Given the low certainty of evidence in the studies included in this report, additional studies with long follow-up times, including more RCTs, would also be beneficial. These studies could help clarify safety outcomes, whether it be through refuting or solidifying the outcomes examined in this report.

Implications for Decision-Making

Performing bilateral opportunistic salpingectomy in people undergoing other abdominal surgeries has become increasingly common in parts of Canda for more than a decade.[9] Given the lack of evidence identified in this study about the association between bilateral opportunistic salpingectomy and the incidence of ovarian cancer, it is important to consider potential risks to patients if bilateral opportunistic salpingectomy was not performed. The findings of this report indicate that many perioperative and postoperative outcomes and adverse events do not significantly differ when bilateral opportunistic salpingectomy is performed compared with when it is not.[7-11] This is not the case for all outcomes, as their may be risks around greater use of some medication, and longer surgical times and hospital stays for patients who undergo bilateral opportunistic salpingectomy. Additionally, given the mixed results about time from surgery to onset of menopause, patient age may play a role in the decision to perform bilateral opportunistic salpingectomy. Discussion with patients about the possibility of the earlier onset of menopause is important as those who are younger may wish to delay or forgo bilateral opportunistic salpingectomy for this reason. Finally, the low certainty of evidence for many of these findings is important to consider in decision-making. Additional research is necessary to further explore the benefits and harms of bilateral opportunistic salpingectomy in people at general population risk of ovarian cancer.

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Appendix 1: Detailed Methods and Selection of Included Studies

Please note that this appendix has not been copy-edited.

Literature Search Methods

An information specialist conducted a literature search on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the International HTA Database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search approach was customized to retrieve a limited set of results, balancing comprehensiveness with relevancy. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. Search concepts were developed based on the elements of the research questions and selection criteria. The main search concepts were salpingectomy and ovarian cancer. The search was completed on July 8, 2024 and limited to English-language documents published since January 1, 2019.

Selection Criteria and Methods

One reviewer screened citations and selected studies. In the first level of screening, titles and abstracts were reviewed and potentially relevant articles were retrieved and assessed for inclusion. The final selection of full-text articles was based on the inclusion criteria presented in Table 1. Figure 1 presents the PRISMA[21] flow chart of the study selection.

