Memorial Sloan Kettering Cancer Center

Ovarian Cancer in 2015: Advances in Screening, Prevention, and Reasons for Hope

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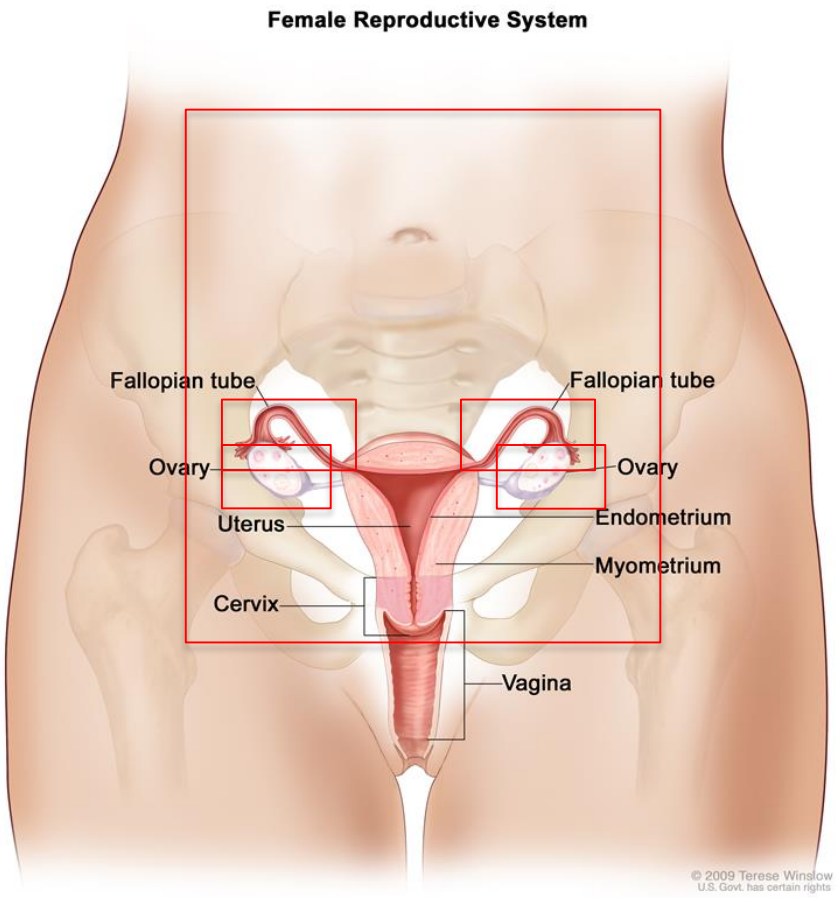
Ovarian Cancer in 2015



Cancer.gov

- Ovary, fallopian tube, peritoneum
  - Does it all start in the fallopian tube?
- Stages:
  - I – limited to ovaries
  - II – spread to pelvis
  - III – spread to upper abdomen or lymph nodes
  - IV – distant spread

Ovarian Cancer in 2015

Incidence: 21,290 (2.6%)

Mortality: 14,180 (5%)

Estimated New Cases

Males			Females		
Prostate	220,800	26%	Breast	231,840	29%
Lung & bronchus	115,610	14%	Lung & bronchus	105,590	13%
Colon & rectum	69,090	8%	Colon & rectum	63,610	8%
Urinary bladder	56,320	7%	Uterine corpus	54,870	7%
Melanoma of the skin	42,670	5%	Thyroid	47,230	6%
Non-Hodgkin lymphoma	39,850	5%	Non-Hodgkin lymphoma	32,000	4%
Kidney & renal pelvis	38,270	5%	Melanoma of the skin	31,200	4%
Oral cavity & pharynx	32,670	4%	Pancreas	24,120	3%
Leukemia	30,900	4%	Leukemia	23,370	3%
Liver & intrahepatic bile duct	25,510	3%	Kidney & renal pelvis	23,290	3%
All Sites	**848,200**	**100%**	**All Sites**	**810,170**	**100%**

