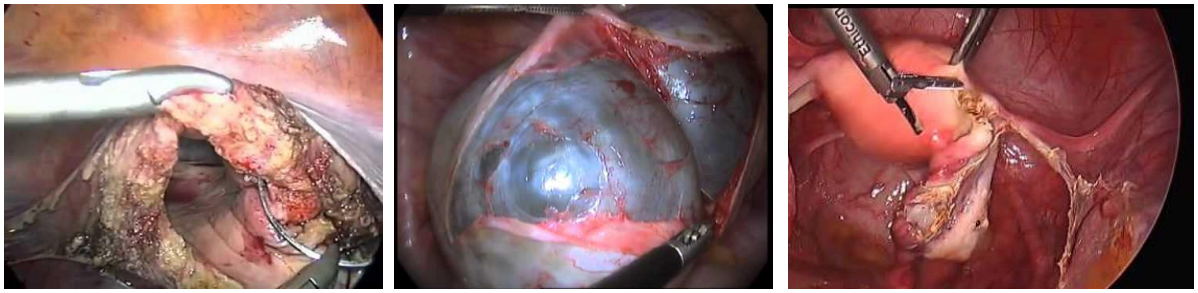
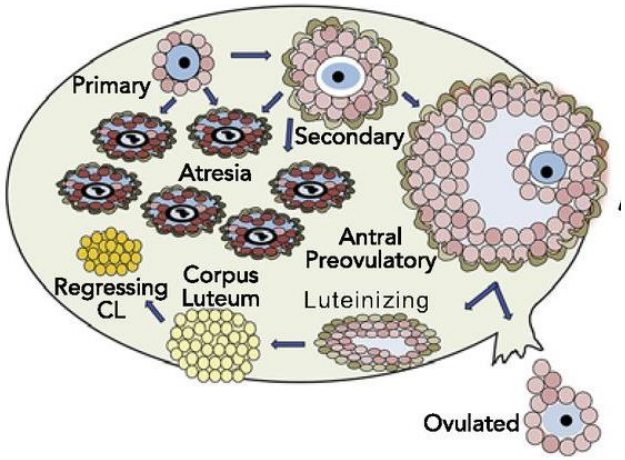
산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법



Chonnam National University Medical School

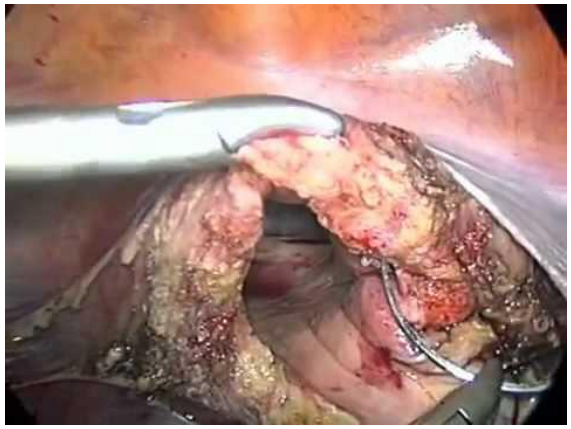
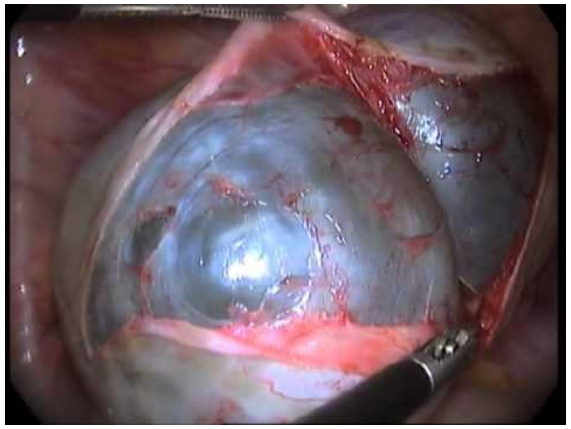
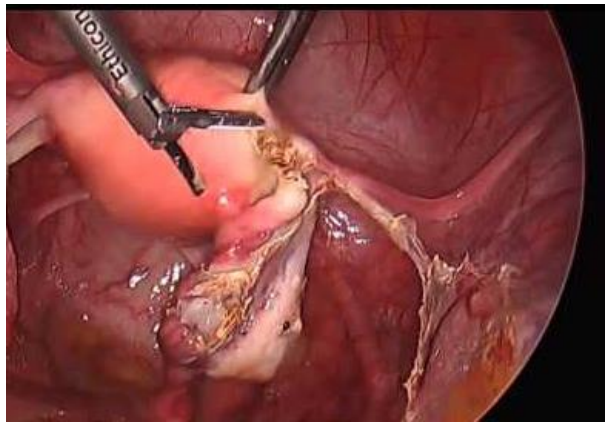
Department of Obstetrics and Gynecology

Cho Moon Kyoung



- Estrogen
- Progesterone
- Testosterone
- Androstenedione
- Inhibin

산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

NON-ovarian	Ovarian cystectomy	Bilateral oophorectomy
		

Fertility and Sterility

Fertil Steril. 1987 Jan;47(1):94-100.

The effect of hysterectomy on the age at ovarian failure: identification of a subgroup of women with premature loss of ovarian function and literature review.

Siddle N, Sarrel P, Whitehead M.

Abstract

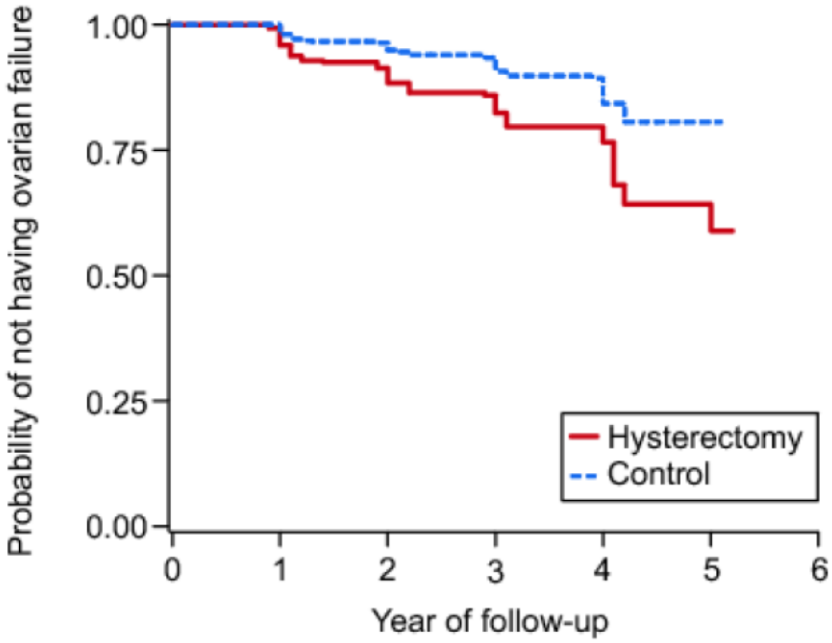
The age at ovarian failure was determined in 90 women who had previously undergone abdominal hysterectomy with bilateral ovarian conservation and in 226 women who had undergone a spontaneous menopause. The mean age of ovarian failure in the hysterectomized group was 45.4 +/- 4.0 years (standard deviation), and this was significantly lower than the mean age of 49.5 +/- 4.04 years in the nonhysterectomized control group (P less than 0.001). There was a significant correlation between the age at hysterectomy and the age of ovarian failure in the women who were 44 years or less at the time of ovarian failure (r = 0.62, P less than 0.001), implying a causal relationship. The indication for hysterectomy did not influence the time of ovarian failure. Two explanations are proposed as to how conventional surgery for hysterectomy may adversely affect ovarian function.

Obstet Gynecol. 2011 December ; 118(6): 1271–1279. doi:10.1097/AOG.0b013e318236fd12.

<prospective cohort study>

Effect of Hysterectomy With Ovarian Preservation on Ovarian Function

	Hazard Ratio*	95% Confidence Interval	*P*
All women			
Controls	1	Reference	
Hysterectomy only	1.74	1.14 – 2.65	0.01
Hysterectomy with unilateral oophorectomy	2.93	1.57 – 5.49	0.001



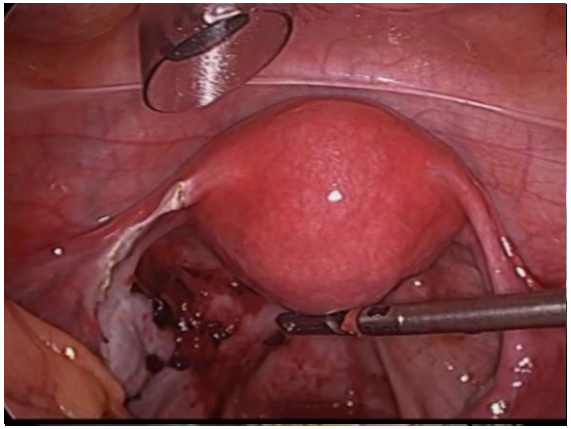
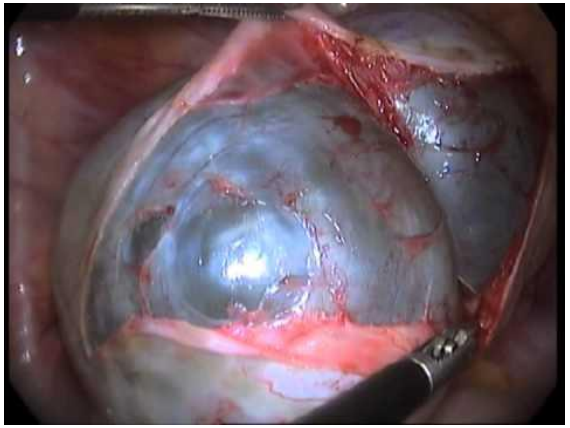
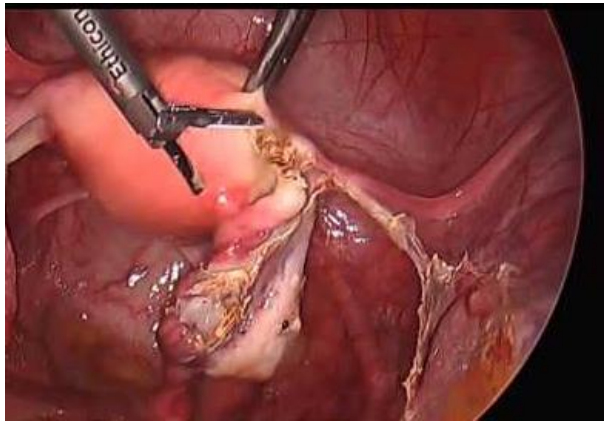
The Ovary: *Original Research*

Association of Ovary-Sparing Hysterectomy With Ovarian Reserve

(2016)

Measure	Hysterectomy Group (n=117)	Referent Group (n=129)	*P**
AMH at baseline (ng/mL)	1.1 (0.4 to 2.2)	1.0 (0.5 to 2.8)	.46
AMH at 1-y follow-up (ng/mL)	0.6 (0.2 to 1.7)	1.0 (0.3 to 2.3)	.04
Nondetectable AMH at 1-y follow-up	15 (12.8)	6 (4.7)	.02
Absolute change in AMH (ng/mL)			
Overall (n=117; 129)[†‡]	−0.3 (−0.7 to −0.1)	−0.2 (−0.7 to 0)	.31
White (n=47; 64)	−0.2 (−0.6 to 0)	−0.2 (−0.6 to 0)	.59
Black (n=67; 60)	−0.3 (−0.9 to −0.1)	−0.2 (−0.8 to 0.1)	.23
% change in AMH			
Overall (n=117; 129)[†‡]	−40.7 (−70.5 to −4.0)	−20.9 (−44.4 to 0)	<.001
White (n=47; 64)	−38.5 (−66.7 to 0)	−23.1 (−47.7 to 0)	.13
Black (n=67; 60)	−48.1 (−76.0 to −11.1)	−16.0 (−42.6 to 1.6)	<.001

산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

NON-ovarian	Ovarian cystectomy	Bilateral oophorectomy
		

Volume 71, Number 6
OBSTETRICAL AND GYNECOLOGICAL SURVEY

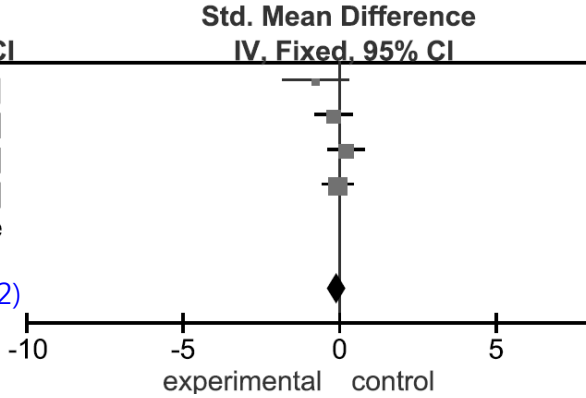
CME REVIEW ARTICLE

The Effect of Salpingectomy on Ovarian Reserve and Ovarian Function

Total dose of FSH needed in IVF-ET cycles

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Nakagawa 2008	1,635	435	6	1,897.5	255	11	7.8%	-0.76 [-1.80, 0.27]
Ni L 2013	1,604.3	423.7	26	1,684.57	416.68	23	26.4%	-0.19 [-0.75, 0.37]
Strandell 2001	2,475	1,090	26	2,261	893	26	28.1%	0.21 [-0.33, 0.76]
Tal J 2002	2,257.5	697.5	26	2,295	682.5	52	37.7%	-0.05 [-0.52, 0.42]
Xi 2012	2,370.8	614.5	76	2,376	620.6	0		Not estimable
Total (95% CI)			**160**			**112**	**100.0%**	**-0.07** (-0.36, 0.22)

