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## The Effects Of Hormone Replacement Therapy (HRT) On Surgically Postmenopausal Women: A Review Of The Literature

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THE EFFECTS OF HORMONE REPLACEMENT THERAPY (HRT) ON  
SURGICALLY POSTMENOPAUSAL WOMEN: A REVIEW OF THE  
LITERATURE

by

Leslie M. Hertweck

A thesis submitted in partial fulfillment of the requirements  
for Honors in the Major Program in Nursing  
in the College of Nursing  
and in the Burnett Honors College  
at the University of Central Florida  
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## **ABSTRACT**

The primary purpose of this research was to examine the effects of HRT in women with acute estrogen deficiency from surgically induced menopause. The secondary purpose was to evaluate how HRT improves symptoms of acute estrogen deficiency and quality of life (QOL) in women using hormone supplementation. Peer reviewed articles published from 2000 to 2017 that were written in the English language with a focus on the use of HRT in women with acute estrogen deficiency after surgical menopause were evaluated for relevance. Evidence suggests the primary reason for decreased use of HRT is the associated risks outweighing the benefits; however, this is not reflected in health care provider's (HCP's) clinical experience. HCP's were more likely to prescribe HRT for themselves or family members if they were experiencing the negative side effects of estrogen deficiency due to surgical menopause, but not to women in their care with similar clinical manifestations of menopause. Additionally, serious risks associated with HRT for acute estrogen deficiency remain incongruent with HRT for women experiencing natural menopause; although risk for breast cancer due to HRT was a universal concern. Risks of HRT related to thromboembolism, stroke and heart disease, were discussed with comparison to the undesirable clinical manifestations of menopause. Results indicate further education and research is needed that explores the risks and benefits for HRT in women with sudden onset of estrogen deficiency from surgical menopause.

## **DEDICATION**

For the field of nursing, the science it generates,  
and all who pursue, use, add to, and value it.

For my parents, Mike and Jackie,  
who have supported and encouraged all my endeavors  
inside and outside of academia.

For my Oma, Virginia Hertweck,  
who set me on this path long ago  
and never could have guessed that she had.

Finally, for my mentor, Dr. Leslee D'Amato- Kubiet,  
whose wisdom and knowledge I aspire to attain.

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## INTRODUCTION

In the United States (US), it is estimated that 1 in 9 women between 35-45 years of age will undergo a hysterectomy, with another 40 percent also having a bilateral salpingo-oophorectomy (BSO) resulting in premature menopause (<40 years of age) or early menopause (41-45 years of age) (Keshavarz, Hillis, Kieke, Marchbanks, 2002). Surgically induced menopause results in the abrupt onset of menopause before the median age of natural menopause. This results in estrogen deficiency that can lead to uncomfortable side effects within a very brief period of time and with an unknown duration of effect. Hormone replacement therapy (HRT), primarily used to treat acute estrogen deficiency, is the standard drug therapy to alleviate the symptoms of surgically induced menopause. However, after questions arose following the publication of results from the Women's Health Initiative regarding negative long-term effects of HRT, research and development of HRT was drastically reduced in women with surgically induced premature or early menopause (Shuster, Rhodes, Gostout, Grossardt, & Rocca, 2010). Women that have undergone hysterectomy with BSO require estrogen replacement in sufficient doses for a duration of time long enough to reduce the consequences of negative physiologic and psychosocial effects caused by abrupt estrogen deficiency. However, prescribing practices and drug therapy adherence for health-preserving estrogen replacement in women with surgically induced menopause often differs between providers and varies amongst use in women.

A disconnect exists between the need for HRT in women experiencing surgically induced menopause and acute estrogen deficiency that is coupled with a lack of knowledge relating to this type of drug therapy. The health risks and dangers associated with long term use of HRT have negatively influenced estrogen replacement in women with induced, premature or early

menopause, potentially causing more long-term harm than good. Consequently, it can be determined that more research is needed in the area of HRT and the ability of HRT to improve quality of life (QOL) in women who suffer from surgically induced menopause symptoms.

## **PROBLEM**

After hysterectomy with BSO, many women suffer the symptoms of premature or early menopause such as increased irritability, sexual dysfunction, and hot flashes. Oftentimes these symptoms are severe and interfere with activities of daily living. HRT can relieve the symptoms of menopause, however health risks associated with long term use of HRT after natural menopause, such as significantly increased risk for breast cancer and cardiac disease, have overshadowed HRT in cases of abrupt estrogen deficiency, where HRT has a physiologic and psychologic benefit.

Understanding the risks and benefits related to HRT in a woman experiencing the clinical manifestations of estrogen deficiency that is not due to natural causes is vital for health care providers. Providing the best formulation and treatment plans for individually-tailored HRT after surgically-induced menopause can be beneficial to health outcomes in both short term treatment of symptoms and in long term overall health status.

## **PURPOSE**

The purpose of this literature review was to examine HRT in women with acute estrogen deficiency following surgically induced menopause. Sufficient evidence exists to suggest health-related benefits when HRT is initiated and encouraged in women after hysterectomy with BSO. More support is needed to help determine the consistency of HRT replacement practices by providers and reduction of menopause symptoms in women that use HRT following hysterectomy with BSO.

## METHOD

An integrative review of the literature was performed that examined health care provider's use of HRT in women with estrogen deficiency after surgical menopause. Key terms used alone and in combination for the literature search included: "hormone replacement therapy\*", "surgical menopause\*", "TAH-BSO", "health care provider\*", "risks", and "estrogen deficiency\*". Data bases for the search included: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Educational Resources Information Center (ERIC), Elton B. Stephens Co. Host (Ebsco Host), Medical Literature On-line (Medline), and Psychological Information Database (PsychINFO). Inclusion criteria consisted of peer-reviewed articles published from 2000 to 2017 that were written in the English language. Articles were also evaluated for relevance to the topic, which included 1) estrogen deficiency following TAH-BSO and natural menopause, 2) health care provider's perceptions of HRT in surgical and natural menopause, and 3) risks versus benefits of HRT in women with sudden onset of estrogen deficiency. Sentinel articles from earlier studies were analyzed for historical context to the topic. Excluded articles focused on HRT used for conditions that did not involve surgical or natural menopause, health care providers that only used homeopathic or bioequivalent hormone therapies for estrogen replacement, and women using HRT that were still of child-bearing age.

Each article was evaluated and individually critiqued for relevance to the topic and application to HRT in women with estrogen deficiency. Subsequently all the critiques were synthesized by the researcher and key data was extracted. Consistent and inconsistent findings were noted along with gaps in the literature. Recommendations for future research were identified. Implications for nursing practice, policy and education were included along with limitations of this review.

## **BACKGROUND**

### **Natural vs. Surgical Menopause**

In the early 1990's, hormone replacement therapy (HRT) for women experiencing hormone imbalance due to menopause first came into mainstream use as drug therapy to relieve symptoms associated with estrogen loss. Since then, the benefits of HRT have been recognized as an integral therapy in postmenopausal women to help offset the side effects of menopause. The undesirable side effects associated with menopause often include increased irritability, night sweats, fatigue, bone loss, hot flashes, reduced sex drive, and vaginal dryness. The side effects of estrogen deficiency can greatly interfere in a woman's perceived quality of life and can lead to problems such as depression and overall dissatisfaction with quality of life. When a woman reaches the onset of menopause, the unpleasant side effects begin slowly and gradually worsen as hormone levels naturally decline. This process happens at a much slower pace than in women that undergo surgical menopause during a procedure known as a total hysterectomy with a bilateral salpingo-oophorectomy. A bilateral salpingo-oophorectomy with total hysterectomy (TAH-BSO) is a surgical procedure that removes the uterus, ovaries, and Fallopian tubes of a woman who has not gone through menopause.

