Reported Referral for Genetic Counseling or BRCA 1/2 Testing Among United States Physicians

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Reported Referral for Genetic Counseling or BRCA 1/2 Testing Among United States Physicians

A Vignette-Based Study

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BACKGROUND: Genetic counseling and testing is recommended for women at high but not average risk of ovarian cancer. National estimates of physician adherence to genetic counseling and testing recommendations are lacking. METHODS: Using a vignette-based study, we surveyed 3200 United States family physicians, general internists, and obstetrician/gynecologists and received 1878 (62%) responses. The questionnaire included an annual examination vignette asking about genetic counseling and testing. The vignette varied patient age, race, insurance status, and ovarian cancer risk. Estimates of physician adherence to genetic counseling and testing recommendations were weighted to the United States primary care physician population. Multivariable logistic regression identified independent patient and physician predictors of adherence. RESULTS: For average-risk women, 71% of physicians self-reported adhering to recommenda-
Rationale

- Genetic counseling and testing recommended for women at high risk, based on personal or family history.

- Women with BRCA1/2 mutations have a substantially higher risk of breast/ovarian cancer:
  - Cumulative breast cancer risk of 57%, 49% for BRCA1/2 carriers.
  - Cumulative ovarian cancer risk of 40%, 18% for BRCA1/2 carriers.

- For BRCA+, interventions can decrease ovarian and breast cancer risk by 80 – 95% - PRIMARY PREVENTION.

- No national study has examined appropriateness of referral to genetic counseling and testing by physician and patient characteristics:
  - National estimates of physician adherence to guidelines are lacking.
Methods

- **Vignette –based survey with hypothetical patients**
  - Annual exam vignette asking about frequency of
    - Referral for genetic counseling or testing
    - Offering or ordering BRCA 1/2 testing
  - Varied patient age, race, insurance status, and risk (family history)
  - Average risk (mother with breast cancer at age 70), medium risk (mother with ovarian cancer at age 62), high risk (personal history of breast cancer at 30, paternal grandmother with ovarian cancer, paternal first cousin with premenopausal breast cancer)

- **3200 family physicians, ob/gyns, general internists surveyed**
  - Identified through American Medical Association (AMA) masterfile

- **Physician characteristics from survey and AMA**
  - Primary setting, geography, fear of malpractice, level of risk taking, where get information, estimation of patient’s ovarian cancer risk
Sample

3200 physicians surveyed

158 excluded

3042

1878 (61.7%) responded

304 excluded

1574
Statistical Analyses

- Only included physicians that received average and high risk vignettes (n = 979)
  - Wanted to focus on vignettes with no question about whether referral was appropriate
- Weighted to be nationally representative of US physicians
  - Representing 93,771 physicians
- Outcome: Adherence to genetic counseling and testing recommendations stratified by risk
  - Average: Almost never referring for genetic counseling or testing and almost never offering or ordering BRCA1/2 testing
  - High: Almost always referring for genetic counseling or testing or almost always offering or ordering BRCA1/2 testing
Calculated unadjusted weighted % of adherence stratified by risk
- By patient and physician characteristics

Stepwise multivariable models using logistic regression were developed separately for average and high risk
- Including all statistically significant ($p \leq 0.05$) physician characteristics
- Patient age, race, insurance status included regardless of significance
- SUDAAN software

ORs converted to RRs using predictive marginals
RESULTS
<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Average-Risk Women (not offering genetic counseling/testing)</th>
<th>High-Risk Women (offering genetic counseling/testing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>71.3</td>
<td>41.1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>70.0</td>
<td>56.6</td>
</tr>
<tr>
<td>51</td>
<td>72.5</td>
<td>26.9</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>66.3</td>
<td>39.9</td>
</tr>
<tr>
<td>Black</td>
<td>76.3</td>
<td>42.3</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>66.1</td>
<td>41.8</td>
</tr>
<tr>
<td>Medicaid</td>
<td>77.3</td>
<td>40.3</td>
</tr>
<tr>
<td></td>
<td>Average-Risk Women (not offering genetic counseling/testing)</td>
<td>High-Risk Women (offering genetic counseling/testing)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>71.3</td>
<td>41.1</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>69.3</td>
<td>49.9</td>
</tr>
<tr>
<td>Men</td>
<td>72.7</td>
<td>34.9</td>
</tr>
<tr>
<td><strong>Specialty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family med</td>
<td>67.6</td>
<td>34.3</td>
</tr>
<tr>
<td>Internal med</td>
<td>73.9</td>
<td>41.1</td>
</tr>
<tr>
<td>Ob/gyn</td>
<td>74.2</td>
<td>57.3</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>80.5</td>
<td>24.8</td>
</tr>
<tr>
<td>Urban</td>
<td>69.3</td>
<td>44.1</td>
</tr>
<tr>
<td>Listed USPSTF among top sources of cancer screening information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>73.3</td>
<td>34.5</td>
</tr>
<tr>
<td>No</td>
<td>69.0</td>
<td>47.6</td>
</tr>
</tbody>
</table>
Adherence to Recommendations by Physician Estimated Risk of Ovarian Cancer

<table>
<thead>
<tr>
<th>MD Estimated Risk</th>
<th>Actual risk: Average</th>
<th>Actual risk: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence (not offering genetic counseling/testing)</td>
<td>77.9</td>
<td>5.4</td>
</tr>
<tr>
<td>Average</td>
<td>Somewhat higher</td>
<td>55.4</td>
</tr>
<tr>
<td>Much Higher</td>
<td>26.0</td>
<td>64.6</td>
</tr>
</tbody>
</table>
## Strengths and Limitations

### Strengths
- Large sample size
- Nationally representative
- Good response rate
- First to provide national estimates by patient and physician characteristics

### Limitations
- Self-report intentions, not actual practice
- Variations in guidelines
  - Lack of clear guidance for average-risk women
Conclusion and Discussion

- Physicians reported referral of many average-risk, not high-risk women
  - Unidentified high-risk women miss out on important services
  - Referring average-risk women is an inefficient use of resources with, at most, minimal clinical benefit

- Education of physicians on risk assessment is needed

- Intervention and education efforts to encourage referral for high-risk, discourage for average-risk
  - Complicated (and differing) guidelines, takes substantial time to take appropriate family history
  - Simple referral tools may help?

- CDC cooperative agreements
  - Promotion breast cancer genomics best practices at state level
Thanks!

For more information on CDC’s cancer prevention and control programs:

[www.cdc.gov/cancer](http://www.cdc.gov/cancer)

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For more information please contact Centers for Disease Control and Prevention

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