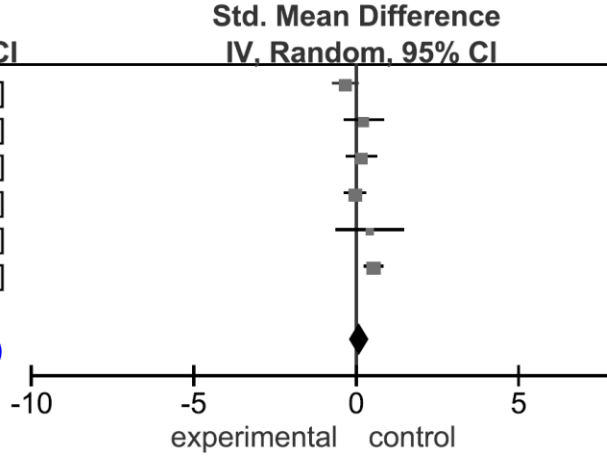
Heterogeneity: Chi² = 2.92, df = 3 (P = 0.40); I² = 0%
Test for overall effect: Z = 0.47 (P = 0.64)



The number of collected oocytes in IVF-ET cycles

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gelbaya TA 2006	10.23	6.08	40	12.92	8.75	103	19.1%	-0.33 [-0.70, 0.04]
Kontoravdis 2006	12.1	5	50	10.9	5.1	15	13.7%	0.24 [-0.34, 0.81]
Lass A 1998	9.9	5.3	29	9.1	4.7	73	17.4%	0.16 [-0.27, 0.59]
Matorras 2013	10.8	6	48	11	5.8	264	20.8%	-0.03 [-0.34, 0.27]
Nakagawa 2008	7.5	5.5	6	5.3	4.7	11	7.0%	0.42 [-0.59, 1.43]
Tal J 2002	5.5	3.4	98	4	2.3	154	22.1%	0.54 [0.28, 0.80]
Total (95% CI)			**271**			**620**	**100.0%**	**0.14** (-0.17, 0.45)

Heterogeneity: Tau² = 0.10; Chi² = 16.95, df = 5 (P = 0.005); I² = 71%
Test for overall effect: Z = 0.87 (P = 0.38)



Volume 71, Number 6
OBSTETRICAL AND GYNECOLOGICAL SURVEY

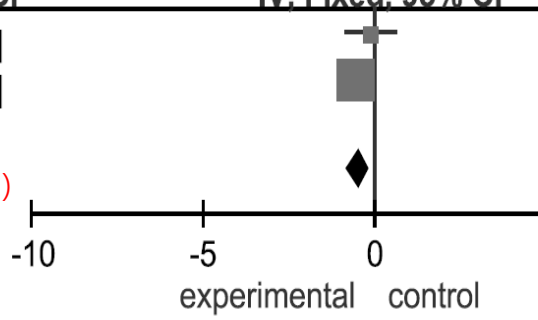
CME REVIEW ARTICLE

The Effect of Salpingectomy on Ovarian Reserve and Ovarian Function

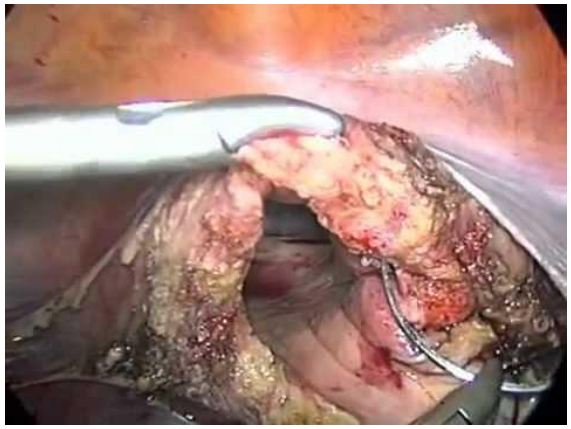
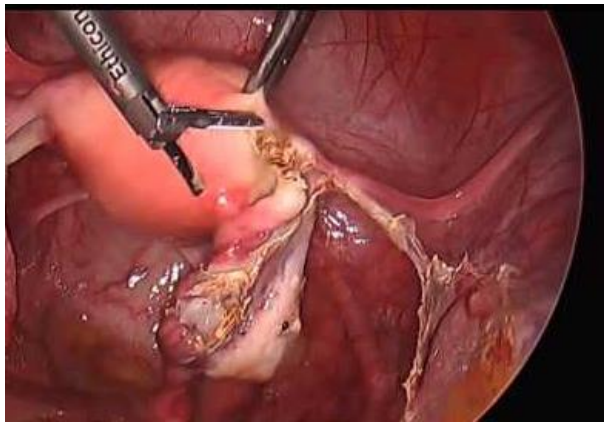
AMH levels

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Findley 2013	1.03	1.04	15	1.25	2.09	15	22.7%	-0.13 [-0.85, 0.59]
Ye 2015	17.8	13.05	41	25.69	14.61	74	77.3%	-0.56 [-0.95, -0.17]
Total (95% CI)			**56**			**89**	**100.0%**	**-0.46** (-0.80, -0.12)

Heterogeneity: Chi² = 1.05, df = 1 (P = 0.30); I² = 5%
Test for overall effect: Z = 2.64 (P = 0.008)



산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

Hysterectomy only	Ovarian cystectomy	Bilateral oophorectomy
		

ORIGINAL ARTICLE

Endocrine Care

The Impact of Excision of Ovarian Endometrioma on Ovarian Reserve: A Systematic Review and Meta-Analysis

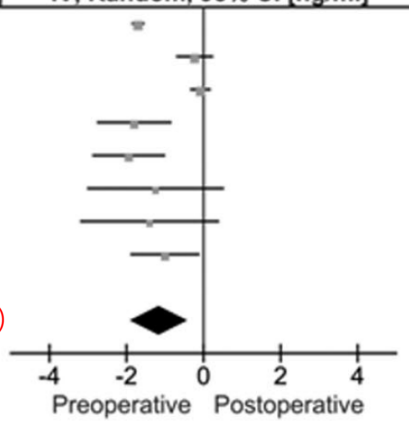
(2012)

Weighted **mean difference** in serum AMH after surgery for endometrioma

	Postoperative			Preoperative				Mean Difference	Mean Difference
Study or Subgroup	Mean [ng/ml]	SD [ng/ml]	Total	Mean [ng/ml]	SD [ng/ml]	Total	Weight	IV, Random, 95% CI [ng/ml]	IV, Random, 95% CI [ng/ml]
Biacchiardi 2011	1.3	0.3	43	3	0.4	43	15.4%	-1.70 [-1.85, -1.55]	
Ercan 2010	1.39	1.16	47	1.62	1.09	47	14.7%	-0.23 [-0.69, 0.23]	
Ercan 2011	1.95	0.62	36	2.03	0.41	36	15.3%	-0.08 [-0.32, 0.16]	
Hirokawa 2011	2.1	1.6	38	3.9	2.5	38	12.5%	-1.80 [-2.74, -0.86]	
Hwu 2011	2.01	1.17	31	3.95	2.34	31	12.6%	-1.94 [-2.86, -1.02]	
Kitajima 2011	3.024	2.48	19	4.27	3	19	8.4%	-1.25 [-3.00, 0.50]	
Lee 2010	3.29	2.11	13	4.69	2.5	13	8.3%	-1.40 [-3.18, 0.38]	
Tsolakidis 2009	2.9	0.63	10	3.9	1.26	10	12.8%	-1.00 [-1.87, -0.13]	
Total (95% CI)	**1.87**		237	**3.0**		237	100.0%	**-1.13** (-1.88, -0.37)	

Heterogeneity: Tau² = 0.95; Chi² = 146.47, df = 7 (P < 0.00001); I² = 95%

Test for overall effect: Z = 2.93 (P = 0.003)



mean diameter of the endometrioma; 3.7~6.7cm

ORIGINAL ARTICLE

Endocrine Care

The Impact of Excision of Ovarian Endometrioma on Ovarian Reserve: A Systematic Review and Meta-Analysis

(2012)

Subgroup analysis

Unilateral endometriomas

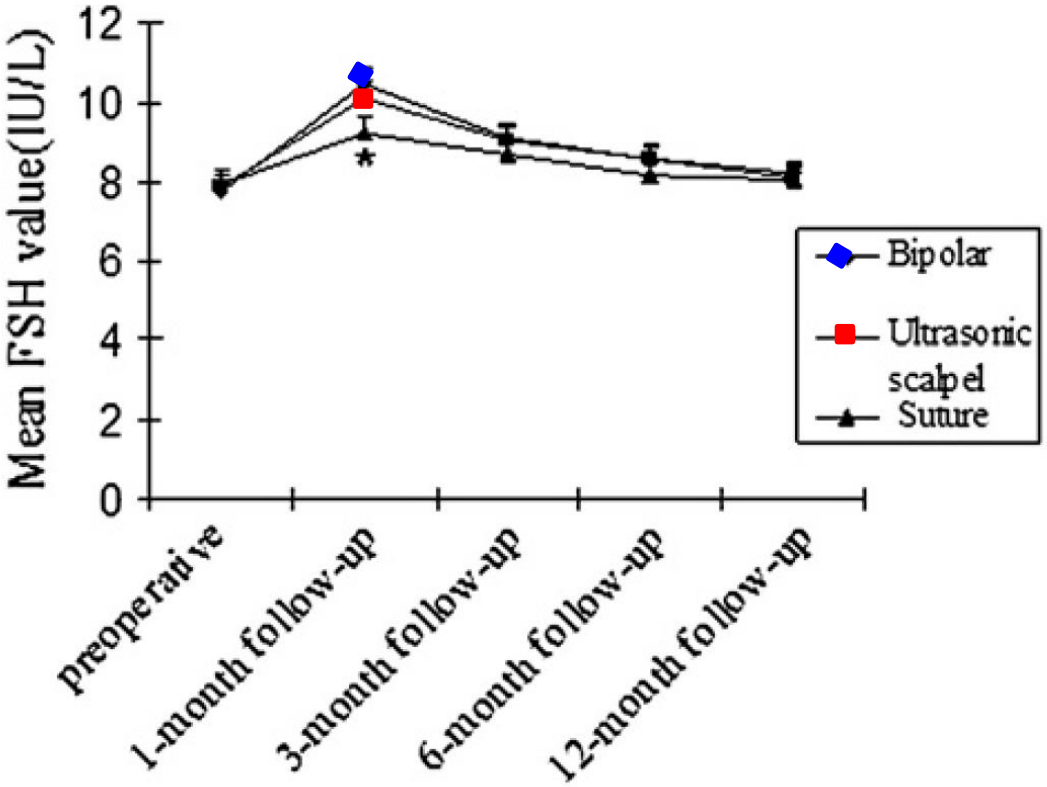
Six studies with 152 excisions were included (25, 27, 29, 34–36). The weighted average preoperative AMH was 3.3 ng/ml. A statistically significant fall (30%) in serum AMH was seen postoperatively (WMD −0.96 ng/ml; 95% CI −0.22 to −1.70; $I^2 = 76\%$).

Bilateral endometriomas

Two studies with 32 patients were identified (34, 35). The weighted average preoperative AMH was 2.7 ng/ml. A trend toward a postoperative fall (44%) in serum AMH was seen at 3–9 months, although this did not reach statistical significance (WMD −1.18; 95% CI 1.07 to −3.34; $I^2 = 89\%$).