A TAH-BSO is often performed to eliminate the unpleasant side effects of menstrual disorders, to eliminate cancers from the body, or to reduce risk of developing reproductive tract cancers in women with significant family history. This non-elective surgery is a very serious decision that women of potentially reproductive age must make in order to preserve their own health either in the present or the future. After the procedure, a sudden onset of symptoms similar to natural menopause is often reported to be more intense and long-lasting than a typical menopause trajectory. Women who undergo TAH- BSO experience menopausal symptoms more

rapidly and report greater dissatisfaction with life, and overall decreased quality of life compared to women who go through menopause gradually. Abadi et al. (2018) write that among the 22 Iranian women sampled a “feeling of an invisible wall” was the main theme and the reflection of women's experience of sexual/marital relationship after surgical menopause. The wall felt by these women is an apt analogy to the feelings of sexual dissatisfaction and disfunction experienced by many women who undergo surgical menopause. Further exploration of sexual function and the effects of both surgical and natural menopause was done by Toptan and Yildiz (2012) who determined a significant positive relationship between the intensity of the symptoms experienced in menopause and the problems experienced in sexual functions, especially in women who underwent surgical menopause. The positive relationship found between menopause symptom levels and the levels of sexual function problems indicates the importance of managing symptoms in menopausal women: as such, the better women are able to manage their menopausal symptoms, the more sexual functions will be positively affected (Toptan and Yildiz, 2012). In addition to the psychological symptoms, increased risk of osteoporosis, heart disease, and stroke, due to estrogen deficiency can affect physical well-being during the changes that occur in menopause. The clinical manifestations of estrogen deficiency after TAH-BSO are mostly preventable through the use of hormone replacement therapy.

### **Perception of Hormone Replacement Therapy**

HRT in post-menopausal women has had a controversial past. The Women's Health Institute released a paper advising against HRT in the early 2000s, and a moratorium was effectively instituted against hormone replacement in post-menopausal women. The risks of HRT also included women with acute estrogen deficiency due to surgical menopause. The risks associated with HRT have been further researched in the last 10 years, resulting in significant

benefits in the advancement of treatment specific to women with a rapid onset of estrogen deficiency caused by TAH-BSO. However, many health care providers remain reluctant to prescribing HRT in women with estrogen deficiency after TAH-BSO.

One Latin American study shows that the average provider will only prescribe hormone replacement therapy to 50% of their client population that has shown need (Danckers, et al., 2016). Many providers continue to believe that hormone replacement therapy can cause more harm than good. Numerous Studies have raised concerns regarding the risk-benefit ratio of hormone replacement therapy. The most common perceived risks of HRT in post-menopausal women are breast cancer and thromboembolism, as well as stroke and heart disease (Chubaty, Shandro, Schuurmans, & Yuksel, 2011). Subsequent studies have shown that the risks associated with HRT affect an average of 6 out of 1000 women that use hormone replacement therapy (Beral, Banks, & Reeves, 2002). Due to the systemic effects of ovarian hormones, other areas of the body must also be considered when looking at potential risk. Bone mineral density reduction is also a concern following surgical and natural menopause. At this time, no evidence exists to say that surgical menopause makes this condition worse over time (Fakkert et al., 2017).

Psychological concerns have also been noted in women, who often see an increase in, or new onset of, anxiety attacks following surgical menopause due to the physiological loss of estrogen. Anxiety attacks are often more prominent in women with no prior psychological history of such attacks (Chung-Park, 2005). The most common complaint from women who undergo this procedure is decreased vaginal lubrication. Decreased lubrication leads to sexual dissatisfaction and a less-positive body image perception (Kokcu et al., 2015). Finally, it has also been shown that hormone therapy does not prevent stroke occurrence but does have a small but statistically significant increase in ischemic stroke risk with standard doses of estrogen as well as

with estrogen and progesterone combined (Lobo, 2007). All such risks have been evaluated and have been shown to have a marginal effect on women.

### **Actual Use of HRT**

Inconsistencies exist regarding prescription practices of health care providers offering women HRT after TAH-BSO. Approximately 80% of providers in a Latin American study said that they would prescribe hormone replacement therapy to themselves or a loved one who was experiencing the symptoms of sudden onset menopause. The same practitioners also report a 30 to 50% prescription rate for women in their practice who exhibit the same signs and symptoms they would treat themselves for (Danckers, et al., 2016). Similar studies offer no reason for a lack of HRT prescription other than perceived risk. This inconsistency between ideology and practice needs to be more thoroughly assessed. Gender concerning health care providers was of significant value for inconsistencies related to HRT in surgical menopause. Male providers were less likely to empathize with the signs and symptoms that are presented by women who undergo surgical menopause procedures. However, empathy only increases slightly within female practitioners (Danckers, et al., 2016).

### **Summary**

Overall, further education and research is needed for healthcare providers and women, regarding the need for HRT in women with acute estrogen deficiency from TAH-BSO. Use of HRT in women with acute estrogen deficiency can help improve physiologic and psychosocial well-being in women following TAH-BSO through relief of acute estrogen deficiency symptoms, such as hot flashes, hair loss, and fatigue. The literature suggests that the long-term benefits of HRT for surgically induced menopause outweigh the risks for harm. HRT can

improve long term health status for disease prevention and slow the progression of chronic disease processes.

## **RESULTS**

### **Natural and Surgical Menopause**

Twenty-nine articles related to HRT use in surgically postmenopausal women were included in this review of literature. Of these articles, the majority (14) were cross-sectional by design, with other categories including meta-analysis, randomized controlled trials, longitudinal studies, case reports, and descriptive research. The majority of the studies were published within the last ten (10) years with several outliers included due to background information valuable to the topic. Cross-sectional studies included primarily used validated surveys and questionnaires as assessment tools. Meta-analysis included two or more related studies that had clinical impact on the use of hormone replacement therapy. Randomized controlled trials were mostly done in animal populations to explore the effects of hormone replacement therapy. Case reports (2) were also gathered to show the severity of menopausal symptoms associated with acute estrogen deficiency initiated by surgical menopause. One position statement by The North American Menopause Society was also included due to recent publication and relevance to the topic.

The majority of amassed research in this literature review states that hormone replacement therapy has more benefits than risks. One of the main benefits reported from use of HRT includes reduced or eliminated symptoms of menopause including hot flashes, mood dysregulation, insomnia, and night sweats. Additional research indicates improvements in sexual relations and satisfaction do to increase vaginal lubrication (Kocku et al., 2015). Kocku et al. (2015) also determined that women who underwent surgical menopause experienced more profound vaginal dryness than women who went through natural menopause. Hormone therapy such as progestin creams were found to improve vaginal lubrication in this population. Use of hormone replacement therapy in surgically postmenopausal women also led to a decreased

perception of severity of surgery, meaning that women prescribed HRT were less likely to negatively perceive their surgery in terms of post-surgical menopausal symptoms severity (Tucker et al., 2016).

Hormone replacement therapy has been shown to affect multiple body and organ systems in the women who use it. One study indicated that pre-surgical diagnoses of anxiety and depression were augmented by acute estrogen deficiency that resulted from surgical menopause were both found to be reduced or relieved by hormone replacement therapy (Chung-Park, 2006). Colorectal cancer and femoral neck fractures were also found to be reduced after a five-year period of use in 1.7 / 1,000 users aged 50 to 59 years and 5.5 in 1000 users ages 60 to 69 (Beral, Banks, & Reeves, 2002). Fakkert et al. (2017) conducted a seventeen (17) study meta-analysis that indicated bone mineral density after surgical menopause was significantly lower than in premenopausal age matched women but not lower than in women with natural menopause. However; HRT has been found to reduce the incidence of bone fractures due to decreased mineral density in other trials (Buist et al., 2004). HRT has also been found to positively influence a limited number of olfactory and cognitive measures during menopause. These measures were specifically related to odor memory and discrimination which were both positively influenced by HRT with some additional implications in reducing the incidence or severity of Alzheimer's type dementia in postmenopausal women (Doty et al., 2015). Research has also demonstrated that surgical menopause correlates with a faster decline in certain cognitive domains, and early start of postmenopausal hormone therapy serves as a protective factor for this decline (Pines, 2014).

