

## GENES TESTED WITH INVITAE HEREDITARY GYNECOLOGIC CANCER PANELS

Invitae has extensive gynecologic cancer testing options, with results available in just 10–21 days.

- Invitae Breast and Gyn Cancers Guidelines-based Panel (19 genes)**
- Invitae Breast and Gyn Cancers Panel (up to 35 genes)**
- Invitae Hereditary Breast and Ovarian Cancer Syndromes Panel (2 genes)**
- Invitae Lynch Syndrome Panel (5 genes)**
- Customized test options**

### GENES TESTED:

- |                                 |                                  |
|---------------------------------|----------------------------------|
| <input type="checkbox"/> ATM    | <input type="checkbox"/> NBN     |
| <input type="checkbox"/> BARD1  | <input type="checkbox"/> NF1     |
| <input type="checkbox"/> BRCA1  | <input type="checkbox"/> PALB2   |
| <input type="checkbox"/> BRCA2  | <input type="checkbox"/> PMS2    |
| <input type="checkbox"/> BRIP1  | <input type="checkbox"/> PTEN    |
| <input type="checkbox"/> CDH1   | <input type="checkbox"/> RAD50   |
| <input type="checkbox"/> CHEK2  | <input type="checkbox"/> RAD51C  |
| <input type="checkbox"/> DICER1 | <input type="checkbox"/> RAD51D  |
| <input type="checkbox"/> EPCAM  | <input type="checkbox"/> SMARCA4 |
| <input type="checkbox"/> MLH1   | <input type="checkbox"/> STK11   |
| <input type="checkbox"/> MSH2   | <input type="checkbox"/> TP53    |
| <input type="checkbox"/> MSH6   | <input type="checkbox"/> _____   |

### NOTES:

## SIMPLE BILLING, NO SURPRISES

### WITHIN THE UNITED STATES

#### INSURANCE

You won't need to contact your insurance company to find out if testing is covered or to obtain reimbursement; Invitae will work directly with them to coordinate coverage and payment. Typically patients pay no more than \$100 out of pocket for one of our tests. If you receive a bill for more than \$100, please call us to discuss payment options. For testing related to a personal or family history of breast, ovarian, colorectal, or uterine cancer (also referred to as HBOC and Lynch syndrome), Invitae offers an out-of-pocket cost estimator, accessible at [www.invitae.com/patient-billing](http://www.invitae.com/patient-billing).

#### PATIENT PAY

You have the option to pay \$250 for your hereditary cancer genetic testing. This option requires upfront payment before test results are released. In addition, your clinician must place the order online and provide your e-mail address so we can send you a link to pay online using a credit card.

#### MEDICARE & FINANCIAL ASSISTANCE

Invitae accepts Medicare and Medicaid. We may also be able to offer testing at limited or no expense to those who qualify for need-based assistance.

For further information, please contact Client Services at [clientservices@invitae.com](mailto:clientservices@invitae.com) or 800-436-3037.

### OUTSIDE THE UNITED STATES

#### PATIENT PAY

You have the option to pay \$250 for your hereditary cancer genetic testing. This option requires upfront payment before test results are released. In addition, your clinician must place the order online and provide your e-mail address so we can send you a link to pay online using a credit card.

#### INSTITUTIONAL BILLING

Invitae will work with your institution to set up a contract if one is not already in place.

For complete billing information, please visit [www.invitae.com/billing](http://www.invitae.com/billing).

*This guide applies only to gene and panel testing; for exome testing please see the Invitae exome patient guide.*



INVITAE

Understanding hereditary  
gynecologic cancers

## THE GENETICS OF GYNECOLOGIC CANCERS

Gynecologic cancers include those of the ovary and uterus. About 1.3% of women will develop ovarian cancer and 2.7% will develop uterine cancer. Most cases of gynecologic cancers are sporadic and not inherited; however, approximately 5%-10% of gynecologic cancers are inherited.

Variants in two genes, BRCA1 and BRCA2, account for the majority of hereditary ovarian cancer cases in women with a strong family history or an early-onset diagnosis. These variants can increase your lifetime risk by up to 54%. Lynch syndrome is the most common inherited cause of uterine cancer.