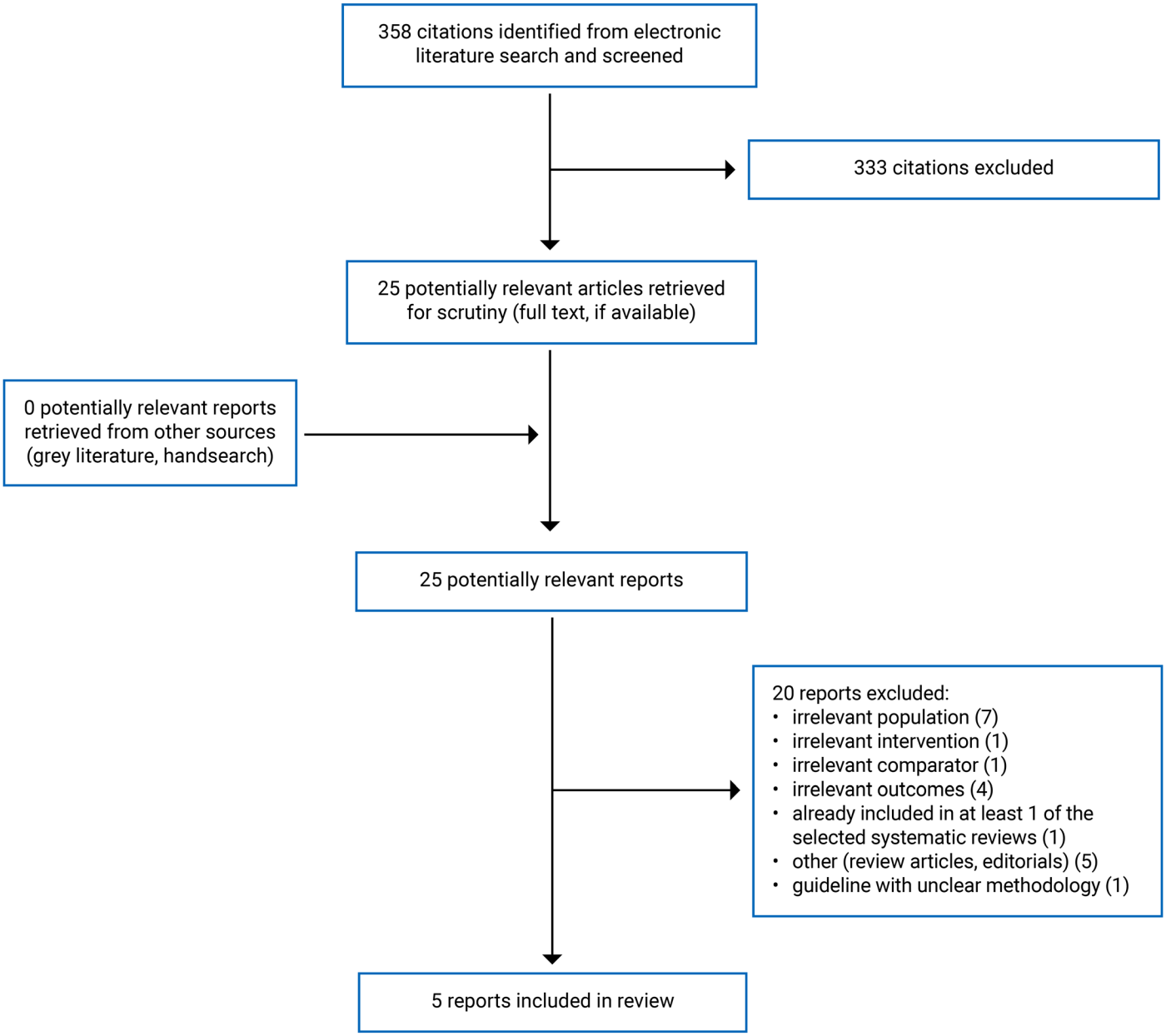
Exclusion Criteria

Articles were excluded if they did not meet the selection criteria outlined in Table 1, they were duplicate publications, or were published before 2019. Studies that included individuals who were at high risk of ovarian cancer, who underwent unilateral salpingectomy, or who had a history of salpingectomy or oophorectomy were excluded. SRs in which all relevant studies were captured in other more recent or more comprehensive SRs were excluded. Primary studies retrieved by the search were excluded if they were captured in 1 or more included SRs. Guidelines with unclear methodology were discussed in the findings but not critically appraised.

Critical Appraisal of Individual Studies

The included publications were critically appraised by 1 reviewer using the following tools as a guide: A MeaSurement Tool to Assess systematic Reviews 2 (AMSTAR 2)[22] for SRs, and the Downs and Black checklist[23] for randomized and nonrandomized studies. Summary scores were not calculated for the included studies; rather, the strengths and limitations of each included publication were described narratively.

Figure 1: Selection of Included Studies



Appendix 2: Characteristics of Included Publications

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Table 2: Characteristics of Included Systematic Reviews

Study citation, country, funding source	Study designs and numbers of primary studies included, date range	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
Magarakis et al. (2022)[7] Sweden **Funding source:** Grants from the Swedish State, the ALF-agreement, and the Swedish Cancer Society	3 RCTs 14 cohort studies All studies are relevant to this report. Up to 2 October, 2020	Female adults with fallopian tubes undergoing planned sterilization procedures through laparoscopy or laparotomy, including Caesarean section.	**Intervention:** Bilateral opportunistic salpingectomy **Comparator:** Bilateral tubal ligation	**Outcomes:** Ovarian cancer, ovarian endocrine function, procedure complications, duration of surgery, length of hospital stay. **Follow-up:** Range of 2 days to 5 years, depending on study and outcome
Van Lieshout. (2019)[8] Netherlands **Funding source:** None	7 RCTs All studies are relevant to this report. Up to January 8, 2019	Premenopausal females with a population-based risk of ovarian cancer undergoing surgery for benign gynecological conditions. N = 350	**Intervention:** Hysterectomy with bilateral opportunistic salpingectomy **Comparator:** Hysterectomy without bilateral opportunistic salpingectomy	**Outcomes:** Incidence of epithelial ovarian cancer, intraoperative complications, postoperative complications, postoperative hormonal status

ALF = Avtal om Läkarutbildning och Forskning; RCT = randomized controlled trial.