Finally, limited research also existed to demonstrate that HRT reduces the incidence of diabetes mellitus in postmenopausal women. A similar study also demonstrated that estrogen

therapy could improve glycemic control in postmenopausal patients with type 2 diabetes, although disparate results have also been reported (Otsuki et al., 2007). Even positive cardiovascular effects are reported with use of HRT, contrary to previous thought. Sanghvi et al. (2018) report that HRT use was not associated with adverse, subclinical changes in cardiac structure and function but was associated however; with, significantly smaller left ventricle and left atrial chamber volumes, which are linked to favorable cardiovascular outcomes.

### **Provider Perceptions of Hormone Replacement Therapy**

The literature review also revealed a discrepancy between provider attitudes toward HRT and their rates of prescription. Two articles that discussed prescriber patterns showed that prescribers were very willing to prescribe HRT to themselves or a family member experiencing symptoms of surgical menopause but were not as willing to prescribe such treatment to their clients. One study specifically found that though 85.4% of providers would use HRT for themselves or a partner, only 48.9% of women who showed a need for this therapy were given a prescription. This same study also revealed that approximately 40% of providers surveyed placed a risk level severity of 5/10 on the use of HRT, citing that thromboembolism and breast cancer development were the highest perceived risks (Danckers et al., 2016).

The second article that highlighted the discrepancy between provider practice and personal beliefs sought to determine whether physician's confidence in the use of HRT for climacteric symptoms had been affected by the negative media interpretation of HRT that has emerged from recent research. The article reveals that 78% of physicians interviewed felt that recent negative portrayal of HRT by the media was unjustified, and that the majority of Physicians surveyed (90%) believe that the benefits outweigh the risks of HRT in suitable cases. Additionally, almost all physicians (97%) believe that the majority of women experienced

positive health benefits which HRT. Similar to the previously cited article almost all physicians (96%) would treat themselves spouse or family member with hormone replacement therapy (Birkhauser and Reinecke, 2008).

The third article that discussed provider practice in HRT usage revealed that of the 70 women sampled, only 40% were prescribed HRT after a surgical menopause procedure. Approximately 10 months after the surgery, when the survey was administered, only 33% of the women were still taking their prescribed regimen. When this rate was compared to similar studies done in North America it was approximately 40% lower than previous rates of prescription and adherence. This is likely due to the impact of the WHI report regarding HRT use and risk (Chubaty, Tami, Shandro, Schuurmans, & Yuksel, 2011).

The overall attitude surrounding HRT in this literature review is skeptical regarding the effects of long and short-term use of HRT. The majority of these concerns are founded in the research from the WHI paper which stated that HRT use could be correlated to breast cancer development, as well as thromboembolism, stroke, and cardiac disease (Writing Group for the Women's Health Initiative Investigators, 2002). What has been discovered since research has been continued is that though these risks are present, they are in very small numbers. The cumulative risk for these diseases and conditions is approximately 1 in 1000 cases (Beral, Banks, & Reeves, 2002). Educating providers regarding the prevalence of these risks is necessary to ensure that they are educated enough to prescribe and discuss this medication option with the women who show a need for this therapy.

### **Prescription Adherence and Therapy Continuation**

An unexpected finding across several research studies analyzed relates to prescription adherence. It was noted that when groups of women were assigned HRT after their surgical

menopause procedure only a handful of them were still taking their prescribed regimen when the studies were conducted, an average of six months to a year later (Chubaty, Tami, Shandro, Schuurmans, & Yuksel, 2011). The reasons for therapy termination were not determined by the studies but are worth studying in the future. Understanding the actual client-experienced side effects and both long and short-term feelings towards hormone replacement therapy is integral to understanding usage patterns of HRT over time. If the prescribed therapy does not work for a woman, that woman is more likely to not adhere to the prescribed regimen and not receive the benefits of the therapy. Understandably, each woman who is prescribed hormone replacement therapy had different hormones from others before their procedure, and all will have varying hormone levels post-surgically as well.

Due to standardized research and case study reports, it is understood that differences exist between women who undergo surgical menopause and are prescribed hormone replacement therapy. Tailoring HRT dosages to the individual who has undergone a TAH-BSO is vital to ensuring that all women are given the opportunity to come back from recovery with balanced hormones. Changing the focus from an estrogen-progestin base to a formulation that consists of estrogen is shown to reduce the long-term risks associated with HRT and should be more thoroughly researched (Jin, 2017). Additionally, conjugated equine estrogen (CEE) use among postmenopausal women was not associated with risk of all-cause, cardiovascular, or cancer mortality during a cumulative follow-up of 18 years after a usage period with a median of 7.2 years (Manson et al., 2017). Lack of adherence must also be studied in these populations so that perceived and actual effectiveness of hormone replacement therapy can be compared and contrasted side by side in a way that sheds light on potential future practice patterns.

## **DISCUSSION**

The studies reviewed in this work provide insight into the benefits and risks HRT as well as prescription patterns and women's adherence to treatment. Research findings revealed the role and potential use of HRT in managing the menopausal symptoms of acute estrogen deficiency induced by surgical menopause. While the review of literature showed occasional mixed results, the use of HRT exhibits several positive effects on client outcomes. The literature also suggested that more research needs to be done into the long-term effects of HRT in order to help women make educated choices regarding their care after surgical menopause.

### **Natural vs. Surgical Menopause**

After conducting a multi-layer search of hormone replacement therapy for surgically postmenopausal women it has been suggested that two types of hormone loss exist: acute and chronic. Natural menopause results in a long-term or chronic deficiency in gonadal hormones that cause the expected manifestations of menopause as they deplete. Natural menopause has the benefit of occurring more slowly than surgical menopause, meaning that hormone levels drop gradually over time instead of instantaneously. Surgical menopause results in an acute cessation of hormone genesis by the removal of the glands and organs that create them. Such rapid of hormone generation causes the same symptoms as natural menopause, but to a greater severity that negatively impacts quality of life.

Differentiating between acute and chronic hormone loss shows the need for even temporary hormone replacement therapy in surgically postmenopausal women to soften the blow of acute hormone loss. By starting women on HRT regimens immediately after surgery and weaning them off slowly, the more severe adverse effects of menopause become diminished and

approximately equal to the severity of side effects experienced in natural menopause. One study indicated that the only statistical difference between the after effects of surgical and natural menopause was lubrication. Vaginal lubrication was found to be more profoundly affected in women who underwent surgical menopause, but this effect was reduced with the addition of HRT to the post-surgical medical routine (Kocku et al., 2015).

While the initial impact of surgical menopause is intense, over time the hormone deficiency is adjusted to, and symptoms become more typical of natural menopause. Replacement therapy can be used to dull the effects of sudden onset menopause as has been discussed. From this literature review it has been gathered that the use of hormone replacement therapy for a short period of time does not cause the long-term negative side effects that were indicated in previous research. In fact, it has been determined by one study that a five to seven-year usage of hormone replacement therapy is not associated with risk of all-cause, cardiovascular, or cancer mortality during a cumulative follow-up of 18 years (Manson et al., 2017). Educating women regarding the differences between acute and chronic hormone loss is important because the differences between the severities of both types of hormone withdrawal are vast. Understanding the ways the body will react to hormone reduction is also important when deciding between treatment options for replacement therapies.