Estimated Deaths

Males			Females		
Lung & bronchus	86,380	28%	Lung & bronchus	71,660	26%
Prostate	27,540	9%	Breast	40,290	15%
Colon & rectum	26,100	8%	Colon & rectum	23,600	9%
Pancreas	20,710	7%	Pancreas	19,850	7%
Liver & intrahepatic bile duct	17,030	5%	Ovary	14,180	5%
Leukemia	14,210	5%	Leukemia	10,240	4%
Esophagus	12,600	4%	Uterine corpus	10,170	4%
Urinary bladder	11,510	4%	Non-Hodgkin lymphoma	8,310	3%
Non-Hodgkin lymphoma	11,480	4%	Liver & intrahepatic bile duct	7,520	3%
Kidney & renal pelvis	9,070	3%	Brain & other nervous system	6,380	2%
All Sites	**312,150**	**100%**	**All Sites**	**277,280**	**100%**

Cancer.org

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Tina's Wish

Know Early. Know Hope.™

Tina's Wish

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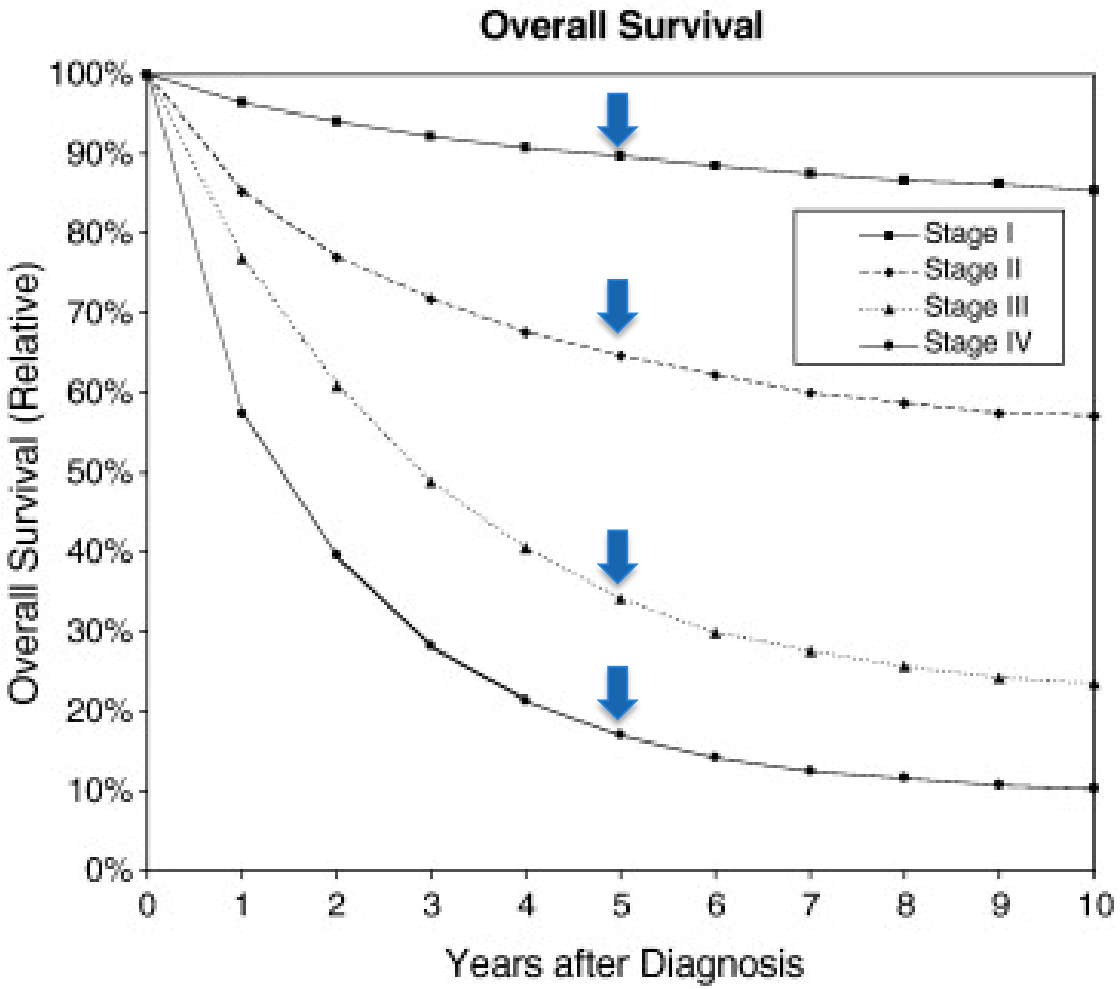
Knowing Early

Stage at Diagnosis



Ten-year (relative) overall survival curves in ovarian cancer patients by American Joint Committee on Cancer (AJCC) stage.