Note: Study authors refer to participants as female, based on biological sex. It was not apparent if authors investigated gender identity.

Table 3: Characteristics of Included Primary Clinical Studies

Study citation, country, funding source	Study design, date range	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
Rufin et al. (2024)[9] Canada **Funding sources:** Canadian Cancer Society Research Institute, Canadian Institutes for Health Research, Vancouver General Hospital, University of British Columbia	Retrospective cohort study January 1, 2008, to March 31, 2021	**Sex:** 100% female **Setting:** Hospitals in British Columbia. **Tubal Ligation, n = 9,744** Age, mean years (SD) = 33.6 (5.03) **Bilateral opportunistic salpingectomy, n = 8,440** Age, mean years (SD) = 34.5 (4.65) All individuals underwent opportunistic salpingectomy or tubal ligation during the same	**Intervention:** Bilateral opportunistic salpingectomy **Comparator:** Tubal ligation	**Outcomes:** Total operating room time, length of hospital stay, surgical complications, postoperative complications, likelihood of filling a prescription for antibiotics or analgesics. **Follow-up:** 6 weeks

Study citation, country, funding source	Study design, date range	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
		hospital stay as live birth via Caesarean section		
Chen et al. (2022)[10] Taiwan **Funding source:** Hualien Tzu Chi Hospital and Buddhist Tzu Chi Medical Foundation	Retrospective cohort January 2007 to December 2015	**Sex:** 100% female **Setting:** 1 hospital in Taiwan **Hysterectomy alone, n = 25** Age, mean years (SD) = 45.76 (3.47) **Hysterectomy with bilateral opportunistic salpingectomy, n = 54** Age, mean years (SD) = 45.52 (3.2) People had a hysterectomy for benign lesions, including: • endometriosis • leiomyoma • prolapse	**Intervention:** Hysterectomy with bilateral opportunistic salpingectomy **Comparator:** Hysterectomy without bilateral opportunistic salpingectomy	**Outcomes:** Time to menopause, symptoms of menopause **Follow-up:** 5 to 10 years
Collins et al. (2019)[11] Sweden **Funding source:** Cancer Research Foundation, Northern Sweden	Retrospective cohort 2013 to 2016	**Sex:** 100% female **Setting:** surgical clinics in Sweden **Hysterectomy alone, n = 3,473** Age, mean years (SD) = 44.1 (6.1) **Hysterectomy with bilateral opportunistic salpingectomy, n = 1,433** Age, mean years (SD) = 45.1 (5.2) All participants had a hysterectomy for benign reasons.	**Intervention:** Hysterectomy with bilateral opportunistic salpingectomy **Comparator:** Hysterectomy without bilateral opportunistic salpingectomy	**Outcomes:** Surgical complications, menopausal symptoms, time in surgery, perioperative blood loss/blood transfusion, duration of hospital stay, days to normal activities of daily living, days out of work, uptake of opportunistic salpingectomy **Follow-up:** • 8 weeks for duration of surgery, perioperative bleeding, administered units of blood, length of hospital stay, days out of work, days to normal activities of daily living • 1 year for menopausal symptoms and complications

NA = not applicable; NR = not reported;, SD = standard deviation.

Note: Study authors refer to participants as female, based on biological sex. It was not apparent if authors investigated gender identity.

Appendix 3: Critical Appraisal of Included Publications

Please note that this appendix has not been copy-edited.

