Identifying Types of Research Materials

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Types of Research Information

- Primary Sources
- Secondary Sources
- Tertiary Sources

Primary Sources

Secondary Sources

Tertiary Sources
Types of Research Information

Primary Sources

• **Original documents, such as:**
  – Scholarly articles reporting new findings
  – Diaries and autobiographies
  – Speeches
  – Letters, minutes, interviews
  – Video footage
  – Official records

• **Creative Works, such as:**
  – Poetry
  – Drama
  – Novels
  – Music
  – Art

• **Relics or artifacts, such as:**
  – Jewelry
  – Pottery
  – Furniture
  – Clothing
  – Buildings
Recognizing a Research Article

Most research articles have the following sections:

• Abstract
• Introduction/Background
• Purpose of study
• Review of the Literature
• Methods
• Data Analysis
• Discussion
• Limits of the Study
• Suggestions for further research
• Conclusion
• References
Breast Cancer After Prophylactic Bilateral Mastectomy in Women with a BRCA1 or BRCA2 Mutation

Hanne Mellers Heusbroek, M.D., Bert van Geel, M.D., Ph.D., Wim L.J. van Puijenbroek, M.Sc., Sonja C. Henzen-Logmans, M.D., Ph.D., Caroline Seynaeve, M.D., Ph.D., Marijn B.E. Menke-Fluitmers, M.D., Ph.D., Carina C.M. Bartels, M.D., Leon C. Verhoog, M.D., Ans M.W. van den Brouwer, M.D., Pietrus F. Niermeijer, M.D., Ph.D., Cecile T.M. Brinkman, M.D., Ph.D., and Jan G.M. Kluis, M.D., Ph.D.

Abstract

Background. Women with a BRCA1 or BRCA2 mutation have a high risk of breast cancer and may choose to undergo prophylactic bilateral total mastectomy. We investigated the efficacy of this procedure in such women.

Methods. We conducted a prospective study of 139 women with a pathogenic BRCA1 or BRCA2 mutation who were enrolled in a breast-cancer surveillance program at the Rotterdam Family Cancer Clinic. At the time of enrollment, none of the women had a history of breast cancer. Seventy-six of these women eventually underwent prophylactic mastectomy, and the other 63 remained under regular surveillance. The effect of mastectomy on the incidence of breast cancer was analyzed by the Cox proportional hazards method in which mastectomy was modeled as a time-dependent covariate.

Results. No cases of breast cancer were observed after prophylactic mastectomy in a mean (±SE) follow-up of 2.9±1.4 years, whereas eight breast cancers developed in women under regular surveillance after a mean follow-up of 3.0±1.5 years (P=0.003; hazard ratio, 0.95; 95% confidence interval, 0.0 to 0.38). The actuarial mean five-year incidence of breast cancer among all women in the surveillance group was 17±7 percent. On the basis of an exponential model, the yearly incidence of breast cancer in this group was 2.5 percent. The observed number of breast cancers in the surveillance group was consistent with the expected number (ratio of observed to expected cases, 1.2; 95% confidence interval, 0.4 to 3.7; P=0.80).

Conclusions. In women with a BRCA1 or BRCA2 mutation, prophylactic bilateral total mastectomy reduces the identification of the breast-cancer-susceptibility genes BRCA1 and BRCA2 evoked widespread interest in genetic testing among women at risk for a mutation in these genes. We found that 67 percent of women without breast cancer who had a 50 percent chance of carrying a BRCA1 or BRCA2 mutation requested genetic testing. This result indicates the need to determine the efficacy of the various options for reducing the risk of breast cancer and for early detection in women with a BRCA1 or BRCA2 mutation.

Women with a BRCA1 or BRCA2 mutation have a cumulative lifetime risk of invasive breast cancer (up to the age of 70 years) of 35 to 75 percent and of invasive epithelial ovarian cancer of 15 to 65 percent. In these women the risk of breast cancer begins to increase near the age of 25 years, and their overall survival once breast cancer does develop is similar to that of age-matched patients with sporadic cases of breast cancer; in both, the 10-year survival rate is about 50 percent.