The impact of electrocoagulation on ovarian reserve after laparoscopic excision of ovarian cysts: a prospective clinical study of 191 patients

(2009)



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journal homepage: www.elsevier.com/locate/ijgo

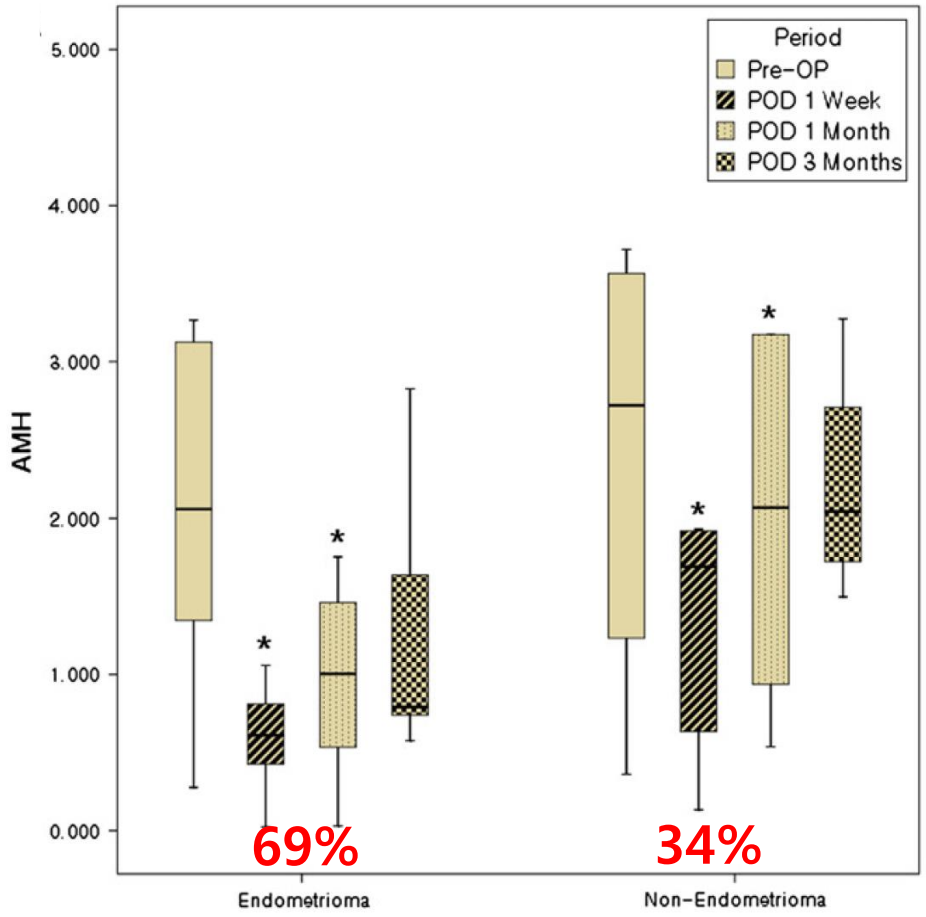
CLINICAL ARTICLE

Effect on ovarian reserve of laparoscopic bipolar electrocoagulation versus laparotomic hemostatic sutures during unilateral ovarian cystectomy

Time of measurement	Laparoscopy group (n = 55)	Laparotomy group (n = 55)	*P* value
Preoperatively, ng/mL	4.2 ± 1.5	4.6 ± 1.5	0.180
Postoperatively, ng/mL			
1st cycle	3.2 ± 0.8	3.7 ± 1.0	0.004
3rd cycle	2.6 ± 0.7[b]	3.5 ± 1.1[c]	<0.001
6th cycle	2.4 ± 0.5[d]	3.6 ± 1.1[e]	<0.001

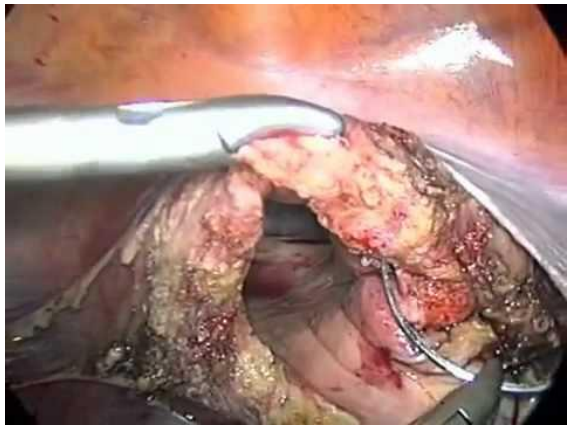
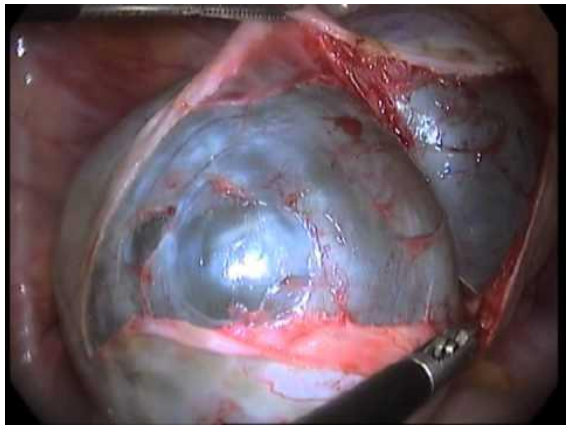
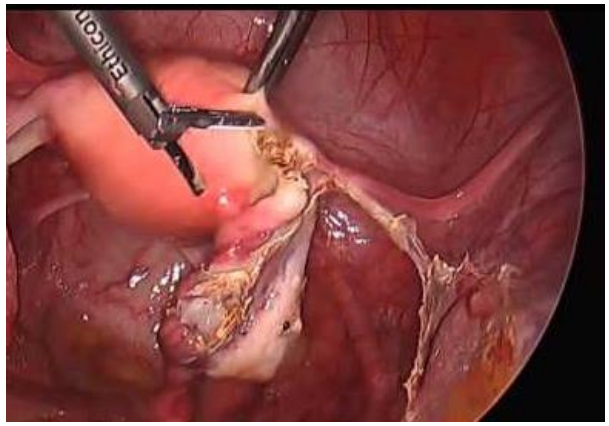
Impact of laparoscopic cystectomy on ovarian reserve: serial changes of serum anti-Müllerian hormone levels

(2010)

