

Ovarian Cancer Screening
EVIDENCE TABLE

Reference	Study Type	Number of Patients	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Taylor KJ, Schwartz PE. Screening for early ovarian cancer. <i>Radiology</i> 1994; 192(1):1-10.	12	N/A	Review the epidemiology and the causes of ovarian cancer and the technology applicable to its possible earlier diagnosis.	CA 125 US may allow diagnosis of stage I disease. Current techniques are only cost effective in women with family history. Estimated cost \$70,000/case with family history vs \$400,000/case in general population.	4
2. Ries L, Melbert D, Krapcho M, et al. SEER Cancer Statistics Review, 1975-2004, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2004/ , based on November 2006 SEER data submission, posted to the SEER web site, 2007.	N/A	N/A	Cancer statistics for ovarian cancer.	N/A	N/A
3. Easton DF, Ford D, Bishop DT. Breast and ovarian cancer incidence in BRCA1-mutation carriers. Breast Cancer Linkage Consortium. <i>Am J Hum Genet</i> 1995; 56(1):265-271.	13	N/A	Evidence of linkage to BRCA1 to estimate the age-specific risks of breast and ovarian cancer in BRCA1-mutation carriers.	BRCA1 is estimated to confer a breast cancer risk of 54% by age 60 years and ovarian cancer risk of 30% by age 60 years.	3
4. Levine D, Gosink BB, Wolf SI, Feldesman MR, Pretorius DH. Simple adnexal cysts: the natural history in postmenopausal women. <i>Radiology</i> 1992; 184(3):653-659.	13	184	To prospectively determine the frequency of simple adnexal cysts in postmenopausal women using TAS and TVS associated with hormones and time since menopause.	Cyst frequency 17%; 53% disappeared, 28% constant, 11% enlarged, 3% decreased, 6% decreased and increased. No relationship with hormones or time from menopause.	2
5. Petricoin EF, Ardekani AM, Hitt BA, et al. Use of proteomic patterns in serum to identify ovarian cancer. <i>Lancet</i> 2002; 359(9306):572-577.	10	116	Assess accuracy of proteomic assay.	Sensitivity 100%; specificity 99%; PPV 94%.	2
6. Mor G, Visintin I, Lai Y, et al. Serum protein markers for early detection of ovarian cancer. <i>Proc Natl Acad Sci U S A</i> 2005; 102(21):7677-7682.	10	106 normal 100 ovarian cancer	Assess accuracy of four serum analytes for detection of ovarian cancer.	Sensitivity 95%; specificity 95%; PPV 95%; NPV 94%.	2
7. Campbell S, Bhan V, Royston P, Whitehead MI, Collins WP. Transabdominal ultrasound screening for early ovarian cancer. <i>BMJ</i> 1989; 299(6712):1363-1367.	10	5,479	Prospective study to assess the value of US in a screening procedure for early ovarian cancer.	False positive for ovarian cancer 2%-3%. Specificity 97.7%, PPV 1%-5%. US can be used to screen women without symptoms for persistent ovarian masses.	2
8. Jacobs I, Davies AP, Bridges J, et al. Prevalence screening for ovarian cancer in postmenopausal women by CA 125 measurement and ultrasonography. <i>BMJ</i> 1993; 306(6884):1030-1034.	10	22,000	To assess performance of serum CA 125 and US for screening ovarian cancer.	Specificity 99.9%, PPV 26.8%, Sensitivity 78.6% (1 year follow-up). Sensitivity: 57.9% (2 years follow-up). Highly specific for ovarian cancer and can detect a substantial proportion of cases at a preclinical stage.	2