Current risk-reduction strategies for women with a BRCA1 or BRCA2 mutation include regular surveillance, prophylactic mastectomy, oophorectomy, or both; and chemoprevention. In our experience, 50 percent of women who have a BRCA1 or BRCA2 mutation have chosen to undergo prophylactic bilateral mastectomy. Until now, however, there have been only retrospective studies of the efficacy of the procedure in women with an increased risk of breast cancer.
Methods

Beginning on January 1, 1992, we studied all women with a BRCA1 or BRCA2 mutation who were being monitored for breast cancer because of familial clustering of breast cancer, ovarian cancer, or both, at the Dana-Farber Cancer Center in Boston, Massachusetts. We included all women who had been given a molecular diagnosis before January 1, 1992. Women with a BRCA1 or BRCA2 mutation in whom breast cancer developed before January 1, 1992, and one woman in whom breast cancer was detected at the first screening were excluded. The date January 1, 1992, was chosen because at this time, a multidisciplinary team at our family cancer clinic took over the care of women at high risk for breast cancer. A total of 139 women fulfilled the criteria. Ultimately, 76 of these women chose to undergo prophylactic bilateral mastectomy before the end of the follow-up period (March 1, 2001), whereas the other 63 women chose to remain under regular surveillance. In all but two women prophylactic mastectomy was performed after the molecular diagnosis was established.

Data Collection and Follow-up

Information on vital status and the occurrence of cancer was extracted from the women's medical files. All women were regularly monitored at our clinic until March 1, 2001, and were enrolled in clinical research programs approved by our institutional review boards (protocol IRB 91–17, updated in 1995). We obtained pathology reports of mastectomy specimens and of all biopsy specimens from the women who were being monitored. Information on chemotherapy performed for any reason (mainly in our clinic) was obtained from the women themselves and was verified by a review of all medical records. Truncalized mastectomy was defined as bilateral mastectomy before the age of 66 years and was performed prophylactically in the case of 59 women, for benign disease in the case of 1 woman, for ovarian cancer in the case of 7 women, and for cervical cancer in the case of 6 women (Table 1). No women were lost to follow-up after prophylactic mastectomy. Of the women in the surveillance group, three died of ovarian cancer and two chose to be monitored at another hospital for practical reasons.

Surgical Techniques and Surveillance

In all cases, a standard, bilateral, simple total mastectomy (including the nipple) was performed by a surgical oncologist at the Dana-Farber Cancer Center. In 76 of the 77 women, the breasts were reconstructed with silicone prostheses by a plastic surgeon in our clinic, followed later by a nipple reconstruction.

According to national guidelines, regular surveillance for breast cancer consists of a monthly breast self-examination, a clinical breast examination every six months, and yearly mammography. Since 1995, magnetic resonance imaging (MRI) has been an option at our clinic for women with mammographically very dense tissue and also in women who wish to undergo this examination. Special attention was focused on the breasts of women with a family history of ovarian cancer. In addition, baseline and follow-up blood samples were drawn for genetic analysis.

Analysis of BRCA1 and BRCA2 Mutations and Histologic Examination

DNA analysis was performed according to standard procedures.‡‡ BRCA1 and BRCA2 linkage analysis was used until 1994 and 1995, respectively, to identify the presence of hereditary breast cancer; from 1994 to 2000 we used direct mutation analysis. All BRCA1 and BRCA2 mutations were pathogenic, since they resulted in a premature truncation of the BRCA1 or BRCA2 protein.

Mastectomy specimens were examined histologically to rule out the presence of occult breast cancer. From each quadrant of the specimen, microscopical sections from three random blocks were examined according to standard procedures.

Statistical Analysis

The data were analyzed using the chi-square test for independence with Yates correction where appropriate, and the Student t test for continuous variables. The chi-square test for trend was used when appropriate. A p value of less than 0.05 was considered significant. The SAS statistical software was used for all analyses.