### **Current Use of Hormone Replacement Therapy**

Hormone replacement therapy has been evaluated time and time again to determine if benefits outweigh risks associated with the therapy. Current literature suggests that overall, providers and prescribers of hormone replacement therapy have a positive opinion of hormone replacement therapy as it relates to reducing the climacteric effects of menopause. Multiple study

suggested that providers would prescribe hormone replacement therapy for themselves or their loved ones if they were experiencing the symptoms of surgical menopause (Danckers et al., 2016; Birkhauser and Reinecke, 2008). As was stated before, the main determinant of hormone replacement therapy use in a client population is the conflicting information given regarding the risk to benefit ratio for Moen replacement therapy.

Even when hormone replacement therapy is prescribed a majority of women stop taking the therapy within a year of prescription (Chubaty, Shandro, Schuurmans, & Yuksel, 2011). more research needs to be done in two reasons why women are stopping HRT before the end of their treatment plan. It can be assumed that women who stop therapy before the end of its course are unhappy with the way the therapy interacts with their body systems. An emphasis has been recently placed on individualized therapies regarding hormone replacement for women with surgical menopause. Individualized therapy promotes patient adherence in that hormone needs are being met to the degree that they are needed in the individual woman as opposed to being made on a generalized scale. Moving forward, individualized hormone levels testing needs to be implemented in women who are prescribed HRT so that their pre-surgical hormone levels are more efficiently reestablished after surgical menopause.

### **Quality of Life on Hormone Replacement Therapy**

The main indication of HRT in surgically postmenopausal women is the relief of climacteric symptoms associated with acute estrogen deficiency. Micronized progesterone administered to postmenopausal women leads to significant improvements in quality of life measures based on specific menopausal symptomatology. Symptoms that are improved by HRT use include sleep problems, anxiety, cognitive difficulties, feelings of attraction, sexual

functioning, and vasomotor symptoms (Fitzpatrick, Pace, & Wiita, 2000). In this literature review, the most frequently reported positive outcome of HRT use is actual or perceived increase in sexual desirability and function. Most women reported that when these feelings of desirability and attractiveness were increased, other vasomotor and psychomotor symptoms were also reduced (Tucker et al., 2016). This finding lends credence to the idea that surgically induced menopause is a procedure with just as many psychological consequences as well as physical. Ensuring that providers are aware of the psychological effects of a TAH-BSO will promote not only the use of HRT but other methods of menopausal symptom control. Increasing symptom control in surgically postmenopausal women will lead to an increase in positive outcomes post-surgically.

### **Benefits of Hormone Replacement Therapy**

As with any type of medical intervention, risks and benefits need to be evaluated on both a population and individual basis. After the Women's Health Initiative released their research in 2002 regarding high risks associated with HRT, prescription rates dropped by approximately 60% (Hersh, Stefanick, & Stafford, 2004). Research involving HRT also dropped off as it was deemed unsafe to continue research on human subjects. The cessation of research that resulted from the release of the Women's Health Initiative paper posed a severe problem for the development of hormone replacement therapy that is still being felt today. After the advent of the WHI, many studies were conducted that more closely examined the benefits of hormone replacement therapy as it affects multiple body and organ systems. The temporary cessation of

hormone replacement therapy research ultimately served to create an exponential increase in research pertaining to risks and benefits of hormone replacement therapy.

### **Barriers to Implementation**

The main barrier to implementation of HRT is a perceived lack of knowledge regarding the benefits and risks of the therapy. While a wide dearth of research exists regarding the benefits and risks of HRT, prescribers still remain on the fence regarding the validity of these results. Overall opinions of hormone replacement therapy are favorable with a majority of physicians stating that they would prescribe the therapy to themselves or their loved ones if experiencing the symptoms associated with acute estrogen deficiency (Danckers et al., 2016; Birkhauser and Reinecke, 2008). The core factor in the lack of prescription of hormone replacement therapy lies in a lack of longitudinal research that is able to significantly compare benefit-to-risk ratios. As the time this therapy is commercially available increases, more crystallized results regarding an actual benefit-to-risk ratio will be found. The fear of possible negative client outcomes is a major preventive factor for the prescription of hormone replacement therapy in the opinion of many prescribers. What should be more important than prescriber preference is client preference. Women need to be educated regarding their post surgical options in menopausal symptom management, including HRT and other non-pharmacological options. As time progresses, information will become more readily available and more informed decisions will be able to be made by women who undergo surgical menopause.

## LIMITATIONS

Several limitations were noted in this review of the literature. Initial search results revealed numerous findings on keywords hormone replacement therapy, surgical menopause, and women; however, fewer original research articles were relevant to the purpose of this investigation. Fewer than ten (10) initial results met inclusion criteria for this review of literature. Search terms were expanded to include keywords including postmenopausal, sexual satisfaction, and bioidentical in order to provide more search results. This limitation is an indication of the lack of research pertaining to women who have undergone surgical menopause and indicates a need for more research pertaining to this population. Inclusion and exclusion criteria are subjective in nature, and that's limit this review of literature.

Many of the studies were limited by small sample sizes and small durations. Only a few studies were longitudinal and collected data for over a year. the majority of studies included small but specific populations, which limits the generalizability of the findings. the largest sample size was over 10,000 women in size, but only served to describe use of hormone replacement therapy during a time when it was not widely prescribed (Beral, Banks, & Reeves, 2002)). Reasons for taking hormone replacement therapy we're not delineated in this study, and therefore results cannot be ascribed to women who have undergone surgical menopause.

Retention of participants also posed a problem in evaluating the long-term effects of hormone replacement therapy. Several studies noted that a high attrition rate existed within their studies meaning that not all women who were prescribed hormone replacement therapy followed through in the manner in which they were instructed. Having a limited number of longitudinal studies further limits this literature review due to the lack of information regarding long term use of hormone replacement therapy. It is important to note however; that it is not uncommon for

research studies requiring regular medical intervention to have high rates of attrition has some participants may not find the therapy beneficial, insurance is changed, or the participant moves out of the demographic targeted by the study.

## **RECOMMENDATIONS FOR HORMONE REPLACEMENT THERAPY**

### **Implementation of Hormone Replacement Therapy**

Hormone replacement therapy is a treatment option for the severe after-effects of surgical menopause that can improve quality of life in women who participate in the therapeutic regimen (Rodriguez and Shoupe, 2015). Health care providers play a significant role in the implementation of hormone replacement therapy for surgically postmenopausal women.

Research overall has shown the benefits of hormone replacement therapy and surgically postmenopausal women range from improvement in quality of life to improvement in function of organ systems. The use of HRT to reduce the severity of menopausal symptoms following surgical menopause is dependent on both the prescriber and the woman receiving the therapy. A discrepancy has been shown between personal opinion and actual practice of providers regarding hormone replacement therapy (Danckers et al., 2016). Understanding the risks and benefits of HRT is a burden that should be equally shared between the prescriber and the recipient of the therapy. Open communication between prescribers and HRT recipients promotes safe and effective use of the therapy.

Education regarding hormone replacement therapy should be standard practice for women who are preparing to undergo surgical menopause. By having an understanding of the therapy, prescribers have the ability to help women make informed decisions regarding their treatment plans after their surgery. Tasneem et al. (2017) found that in addition to education among providers lacking in breadth and scope, no decision aid tool (DAT) exists to help women make decisions regarding management of their menopausal symptoms. In fact, most DATs focused on HRT as the only treatment option for menopausal symptoms which excludes many other treatment options available to surgically postmenopausal women (Siyam, Sultani, Ross,

Chatterley, & Yuksel, 2017). More research is also needed in this area in order to delineate the risks and benefits of hormone replacement therapy in this population more firmly. Healthcare providers can play an equal role in both client education and research development regarding HRT.