Table 4: Strengths and Limitations of Systematic Reviews Using AMSTAR 2[22]

Strengths	Limitations
Magarakis (2022)[7]	
The authors reported all components of the PICO for their research question. The authors published a protocol before conducting their review. The authors explained their selection for using both NRSs and RCTs. The authors performed study selection and data extraction in duplicate. The authors provided a list of excluded studies and reasons for exclusion. The characteristics of primary studies were included. The authors used appropriate methods for statistical combination of results (i.e., random-effects model) and inverse weighted statistics to help minimize imprecision. The authors used the GRADE approach to help determine certainty of their results. The authors declared that there were no conflicts of interest.	The authors did not search trial or study registries, grey literature, or consult content experts. The authors provided few details about the characteristics of included primary studies. The authors did not report on the sources of funding for the primary studies included in the review. The authors assessed the risk of bias for individual studies however the details of these assessments were not clearly reported.
van Lieshout (2019)[8]	
The authors reported all components of the PICO for their research question. The authors published a protocol before conducting their review and discussed deviations from the protocol. The authors explained their selection for using both NRSs and RCTs. The authors used a comprehensive literature search strategy that include consultation with content experts. Multiple authors performed study selection and data extraction. The authors provided a list of excluded studies and reasons for exclusion. The characteristics of primary studies were included in good detail. The authors used appropriate methods for statistical combination of results (i.e., fixed-effects model) and justified their reasons for doing so. The authors used the GRADE approach to help determine certainty of their results and downgraded certainty of evidence based on risk of bias. The authors reported potential conflicts of interest and the steps taken to avoid them.	The authors did assess the potential impact of the risk of bias in individual studies on the results of the meta-analysis. The authors did not clearly discuss the heterogeneity observed in the results.

GRADE = Grading of Recommendations, Assessment, Development, and Evaluation; PICO = population, intervention, comparison, and outcome; NRS = nonrandomized study; RCT = randomized controlled trial.

Table 5: Strengths and Limitations of Clinical Studies Using the Downs and Black Checklist[23]

Strengths	Limitations
Rufin (2024)[9]	
The authors clearly described the objective, intervention, main outcomes, and inclusion and exclusion criteria of the study. The main findings of the study were clearly described. Due to the population-based nature of this study, the staff, places, and facilities where patients were treated were likely to be representative of the treatment that most patients receive. The study used appropriate statistical tests to assess the main outcomes. The study provided estimates of variability (standardized mean difference, standard deviation, confidence intervals) in the outcome data. The study provided information on missing data, which was similar between the intervention and comparator groups. The study investigated adverse events as some of its main outcomes. The actual P values were reported. The study stated potential confounding variables, tested their effects in the statistical analysis, and adjusted regression models accordingly. The study had a large sample size. The study authors reported sources of funding and potential conflicts of interest.	While the mean age between the 2 treatment groups was similar, the age of patients who underwent a tubal ligation skewed slightly younger than those who underwent opportunistic salpingectomy. The study design was a retrospective cohort study. As a result, there was no randomization or blinding in the study. The patients' risk level for ovarian cancer was not specified.
Chen (2022)[10]	
The authors clearly described the objective, intervention, main outcomes, and inclusion and exclusion criteria of the study. The main findings of the study were clearly described. The authors used appropriate statistical tests to assess the main outcomes. The study reported estimates of variability (standard deviation, confidence intervals) in the outcome data. The actual P values were reported. All participants were recruited from the same hospital, within the same study period, and were followed up for 5 to 10 years. The study authors reported their sources of funding and declared they had no conflict of interest.	The study design was a retrospective cohort study. As a result, there was no randomization or blinding in the study. The study had a relatively small sample size of 79 patients. The confounding variables and methods to address them were poorly reported. The authors did not comprehensively examine adverse events. The sampling strategy was unclear. The patients' risk level for ovarian cancer was not specified.
Collins (2019)[11]	
The authors clearly described the objective, intervention, main outcomes, and inclusion and exclusion criteria of the study. Due to the population-based nature of this study, the staff, places, and facilities where patients were treated were likely to be representative of the treatment that most patients receive. The main findings of the study were clearly described. The study reported adverse events as some of its primary	The study design was a retrospective cohort study. As a result, there was no randomization or blinding in the study. The authors reported adjusting for potential confounders in statistical analysis but does not provide a clear list such confounders. The study did not report losses to follow up. The patients' risk level for ovarian cancer was not specified.