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9. Fleischer AC, McKee MS, Gordon AN, et al. Transvaginal sonography of postmenopausal ovaries with pathologic correlation. <i>J Ultrasound Med</i> 1990; 9(11):637-644.	10	34 patients 67 ovaries	Accuracy of TVS in detecting postmenopausal ovaries.	PPV for detecting an ovarian mass 94%. NPV for exclusion of ovarian mass 92%. TVS can accurately delineate the ovaries in most, but not all, postmenopausal women.	3
10. Van Nagell JR, Jr., DePriest PD, Puls LE, et al. Ovarian cancer screening in asymptomatic postmenopausal women by transvaginal sonography. <i>Cancer</i> 1991; 68(3):458-462.	10	100	To determine the efficacy of TVS as a screening method for ovarian cancer in asymptomatic postmenopausal women.	2.5% (33%) ovarian abnormalities with 2 malignancies, TVS efficient, easy to perform, reduce mortality.	2
11. van Nagell JR, Jr., DePriest PD, Reedy MB, et al. The efficacy of transvaginal sonographic screening in asymptomatic women at risk for ovarian cancer. <i>Gynecol Oncol</i> 2000; 77(3):350-356.	10	14,469	Assess efficacy of TVS as a screening method for ovarian cancer.	Sensitivity 81%, Specificity 99%, PPV 9.4%, NPV 99.97%. TVS annual screening assoc with a decrease of stage at detection and mortality.	2
12. Sato S, Yokoyama Y, Sakamoto T, Futagami M, Saito Y. Usefulness of mass screening for ovarian carcinoma using transvaginal ultrasonography. <i>Cancer</i> 2000; 89(3):582-588.	2	183,034	Assess efficacy of TVS screening for ovarian cancer.	22 primary tumors and 2 metastatic tumors were detected for a diagnostic rate of 0.047%. Of 22, 77% stage I ovarian cancer.	1
13. Buys SS, Partridge E, Greene MH, et al. Ovarian cancer screening in the Prostate, Lung, Colorectal and Ovarian (PLCO) cancer screening trial: findings from the initial screen of a randomized trial. <i>Am J Obstet Gynecol</i> 2005; 193(5):1630-1639.	8	39,115	Evaluate accuracy of screening with TVS plus CA 125.	Abnormal TVS 4.7%; Abnormal CA 125 1.4%; 29 ovarian cancer, 26 ovarian cancer, 2 fallopian tub, 1% peritoneal neoplasm, PPV TVS 3.7%, PPV CA 125 1.0%, TVS and CA 125; PPV 23.5%.	1
14. Bourne TH, Whitehead MI, Campbell S, Royston P, Bhan V, Collins WP. Ultrasound screening for familial ovarian cancer. <i>Gynecol Oncol</i> 1991; 43(2):92-97.	10	776	Screen women with one close relative with ovarian cancer using TVS.	PPV and prevalence greater than general population.	2
15. Karlan BY, Platt LD. The current status of ultrasound and color Doppler imaging in screening for ovarian cancer. <i>Gynecol Oncol</i> 1994; 55(3 Pt 2):S28-33.	13	11,283	Prospective screening trial to determine number of surgeries required to rule out diagnosis of ovarian cancer in low risk vs high risk population.	32 surgeries to diagnose stage I ovarian cancer in low risk population compared to 17 surgeries in high risk population.	2
16. Karlan BY, Baldwin RL, Lopez-Luevanos E, et al. Peritoneal serous papillary carcinoma, a phenotypic variant of familial ovarian cancer: implications for ovarian cancer screening. <i>Am J Obstet Gynecol</i> 1999; 180(4):917-928.	3	1,261	Review patients' reports to determine the cancers arising during a familial ovarian cancer screening program and investigate the tumor's clonality and association with BRCA1 and BRCA2 mutations assess ovarian cancer in patients with familial history of ovarian cancer.	3 stage I ovarian cancer, 7 peritoneal serous papillary cancers. Multifocal peritoneal serous papillary carcinoma may be a phenotypic variant of familial ovarian cancer, and screening strategies for these women cannot rely on US and CA 125 testing to detect early disease.	2

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17. Fleischer AC, Cullinan JA, Peery CV, Jones HW, 3rd. Early detection of ovarian carcinoma with transvaginal color Doppler ultrasonography. <i>Am J Obstet Gynecol</i> 1996; 174(1 Pt 1):101-106.	13	206	Retrospective analysis to assess accuracy of TV-CDS for early detection of ovarian cancer.	26 ovarian cancers detected; >70% of which were stage I or II.	3
18. Jokubkiene L, Sladkevicius P, Valentin L. Does three-dimensional power Doppler ultrasound help in discrimination between benign and malignant ovarian masses? <i>Ultrasound Obstet Gynecol</i> 2007; 29(2):215-225.	3	106	To determine if tumor vascularity as assessed by 3D TVS helps differentiate benign vs malignant.	3D improved diagnosis only marginally over 2D.	2
19. Marret H, Sauget S, Giraudeau B, et al. Contrast-enhanced sonography helps in discrimination of benign from malignant adnexal masses. <i>J Ultrasound Med</i> 2004; 23(12):1629-1639; quiz 1641-1642.	2	99	To assess whether contrast TVS could differentiate benign and malignant adnexal masses.	Sensitivity between 96%-100%; specificity 83%-98%; Contrast may easily and precisely discriminate benign from malignant adnexal lesions.	3
20. Orden MR, Jurvelin JS, Kirkinen PP. Kinetics of a US contrast agent in benign and malignant adnexal tumors. <i>Radiology</i> 2003; 226(2):405-410.	10	70	To evaluate the effects of a microbubble contrast agent on US examination of adnexal tumors, with focus on the timing of the transit of the microbubble bolus.	Benign/malignant ovarian cancer had different contrast kinetics.	3
21. Testa AC, Ferrandina G, Fruscella E, et al. The use of contrasted transvaginal sonography in the diagnosis of gynecologic diseases: a preliminary study. <i>J Ultrasound Med</i> 2005; 24(9):1267-1278.	10	89	Assess efficacy of contrasted transvaginal US in diagnosis of gynecologic diseases.	Contrast improved TVS diagnosis of ovarian cancer.	2
22. Weiner Z, Beck D, Shtainer M, et al. Screening for ovarian cancer in women with breast cancer with transvaginal sonography and color flow imaging. <i>J Ultrasound Med</i> 1993; 12(7):387-393.	10	600	Determine the efficacy of TVS color flow screening for ovarian cancer in patients with previous breast cancer.	Prevalence .5%. Specificity of TVS for malignant ovarian tumors 97.5%, PPV 25%, specificity of color flow 99.8%, PPV 60%.	2
23. Guerriero S, Alcazar JL, Ajossa S, et al. Comparison of conventional color Doppler imaging and power doppler imaging for the diagnosis of ovarian cancer: results of a European study. <i>Gynecol Oncol</i> 2001; 83(2):299-304.	9	656	Compare the diagnostic accuracy of conventional color Doppler (CCD) imaging and power Doppler (PD) imaging in the diagnosis of ovarian cancer.	The false-positive rate of B-mode imaging was similar in the two institutions (17% vs 18%), while the false-positive rates of CCD and PD imaging were 4.6% and 7.4%, respectively. Lower sensitivity in differentiation of benign from malignant ovarian lesions was found using CCD (87% vs 100%).	2