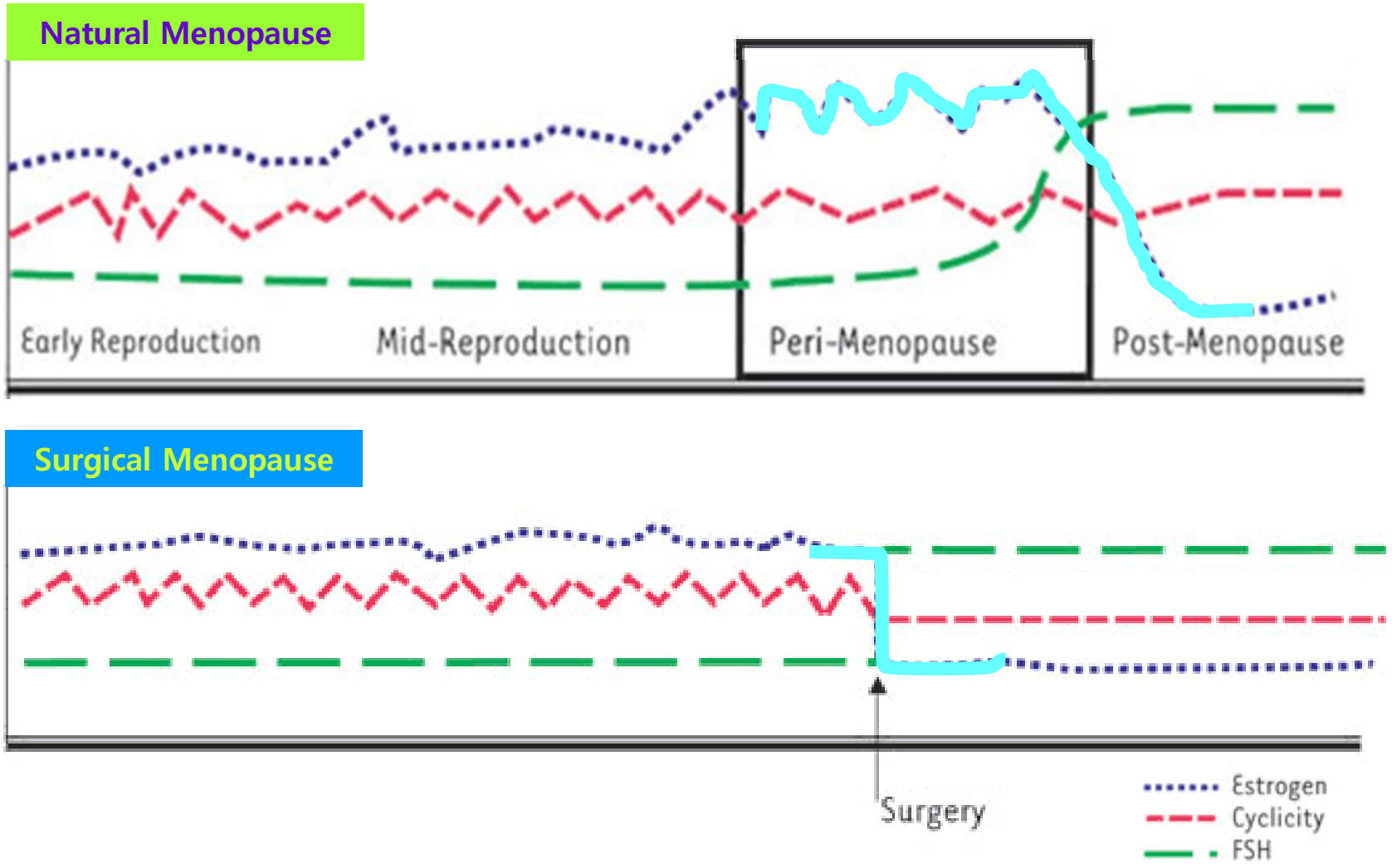


산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

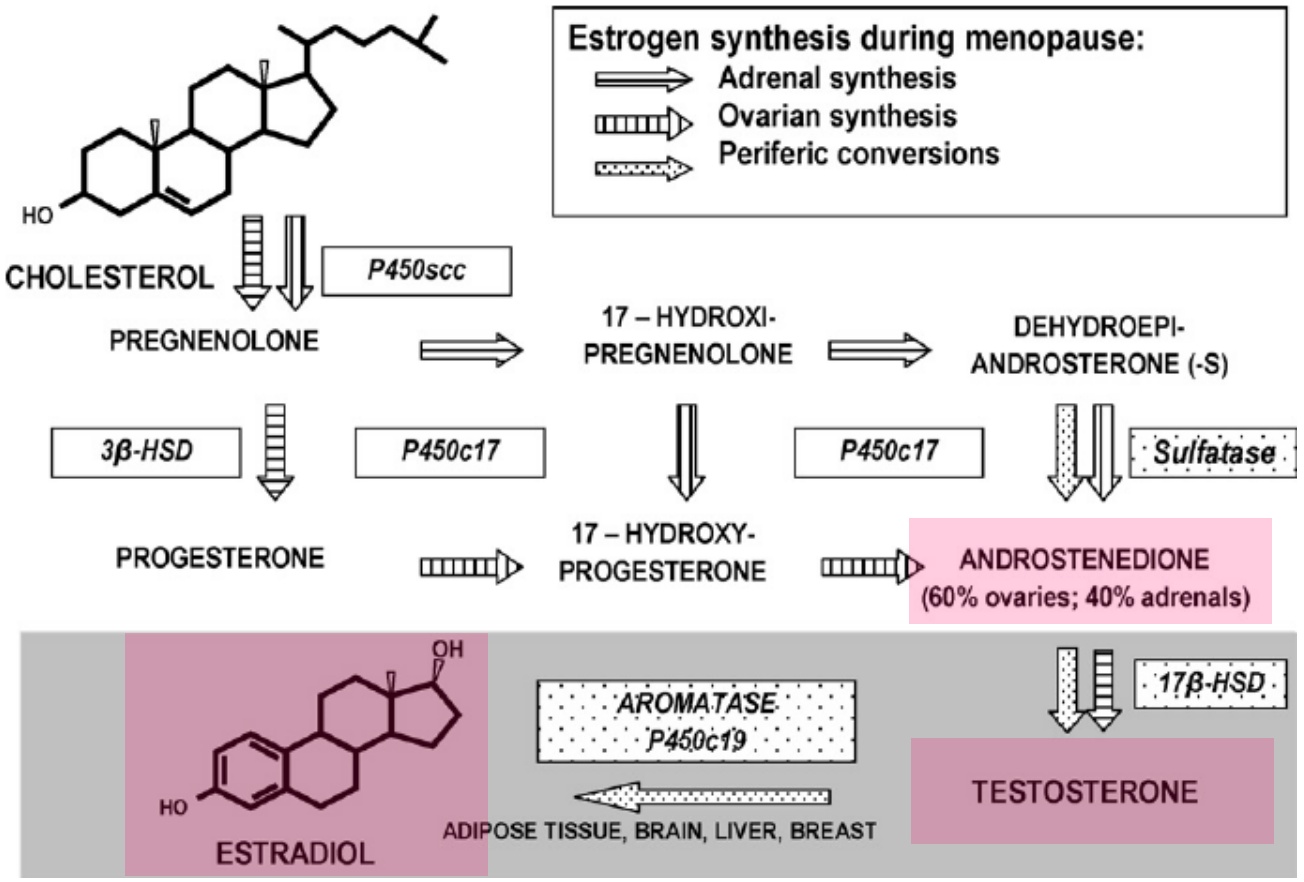
Pre-menopausal

Hysterectomy only	Ovarian cystectomy	Bilateral oophorectomy
		

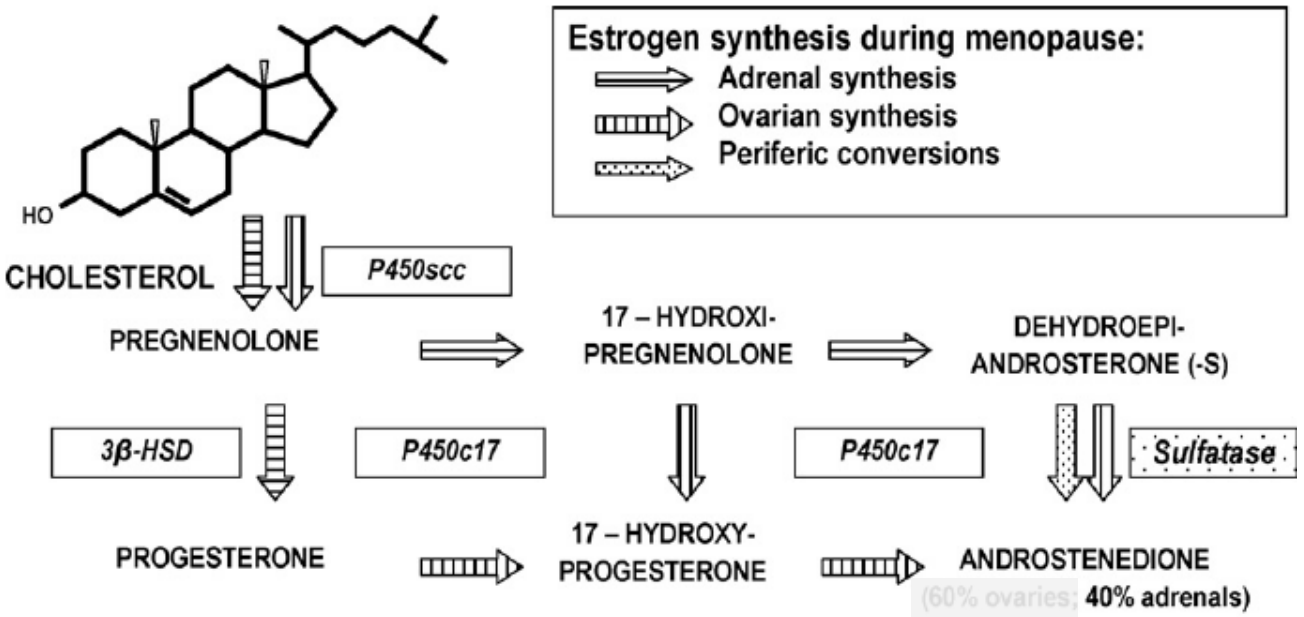
Estrogen levels



Natural Menopause



Surgical Menopause

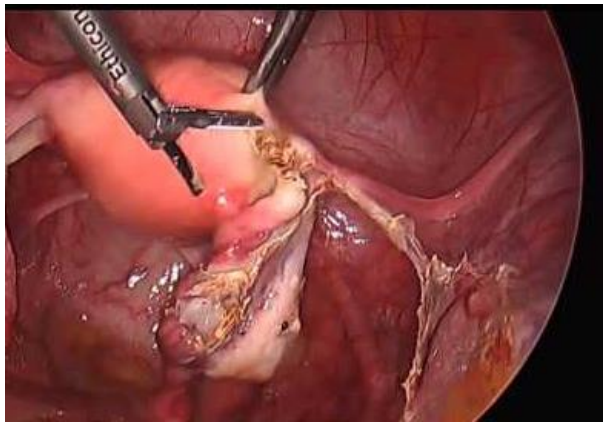


Biosynthesis of steroids

	Reproductive age (mg/day)	Natural Menopause (mg/day)	Surgical Menopause (mg/day)
Androstenedione	2–3	0.5–1.0	0.4–0.8
Dihydroepiandrosterone	6–8	1.5–4.0	1.5–4.0
Dihydroepiandrosterone sulphate	8–16	4–9	4–9
Testosterone	0.2–0.25	0.05–0.1	0.02–0.07

Pre-menopausal

Bilateral oophorectomy



- Vasomotor symptom
- Bone health
- Cardiovascular health
- Cognitive function
- Mortality

Menopause: The Journal of The North American Menopause Society
Vol. 18, No. 7, pp. 778-785
DOI: 10.1097/gme.0b013e318207851d

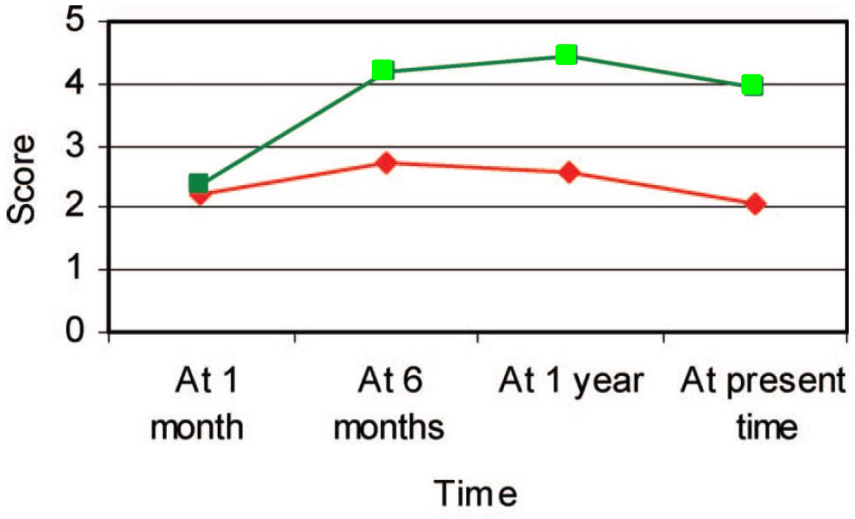
A large multinational study of vasomotor symptom prevalence, duration, and impact on quality of life in middle-aged women

Vasomotor symptoms	Natural	Surgical	*P*
% Any degree (95% CI)	52.3 (51.1-53.5)	65.6 (62.2-68.8)	0.0001
% Bothersome (95% CI)	8.9 (8.2-9.7)	16.1 (13.8-18.9)	0.0001
n	6,310	833	

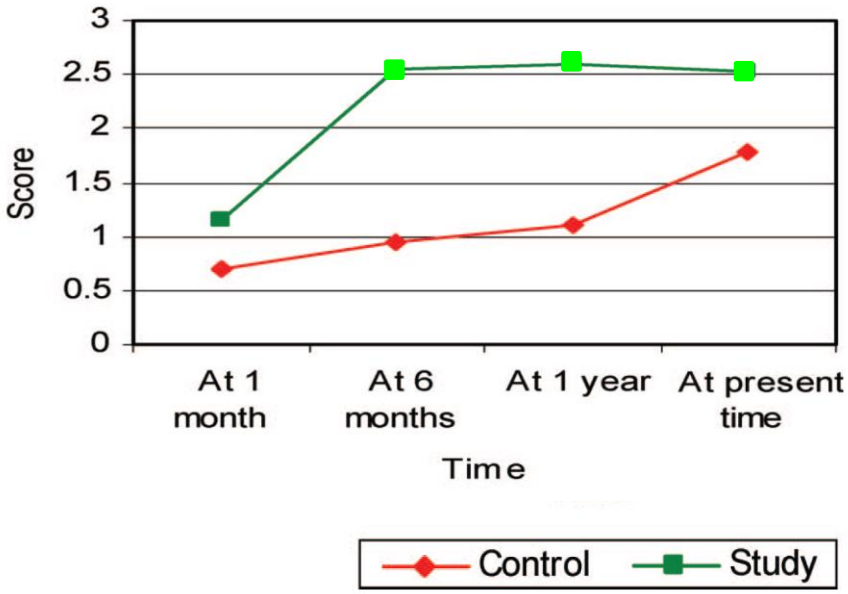
Climacteric symptoms in women undergoing risk-reducing bilateral salpingo-oophorectomy

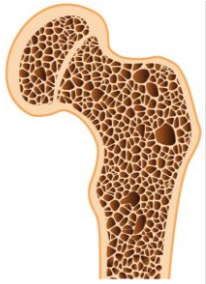
(2009)

Vasomotor symptom



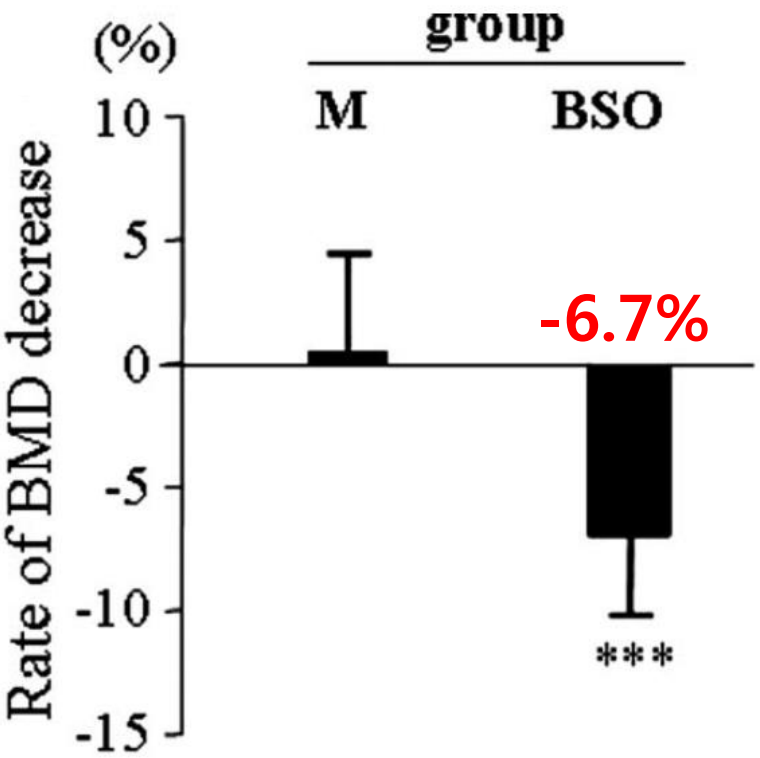
Somatic climacteric symptom

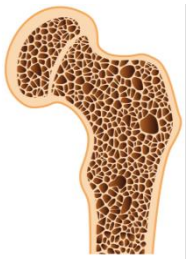




CLIMACTERIC 2011;14:445–452

Impact of surgical menopause on lipid and bone metabolism





Oophorectomy and Spine Bone Density: Evidence of a Higher Rate of Bone Loss in Surgical Compared with Spontaneous Menopause.

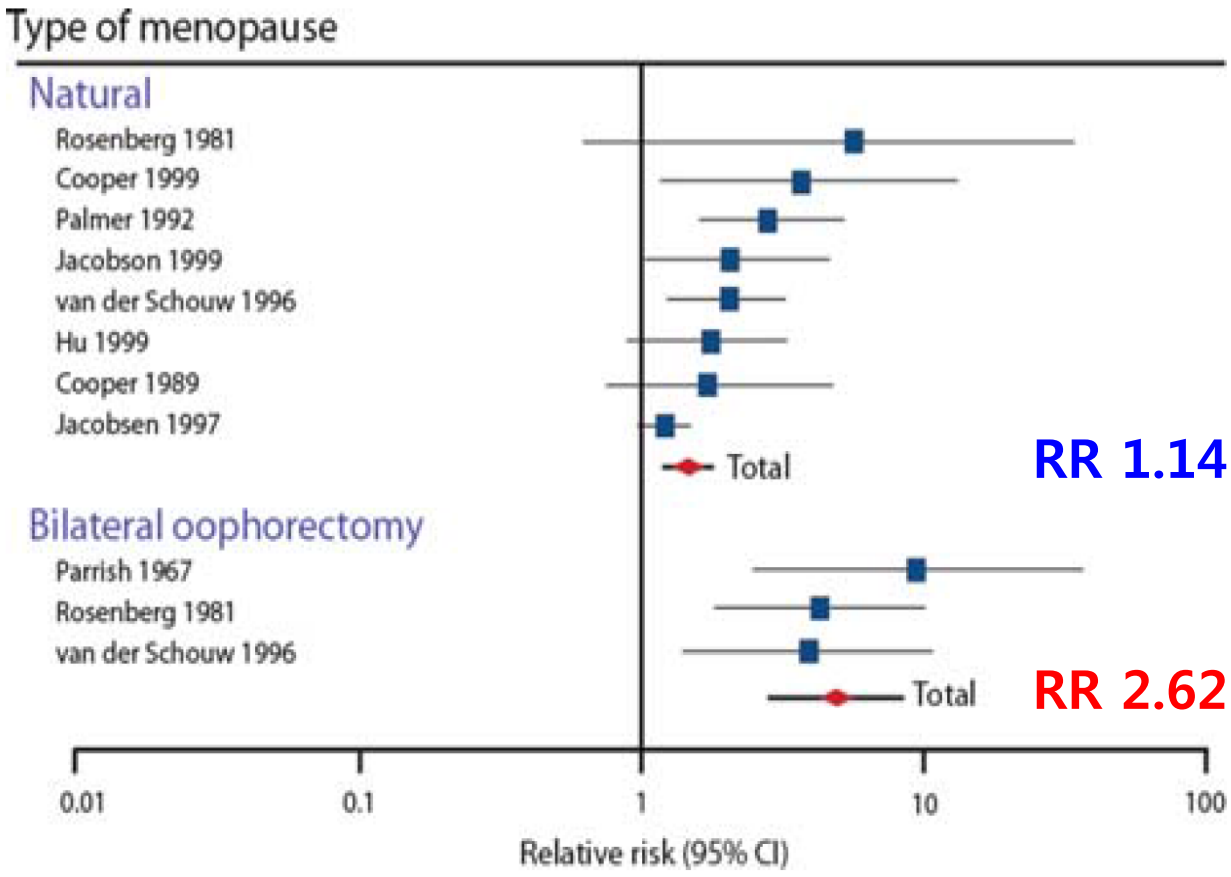
Pansini, Francesco; Bagni, Bruno; Bonaccorsi, Gloria; Albertazzi, Paola; Zanotti, Laura; Farina, Antonio; Campobasso, Carlo; Orlandi, Roberto; Mollica, Gioacchino

