Genetic Risk Assessment at Breast Centers, What Works
Session 44
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Objectives

1. Understand the current guidelines for Hereditary Breast and Ovarian Cancer Syndrome (HBOC).
   - Identifying HBOC patients
   - Breast cancer screening for HBOC patients
2. Describe examples of successful HBOC screening processes, including what minimum standards are required.
3. Formulate action ideas to improve HBOC screening processes at your site including clear roles/responsibilities for HBOC screening
About CBM-HC

• Independent investigator firm, focused on health services research
• **Goal:** to help adoption of personalized medicine and personalized care by researching, developing and implementing care models with focus on Oncology
• **Collaborative Approach:** academics, community providers, patient groups, payers, product developers, others.
• **Key collaborations** (faculty appointments): Northwestern University (focus on adoption) and UCSF (Reimbursement Council)
• **Healthcare scope:** Adoption of new and existing diagnostics, therapies and models in care delivery, and coverage / reimbursement

Why Does Hereditary Breast and Ovarian Cancer (HBOC) Risk Matter?

**Women with HBOC have:**
- 50-85% lifetime risk of breast cancer
- 30-50% of breast cancer before 50
- 15-50% lifetime risk of ovarian cancer
- 40-60% chance of developing a second breast cancer

Guidelines for Genetic Risk Assessment

*The National Accreditation Program for Breast Centers (NAPBC)*

**Standard 2.16**

• Cancer risk assessment, genetic counseling and genetic testing services are provided or referred based on a patient’s family and personal history
• Not all breast cancer patients will need to be referred to a cancer genetics professional and referral should be based on national guidelines (e.g., NCCN, ASCO, ASBS, others).

But who is responsible to conduct assessment?
Identifying HBOC patients

NCCN Guidelines - Genetic Risk Assessment

An unaffected individual with a family history of one or more of the following:

- A known mutation in a breast cancer susceptibility gene within the family
- \( \geq 2 \) breast primary cancer in single individual
- \( \geq 2 \) individuals with breast primaries on the same side of the family (maternal or paternal)
- \( \geq 1 \) ovarian cancer primary from same side of the family (including fallopian tube, primary peritoneal)
- First or second degree relative with breast cancer \( \leq 45 \) y
- Male breast cancer


continued on next page

NCCN Guidelines - Genetic Risk Assessment

An unaffected individual with a family history of one or more of the following, continued:

- 1 family member on the same side of the family w a combo of breast cancer and \( \geq 1 \) of the following (especially with early onset):
  - pancreatic cancer,
  - aggressive prostate cancer (Gleason score \( \geq 7 \)),
  - sarcoma,
  - adrenocortical carcinoma,
  - brain tumors,
  - endometrial cancer,
  - leukemia/lymphoma;
  - thyroid cancer,
  - dermatologic manifestations and/or macrocephaly,
  - amartomatous polyps of GI track;
  - diffuse gastric cancer

NCCN Guidelines - Genetic Risk Assessment

For Affected patients, with breast cancer, all previous guidelines apply and/or one or more of the following:

• Early-age-onset breast cancer, clinically use ≤ 50 y
• Triple negative (ER-, PR-, HER2-) breast cancer
• Ovarian cancer
• Breast cancer at any age, and
  o ≥ 1 close blood relative with breast cancer ≤ 50 y, or
  o ≥ 1 close blood relative with epithelial ovarian cancer at any age, or
  o ≥ 2 close blood relatives with breast cancer and/or pancreatic cancer at any age
  o From a population at increased risk

*National Comprehensive Cancer Network - NCCN Guidelines Version 4.2013, Breast and/or Ovarian Cancer Genetic Assessment, BR/OV-1

Carole’s Story

• Two sisters with breast cancer before 45, strong family history on her fathers side of various cancers
• Carol started annual mammograms at 35
• No one – not her PCP, OB/GYN, Breast imaging center – ever mentioned genetic assessment or counseling
• At 41 years old, Carole noticed changes on her breast skin, 2 months after a normal screening mammogram
• Carole diagnosed with stage 3b BC, treated recurred 9 months later with MBC

Joan’s Story

• Joan diagnosed with early triple negative breast cancer at age 42
• Strong family history, mother with breast and ovarian cancer, and other close relatives
• No one, not her Radiologist, Surgeon, PCP, OB/GYN, ever mentioned genetic assessment or counseling
• Post lumpectomy, at her first consult, medical oncologist inquired about genetic assessment
• Joan pursues genetic counseling and testing, she is BRCA 1 positive
• 5 months after lumpectomy, Joan had a bi-lateral mastectomy followed by reconstructive surgery
Breast Cancer Screening Guidelines for HBOC patients

Screening Guidelines - HBOC
Women with identified or suggestive genetic predisposition

- Breast awareness
- Clinical breast exam every 6-12 months starting at age 25
- Annual mammogram and breast MRI starting at age 25 or individualized based on earliest age of onset in family
- Consider risk reduction strategies


Screening Guidelines - HBOC
Men with identified or suggestive genetic predisposition

- Breast awareness
- Clinical breast exam every 6-12 months starting at age 35
- Baseline mammogram at age 40
- Annual mammogram if gynecomastia or parenchymal / glandular breast density on baseline study

Patients with a BRCA mutation have a higher risk of breast cancer and of breast cancer recurrence.