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Knowing Early: Screening

Where we have been . . .

"Currently, it appears that the best way to detect early ovarian cancer is for both the patient and her clinician to have a high index of suspicion of the diagnosis in the symptomatic woman"

- ACOG Committee Opinion March 2011

Stage I–II HGSC	NR	NR	2 (17%)	2 (22%)
Prevalence (%)	0·084	0·074	0·069	0·756
Prevalence ratio (95% CI)†	9·1 (4·6–17·9)	10·2 (5·4–19·4)	11·0 (5·2–22·9)	1 (reference)

RCT=randomised controlled trial. OC=ovarian cancer. HGSC= high-grade serous cancer. NR=not reported. *Collectively, the trials enrolled around 340 000 women, including controls. †Prevalence ratio estimates include cancers detected and not detected by screening tests.

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Signs and Symptoms

Abdominal or pelvic pain

Bloating

Early satiety (difficulty eating, feeling full quickly)

Pain during intercourse

Changes in bowel habits

Urinary symptoms

Screening: UKCTOCS

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Risk Algorithm Using Serial Biomarker Measurements Doubles the Number of Screen-Detected Cancers Compared With a Single-Threshold Rule in the United Kingdom Collaborative Trial of Ovarian Cancer Screening

- Study of over 46,000 women over age 50 in the UK
- Multimodal strategy using annual CA125 and the Risk of Ovarian Cancer Algorithm (ROCA)
  - Risk as determined by a complex calculation incorporating age and change in CA125 over time

Menon et al. JCO May 2015.

Screening: UKCTOCS

- Annual CA125 blood test
- Further evaluation prompted by Risk of Ovarian Cancer Algorithm
  - Normal risk
  - Intermediate risk
  - Elevated risk

Doubled the number of screen detected ovarian cancers (41% early stage)

Menon et al. JCO May 2015.

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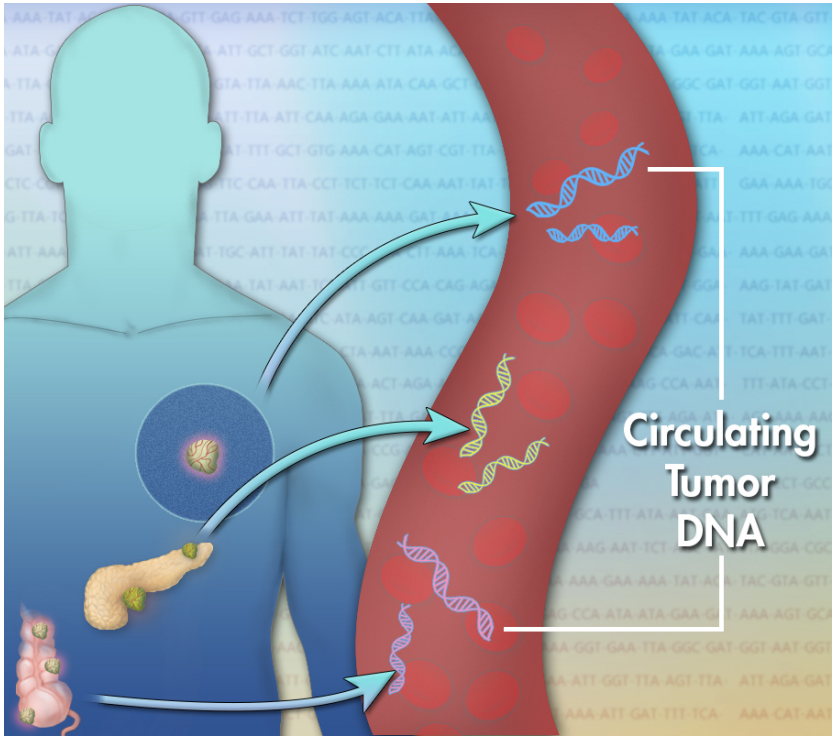
Novel Screening Strategies

Circulating tumor DNA (ctDNA)

- DNA fragments released into the bloodstream by dying tumor cells
- Can monitor tumor dynamics
- Novel biomarker for ovarian cancer
  - Surgical outcome
  - Monitor for disease recurrence
  - Response to therapy
  - **Early detection??**
- Under-developed at MSK