Menopause: 1995

To compare the influence of spontaneous and surgical menopause on bone loss, we measured with dual x-ray absorptiometry (DXA) the spinal bone mineral density (BMD) in 513 women recruited at the Menopause Clinic at Ferrara University Hospital. One hundred one women were premenopausal with regular menstrual cycles; 185 women were perimenopausal with irregular periods or with absence of menstruation for <11 months; 160 women had spontaneous menopause with at least 12 months of amenorrhea; 67 women had a surgical menopause (hysterectomy with bilateral oophorectomy) prior to which they had regular menstruation. To minimize the age bias on BMD, all postmenopausal patients were selected to have the age range at menopause corresponding with the chronological age range (45-53 years) of premenopausal women used as reference. Moreover, to evaluate the influence of time since menopause on BMD, all postmenopausal women were stratified in five categories according to time lapsed since their last menses or oophorectomy. BMD values of spontaneous and surgical menopause do not appear to differ significantly (0.908 4pM 0.146 and 0.885 +/- 0.129 g/cm2, mean +/- SD). However, the difference between the menopausal groups becomes evident when BMD results take into account the interval since menopause. After 61-144 months of amenorrhea, women who had undergone spontaneous menopause had a cumulative bone loss of 21.8% in comparison with premenopausal BMD, whereas women who had undergone surgical menopause had a bone loss of 25.8%. The yearly percentage of bone loss values of surgical menopause (ranging from 3.72 to 7.93) settled to ~1% per year after 5 years from oophorectomy, whereas the percentage values of spontaneous menopause (ranging from 1.75 to 4.65) settled to 1% per year after 3 years since the last menses. The difference between bone loss rates of spontaneous and surgical menopause, evaluated by comparison of regression coefficients (- 0.027 and -0.051, respectively) of linear regressions of BMD values on time since menopause, was statistically significant (p <= 0.001). Odds ratio (OR) of osteopenia (as Tscore, >= - 1) was significantly higher in surgical menopause (OR, 10.36; CI, 24.69-4.34) compared with spontaneous menopause (OR, 7.11; CI, 14.73-3.43). Our data support the evidence that women undergoing bilateral oophorectomy while still menstruating are at a higher risk of osteopenia than women undergoing menopause spontaneously.

Menopause: The Journal of The North American Menopause Society
Vol. 13, No. 2, pp. 265-279
DOI: 10.1097/01.gme.0000218683.97338.ea

Postmenopausal status and early menopause as independent risk factors for cardiovascular disease: a meta-analysis

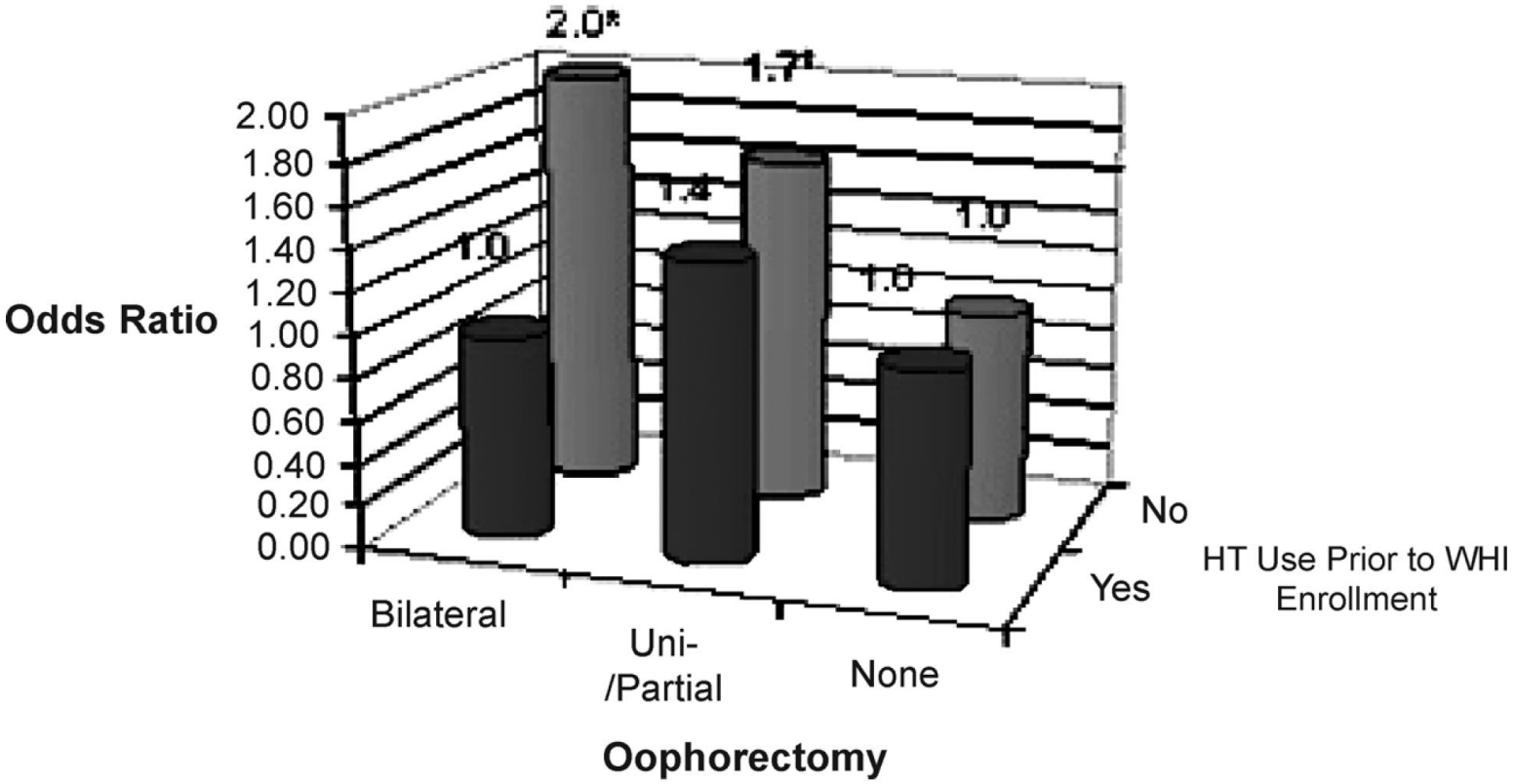


Menopause: The Journal of The North American Menopause Society
Vol. 15, No. 4, pp. 639-647
DOI: 10.1097/gme.0b013e31816d5b1c

Oophorectomy, hormone therapy, and subclinical coronary artery disease in women with hysterectomy: the Women's Health Initiative coronary artery calcium study

OR of a **coronary artery calcium score**

OR 2.0 (1.2, 3.4)



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Maturitas 53 (2006) 226–233
MATURITAS
THE EUROPEAN MENOPAUSE JOURNAL
www.elsevier.com/locate/maturitas

<prospective cohort study>

The association between early menopause and risk of ischaemic heart disease: Influence of Hormone Therapy☆

Risk of first ever **ischemic heart disease**

Menopausal age definitior	Age at menopause	
	<40 years, $n = 380$	40–45 years, $n = 1967$
At ovariectomy		
Cases (person time)	7(610)	4(794)
Rate/1000	11.4(5.5–24.0)	5.0(1.9–13.4)
Univariate	7.6(1.9–31.0)	2.3(0.5–10.3)
Multivariate	8.7(2.0–38.1)	3.1(0.7–15.1)
Spontaneous		
Cases (person time)	9(922)	25(4301)
Rate/1000	9.8(5.1–18.8)	5.8(3.9–8.6)
Univariate	2.4(1.2–4.8)	1.3(0.8–2.1)
Multivariate'	2.2(1.0–4.9)	1.2(0.7–2.0)

Increased risk of cognitive impairment or dementia in women who underwent oophorectomy before menopause

Cohort or stratum	Women at risk	Follow-up (person-years)	Women with cognitive impairment or dementia	Adjusted hazard ratio (95% CI)†	*p*
Overall					
Referent women	1,472	39,044	98	1.0 (ref.)	—
Any oophorectomy	1,489	40,736	150	1.46 (1.13–1.90)	0.005

Age at surgical menopause influences cognitive decline and Alzheimer pathology in older women

(2012)

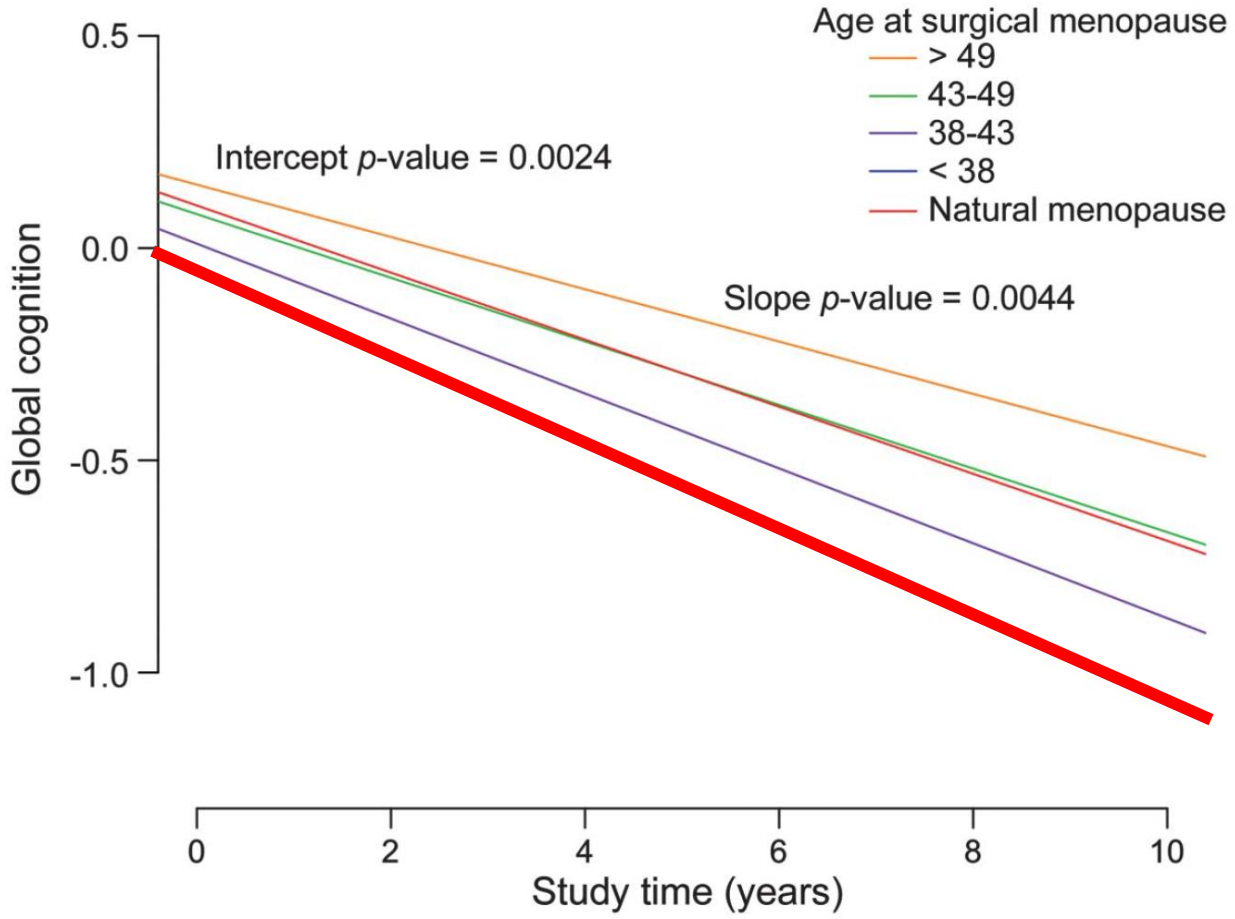
Inverse association
between **age** at surgical menopause and risk of neurologic outcomes

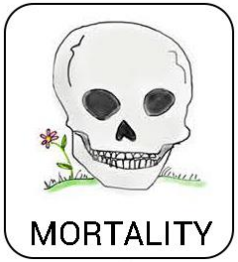
	Estimate	*p* Value
Longitudinal cognitive decline (n = 593)		
Global cognition	0.0024	0.0007
Domains		
Episodic memory	0.0032	0.0003
Semantic memory	0.0025	0.0022
Working memory	0.0010	0.1219
Visuospatial ability	0.0012	0.0909
Perceptual speed	0.0009	0.2920

Age at surgical menopause influences cognitive decline and Alzheimer pathology in older women

(2012)

Estimated **slope of decline in global cognition**
according to age at surgical menopause





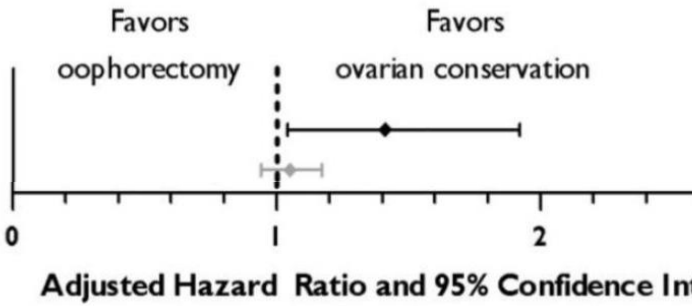
Obstet Gynecol. 2013 April ; 121(4): 709–716. doi:10.1097/AOG.0b013e3182864350.