TABLE 1. CHARACTERISTICS OF THE WOMEN. *

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mastectomy Group (n=76)</th>
<th>Surveillance Group (n=63)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at entry, yr</td>
<td>27.4±8.7</td>
<td>29.6±8.8</td>
<td>0.62</td>
</tr>
<tr>
<td>Median age, yr</td>
<td>29.8</td>
<td>31.0</td>
<td></td>
</tr>
<tr>
<td>Range, yr</td>
<td>18–54</td>
<td>23–67</td>
<td></td>
</tr>
<tr>
<td>&lt;10 yr, no. (%)</td>
<td>11 (14)</td>
<td>17 (27)</td>
<td></td>
</tr>
<tr>
<td>10–29 yr, no. (%)</td>
<td>29 (38)</td>
<td>17 (27)</td>
<td></td>
</tr>
<tr>
<td>30–49 yr, no. (%)</td>
<td>24 (32)</td>
<td>16 (26)</td>
<td></td>
</tr>
<tr>
<td>≥50 yr, no. (%)</td>
<td>10 (13)</td>
<td>11 (17)</td>
<td></td>
</tr>
<tr>
<td>Preventive mastectomy</td>
<td>44 (58)</td>
<td>41 (65)</td>
<td>0.01</td>
</tr>
<tr>
<td>Other malignant disease</td>
<td>2 (3)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Gynecologic symptoms</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Mean age, yr</td>
<td>30.7±8.7</td>
<td>31.0±8.8</td>
<td>0.87</td>
</tr>
<tr>
<td>Median age, yr</td>
<td>29.1</td>
<td>29.8</td>
<td></td>
</tr>
<tr>
<td>Range, yr</td>
<td>18–60</td>
<td>24–77</td>
<td></td>
</tr>
<tr>
<td>No. of women</td>
<td>63</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Duration of surveillance, yr</td>
<td>4.8±3.3</td>
<td>5.1±4.8</td>
<td>0.005</td>
</tr>
<tr>
<td>Mastectomy group</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Median age, yr</td>
<td>1.3</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Range, yr</td>
<td>0.1–5.7</td>
<td>0.1–5.7</td>
<td></td>
</tr>
<tr>
<td>No. of women</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>BRCA1</td>
<td>64 (84)</td>
<td>56 (89)</td>
<td>0.42</td>
</tr>
<tr>
<td>BRCA2</td>
<td>12 (16)</td>
<td>7 (11)</td>
<td></td>
</tr>
<tr>
<td>No. of cases of breast cancer</td>
<td>0</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

*Plus–minus values are mean ± SE. Preventive mastectomy was defined as bilateral mastectomy before the age of 35 years.

The age at entry in the mastectomy group is based on the date of prophylactic mastectomy, and the age at entry in the surveillance group is based on the date on which breast cancer was initiated.
### Table 2. Characteristics of the Eight Women in the Surveillance Group in Whom Breast Cancer Developed.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Age at Diagnosis</th>
<th>Mutation</th>
<th>Mastectomy</th>
<th>Follow-Up After Diagnosis</th>
<th>Current Status*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
<td>4284delAG in BRCA1</td>
<td>No</td>
<td>15 NED</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>16512-16512del185 in BRCA1 (a 1.8-kb deletion affecting exon 13)</td>
<td>No</td>
<td>41 Died of breast cancer</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>4284delAG in BRCA1</td>
<td>No</td>
<td>18 NED</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>1654delAA in BRCA1</td>
<td>No</td>
<td>31 NED</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>43</td>
<td>16512-16512del185 in BRCA1 (a 1.8-kb deletion affecting exon 13)</td>
<td>No</td>
<td>97 NED</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td>1125delC in BRCA1</td>
<td>No</td>
<td>25 NED</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>49</td>
<td>1656delA+G1665 in BRCA1</td>
<td>Yes</td>
<td>14 NED</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>53</td>
<td>16521-16521del150 in BRCA1 (a 3.5-kb deletion affecting exon 22)</td>
<td>Yes</td>
<td>19 NED</td>
<td></td>
</tr>
</tbody>
</table>

*NED denotes no evidence of disease.

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**BREAST CANCER AFTER PROPHYLACTIC BILATERAL MASTECTOMY IN WOMEN WITH A BRCA1 OR BRCA2 MUTATION**