Strengths	Limitations
outcomes. The authors used appropriate statistical tests to assess the main outcomes. The authors reported estimates of variability (interquartile range, confidence intervals) in the outcome data. The authors reported actual P values. The study had a large sample size. The study authors reported their sources of funding and declared they had no conflict of interest.	

Appendix 4: Main Study Findings

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Table 6: Summary of Findings by Outcome – Duration of Surgery and Length of Hospital Stay

Citation	Study design, subgroup	Outcome measure	Tubal ligation	Bilateral opportunistic salpingectomy	Effect estimate (95% CI)	P value	Heterogeneity (I^2), % (P value)
Duration of surgery							
Rufin et al. (2024)[9]	Retrospective cohort study	Minutes (SD)	75.1 (27.3)	83.3 (26.7)	SMD: 0.304 (NR)	< 0.001	NA
Magarakis et al. (2022) [7]	SR (2 RCTs), Caesarean section with classical surgical technique	Minutes	—	—	MD: 14.61 (6.15 to 23.07)	0.0007	0 (0.84)
	SR (1 RCT), Caesarean section with advanced bipolar device	Minutes	—	—	MD: 8.00 (−17.96 to 1.96)	0.12	NA
	SR (7 cohort studies), Caesarean section	Minutes	—	—	MD: 5.55 (2.34, to 8.76)	0.0007	51 (0.06)
	SR (3 cohort studies), laparoscopy	Minutes	—	—	MD: 8.91 (5.29 to 12.53)	< 0.0001	53 (0.12)
Length of hospital stay							
Rufin et al. (2024)[9]	Retrospective cohort study	Days (SD)	2.70 (1.55)	2.48 (1.86)	SMD: 0.128 (NR)	< 0.001	NA
Magarakis et al. (2022) [7]	SR (3 RCTs)	Days	—	—	MD: −0.25 (−0.062 to 0.11)	0.18	15 (0.31)
	SR (4 cohort studies)	Days	—	—	MD: −0.08 (−0.23 to 0.06)	0.27	63 (0.27)

CI = confidence interval; MD = mean difference; NA = not applicable; NR = not reported; RCT = randomized controlled trial; SMD = standardized mean difference; SR = systematic review.

Note: This table has not been copy-edited.

Table 7: Summary of Findings by Outcome – Perioperative and Postoperative Outcomes in Rufin et al. (2024)[9]

Outcome	Effect estimate for bilateral opportunistic salpingectomy group[a] (95% CI)	Comment
Perioperative complications	aOR: 0.77 (0.61 to 0.99)	The bilateral opportunistic salpingectomy group is less likely to experience perioperative complications.
Total readmissions	aOR: 0.86 (0.70 to 1.06)	No statistically significant difference between the tubal ligation group and bilateral opportunistic salpingectomy group.
Ultrasound visits	aOR: 0.79 (0.68 to 0.92)	The bilateral opportunistic salpingectomy group is less likely to have ultrasound visits.
Laboratory visits	aOR: 0.81 (0.72 to 0.91)	The bilateral opportunistic salpingectomy group is less likely to have laboratory visits.
Total infections and other complications combined	aOR: 1.17 (0.76 to 1.85)	No statistically significant difference between the tubal ligation group and bilateral opportunistic salpingectomy group.

aOR = adjusted odds ratio; CI = confidence interval.

Note: the fully adjusted model controlled for year of surgery, patient age, income, previous Caesarean sections, previous gynecologic surgeries, and parity.

[a]Tubal ligation was used as the reference.

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Table 8: Summary of Findings by Outcome – Postoperative Medication Use in Rufin et al. (2024)[9]

Outcome	Effect estimate for bilateral opportunistic salpingectomy group[a] (95% CI)	Comment
Antibiotic use	aOR: 1.08 (0.98 to 1.20)	No statistically significant difference between the tubal ligation group and bilateral opportunistic salpingectomy group.
Prescription NSAID use	aOR: 1.18 (1.07 to 1.28)	The bilateral opportunistic salpingectomy group is more likely to use prescription NSAIDs.
Prescription opioid use	aOR: 1.23 (1.12 to 1.35)	The bilateral opportunistic salpingectomy group is more likely to use prescription opioids.

aOR = adjusted odds ratio; CI = confidence interval; NSAID = nonsteroidal anti-inflammatory.