Long-term Mortality Associated with Oophorectomy versus Ovarian Conservation in the Nurses' Health Study

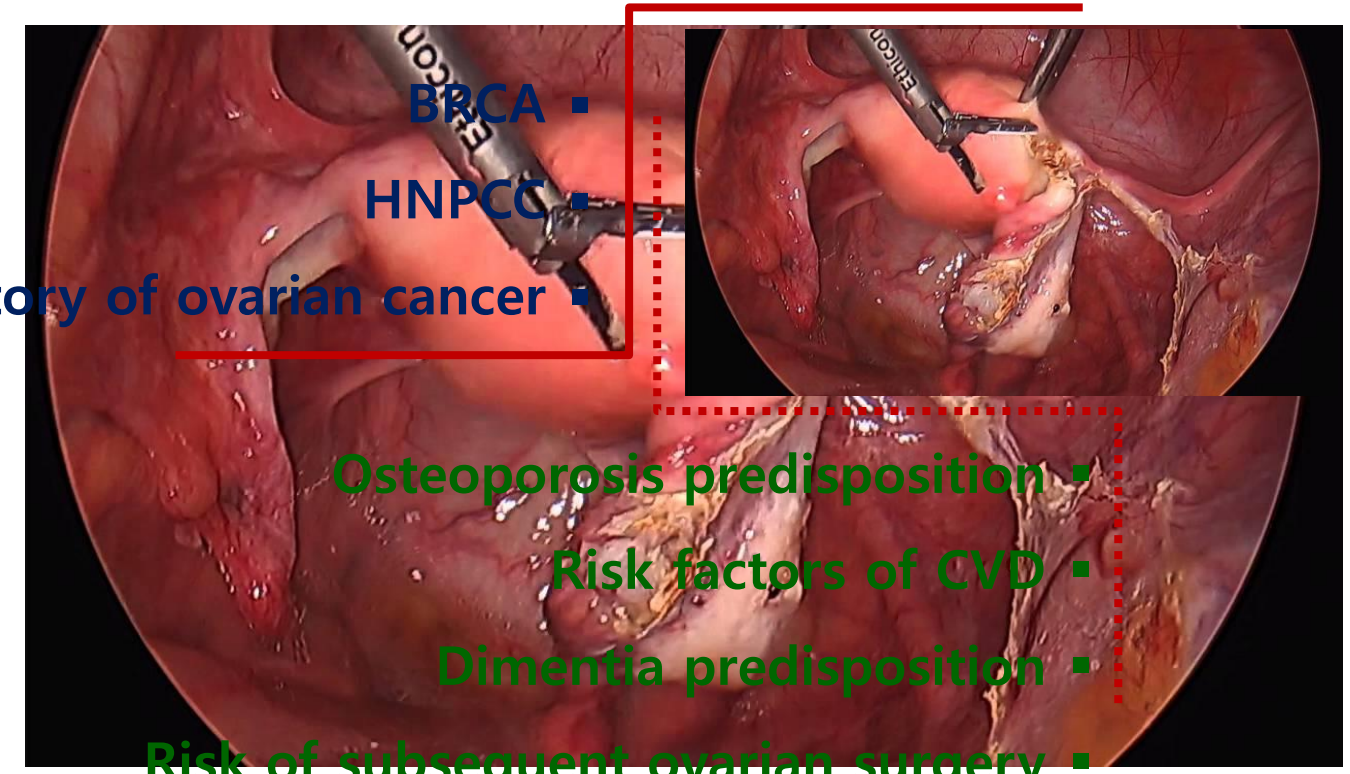
All-cause deaths for women with **bilateral oophorectomy**

Compared with ovarian conservation at time of hysterectomy **before age 50**

	Number of Deaths			
	Ovarian Conservation	Bilateral Oophorectomy	HR (95% CI)[a]	P-value Interaction[b]
ALL-CAUSE DEATHS				
Never ET User	196	96	**1.41** (1.04, 1.92)	0.03
Past or Current ET User	635	1060	1.05 (0.94-1.17)	

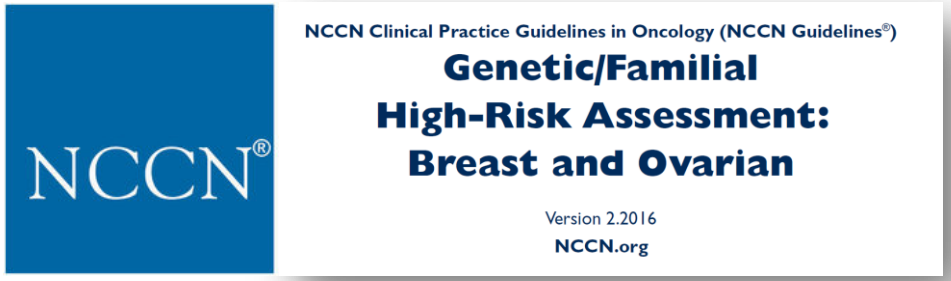


Prophylactic bilateral (salpingo-)oophorectomy



Breast cancer and Ovarian cancer risk for women with **BRCA mutations**

Type of Cancer	**BRCA1** mutation	**BRCA2** mutation
Breast	55–65%	45%
Ovary	39%	11–17%



Risk Management for Women with BRCA Mutations

Ovarian cancer risk management:

- Risk-reducing removal of ovaries and fallopian tubes between age 35 and 40 and upon completion of child bearing.
- Delaying risk-reducing removal of ovaries and fallopian tubes until age 40-45 is "reasonable" for BRCA2 mutation carriers who have undergone risk-reducing mastectomy, because the average age of ovarian cancer onset is 8-10 years later than in BRCA1 mutation carriers.
- Routine ovarian cancer screening using transvaginal ultrasound and a CA-125 blood test is not recommended by guidelines but may be performed at the doctor's discretion starting at age 30-35.

PERGAMON

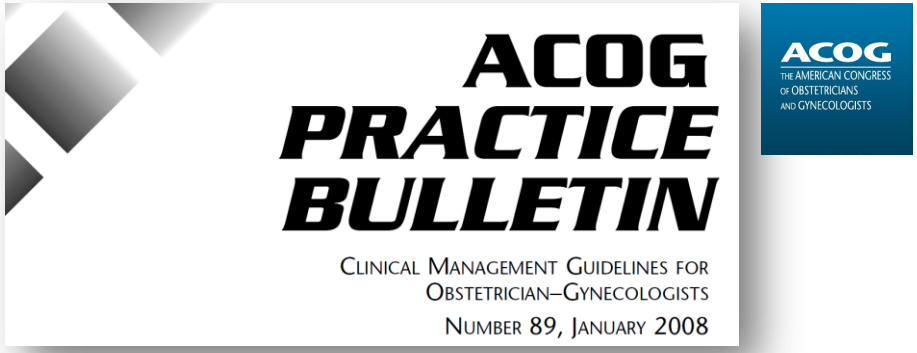
European Journal of Cancer 39 (2003) 505–510

European Journal of Cancer

www.ejconline.com

Family history of cancer and risk of ovarian cancer

	No. cases	No. controls	OR[a] (95% CI)[b]
No family history	1004	2402	1[c]
No. of affected relatives			
1	25	9	6.8 (2.9–16)
⩾2	2	0	∞
Youngest age at diagnosis in relatives (years)			
<50	8	1	13 (1.5–112)
⩾50	19	8	6.2 (2.5–16)
Relative affected			
Mother	13	5	6.5 (2.1–20)
Sister	13	4	7.7 (2.3–26)
Mother and sister	1	0	∞



▶ *How often will ovarian preservation result in reoperation?*

The frequency of repeat surgery for ovarian pathology is reported to be twice as high in women who had one ovary retained versus both (7.6% versus 3.6%). Most of these repeat surgical procedures are performed because of pelvic pain or a pelvic mass and occur within 5 years of the hysterectomy. Women with endometriosis, pelvic inflammatory disease, and chronic pelvic pain are at higher risk of reoperation if the ovaries are retained. The risk of subsequent ovarian surgery should be weighed against the benefit of ovarian retention in these patients.

NAMS
THE NORTH AMERICAN MENOPAUSE SOCIETY

ACOG
THE AMERICAN CONGRESS OF OBSTETRICIANS AND GYNECOLOGISTS

Menopause: The Journal of The North American Menopause Society
Vol. 24, No. 7, pp. 000-000
DOI: 10.1097/GME.0000000000000921

POSITION STATEMENT

The 2017 hormone therapy position statement of The North American Menopause Society

- Ovarian conservation is recommended, if possible, when hysterectomy for benign indications is performed in pre-menopausal women at average risk for ovarian cancer.

SGO
Society of Gynecologic Oncology

Current Commentary

Prophylactic and Risk-Reducing Bilateral Salpingo-oophorectomy

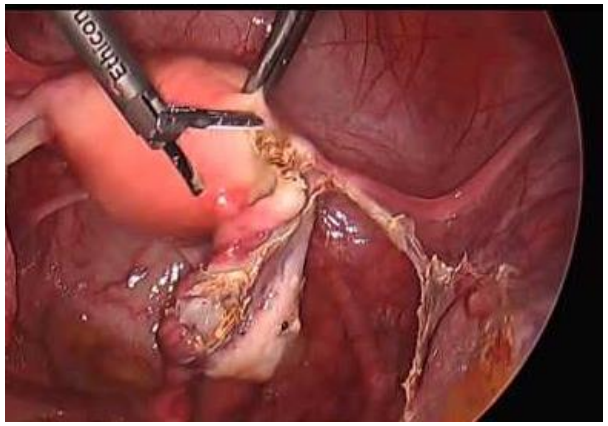
Recommendations Based on Risk of Ovarian Cancer

For women at average risk of ovarian cancer who are undergoing a hysterectomy for benign conditions, the decision should be individualized after appropriate informed consent, including a careful analysis of personal risk factors, concomitant disease, presence of gynecologic disease (endometriosis, chronic pain, infection), and age. There are several studies suggesting an overall negative health impact when performed before the age of menopause, particularly in the absence of estrogen replacement. Ovarian conservation before menopause may be especially important in patients with a personal or strong family history of cardiovascular or neurological disease, or for those women unable or unwilling to use hormonal therapy until the approximate age of menopause.

Management

Pre-menopausal

Bilateral oophorectomy

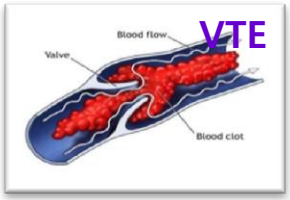


Menopause: The Journal of The North American Menopause Society
Vol. 24, No. 7, pp. 000-000
DOI: 10.1097/GME.0000000000000921

POSITION STATEMENT

The 2017 hormone therapy position statement of The North American Menopause Society

- In women with POI or early natural or induced menopause or who have had surgical menopause and who are otherwise appropriate candidates for HT, early initiation of HT and continued use at least until the median age of menopause (52 y) is recommended. This is based on observational evidence of potential prevention of risks related to early estrogen loss on CHD, osteoporosis, affective disorders, sexual dysfunction, GSM, and lowered cognitive function.