## LIFETIME CANCER RISKS

**A genetic variation in BRCA1 or BRCA2 and/or Lynch syndrome genes can increase the likelihood that a person will develop not just gynecologic cancer, but also several other types of cancer in his or her lifetime.**

		Ovarian Cancer	Uterine Cancer	Breast Cancer	Colorectal Cancer	Pancreatic Cancer
BRCA GENES	BRCA1	Up to 54% <sup>1,4</sup>	No known risk	Up to 87% <sup>1,4</sup>	No known risk <sup>21</sup>	1-3% <sup>3,15,18</sup>
	BRCA2	Up to 27% <sup>2</sup>	Unknown <sup>12,20</sup>	Up to 84% <sup>2</sup>	No known risk <sup>21</sup>	2-7% <sup>3,15,18</sup>
LYNCH SYNDROME GENES	EPCAM	Elevated <sup>8</sup>	12-55% <sup>13</sup> (higher closer to MSH2 promoter)	Unknown <sup>6,17</sup>	75-82% <sup>11,13</sup>	Up to 4% <sup>9,22</sup>
	MLH1	Up to 20% <sup>22</sup>	14-54% <sup>22</sup>	Unknown <sup>6,17,24</sup>	Up to 82% <sup>9,19</sup>	Up to 4% <sup>9,22</sup>
	MSH2	Up to 24% <sup>14</sup>	20-30% <sup>5,14,19</sup> Up to 54% <sup>19</sup>	Unknown <sup>6,17</sup>	Up to 82% <sup>11,22</sup>	Up to 4% <sup>9,22</sup>
	MSH6	Elevated; 6-8% <sup>17</sup>	Up to 71% <sup>5,16</sup>	Unknown <sup>6,17</sup>	Men: up to 44% <sup>10</sup> Women: up to 20% <sup>10</sup>	Up to 4% <sup>9,22</sup>
	PMS2	Elevated <sup>23</sup>	Up to 15% <sup>23</sup>	Unknown <sup>6,17</sup>	Up to 20% <sup>7</sup>	Elevated <sup>9</sup>

1. PMID: 7907678  
2. PMID: 9497246  
3. PMID: 12237281  
4. PMID: 12677558  
5. PMID: 15236168  
6. PMID: 18398828  
7. PMID: 18602922  
8. PMID: 19177550  
9. PMID: 19861671  
10. PMID: 20028993  
11. PMID: 20301390  
12. PMID: 20850175  
13. PMID: 21145788  
14. PMID: 21642682  
15. PMID: 22187320  
16. PMID: 22619739  
17. PMID: 23091106  
18. PMID: 23099806  
19. PMID: 23255516  
20. PMID: 23562522  
21. PMID: 24292448  
22. PMID: 25070057  
23. PMID: 25856668  
24. PMID: 26101330

## WHO SHOULD CONSIDER GENETIC TESTING?

Genetic testing may be appropriate if you have:

- ovarian, fallopian tube, or primary peritoneal cancer at any age
- uterine cancer, particularly if early-onset (before 50 years of age)
- breast cancer, particularly if early-onset (before 50 years of age)
- colorectal cancer, if early onset (before 50 years of age)
- multiple primary cancers such as uterine and colon
- a close blood relative who meets the above criteria
- three blood relatives with cancer (particularly ovarian, uterine, breast, colon, gastric, pancreatic, and/or prostate cancer)

## NOTES:

Learn more at [www.invitae.com/patients](http://www.invitae.com/patients).

## WHAT ARE THE BENEFITS OF TESTING?

Knowing if you have an inherited risk for cancer can be a useful tool to guide prevention and risk-reduction. If you have an elevated risk of developing cancer based on your genetic test result, you can work with your healthcare provider to create a plan designed to prevent a cancer entirely, or help to identify a cancer at its earliest, most treatable stage.

In addition, genetic testing produces information that may help you and your healthcare provider:

- provide an explanation for your personal or family history of cancer
- evaluate your risk of developing future cancers
- make informed medical decisions, including treatment for an already-diagnosed cancer and/or surveillance and preventive options to help detect or prevent future cancers
- qualify you for participation in clinical trials or research studies
- identify other at-risk relatives for whom genetic testing is recommended

## WHAT CAN MY FAMILY DO WITH THIS INFORMATION?

Identifying at-risk family members is one of the most important benefits of genetic testing. Screening family members for known familial genetic variants gives those who test positive the opportunity to make informed decisions on prevention strategies. For those who test negative, the results can bring peace of mind. Invitae offers a Family Variant Testing program; please inquire with your doctor.

For more information on the benefits of genetic testing, please visit [www.invitae.com/patients](http://www.invitae.com/patients).