Note: the fully adjusted model controlled for year of surgery, patient age, income, previous Caesarean sections, previous gynecologic surgeries, and parity.

[a]Tubal ligation was used as the reference.

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Table 9: Summary of Findings by Outcome – Endocrine Function in Magarakis et al. (2022)[7]

Study design	Outcome measure	Narrative findings
SR (1 RCT, 2 cohort studies)	Change in AMH (1 RCT) Menstrual irregularities (1 cohort study) Time to menopause-related physician visit and HRT prescription (1 cohort study)	No statistically significant difference between the tubal ligation group and bilateral opportunistic salpingectomy group

AMH = anti-mullerian hormone; HRT = hormone replacement therapy; RCT = randomized controlled trial; SR = systematic review.

Note: This table has not been copy-edited.

Table 10: Summary of Findings by Outcome – Blood Loss in Magarakis et al. (2022)[7]

Study design	Outcome measure	Narrative findings
SR (3 RCTs, 12 cohort studies)	Volume (mL), change in hematocrit/hemoglobin, symptoms of anemia, hematoma formation, need for blood transfusions	Differences in blood loss between the tubal ligation group and bilateral opportunistic salpingectomy group were unclear

RCT = randomized controlled trial; SR = systematic review.

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Table 11: Summary of Evidence for Hysterectomy With Bilateral Opportunistic Salpingectomy Versus Hysterectomy Alone in a Systematic Review and Meta-Analysis by van Lieshout et al. (2019)[8]

Outcomes	Assumed risk Hysterectomy alone	Corresponding risk Hysterectomy with bilateral opportunistic salpingectomy (95% CI)	Effect estimate (95% CI)	Total number of participants (studies)	Quality of the evidence	P value	Heterogeneity (I^2), % (P value)
Intraoperative complications	21 per 1,000	7 fewer per 1,000 (19 fewer to 29 more)	OR: 0.66 (0.11 to 3.94)	104 (1 RCT)	Very low	0.65	NA
Short-term postoperative complications	27 per 1,000	23 fewer per 1,000 (27 fewer to 29 more)	OR: 0.13 (0.01 to 2.14)	68 (1 RCT)	Very low	0.15	NA
Postoperative hormonal status (AMH), pmol/L	3.59 to 13.00	0.94 lower (−1.89, 0.01)	—	283 (5 RCTs)	Low	0.05	0 (0.76)
Incidence of epithelial ovarian cancer	No included studies reported on this outcome						

AMH = anti-mullerian hormone; CI = confidence interval; NA = not applicable; OR = odds ratio; RCT = randomized controlled trial.

Note: This table has not been copy-edited.

Table 12: Summary of Findings by Outcome – Perioperative and 8-Week Postoperative Outcomes in Collins et al. (2019)[11]

Outcome	Number of participants	Unit of measurement	Hysterectomy alone	Hysterectomy with bilateral opportunistic salpingectomy	95% CI	Comment
Duration of surgery	3,147	minutes	114	−2.7	(−5.8 to 0.5)	Difference between groups is not statistically significant.
Perioperative bleeding	3,140	mL	140	−19.9	(−39.8 to −0.1)	Less bleeding in the bilateral opportunistic salpingectomy group.
Blood transfusion	3,122	U	0.08	−0.03	(−0.8 to 0.02)	Difference between groups is not statistically significant.
Hospital Stay	3,104	days	0.7	+ 0.1	(0.02 to 0.18)	Longer hospital stay in the bilateral opportunistic salpingectomy group.
Days to normal ADL	2,422	days	7.7	0.04	(−0.5 to 0.6)	Difference between groups is not statistically significant.
Days out of Work	2,139	days	22	−0.3	(−1.5 to 0.9)	Difference between groups is not statistically significant.

ADL = activities of daily living; CI = confidence interval.

Note: This table has not been copy-edited.