### Table 3. Characteristics of the Tumors in the Eight Women in the Surveillance Group in Whom Breast Cancer Developed.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Tumor Size</th>
<th>No. of Positive Nodes/Total Nodes Assessed</th>
<th>Histologic Type</th>
<th>ER/PR Assay Status</th>
<th>Estrogen and Progesterone Receptor Status</th>
<th>Time from Stage of Surveillance to Diagnosis</th>
<th>US</th>
<th>CBE</th>
<th>MAMMOGRAPHY</th>
<th>MRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25, 13</td>
<td>1/15</td>
<td>Ductl III</td>
<td>Negative</td>
<td>3 SC SC PB SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>46</td>
<td>2/14</td>
<td>Ductl III</td>
<td>Negative</td>
<td>12 SC SC PB ND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>0/1 sentinel node</td>
<td>Ductl III</td>
<td>Negative</td>
<td>31 NA NA NA SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>8/21</td>
<td>Ductl III</td>
<td>Negative</td>
<td>10 SC SC SC SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>6/18</td>
<td>Ductl III</td>
<td>Negative</td>
<td>23 NA NA NA SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>0/10</td>
<td>Ductl III</td>
<td>Negative</td>
<td>38 SC SC SC PB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>0/1 sentinel node</td>
<td>Ductl II</td>
<td>Negative</td>
<td>41 NA NA NA SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>0/1 sentinel node</td>
<td>Ductl III</td>
<td>Positive</td>
<td>21 NA NA NA SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*US denotes breast ultrasound, CBE clinical breast examination, MRI magnetic resonance imaging, SC suspicion of cancer, PB high probability of a benign lesion, ND not done, and NA no abnormalities.
Results

Characteristics of the Women

Table 1 lists the general characteristics of the women who chose to undergo prophylactic mastectomy and those who opted for surveillance. Significantly more women in the mastectomy group than the surveillance group had undergone a premenopausal oophorectomy (44 vs. 24 [58 percent vs. 38 percent], P = 0.03). All gynecologic cancers occurred before the age of 56 years; the two such cases in the mastectomy group were ovarian cancers, stage IC. There were no significant differences between the two groups with respect to age, average duration of follow-up after entry into the study, follow-up after premenopausal oophorectomy, and type of mutation. The 26 distinct mutations—23 in BRCA1 and 3 in BRCA2—were distributed in a similar fashion in the two groups. The 139 women were from a total of 70 families, the number of women from each family ranging from 1 to 5.

The mean (±SE) duration of follow-up was 2.9±1.4 years (219 woman-years) in the mastectomy group and 3.0±1.5 years (190 woman-years) in the surveillance group (Table 1). The total number of woman-years of surveillance increased from 190 to 318 when the 128 woman-years of surveillance before prophylactic mastectomy was added.

Incidence of Breast Cancer

After prophylactic mastectomy, no case of invasive breast cancer was observed in any of the 76 women during 219 woman-years at risk (Fig. 1). In the surveillance group eight invasive breast cancers were detected during 318 woman-years at risk, for a yearly incidence of 2.5 percent. The ratio of observed cases to expected cases was 1.2 (8 vs. 6.7, 95 percent confidence interval,
0.4 to 3.7, P=0.80). All the affected women were from different families. The actuarial mean five-year incidence of breast cancer in the women in the surveillance group (Fig. 1) was 17 ± 7 percent, but the number of women at risk at five years was only eight. To obtain a more stable estimate with longer periods of follow-up, we calculated cumulative incidence probabilities with the use of an exponential model in which the hazard rate was assumed to be constant. According to this model, the yearly incidence of breast cancer was 2.5 percent and the five-year cumulative incidence was 12 percent (95 percent confidence interval, 6 to 23 percent) (Fig. 1). Disregarding the years of surveillance before prophylactic mastectomy and thus restricting the actuarial analysis to the 63 women in the surveillance group, we estimated that the five-year risk of breast cancer was 24±9 percent.

Cox proportional-hazards analysis showed that mastectomy significantly (P<0.003) decreased the incidence of breast cancer (hazard ratio, 0.95 percent; confidence interval, 0 to 0.36). After adjustment for the change in menopausal status, the protective effect of mastectomy remained statistically significant (P=0.01).

Outcome in the Women with Breast Cancer

None of the eight patients in the surveillance group in whom breast cancer developed had been scheduled to undergo prophylactic mastectomy at the time of the diagnosis. The characteristics of the women and the tumors are described in Tables 2 and 3, respectively. Patients 7 and 8 underwent bilateral oophorectomy 14 and 12 months, respectively, before the diagnosis of breast cancer. Of the eight cancers, four (in Patients 1, 2, 4, and 6) were detected between screening sessions (so-called interval cancers). In these four patients the interval from screening to diagnosis was two to five months. The cancers in the other four patients (Patients 3, 5, 7, and 8) were detected during a screening session. Patient 1 became symptomatic eight weeks after her first clinical breast-cancer screening; the results of which were negative. In four of the eight patients, breast cancer was detected before the molecular diagnosis was made.