### **Research**

Further research is needed to help healthcare professionals weigh the risks and benefits of hormone replacement therapy as they pertain to individual women. Generalizations about HRT and its effect on the surgically post-menopausal woman are dangerous in that they do not account for the baseline health differences between women in a similar population.

The majority of studies gathered in this literature review used relatively homogeneous populations to study the risks and benefits of HRT. In order for search results to be more generalizable to the overall population research studies need to pull from a heterogenous pool of participants that vary in age and demographic information. Additionally, sample sizes need to be increased in size as well as diversity. Several studies pulled had high rates of participation but even these were subject to significant attrition rates over the time in which the study was conducted. As HRT is continually used in practice for women who have undergone surgical menopause it will become easier to create longitudinal studies that clearly demonstrate the long-term effects of hormone replacement therapy.

Further research is also needed to determine if non-prescription from prescribers is the main reason that women are not taking hormone replacement therapy after surgically induced menopause, or if the reason is multifactorial. One study indicated that of women taking hormone replacement therapy immediately after surgical menopause, only 33% percent were still taking

therapy after 10 months (Chubaty, Shandro, Schuurmans, & Yuksel, 2011). The reasons behind this elevated level of non-compliance with HRT post surgically needs to be examine in a homogeneous and large population in order to determine perceived effectiveness of hormone replacement therapy in this population.

### **Education**

Education of healthcare providers is essential to successfully implement hormone replacement therapy used in surgically postmenopausal women. Literature findings suggest that women are interested in using medical intervention in order to reduce the severity of menopausal symptoms associated with surgical menopause, but that public opinion and discourse do not allow for information regarding safe practices to be widely disseminated (Burrell, Valledor, Crowe, & Whitehead, 2010). A foundation of knowledge is needed to understand the overall long and short-term effects of HRT. Any member of the healthcare team who will be interacting with a woman using HRT needs a fundamental knowledge regarding the therapy and its implementation.

In addition to having an internal wealth of knowledge, healthcare providers need to have resources available to show women who have undergone surgical menopause. The information disseminated by these resources should be factual, current, and simply stated in order to achieve maximum benefit. This information should also be available regarding different formulations of hormone replacement therapy including the estrogen-only modality that is gaining interest in recent years (Jin, 2017). Bioidentical hormones should also be considered as they are also in a developing field (Manson et al., 2017). What remains after all this information is gathered and distributed to women is making sure that the physician or prescriber of HRT as well as the entire

healthcare team, is able to follow up with the woman on this therapy in order to ensure that best practice is being used. Women who are followed closely throughout their therapy feel that they are able to freely discuss their treatment and manage it with the healthcare team which leads to better adherence and satisfaction in the long run (Pezaro et al., 2012).

### **Medical Practice**

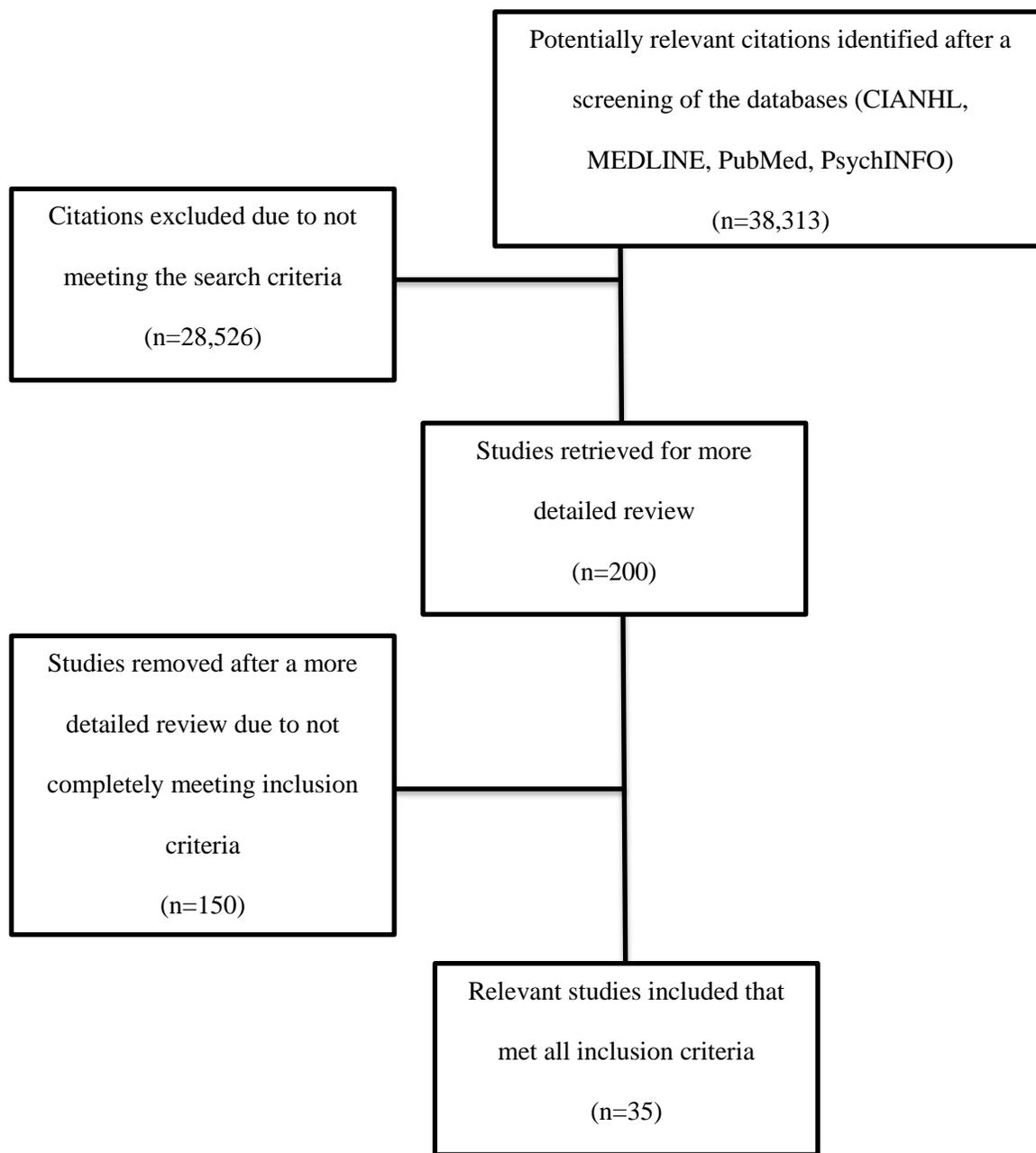
Implication of hormone replacement therapy has many implications for all members of the healthcare team. Prescribers, including doctors and nurse practitioners, need to have a firm understanding of their clients Baseline health and needs before prescribing or using any form of hormone replacement therapy. Individually tailoring therapy to women who have undergone surgical menopause is important so that she receives the maximum benefit from her prescribed therapy. Regular follow-up and evaluation of lab values needs to be implemented as a protocol to ensure continued benefit over the course of the therapy. Phlebotomists and lab technicians need to ensure that the woman receiving HRT is regularly being brought in for blood draws and lab evaluations in order to keep hormones within a prescribed therapeutic range. Nurses also play an important role in the delivery of HRT due to having a high level of direct patient contact. The nurse is especially responsible for having factual information regarding HRT as they are often the first person a woman sees when coming to a medical facility. Nurses need to have a wealth of knowledge regarding HRT as they are often the sounding board for questions and concerns regarding all types of medical intervention.