Table 13: Summary of Findings by Outcome – Complications 1 Year Postoperatively, in Collins et al. (2019)[11]

Outcome	Number of participants	Percentage of outcome in hysterectomy alone	Percentage of outcome in hysterectomy with bilateral opportunistic salpingectomy	Effect estimate (95% CI)	Comment
Minor complications	1,610	12.1	16.6	aRR[a]: 1.30 (0.93 to 1.83)	Difference between groups is not statistically significant.
Major complications	1,890	2.6	3.1	aRR[b]: 1.08 (0.52 to 2.27)	Difference between groups is not statistically significant.

aRR = adjusted odds ratio; CI = confidence interval.; vs. = versus.

[a]Adjusted for surgical route, body mass index, smoking status, previous salpingitis.

[b]Adjusted for surgical route, body mass index, age, and type of hysterectomy (total vs. partial).

Note: This table has not been copy-edited.

Table 14: Summary of Findings by Outcome – Menopausal Symptoms 1 Year Postoperatively, in Collins et al. (2019)[11]

Outcome	Percentage of outcome in hysterectomy alone	Percentage of outcome in hysterectomy with bilateral opportunistic salpingectomy	Effect estimate (95% CI)	Comment
Menopausal symptoms	24.1	31.1	aRR[a]: 1.33 (1.04, 1.69)	Increased risk in menopausal symptoms in the bilateral opportunistic salpingectomy group.

aRR = adjusted odds ratio; CI = confidence interval.

[a]Adjusted for age, body mass index, smoking status, parity, American Society of Anesthesiologists Classification.

Note: This table has not been copy-edited.

Table 15: Summary of Findings by Outcome – Time to Menopause, in Chen et al. (2022)[10]

Age group	Number of participants	Hysterectomy alone, mean in years (SD)	Hysterectomy with bilateral opportunistic salpingectomy, mean in years (SD)	Total, mean (SD)	P value	Comment
All	79	2.93 (2.43)	1.84 (1.85)	2.18 (2.09)	0.031	Significantly shorter time to menopause in bilateral opportunistic salpingectomy group.
< 40 years	5	4.60 (NA)	0.44 (0.40)	1.27 (1.89)	NA	Difference between groups is not statistically significant.
40 to 44 years	15	2.86 (2.71)	0.80 (0.75)	1.60 (2.09)	0.094	Difference between groups is not statistically significant.
45 to 50 years	58	2.86 (2.42)	2.21 (1.95)	2.40 (2.10)	0.286	Difference between groups is not statistically significant.

NA = not applicable; SD = standard deviation.

Note: This table has not been copy-edited.

Table 16: Summary of Findings by Outcome – Menopausal Characteristics, in Chen et al. (2022)[10]

Characteristic	Hysterectomy alone, n (%)	Hysterectomy with bilateral opportunistic salpingectomy, n (%)	Total, n (%)	P value	Comment
Hormone therapy use	19 (76)	39 (72.2)	58 (73.4)	0.724	Difference between groups is not statistically significant.
Hot flush	12 (57.1)	21 (38.9)	33 (44)	0.153	Difference between groups is not statistically significant.
Night sweats	5 (25)	12 (22.6)	17 (23.3)	0.529	Difference between groups is not statistically significant.
Sleep problems	9 (41)	7 (13)	16 (21.1)	0.01	Significantly more sleep problems in the bilateral opportunistic salpingectomy group.
Mood changes	0 (0)	4 (7.5)	4 (5.6)	0.285	Difference between groups is not statistically significant.
Dryness	3 (11.3)	6 (11.3)	9 (12.5)	0.440	Difference between groups is not statistically significant.
Dysuria	0 (0)	3 (5.6)	3 (4.1)	0.399	Difference between groups is not statistically significant.

Characteristic	Hysterectomy alone, n (%)	Hysterectomy with bilateral opportunistic salpingectomy, n (%)	Total, n (%)	P value	Comment
Recurrent UTI	0 (0)	0 (0)	0 (0)	1	Difference between groups is not statistically significant.
Sexual dysfunction	1 (5.3)	7 (13%)	8 (11)	0.328	Difference between groups is not statistically significant.