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24. Timmerman D, Testa AC, Bourne T, et al. Logistic regression model to distinguish between the benign and malignant adnexal mass before surgery: a multicenter study by the International Ovarian Tumor Analysis Group. <i>J Clin Oncol</i> 2005; 23(34):8794-8801.	13	1,066	Develop logistic regression model for sonographic distinction of benign vs malignant ovarian masses.	Sensitivity 93%; specificity 76%. Because the model was constructed from multicenter data, it is more likely to be generally applicable.	2
25. Fishman DA, Cohen L, Blank SV, et al. The role of ultrasound evaluation in the detection of early-stage epithelial ovarian cancer. <i>Am J Obstet Gynecol</i> 2005; 192(4):1214-1221; discussion 1221-1212.	10	4,526	Examined usefulness of US in the detection of early-stage epithelial ovarian cancer.	37 benign ovarian cancer tumors; 12 gynecologic malignancies. Limited value of TVS alone.	1
26. Adonakis GL, Paraskevidis E, Tsiga S, Seferiadis K, Lolis DE. A combined approach for the early detection of ovarian cancer in asymptomatic women. <i>Eur J Obstet Gynecol Reprod Biol</i> 1996; 65(2):221-225.	10	2,000	Investigate the effectiveness of the combined procedure including pelvic examination and serum CA 125 for ovarian cancer screening.	Combined approach had sensitivity 100%, specificity 99.70% and PPV 22%.	2
27. Fung MF, Bryson P, Johnston M, Chambers A. Screening postmenopausal women for ovarian cancer: a systematic review. <i>J Obstet Gynaecol Can</i> 2004; 26(8):717-728.	11	N/A	Assess ovarian cancer screening in asymptomatic, general-risk postmenopausal women.	Screening tests for CA125 and US had low PPV, and a false-positive rate of 0.01% to 5.8%. Of every 10,000 women participating in an annual screening program with CA125 for 3 years, 800 will have an US because of an elevated CA125, 30 will undergo surgery because of an abnormal US, and 6 will have ovarian cancer detected at surgery (3 will be diagnosed at early-stage disease and have a chance of a cure).	3
28. Menon U, Skates SJ, Lewis S, et al. Prospective study using the risk of ovarian cancer algorithm to screen for ovarian cancer. <i>J Clin Oncol</i> 2005; 23(31):7919-7926.	8	13,582	Prospective study to evaluate prevalence screening using age and CA 125.	Specificity 99.8%; PPV 19%. An ovarian cancer screening strategy using the ROC algorithm is feasible and can achieve high specificity and PPV in postmenopausal women.	1
29. Jacobs IJ, Menon U. Progress and challenges in screening for early detection of ovarian cancer. <i>Mol Cell Proteomics</i> 2004; 3(4):355-366.	12	N/A	Review articles from the last decade that have been directed toward improving outcomes for ovarian cancer.	Further developments in serum proteomic analysis will provide powerful methods for screening in ovarian cancer. There is some interest in initial results using surface-enhanced laser desorption/ionization (SELDI) in ovarian cancer.	4

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30. Tailor A, Bourne TH, Campbell S, Okokon E, Dew T, Collins WP. Results from an ultrasound-based familial ovarian cancer screening clinic: a 10-year observational study. <i>Ultrasound Obstet Gynecol</i> 2003; 21(4):378-385.	10	2,500	Assess the use of TVS as a screening test for familial ovarian cancer.	Sensitivity of US 92%; specificity 97.8%. TSV can effectively detect intraovarian cancer and tumors of borderline malignancy.	1

Evidence Table Key

Study Type Key

Numbers 1-7 are for studies of therapies while numbers 8-15 are used to describe studies of diagnostics.

1. Randomized Controlled Trial — Treatment
2. Controlled Trial
3. Observation Study
 - a. Cohort
 - b. Cross-sectional
 - c. Case-control
4. Clinical Series
5. Case reviews
6. Anecdotes
7. Reviews

8. Randomized Controlled Trial — Diagnostic
9. Comparative Assessment
10. Clinical Assessment
11. Quantitative Review
12. Qualitative Review
13. Descriptive Study
14. Case Report
15. Other (Described in text)

Strength of Evidence Key

- Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.
- Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.
- Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.
- Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.