### **Conclusion**

Hormone replacement therapy has the potential to change the way women recover from surgical menopause. Prescribers need to understand the risks and benefits of HRT in order to

help women create a treatment plan that helps them manage the negative side effects of surgical menopause. This literature review suggests that HRT overall benefits women who have undergone surgical menopause by reducing the severity of the menopausal symptoms felt after a TAH-BSO (Kaur, Malla, & Gupta, 2017). However, some professionals are still unsure if the benefits actually do outweigh the risks when prescribing hormone replacement therapy and believe that hormone replacement therapy needs to be more thoroughly examined for adverse long-term effects when used in this population (Crauciuc et al., 2013). The North American Menopause Society has recently released a statement that is supported by over twenty international agencies considered to be experts in menopause and women's health. This statement declares that: "Hormone therapy (HT) remains the most effective treatment for vasomotor symptoms (VMS) and the genitourinary syndrome of menopause (GSM) and has been shown to prevent bone loss and fracture. The risks of HT differ depending on type, dose, duration of use, route of administration, timing of initiation, and whether a progestogen is used. Treatment should be individualized to identify the most appropriate HT type, dose, formulation, route of administration, and duration of use, using the best available evidence to maximize benefits and minimize risks, with periodic reevaluation of the benefits and risks of continuing or discontinuing HT" (The North American Menopause Society, 2017). Additional research needs to be done into the new formulations for HRT for equal or better effectiveness with the potential of fewer adverse health outcomes.

## APPENDIX A: FIGURE



Key Search Terms = surgical menopause AND hormone replacement therapy AND menopause AND risks AND uses

Limiters = English language, peer-reviewed, full text online, publication date from 2000 to present

**Figure 1: Consort Diagram of Thesis Methodology**

## APPENDIX B: TABLE

**Table 2: Table of Evidence of Reviewed Literature**

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Beral, V., Banks, E., &amp; Reeves, G. (2002). Evidence from randomised trials on the long-term effects of hormone replacement therapy. <i>Lancet</i>, 360(9337), 942.</p>	<p>Systematic review  Four trials analyzed</p>	<p>N = 20,000 over four studies</p>	<p>To determine the effects of hormone replacement therapy over long-term in regard to cancer of the breast, endometrium, and colorectum; coronary heart disease; stroke; pulmonary embolism; and fractured femur neck</p>	<p>Increased risk of disease as a result of using HRT for over 5 years.  These disease risk odds increase with increased age, and are anywhere between 1.7 - 12 cases per 1000</p>	<p>Use of HRT over a five-year period by healthy postmenopausal women is estimated to cause extra breast cancer, stroke, or pulmonary embolus in about 6 per 1000 users. however, incidences of colorectal cancer or fractured neck of femur is reduced to 1.7 per 1000 users</p>	<p>More research needs to be done to determine if rare conditions are affected by HRT.  Increase disease risk must also be determined when utilizing other formulations of hormones such as oestrogen or progestin.  Actual percentage of acquiring disease must be discussed while determining HRT formulations.</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Birkhäuser, M. H., &amp; Reinecke, I. (2008). Current trends in hormone replacement therapy: perceptions and usage. <i>Climacteric</i>, 11(3), 192-200. doi:10.1080/13697130802060455</p>	<p>Structured questionnaire completed via internet</p> <p>Cross-sectional survey</p>	<p>N= 600 physicians</p> <p>Physicians who specialize in treating menopausal women</p> <p>Physicians were recruited from the United States, France, Germany, the United Kingdom, Sweden, and Poland</p>	<p>To determine whether positions confidence in the use of HRT has been affected by negative media interpretation of data from studies investigating HRT such as the Women's Health Initiative study</p>	<p>A profession wide knee-jerk reaction occurred when the WHI released evidence that hormone replacement therapy was more detrimental than beneficial</p> <p>5 years after that study was released, the evidence was reevaluated and found not as jarring</p>	<p>Almost all Physicians would treat themselves with HRT if they were having the same symptoms</p> <p>78% of Physicians felt that the recent negative portrayal of HRT by the media was unjustified</p> <p>90% of Physicians believe that the benefits outweigh the risks of HRT in suitable patients</p>	<p>Doing a critical evaluation of evidence before all turn treatment plans is necessary in order to promote the highest quality of patient care.</p> <p>It is important to never abandon the old or adopt the new too quickly</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Buist, D. S., Newton, K. M., Miglioretti, D. L., Beverly, K., Connelly, M. T., Andrade, S., . . . Kessler, L. (2004). Hormone Therapy Prescribing Patterns in the United States. <i>Obstetrics &amp; Gynecology</i>, 104(5), part 1, 1042-1050. doi:10.1097/01.aog.0000143826.38439.af</p>	<p>Observational cohort study</p> <p>Used automated Pharmacy data to identify all oral and transdermal estrogen and progestin dispensed during the study.</p>	<p>N= 169586</p> <p>Women aged 40 - 80 years old who were enrolled in five Health maintenance organizations in the United States</p>	<p>Examine prescribing patterns for estrogen plus progestin and estrogen alone in the United States in the 2 years before the published results of women's health initiatives (WHI) hormone therapy trials early termination and for 5 months after they release</p>	<p>WHI hormone therapy trial indicated that the risks of using hormone therapy outweigh the benefits for women without menopausal symptoms</p> <p>many women were not aware of the results of the WHI trial</p>	<p>The diffusion of the WHI hormone therapy trial results had it in media impact on the discontinuation of hormone and estrogen therapy and is likely responsible for the decline in the initiation of the Therapies</p>	<p>Informing women regarding the risks and benefits of HRT helps them to make an educated decision regarding their treatment.</p> <p>Further exploration of why women continue to use hormone replacement therapy are indicated</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Chubaty, A., Shandro, M. L., Schuurmans, N., &amp; Yuksel, N. (2011). Practice patterns with hormone therapy after surgical menopause. <i>Maturitas</i>, 6969-73. doi:10.1016/j.maturitas.2011.02.004</p>	<p>Cross-sectional chart review with telephone follow-up</p>	<p>N = 70</p> <p>Charts selected using ICD 10 codes for hysterectomy and BSO</p> <p>Participants were women between the ages of 20 and 50 who had hysterectomy or BSO between December 1st 2006 and November 30th 2007</p>	<p>To describe practice patterns with HRT in women after surgical menopause and to describe their experience of hot flashes and other menopausal symptoms</p>	<p>Many women are not being prescribed hormone replacement therapy after hysterectomy and BSO procedures</p>	<p>HRT can be beneficial in preventing cardiovascular disease and osteoporosis in women who undergo surgical menopause. However, over two-thirds of women were not on HRT after surgical menopause and as a result were having daily hot flashes</p>	<p>More education prior to surgery or a discharge may increase HRT prescription rates.</p> <p>Increase in prescription rates will reduce the incidence of menopausal symptoms in surgically postmenopausal woman</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
Chung-Park, M. (2005). Anxiety attacks following surgical menopause: a case report. <i>Holistic Nursing Practice</i> , 19(5), 236-240.	Clinical case report/ research synthesis	Clinical case was female 45 years old, gravida 3, para 2 who underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy	To determine a causal relationship between surgical menopause and increased anxiety attacks	Women experience mood disorders more often than men  Symptom severity varies between women. The severity is increased in women with pre-existing mental health conditions	Psychological disorders can be a result of menopause.  These findings are more severe in cases of surgical menopause.  To help reduce these symptoms, an HRT regimen should be considered	Gathering a psychiatric history for patients undergoing surgical menopause is important.  Hormone replacement therapy should be considered in women with a history of psychiatric disorders, or who are at risk for developing such a disorder