UTI = urinary tract infection.

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Appendix 5: Summary of Economic Evaluations and Committee Opinion of Potential Interest

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Economic Evaluations Regarding Bilateral Opportunistic Salpingectomy

We found 5 economic evaluations[13-15,17,18] that used theoretical cohorts to project the cost-effectiveness of bilateral opportunistic salpingectomy:

- compared to no opportunistic salpingectomy at the time of laparoscopic cholecystectomy (1 study)[13]
- compared to tubal ligation after vaginal delivery (1 study)[14]
- compared to tubal ligation, and no opportunistic salpingectomy at the time of hysterectomy (1 study)[15]
- compared to tubal ligation at the time of Caesarean delivery (2 studies).[17,18]

In all of these studies, authors concluded that bilateral opportunistic salpingectomy was the more cost-effective option.[13-15,17,18] The data from these studies are based on population statistics and theoretical cohorts rather than clinical trials and therefore should be interpreted with caution; however, these findings may provide useful information to decision-makers.[13-15,17,18]

Committee Opinion Regarding Bilateral Opportunistic Salpingectomy

We did not identify any evidence-based guidelines that met methodological requirements for inclusion; however, we did identify 1 committee opinion paper published by American College of Obstetricians and Gynecologists about opportunistic salpingectomy as strategy for epithelial ovarian cancer prevention.[16] The committee concluded that salpingectomy performed during hysterectomy or as a sterilization method does not appear to be associated with increases in adverse events including complications and altered ovarian function compared to hysterectomy alone or tubal ligation.[16] The development of these recommendations and conclusions are not based on systematic methods and therefore should be interpreted with caution; however, they may provide useful information to decision-makers.

Appendix 6: References of Potential Interest

Please note that this appendix has not been copy-edited.

Systematic Reviews

Unclear Methodology

Kahn RM, Gordhandas S, Godwin K, et al. Salpingectomy for the Primary Prevention of Ovarian Cancer: A Systematic Review. *JAMA Surg.* 2023;158(11):1204-1211.

Nonrandomized Studies

Includes Patients With Elevated Risk of Ovarian Cancer

Hanley GE, Pearce CL, Talhouk A, et al. Outcomes From Opportunistic Salpingectomy for Ovarian Cancer Prevention. *JAMA Netw.* 2022;5(2):e2147343.

Economic Evaluations

Theoretical Cohorts

Matsuo K, Chen L, Matsuzaki S, et al. Opportunistic Salpingectomy at the Time of Laparoscopic Cholecystectomy for Ovarian Cancer Prevention: A Cost-effectiveness Analysis. *Ann Surg.* 2023;277(5):e1116-e1123.

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Subramaniam A, Einerson BD, Blanchard CT, et al. The cost-effectiveness of opportunistic salpingectomy versus standard tubal ligation at the time of cesarean delivery for ovarian cancer risk reduction. *Gynecol Oncol.* 2019;152(1):127-132.

Venkatesh KK, Clark LH, Stamilio DM. Cost-effectiveness of opportunistic salpingectomy vs tubal ligation at the time of cesarean delivery. *Am J Obstet Gynecol.* 2019;220(1):106.e101-106.e110.

Guidelines and Recommendations

Committee Opinion

Anonymous. ACOG Committee Opinion No. 774: Opportunistic Salpingectomy as a Strategy for Epithelial Ovarian Cancer Prevention. *Obstet Gynecol.* 2019;133(4):e279-e284.

Review Articles

Zadabedini Masouleh T, Etchegary H, Hodgkinson K, Wilson BJ, Dawson L. Beyond Sterilization: A Comprehensive Review on the Safety and Efficacy of Opportunistic Salpingectomy as a Preventative Strategy for Ovarian Cancer. *Curr Oncol.* 2023;30(12):10152-10165.

Buffeteau A, Tanguy Le Gac Y, Weyl A, Chantalat E, Guerby P, Vidal F. Rationale for opportunistic salpingectomy during gynecological surgery for a benign condition: A review of the available literature. *J Gynecol Obstet Hum Reprod*. 2020;49(8):101829.

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