Breast cancer patients with a BRCA mutation are more likely to view mastectomy as the best way to reduce future breast cancer recurrence while avoiding multiple surgeries and radiation (Schwartz, JCO-2004)

**Timing is key**, breast cancer patients with a history suggestive of a genetic syndrome, need access to immediate genetic assessment and, if indicated, genetic testing prior to making a surgical decision.
Breast and Ovarian Cancer Genetic Syndromes / Genes

Hereditary Breast Ovarian Cancer Syndrome (HBOC)
Li-Fraumeni Syndrome
Cowden Syndrome
Lynch Syndrome
Peutz-Jeghers Syndrome
Hereditary Diffuse Gastric Cancer Syndrome

Gene Panels for patients suggestive of genetic syndrome but negative for high penetrance genes (such as BRCA 1/2):

- ATM
- MLH1
- PALB2
- RAD51D
- BARD1
- MSH2
- PM2
- STK11
- BRF
- MSH6
- PTEN
- TP53
- CDH1
- MSHH
- RAD50
- CHEK1
- MRE11A
- RAD51B
- CHEK2
- NBN
- RAD51C

What are effective practices for HBOC assessment

HBOC Assessment Studies
Studies on the use of HBOC assessment in breast cancer imaging and treatment settings

- HBOC assessment and testing at 26 breast imaging centers
  Study conducted through The Metropolitan Chicago Breast Cancer Task Force and supported by Susan G. Komen for the Cure
- Intervention study - HBOC screening tool at large breast center
  supported by the Lynn Sage Cancer Research Foundation
- HBOC services within a large health system at all points of care
- Barriers to the use of genetic assessment for newly diagnosed breast cancer patients
  supported by the Lynn Sage Cancer Research Foundation
- HBOC assessment of young adults across NCCN centers
  Use and reimbursement of next generation sequencing for germ-line (genetic) mutations
  supported by R01 from National Human Genome Research Institute
- Secondary data analyses (claims and EMR) to determine timing and patterns of genetic counseling, testing and related interventions
**Imaging Site 1 – Consult with a high risk clinic**

**Key Components**
- Poster with genetic risk factors in each imaging room
- Tech reviews patient personal and family history
- If indicated, patient gets a letter and/or call from a breast health nurse to setup consult
- Consult conducted with breast surgeon and/or breast oncologist, free to patient
- If indicated, genetic testing is conducted

**Best Fit:**
- High volume of patients
- Commitment of institution to support high risk clinic
- Availability of resources to follow up with patients

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**Imaging Site 2 – Referral to genetic counseling**

**Key Components**
- Genetic risk factors documented in EMR / Mammography information system
- Radiologist reviews risk factors and, when indicated, creates referrals to genetic counseling
- Radiologist also uses risk factors to recommend adjusted screening modality (e.g., MRI)
- Radiologist has a resource to follow up with patient and provide referral

**Best Fit:**
- Lower volume of patients
- Access to genetic counseling
- Confidence in relationship with primary care physicians

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**Imaging Site 3 – HBOC Screening tool and letter**

**Key Components**
- Incorporate risk screening questions in patient history
- Tech reviews answers, using quick scoring method
- If indicated by score, Tech provides patient a letter encouraging the patient to setup a consult with:
  - Genetic counseling
  - High risk breast clinic
  - Genetic counseling phone line
- Tech makes note in patient’s file

**Best Fit:**
- Any volume of patients
- Relationship with genetic assessment providers that are suggested in patient letter
**Treatment Site 4 – Multidisciplinary Clinic**

**Key Components**
- Incorporate risk screening questions in patient history
- Based on history, include Genetic Assessment for patient during multidisciplinary clinic *(a different site does this "virtually" through a nurse navigator coordinating care)*
- With patient agreement, draw blood and order test during first consult
- Arrange surgical decision to be made after genetic test results are available

**Best Fit:**
- Site with multidisciplinary clinic in place
- Volume high enough to support genetic assessment staff time

**Treatment Site 5 – Neo-Adjuvant Treatment First**

**Key Components**
- Incorporate risk screening questions in patient history
- If patient indicated for genetic / familial risk, arrange for genetic assessment and testing
- Start treatment protocol via neo-adjuvant / pre-operative chemotherapy before surgery
- Delay surgical decisions and consults until test results are back

**Best Fit:**
- Any volume of patients
- Institutional support of surgical delays

**Actions you and your site may take - HBOC assessment**
Actions you may take


- Be aware of resources available within your institution and in your community
  - Genetic Assessment
  - High Risk Breast Clinics
  - Physicians with expertise/experience in cancer genetics

- If you see something, say something:
  - E.g.; Have you had a discussion with your PCP about your family history?
  - E.g.; Based on your history, I encourage you to consider genetic assessment so you can make proactive and informed decisions about your health

Actions your institution may take

- Use standard patient history questions, update at least annually based on NCCN guidelines
- Include genetic risk factor review for all patients during breast conference / tumor board
- Pilot and implement a process to review patient history and to immediately direct indicated patients to genetic assessment, assign responsibility.
- Conduct education sessions at your site(s) on breast health considerations:
  - Genetic risk and other high risk factors
  - Risk reduction strategies
  - Guideline directed screening standards for patients with high risk

Let's help patients be aware of their genetic risk so they can make informed health decisions.
Thank you!

Select publications and abstracts