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Danckers, L., Blümel, J. E., Witis, S., Vallejo, M. S., Tserotas, K., Sánchez, H., &amp; ... Chedraui, P. (2016). Personal and professional use of menopausal hormone therapy among gynecologists: A multinational study (REDLINC VII). <i>Maturitas</i>, 8767-71. doi:10.1016/j.maturitas.2016.02.015</p>	<p>Cross-sectional</p> <p>A self-administered and anonymous questionnaire was delivered to certified gynecologists in 11 Latin American countries</p>	<p>N=1837</p> <p>Mean age was 48.1, 55.5% were male</p>	<p>To determine the use of HRT and perceived related risks among gynecologist</p>	<p>Percentage of women using HRT is very low, possibly related to lack of prescription</p> <p>Gynecologists surveyed were mostly supportive of HRT use if menopausal symptoms were present</p> <p>Gynecologists are still concerned about the risk of breast cancer and thromboembolism</p>	<p>The main reason for the low rate of hormone replacement therapy use is lack of prescription</p> <p>Latin American gynecologists are mostly supporters of HRT use for themselves or their partners</p> <p>This belief does not translate into clinical practice with clients</p>	<p>Education of women regarding HRT is important</p> <p>Education can guide women to ask the right questions regarding HRT</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Doty, et.al (2015). Influences of hormone replacement therapy on olfactory and cognitive function in postmenopausal women. <i>Neurobiology of Aging</i>, 36(6), 2053-2059, <a href="https://doi.org/10.1016/j.neurobiolaging.2015.02.028">https://doi.org/10.1016/j.neurobiolaging.2015.02.028</a>.</p>	<p>Cross-sectional</p> <p>a series of olfactory and cognitive tests were given during a 5 hour session</p> <p>Peripheral venous blood was then collected for hormone assays</p> <p>Study was single blinded</p>	<p>N = 432</p> <p>healthy postmenopausal women with varying histories of HRT treatment</p>	<p>To evaluate the influences of HRT on tests of odor identification, detection, memory discrimination, and cognition</p>	<p>Gonadal hormone deficiency can lead to cognitive decline</p> <p>Decreased olfaction can be an early sign of Alzheimer's dementia</p> <p>Beginning hormone replacement therapy soon after menopause produces the greatest benefit</p>	<p>After controlling for age and IQ odor memory and discrimination is positively influenced by HRT</p> <p>HRT was found to have a positive effect on results from the National Adult Reading Test (NART-IQ)</p>	<p>Understanding the role of gonadal hormones in memory and cognition can help the healthcare team direct women with risk of memory impairment toward the use of hormone replacement therapy soon after menopause</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Fakkert, I., Teixeira, N., Abma, E., Slart, R., Mourits, M., Bock, G., &amp; ... de Bock, G. H. (2017). Bone mineral density and fractures after surgical menopause: systematic review and meta-analysis. <i>BJOG: An International Journal of Obstetrics &amp; Gynaecology</i>, 124(10), 1525-1535. doi:10.1111/1471-0528.14703</p>	<p>Systematic review and meta-analysis conducted by a literature search</p>	<p>17 studies were included comprising 43386 women with surgical menopause</p> <p>10 studies provided sufficient data for meta-analysis</p>	<p>To investigate bone mineral density and Fracture prevalence after surgical menopause</p>	<p>Sudden drop in hormones caused by surgical menopause can possibly increase the risk of bone fracture</p> <p>Gradual tapering of hormones in natural menopause possibly leads to a less severe increase in bone fractures</p>	<p>Lumbar spine and femoral neck fractures are more common in women with surgical menopause than in premenopausal age-matched women</p> <p>No consistent differences were observed for bone mineral density or fracture rate between surgical or natural menopause</p>	<p>Ensuring that women of menopausal age or women about to undergo surgical menopause have an adequate amount of calcium can reduce reduction in mineral density and fracture incidence</p> <p>Education regarding bone density after menopause of either type can elevate compliance in a calcium regimen</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Fitzpatrick, L. A., Pace, C., &amp; Wiita, B. (2000). Comparison of Regimens Containing Oral Micronized Progesterone or Medroxyprogesterone Acetate on Quality of Life in Postmenopausal Women: A Cross-Sectional Survey. <i>Journal of Womens Health &amp; Gender-Based Medicine</i>, 9(4), 381-387. doi:10.1089/1524609005002069</p>	<p>Cross-sectional survey</p> <p>QOL was assessed via telephone interview using the Greene Climacteric Scale and the Women's Health Questionnaire</p>	<p>N= 176</p> <p>Women who were currently using HRT containing micronized progesterone for 1 - 6 months and had previously received HRT containing MPA</p>	<p>to examine quality of life related to physiological, somatic, and vasomotor effects of changing progestogen treatment from medroxyprogesterone acetate (MPA) to micronized progesterone in postmenopausal women</p>	<p>Estrogens produce vaginal bleeding in about three fourths of women and increase the risk of endometrial cancer</p>	<p>Approximately 80% of women who used micronized progesterone HRT had significant improvement in all around symptoms and reported an increased quality of life</p>	<p>Understanding that different treatment regimens work differently for everyone is important to providing the highest quality of care.</p> <p>Trends in prescription patterns should also be noted to help make the best fit more quickly</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Hersh, A., Stefanick, M. &amp; Stafford, R. (2004). National Use of Hormone Replacement Therapy: Annual trends and Response to Recent Evidence. <i>JAMA</i>(291), 47-53. doi:10.1001/jama.291.1.47</p>	<p>The National Prescription adult database provided data on the number of hormone therapy prescriptions filled by retail pharmacies</p> <p>the national disease and therapeutic index database provided data on patient visits to office-based Physicians during which hormone therapy was prescribed</p>	<p>Population data was extrapolated using the National Prescription Audit database and the National Disease and Therapeutic Index database</p>	<p>To describe patterns of hormone therapy used from 1995 until July 2003</p>	<p>Hormone replacement therapy prescriptions increase from 58 million in 1995 to 90 million in 1999, and then remain stable through June 2002</p> <p>After the release of the women's Health Institute report on the risks associated with hormone replacement therapy prescription rates rapidly declined</p>	<p>Clinical practice may have responded to rapidly to recent evidence of harms associated with hormone therapy</p> <p>Since July 2002 many patients have discontinued HRT or are tapering to lower doses</p>	<p>Actions from the medical community directly affect many aspects of patient care including prescription rate, quality of care, and treatment outcomes.</p> <p>Fully understanding the important of decision-making in the profession holds the healthcare team more responsible for their actions</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Jin, J. (2017). Hormone Therapy for Primary Prevention of Chronic Conditions in Postmenopausal Women. <i>Jama</i>, 318(22), 2265. doi:10.1001/jama.2017.18440</p>	<p>Evidence review of the benefits and harms of systemic (ie, oral or transdermal) hormone therapy for the prevention of chronic conditions in postmenopausal women</p>	<p>This recommendation statement applies to asymptomatic, postmenopausal women who are considering hormone therapy for the primary prevention of chronic medical conditions</p>	<p>To update the 2012 US Preventive Services Task Force (USPSTF) recommendation on the use of menopausal hormone therapy for the primary prevention of chronic conditions.</p>	<p>The review did not address hormone therapy for preventing or treating menopausal symptoms.</p> <p>This statement does not apply to women who are considering hormone therapy for the management of menopausal symptoms, or women who have had premature menopause or surgical menopause.</p>	<p>The USPSTF recommends against the use of combined estrogen and progestin and estrogen alone for the primary prevention of chronic conditions in postmenopausal women</p>	<p>Understanding medication formulation recommendations can help provide a higher quality of client care</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p><b>Keshavarz, H., Hillis, S.D., Kieke, B.A., Marchbanks, P.A. (2002).</b> Surveillance Summaries. MMWR. <i>Hysterectomy Surveillance, United States, 1994–1999</i>; pp. 1–8.</p>	<p>Meta-analysis and systematic review of all chart data for women within the appropriate age and time demographic. The National Hospital Discharge Survey was used to gather the data</p>	<p>women aged <math>\geq 15</math> years who had a hysterectomy during 1994--1999</p>	<p>To gather data on women who have undergone surgical menopause and to analyze National Data regarding pelvic surgery in the United States population</p>	<p>Uterine leiomyoma, endometriosis, and uterine prolapse were the most common indications for hysterectomy</p> <p>Women aged 40-44 years old were the most common recipients of hysterectomies</p>	<p>The total number of hysterectomies performed in the United States increased during the time frame of the study</p> <p>55% of women who had a hysterectomy during this time also had a bilateral oophorectomy, also known as Surgical menopause</p> <p>The increase in the number of hysterectomies performed correlates with the increase of use of HRT</p>	<p>Understanding menopausal causes such as surgery and properly identifying early onset menopause can help women attain access to HRT to increase quality of life</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Kokcu, A., Kurtoglu, E., Bildircin, D., Celik, H., Kaya, A., &amp; Alper, T. (2015). ORIGINAL RESEARCH: Does Surgical Menopause Affect Sexual Performance Differently from Natural Menopause?. <i>The Journal of Sexual Medicine</i>, 121407-1414. doi:10.1111/jsm.12891</p>	<p>Cross sectional survey</p>	<p>N = 243, 121 women who underwent surgical menopause and 122 women who underwent natural menopause, who were between the ages of 45 and 65</p>	<p>To investigate whether surgical menopause affect sexual performance differently than natural menopause</p>	<p>The sudden drop in hormones associated with surgical menopause could cause exacerbated menopause symptoms that would reduce quality of life</p>	<p>With the exception of lubrication there were no statistically significant differences between surgical and natural menopause</p>	<p>Understanding the lubrication needs of sexually active women after surgical menopause can help the healthcare team guide women proactively toward lubrication solutions to increase sexual satisfaction</p> <p>Understanding the lubrication means of non-sexually active women is also important to ensure daily comfort quality of life</p>

