# Breast Cancer Risk Assessment v3 Client Review Document

## Overview

The Breast Cancer Risk Assessment calculates the risk of developing invasive breast cancer over specific periods of time and analyzes a woman's family history of certain types of related cancers to provide a recommendation for genetic evaluation.

## Main Scientific Basis

This HRA was designed using the National Cancer Institute (NCI) Gail Model[1-6] and the Family History Survey[7] (FHS-7).

## Product Description

The Breast Cancer Risk Assessment asks a series of questions and uses the NCI Gail Model to calculate a 5-year and lifetime risk of developing invasive breast cancer. The HRA also uses the FHS-7 to analyze the woman's family history of certain types of related cancers to provide a recommendation for genetic evaluation. Additionally, several other potential risk factors for breast cancer are identified, including: Ashkenazi Jewish ancestry, menstrual history, hormonal birth control use, reproductive history, postmenopausal hormone therapy, age, breastfeeding history, previous breast biopsy, dense breast tissue on mammogram**,** weight after menopause, smoking, exercise habits, and alcohol use.[8]

## Key Result Provided in Client Portal

The primary result from the Breast Cancer Risk Assessment is the 5-year risk of developing invasive breast cancer. The results are categorized into high, increased, low, and unknown risk. Follow-up messaging, emails, and programs can be developed to align with these categories.

## Mammograms and Shared Decision-Making

Routine mammography is noted as the most effective way to screen for breast cancer. Women of all ages are urged talk to their doctor about screening for breast cancer. Women with an increased risk for breast cancer may need to start screening before the age of 40.[9]

## About the Gail Model

The Gail Model is a statistical model created at the National Cancer Institute to calculate 5-year and lifetime risks of developing invasive breast cancer. The Gail model uses a woman's medical history (number of previous breast biopsies and the presence of atypical hyperplasia in any previous breast biopsy specimen); reproductive history (age at the start of menstruation and

age at the first live birth of a child); and history of breast cancer in mother, sisters, and daughters to calculate these risks. The model was last updated in 2011.

## About the FHS-7

The Family History Survey[7] (FHS-7) is a simple family history questionnaire that has been clinically validated to identify women who should be referred for genetic evaluation by a specialist. This questionnaire includes a series of questions about the woman's family history of breast, ovarian, and colorectal cancer in order to make the recommendation.

## References


1. Gail MH, Brinton LA, Byar DP, Corle DK, Green SB, Shairer C, Mulvihill JJ: Projecting individualized probabilities of developing breast cancer for white females who are being examined annually. *J Natl Cancer Inst*. 81(24):1879-86, 1989.
2. Costantino JP, Gail MH, Pee D, Anderson S, Redmond CK, Benichou J, Wieand HS: Validation studies for models projecting the risk of invasive and total breast cancer incidence. *J Natl Cancer Inst*. 91(18):1541-8, 1999.
3. Gail MH, Costantino JP, Bryant J, Croyle R, Freedman L, Helzlsouer K, Vogel V: Weighing the risks and benefits of tamoxifen treatment for preventing breast cancer. *J Natl Cancer Inst*. 91(21):1829-46, 1999.
4. Rockhill B, Spiegelman D, Byrne C, Hunter DJ, Colditz GA: Validation of the Gail et al. model of breast cancer risk prediction and implications for chemoprevention. *J Natl Cancer Inst*. 93(5):358-66, 2001.
5. Gail MH, Costantino JP, Pee D, Bondy M, Newman L, Selvan M, Anderson GL, Malone KE, Marchbanks PA, McCaskill-Stevens W, Norman SA, Simon MS, Spirtas R, Ursin G, and Bernstein L. Projecting Individualized Absolute Invasive Breast Cancer Risk in African American Women. *J Natl Cancer Inst*. 99(23):1782-1792, 2007.
6. Matsuno RK, Costantino JP, Ziegler RG, Anderson GL, Li H, Pee D, Gail MH. Projecting Individualized Absolute Invasive Breast Cancer Risk in Asian and Pacific Island American Women. *J Natl Cancer* Inst. 2011. doi:10.1093/jnci/djr154.
7. Ashton-Prolla P, Giacomazzi J, Schmidt AV, Roth FL, Palmero EI, Kalakun L, et al. Development and validation of a simple questionnaire for the identification of hereditary breast cancer in primary care. *BMC Cancer*. 9:283, 2009.
8. Breast Cancer Facts & Figures 2017-2018. Publication No. 861017. American Cancer Society Website. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/breast-cancer-facts-and-figures/breast-cancer-facts-and-figures-2017-2018.pdf. Updated 2017. Accessed March 25, 2018.
9. Monticciolo DL, Newell MS, Moy L, Niell B, Monsees B, Sickles EA: Breast Cancer Screening in Women at Higher-Than-Average Risk: Recommendations From the ACR. *J Am Coll Radiol.* 15:408-414, 2018.