Research

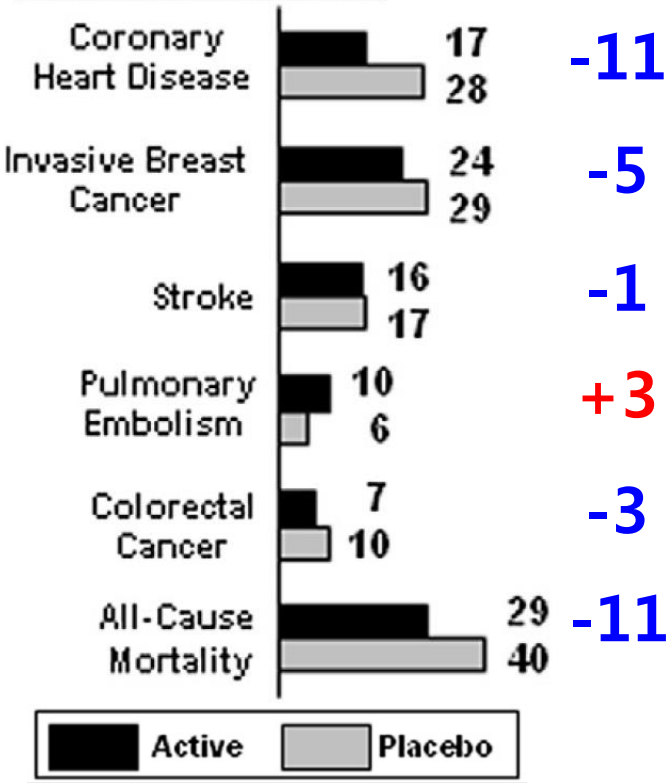
Original Investigation

Menopausal Hormone Therapy and Health Outcomes During the Intervention and Extended Poststopping Phases of the Women's Health Initiative Randomized Trials

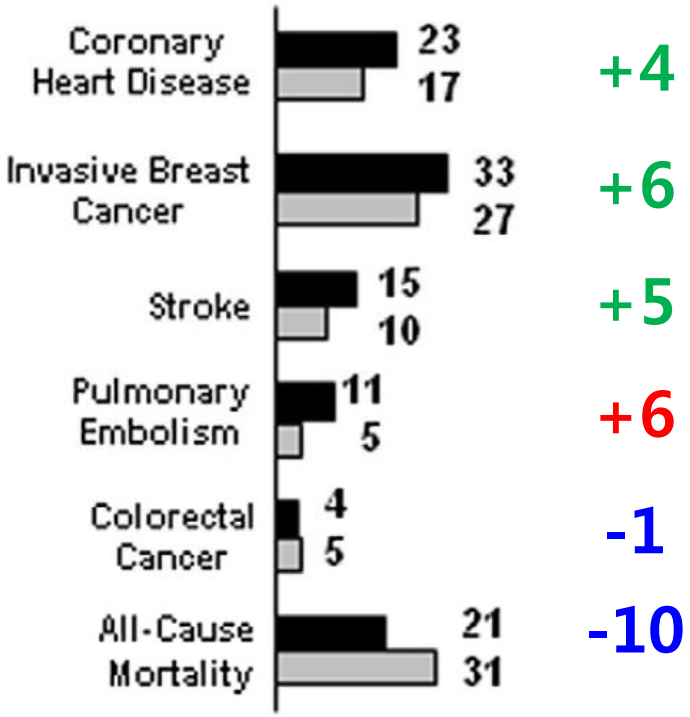
Age 50 - 59

Cases per 10,000 PYs

CEE–Alone Trial



CEE+MPA Trial



Journal of Thrombosis and Haemostasis, **9**: 85–91 DOI: 10.1111/j.1538-7836.2010.04108.x

ORIGINAL ARTICLE

Incidence of venous thromboembolism in Korea: from the Health Insurance Review and Assessment Service database

Annual incidence of VTE **in Korean female population**

	VTE	DVT	PE
30–39	5.03	2.65	1.50
40–49	9.71	4.77	3.40
50–59	13.13	5.77	5.58
60–69	41.17	14.78	22.20

ORIGINAL CONTRIBUTION

JAMA-EXPRESS
2002

- 16,680 postmenopausal women
- 50-79 years
- CEE 0.625mg/d + MPA 2.5mg/d or placebo
- Average F/U **5.2 years**
- 1993-1998

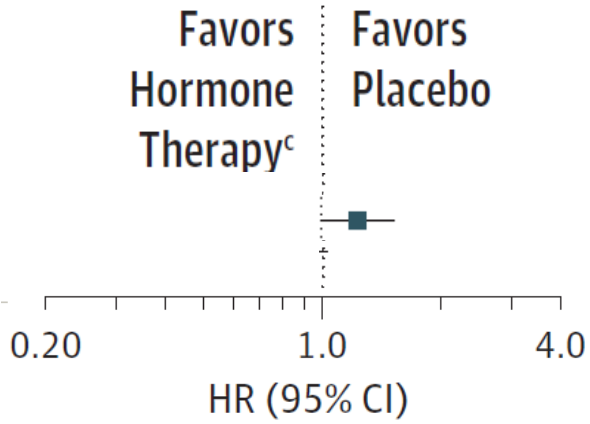
EP arm

Risks and Benefits of Estrogen Plus Progestin in Healthy Postmenopausal Women

Principal Results From the Women's Health Initiative Randomized Controlled Trial

Invasive breast cancer

No. (%) of Events[a]				
CEE+MPA (n=8560)	Placebo (n=8102)	Difference/ 10 000 PY[b]	HR (95% CI)	*P* Value
206 (0.43)	155 (0.35)	9	1.24 (1.01-1.53)	.04



Menopause: The Journal of The North American Menopause Society
Vol. 18, No. 7, pp. 778-785
DOI: 10.1097/gme.0b013e318207851d

A large multinational study of vasomotor symptom prevalence, duration, and impact on quality of life in middle-aged women

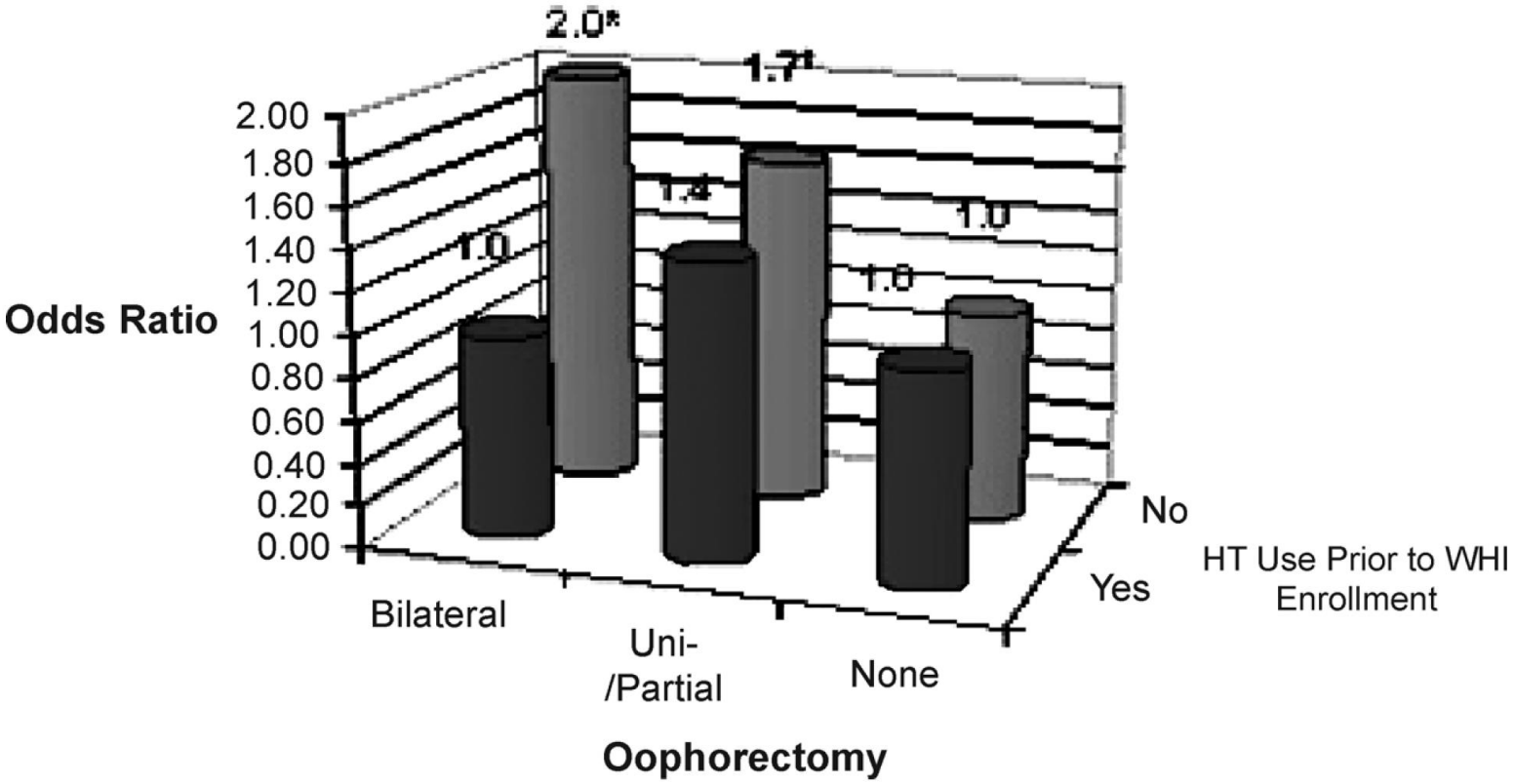
	HT use		
Vasomotor symptoms	Natural	Surgical	*P*
% Any degree (95% CI)	55.8 (52.4-59.1)	65.8 (60.5-70.7)	0.001
% Bothersome (95% CI)	8.8 (7.2-10.9)	9.0 (6.3-12.6)	NS
n	886	344	

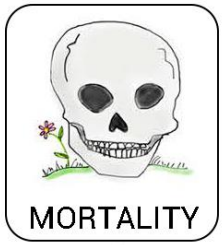
Menopause: The Journal of The North American Menopause Society
Vol. 15, No. 4, pp. 639-647
DOI: 10.1097/gme.0b013e31816d5b1c

Oophorectomy, hormone therapy, and subclinical coronary artery disease in women with hysterectomy: the Women's Health Initiative coronary artery calcium study

OR of a **coronary artery calcium score**

OR 2.0 (1.2, 3.4) **OR 1.0** (0.6, 1.4)



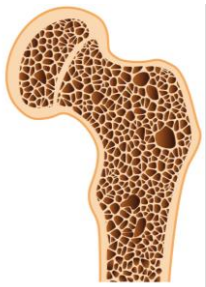


Menopause: The Journal of The North American Menopause Society
Vol. 16, No. 1, pp. 15-23
DOI: 10.1097/gme.0b013e31818888f7

Increased cardiovascular mortality after early bilateral oophorectomy

- cohort study
- 1,091 women with bilateral oophorectomy

Cohort or stratum	Women at risk	Person-years of follow-up	Total deaths, n	CVD listed anywhere on the death certificate[b] Deaths, n (%)	HR (95% CI)	*P*
Analyses stratified by age at oophorectomy or index year						
Younger (<45 y)						
Referent women	1,417	38,106	229	104 (7.3)	1.00 (reference)	—
Oophorectomy	413	11,179	94	45 (10.9)	1.44 (1.01-2.05)[c]	0.04
Estrogen given from surgery until age 45 y or longer	151	4,167	20	7 (4.6)	0.65 (0.30-1.41)[d]	0.28
Estrogen not given or discontinued before age 45 y	262	7,012	74	38 (14.5)	1.84 (1.27-2.68)[d]	0.001
Prophylactic	124	3,164	33	15 (12.1)	1.73 (1.00-2.98)	0.049
Benign conditions	289	8,015	61	30 (10.4)	1.32 (0.88-1.99)	0.18



Hormone replacement therapy in young women with surgical primary ovarian insufficiency

(2016)

Effect of **delay in MHT** on bone health
in women undertaking bilateral risk reducing salpingo-oophorectomy

Length of estrogen deprivation, mo	DEXA normal, n (%)	Osteopenia (DEXA T score −1.0 to −2.4), n (%)	Osteoporosis (DEXA T score < −2.4), n (%)
0	26 (84)	4 (13)	1 (3)
1–23	6 (60)	3 (30)	1 (10)
≥24	42 (54)	26 (33)	10 (13)

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ELSEVIER
Maturitas 53 (2006) 226–233
MATURITAS
THE EUROPEAN MENOPAUSE JOURNAL
www.elsevier.com/locate/maturitas

<prospective cohort study>

The association between early menopause and risk of ischaemic heart disease: Influence of Hormone Therapy☆

Menopausal age definition	Menopausal age	
	≤45 years	
	Never HT	Ever HT
At ovariectomy		
Cases (person years)	5(309)	6(1094)
Rate/1000	16.2(6.7–38.9)	5.5(2.4–12.2)
Multivariate	2.9(0.9–9.5)	Ref.
Not at ovariectomy		
Cases (person years)	28(4488)	42(8092)
Rate/1000	6.2(4.3–9.0)	6.2(4.6–8.3)
Multivariate	0.9(0.4–2.3)	1.3(0.6–3.1)
All		
Cases (person years)	33(4797)	48(7908)
Rate/1000	6.9(4.9–9.7)	6.1(4.6–8.1)
Multivariate	0.8(0.5–1.4)	Ref.