<b>Author(s), Year, Location</b>	<b>Study Design</b>	<b>Sample Size and Population</b>	<b>Purpose</b>	<b>Significant Risk Factors</b>	<b>Key Findings</b>	<b>Implications for Practice</b>
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<p>Lobo, R. A. (2007). Menopause and stroke and the effects of hormonal therapy. <i>Climacteric</i>, 10(Sup2), 27-31. doi:10.1080/13697130701550903</p>	<p>Meta-analysis</p>	<p>Population for the study was the population from the Articles included in the meta-analysis</p> <p>Menopausal and postmenopausal women between the ages of 50 to 84</p>	<p>To determine the relationship between hormone replacement therapy and the incidence of stroke in postmenopausal women</p>	<p>Stroke is the 3rd leading cause of death in women in the U.S.</p> <p>Stroke risk increases dramatically after menopause</p> <p>Data are inconsistent regarding relationship between HRT and stroke</p>	<p>Hormone therapy does not prevent stroke occurrence</p> <p>A statistically significant increase in ischemic stroke risk with standard doses of estrogen as well as with estrogen/progestogen</p> <p>This risk is lowered with earlier starts of therapy, the use of a lower estrogen dose, and the use of unopposed estrogen and non-hypertensive women</p>	<p>Assessing the cardiovascular status of women who will be using hormone replacement therapy is imperative to adjust dosage properly to mitigate possible increase in stroke risk</p>
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Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Manson JE, Aragaki AK, Rossouw JE, Anderson GL, Prentice RL, LaCroix AZ, ... Wactawski-Wende J. (2017) Menopausal Hormone Therapy and Long-term All-Cause and Cause-Specific Mortality, The Women's Health Initiative Randomized Trials. <i>JAMA</i>, 318(10):927–938. doi:10.1001/jama.2017.11217</p>	<p>observational follow up of US multi-ethnic postmenopausal women aged 50 - 79 years enrolled into randomized clinical trials between 1993 and 1998 and followed up through December 31st 2014</p>	<p>N = 27347  Postmenopausal women age 50 - 75 years who were previously enrolled in hormone replacement therapy trials</p>	<p>To examine total and cause specific cumulative mortality, including during the intervention and extended post intervention follow-up, of the two Women's Health Initiative hormone therapy trials</p>	<p>Conjugated equine estrogens (CEE) plus medroxyprogesterone acetate (MPA) trial was stopped early (after 5.6 years) due to an increased risk of breast cancer and overall risks exceeding benefits; the CEE-alone trial was stopped after 7.2 years due to an increased risk of stroke</p>	<p>Hormone therapy with CEE plus MPA for a median of 5.6 years or with CEE alone for a median of 7.2 years was not associated with risk of all-cause, cardiovascular, or cancer mortality during a cumulative follow-up of 18 years.</p> <p>Menopausal hormone therapy for 5 to 7 years was not associated with risk of long-term all-cause mortality</p>	<p>Understanding long term effects of HRT can help the healthcare team guide women to make educated decisions regarding therapy options postmenopausal surgery</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>Shuster, L. T., Rhodes, D. J., Gostout, B. S., Grossardt, B. R., &amp; Rocca, W. A. (2010). Premature menopause or early menopause: long-term health consequences. <i>Maturitas</i>, 65(2), 161.  <a href="http://doi.org/10.1016/j.maturitas.2009.08.003">http://doi.org/10.1016/j.maturitas.2009.08.003</a></p>	<p>Literature review and meta-analysis of the Mayo Clinic Cohort Study of Oophorectomy and Aging</p>	<p>Population was found from the Mayo Clinic Cohort Study of Oophorectomy And Aging</p>	<p>Review and summarize current evidence on health consequences of premature and early menopause</p>	<p>Women who experience premature menopause (before age 40 years) or early menopause (between ages 40 and 45 years) experience an increased risk of overall mortality, cardiovascular diseases, neurological diseases, psychiatric diseases, osteoporosis</p>	<p>Some of the negative health effects may be prevented by estrogen treatment initiated after the onset of menopause.             Estrogen alone does not prevent all long-term consequences, so combination HRT is likely the best course of action</p>	<p>Understanding hormonal mechanisms of menopause can help the healthcare team guide women toward more effective combinations of HRT in order to increase quality of life and reduce negative health effects that result from early onset menopause</p>

Author(s), Year, Location	Study Design	Sample Size and Population	Purpose	Significant Risk Factors	Key Findings	Implications for Practice
<p>West SL, D'Aloisio AA, Agans RP, Kalsbeek WD, Borisov NN, Thorp JM. (2008) Prevalence of Low Sexual Desire and Hypoactive Sexual Desire Disorder in a Nationally Representative Sample of US Women. <i>Arch Intern Med</i>, 168(13):1441–1449. doi:10.1001/archinte.168.13.1441</p>	<p>Cross-sectional study</p> <p>Low sexual desire was defined using the Profile of Female Sexual Function desire domain, and HSDD was defined using the Profile of Female Sexual Function and the Personal Distress Scale</p>	<p>N=2207</p> <p>755 premenopausal women and 552 naturally and 637 surgically menopausal women.</p> <p>nationally representative sample of women aged 30 - 70 years in study relationships for 3 months or longer</p>	<p>To estimate the prevalence of low sexual desire and hypoactive sexual desire disorder (HSDD) in US women, focusing on their menopausal status</p>	<p>Surgical menopause causes more distress regarding low desire for sexual activity</p> <p>Depression and antidepressants were strongly associated with low desire and HSDD</p> <p>Current use of hormonal therapy among menopausal women did not modify the association between type of menopause and low desire or HSDD</p>	<p>Prevalence of low sexual desire is elevated among surgically and naturally menopausal women</p> <p>Distress about HSDD was more than twice as prevalent among surgically menopausal women</p>	<p>Understanding actual and perceived client dissatisfaction helps build a trusting relationship that promotes wellbeing for women</p>

**Table 2: Table of Evidence of Reviewed Literature**

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