Graphic Credit: Jonathan Bailey, NHGRI

Knowing Your Risk

Increased Risk

- Family history
- Age
- Infertility
- Personal history of breast cancer

Decreased Risk

- Removal of ovaries and fallopian tubes
- Oral contraceptive pills
- Pregnancy
- Breast-feeding
- Tubal ligation

Knowing Your Risk

Family history is the most important risk factor

- Family history of ovarian, breast, uterine, or colon cancer may indicate increased risk

- Genetic evaluation:
  - *BRCA1* and *BRCA2* mutations (15%)
  - Other inherited mutations (5-6%)
    - Lynch syndrome (*MLH1, MSH2, MSH6, PMS2)*
    - *ATM, BARD1, BRIP1, CDH1, CHEK2, EPCAM, MRE11A, MUTYH, NBN, NF1, PALB2, PTEN, RAD50, RAD51C, RAD51D, SMARCA4, STK11, TP53*

SGO Clinical Practice Statement March 2014

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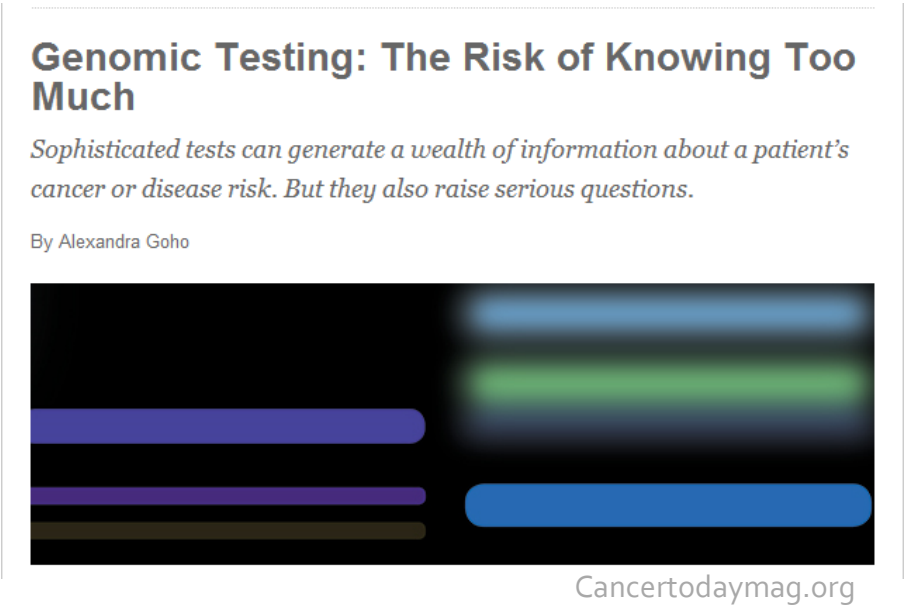
Genetic testing

Multi-gene panels

- Next generation sequencing
- Commercially available or institution based

- *PROS*
  - Inexpensive
  - Efficient
  - Valuable information
- *CONS*
  - Varying levels of provider involvement
  - Increasing complexity of results
    - Genes rarely act alone
    - Results with uncertain significance



-Family history should guide management when results unclear

-A close relationship with a provider experienced in the care of high-risk women is key to success

SGO Clinical Practice Statement March 2014

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Knowing Hope

Decreasing Your Risk

1. Women with ovarian cancer should have genetic testing

2. Oral contraceptive pills

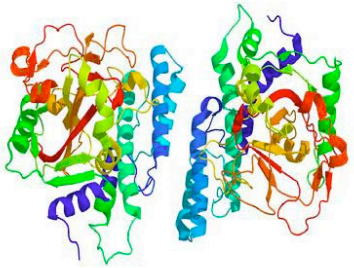
3. Preventative surgery
   - High risk women should have their ovaries and fallopian tubes removed (by age 40)
     - 90% decreased risk of ovarian cancer and a 50% decreased risk of breast cancer
   - Consider at least removal of the fallopian tubes

4. Average risk women undergoing any pelvic surgery should consider removal of the fallopian tubes

Knowing Hope

Better Treatments

- Advances in surgical treatment
  - Increasing the rate of complete gross resection
  - Optimizing recovery and minimizing risk
- Advances in chemotherapy
  - HIPEC (Heated Intraperitoneal chemoperfusion)
- Advances in biologic and targeted agents
  - Bevacizumab (Avastin)
  - PARP inhibitors



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Knowing Hope…

July 2004

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