Hormone therapy and Alzheimer disease dementia

(2012)

New findings from the Cache County Study

	No.[a]	P-Y	AD	HR (95% CI) Adjusted 2[c]
No HT	663	4,577	89	1.0
HT (any type) initiated within 5 y of menopause for <3 y	170	1,223	13	0.71 (0.39-1.28)
HT initiated within 5 y of menopause for 3-10 y	80	645	6	0.71 (0.31-1.65)
HT initiated within 5 y of menopause for ≥10 y	452	3,513	29	0.63 (0.41-0.98)[d]
HT initiated >5 y after menopause for <3 y	122	966	11	1.04 (0.54-1.97)
HT initiated >5 y after menopause for 3-10 y	104	820	8	0.92 (0.44-1.92)
HT initiated >5 y after menopause for ≥10 y	114	842	11	1.00 (0.53-1.91)

Menopause: The Journal of The North American Menopause Society
Vol. 21, No. 7, pp. 763-768
DOI: 10.1097/gme.0000000000000126

BRCA1 mutation

BRCA2 mutation

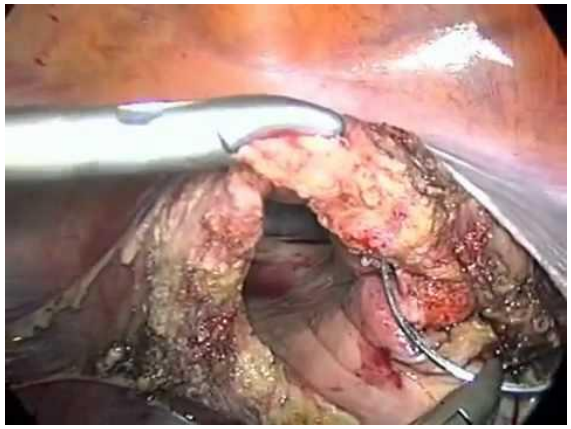
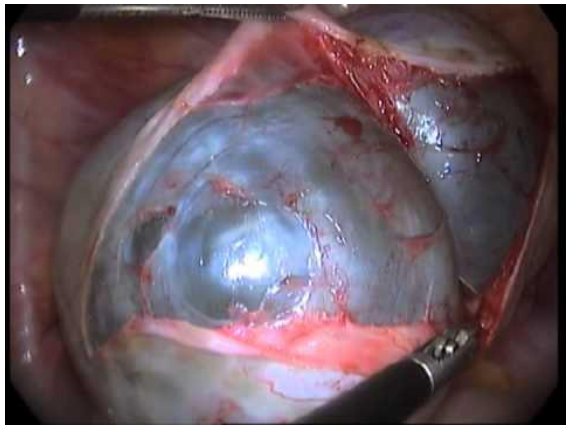
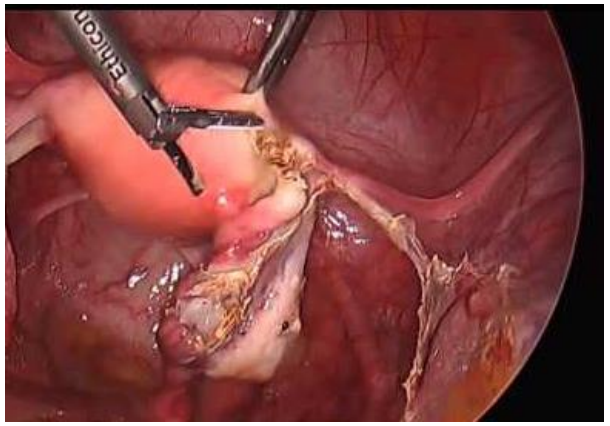
REVIEW ARTICLE

Hormone therapy in oophorectomized BRCA1/2 mutation carriers

Study	BRCA1/2 mutation carriers who received HT after RRSO	E_2, PG + E_2 HT duration (y)	Breast cancer risk
Rebbeck et al	93	Not specified	HR, 0.37; 95% CI, 0.14-0.96
Eisen et al	57	4	OR, 0.48; 95% CI, 0.19-1.21
Gabriel et al	33	2.79	men with breast cancer, 3/33; 9.09%

산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

Post-menopausal

Hysterectomy only	Ovarian cystectomy	Bilateral oophorectomy
		

0021-972X/07/$15.00/0
Printed in U.S.A.

The Journal of Clinical Endocrinology & Metabolism 92(8):3040–3043

doi: 10.1210/jc.2007-0581

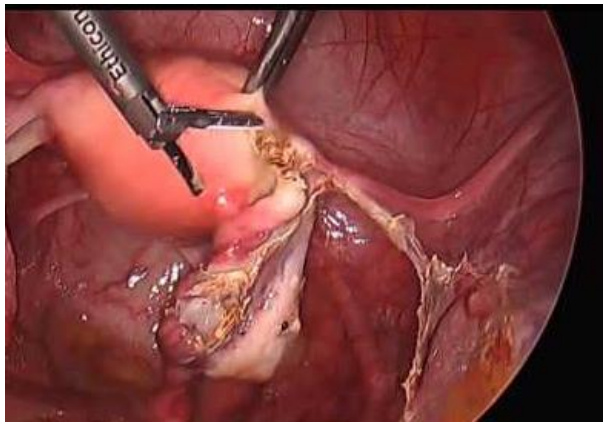
Ovarian Androgen Production in Postmenopausal Women

BSO

	Preoperative	Postoperative	Percent difference (%)	*P* value
T (ng/ml)	2.6 (1.0–6.0)	1.5 (0.6–2.1)	42	<0.05
A (ng/ml)	0.6 (0.2–0.9)	0.5 (0.2–1.2)	17	NS
DHEA (ng/ml)	2.2 (0.6–5.4)	1.8 (0.7–3.1)	18	NS
E1 (pg/ml)	46.0 (25.0–119.0)	33.9 (17.0–61.0)	26	<0.05
E2 (pg/ml)	15.9 (3.0–32.0)	14.7 (4.0–62.0)	8	NS

Post-menopausal

Bilateral oophorectomy



Vasomotor symptom

Bone health

Cardiovascular health

Cognitive function

Mortality

JOURNAL OF BONE AND MINERAL RESEARCH
Volume 18, Number 5, 2003

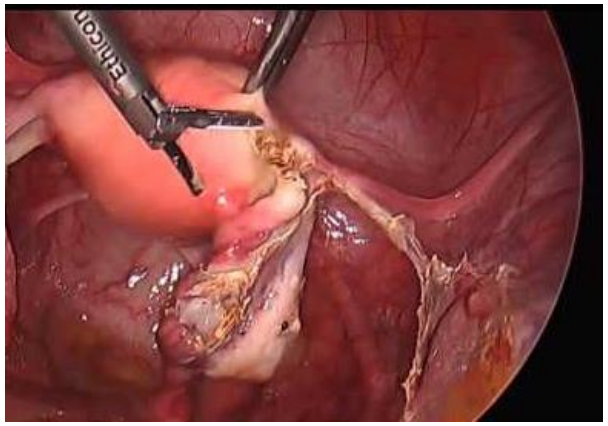
Fracture Risk After Bilateral Oophorectomy in Elderly Women*

350 women who were already postmenopausal when they underwent bilateral (or second unilateral) oophorectomy for a benign ovarian Condition	*Any osteoporotic fracture* [HR (95% CI)]*
Age (per 10 years)	1.85 (1.48–2.31)
Anticonvulsants ≥6 months	5.12 (1.24–21.2)
Anticoagulants ≥6 months	—
Thiazide diuretics ≥6 months	0.60 (0.40–0.90)
Obesity (BMI > 27.3 kg/m^2)	—
Prior osteoporotic fracture	2.58 (1.48–4.48)
Kyphosis	1.85 (1.26–2.72)
Alcoholism	—
Index year	1.03 (1.01–1.05)

Fracture of the hip, spine, or distal forearm caused by moderate trauma at age 35 years or older.

Post-menopausal

Bilateral oophorectomy



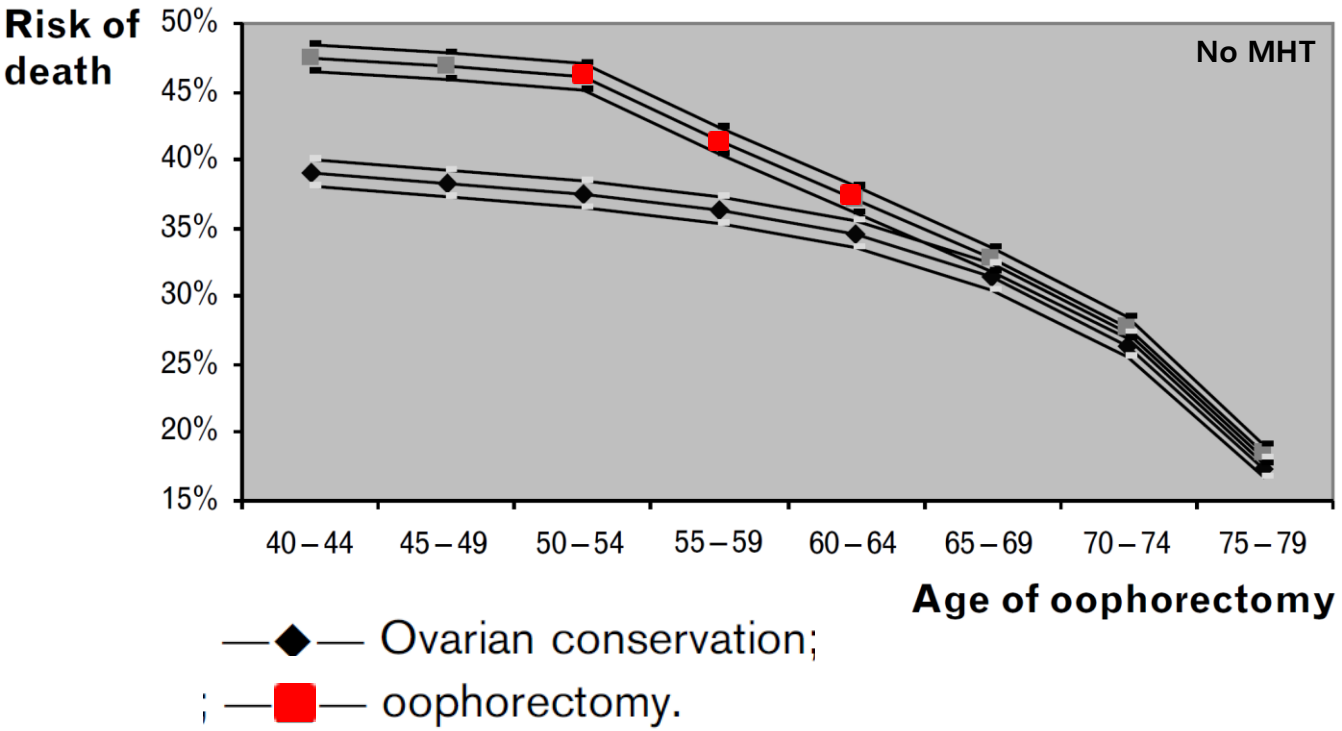
- Vasomotor symptom ↓
- Bone health ↓
- Cardiovascular health ↓
- Cognitive function ↓
- Mortality ↓

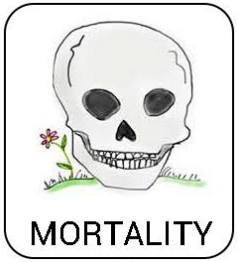
(2007)

Elective oophorectomy in the gynecological patient: when is it desirable?

William H. Parker[a], Donna Shoupe[b], Michael S. Broder[a], Zhimei Liu[c], Cindy Farquhar[d] and Jonathan S. Berek[e]

Risk of death by age 80 years
as a function of age at oophorectomy





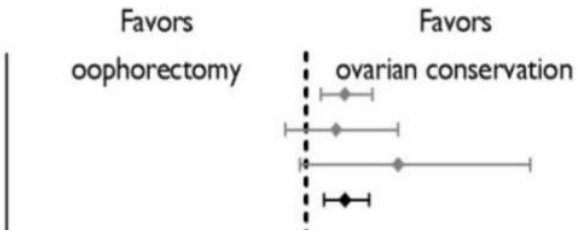
Obstet Gynecol. 2013 April ; 121(4): 709–716. doi:10.1097/AOG.0b013e3182864350.

Long-term Mortality Associated with Oophorectomy versus Ovarian Conservation in the Nurses' Health Study

All-cause deaths for women with **bilateral oophorectomy**

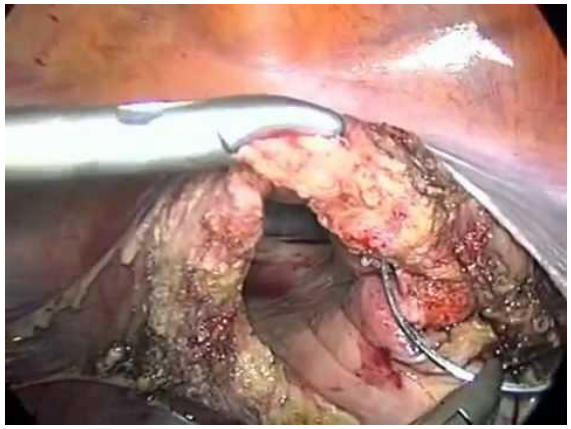
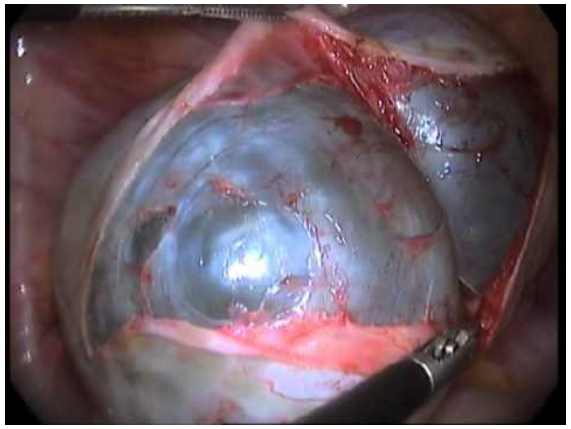
Compared with ovarian conservation at time of hysterectomy

DEATHS	Number of Deaths: Ovarian Conservation	Number of Deaths: Bilateral Oophorectomy	HR (95% CI)[a]	P-value Interaction[b]
< 50 y	1388	2045	1.13 (1.05-1.22)	
50-59 y	227	656	1.10 (0.93-1.31)	0.46
≥ 60 y	134	149	1.31 (0.98-1.75)	
ALL	1749	2850	1.13 (1.06-1.21)	



산부인과 수술 후 호르몬 변화와 수술 후 폐경의 치료법

Pre-menopausal

NON-ovarian	Ovarian cystectomy	Bilateral oophorectomy
		


THANK YOU
FOR YOUR ATTENTION !
李敏