



Ovarian Cancer Screening: Are There Any Options?

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Ovarian cancer is the leading cause of death among cancers of the reproductive system (22,220 cases are estimated for 2005) and the fourth-leading cause of all cancer deaths among American women (16,210 estimated deaths in 2005) (American Cancer Society [ACS], 2005). In the general population, 1 in 70 women, or 1.5% of all women, will develop ovarian cancer. Although the rate is much lower in comparison to the 13.4% of women who will develop breast cancer, 5.5% who will develop colorectal cancer, and 2.6% who will develop uterine cancer, ovarian cancer's five-year survival rate for all stages is a dismal 44% as compared to 88%, 84%, and 63% for these other cancers, respectively (Ries et al., 2004).

Despite advances in surgery and treatment modalities, the prognosis for most women with ovarian cancer continues to be poor. The five-year survival rate for women with advanced-stage disease (stage III–IV) is 29% in contrast to a 94% survival rate in women with early and localized disease. Only 19% of ovarian cancers are detected when confined to the ovary (ACS, 2005). Ovarian cancer usually is diagnosed in an advanced stage because it presents with few, if any, distinctive symptoms. Even when subtle symptoms such as abdominal bloating and discomfort, dyspepsia, and unexplained weight loss or gain occur, they usually happen after the extensive spread of ovarian cancer (Fishman & Bozorgi, 2002). Because of a lack of specific or early warning symptoms, the accurate and early detection of early-stage ovarian cancer is critical.

Figure 1 highlights risk factors for developing ovarian cancer. With the exception of women with known mutations for breast and ovarian cancer (*BRCA1* and *BRCA2*) and hereditary nonpolyposis colorectal cancer

- Increasing age
- Personal history of breast cancer
- Family history of ovarian or breast cancer
- Mutation of the *BRCA1* or *BRCA2* genes
- Presence of hereditary nonpolyposis colorectal cancer mutation
- Nulliparity
- Obesity

FIGURE 1. RISK FACTORS FOR DEVELOPING OVARIAN CANCER

Note. Based on information from American Cancer Society, 2005.

(HNPCC), risk factor assessment is not particularly helpful in identifying women who might benefit from aggressive screening. For women with known *BRCA1* and *BRCA2* and HNPCC mutations, current screening modalities likely are inadequate, and such women should be counseled about the risks and benefits of prophylactic surgery between the ages of 35 and 45, when childbearing is complete.

Bimanual rectovaginal examination, ultrasound, and the cancer antigen-125 (CA-125) blood test are three modalities used to screen for ovarian cancer. However, according to several published screening guidelines, insufficient evidence exists to recommend population-based screening for ovarian cancer. Currently available methods have not been shown to be effective in reducing mortality and morbidity from the disease. Furthermore, costs associated with annual screening of women older than 45 in the general population using ultrasound and CA-125 was estimated 10 years ago to be more than \$13 billion yearly (Gladstone, 1994). Because of these limitations, organizations such as the American Academy of Family Physicians and the U.S. Preventive

Services Task Force do not recommend screening for ovarian cancer. Table 1 provides a comparison of screening guidelines from professional organizations (American Academy of Family Physicians, 2003; Gladstone; Institute for Clinical Systems Improvement, 2004; Scottish Intercollegiate Guidelines Network, 2003; Smith, Cokkinides, & Eyre, 2005; U.S. Preventive Services Task Force, 2004).

The potential benefit of a screening test for ovarian cancer is the ability to identify the disease in its early stages, when treatment is more likely to be effective. Such a test should have high sensitivity and specificity with an acceptable positive predictive value. Specificity is a major concern in ovarian cancer screening. A test with 98% specificity would result in 50 false positive results for every case of ovarian cancer detected in screening of postmenopausal women. This is unacceptable given that women would experience further expensive testing and possibly require exploratory surgery, a large expense not without risks. Most experts recommend that a screening test for ovarian cancer requires a 99.6% specificity to yield a positive predictive value of 10%. At a specificity of 99.6%, 1 of 10 patients taken to the operating room actually would have cancer (Fishman & Bozorgi, 2002). At present, no such screening test exists for ovarian cancer.

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