Histologic Findings in the Mastectomy Group

Invasive cancer was not detected in any of the specimens obtained at the time of prophylactic mastectomy. One 44-year-old woman with a BRCA1 mutation had lobular carcinoma in situ.

DISCUSSION

In this prospective study we assessed the incidence of breast cancer in 139 women with a BRCA1 or BRCA2 mutation who chose to undergo either prophylactic mastectomy or regular surveillance. Whereas breast cancer developed in 8 of 63 women in the surveillance group, no cases of breast cancer occurred among the 76 women who underwent prophylactic mastectomy. The observed number of breast cancers in the group under surveillance is compatible with the reported incidence of breast cancer in women with a BRCA1 or BRCA2 mutation. As compared with the incidence in the surveillance group, the incidence of breast cancer in the prophylactic-mastectomy group was significantly reduced (P<0.003), but the mean follow-up of three years calls for a cautious interpretation of our results.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Age at Diagnosis</th>
<th>Mutation</th>
<th>Race</th>
<th>Oophorectomy</th>
<th>Follow-up after Diagnosis</th>
<th>Current Status*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>4284del1G in BRCA1</td>
<td>Yes</td>
<td>1.5</td>
<td>NED</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>11112+6del6585 in BRCA1</td>
<td>No</td>
<td>41</td>
<td>Died of breast cancer</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>2044del6AA in BRCA1</td>
<td>No</td>
<td>12</td>
<td>NED</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>4284del1G in BRCA1</td>
<td>No</td>
<td>12</td>
<td>NED</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>41</td>
<td>11112+6del6585 in BRCA1</td>
<td>No</td>
<td>97</td>
<td>NED</td>
<td></td>
</tr>
</tbody>
</table>

* NED: Not excluded.
Conclusion

Limited Study & Further Research

We are indebted to Madeline Tillans-Einhorn and Lin van Zundert for conducting surveillance, to Ruby Tong for breast reconstruction in the patients, to Mieke Kruger and Leon Aronson for assistance with data analysis, to Lisa Crenna and Ann Claxton for data collection, to Didly Hallay and Peter Dovers for statistical and in Petra see for assistance with the preparation of the manuscript.

REFERENCES

Path of Publications

Primary Resources

Secondary Resources

Tertiary Resources
Types of Research Information
Secondary Sources

• **Definition**- interpret and analyze primary sources. They are a step removed from the event or original product.

• **Examples**
  – Textbooks
  – Magazine or newspaper articles
  – Criticisms & commentaries
  – Systematic reviews, meta analyses/syntheses
  – Web sites
Examples of Secondary Sources

**Hospital Compare**

Hospital Compare is a consumer-oriented website that provides information on how well hospitals provide recommended care to their patients. This information can help consumers make informed decisions about health care. Hospital Compare allows consumers to select multiple hospitals and directly compare performance measures related to heart attack, heart failure, pneumonia, surgery and other conditions. These results are organized by:

- Patient Survey Results
- Timely and Effective Care
- Readmissions, Complications, and Deaths
- Use of Medical Imaging
- Linking Quality to Payment
- Medicare Volume

Access the Hospital Compare Web site at www.hospitalcompare.hhs.gov.

Hospital Compare was created through the efforts of Medicare and the Hospital Quality Alliance (HQA). Improving Care Through Information was created in December 2002. HQA was a public-private collaboration established in December 2002 to promote reporting on hospital quality of care. HQA consisted of organizations that represented consumers, hospitals, doctors, employers, accrediting organizations, and federal agencies. The HQA effort was intended to make it easier for consumers to make informed health care decisions and to support efforts to improve quality in U.S. hospitals. Since its inception, many new measures and topics have been displayed in the site.

**REVIEW**

A systematic review of advanced practice nurses' skin cancer assessment barriers, skin lesion recognition skills, and skin cancer training activities

Lois J. Loschelder, PhD, RN (Associate Professor of Nursing)**, John M. Harris, Jr., MD, MBA (President)** & Claire Carol, RN, FNP-C, MD (Associate Professor of Dermatology)**

**Abstract**

Purpose: Little is known about the skin cancer detection skills of advanced practice nurses (APNs). This systematic review of published literature seeks to describe APN barriers to skin examination, APN ability to recognize suspicious skin lesions, and APN skin cancer detection and training activities.

Data sources: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines guided the literature search of PubMed, Web of Science, and CINAHL databases and interpretation of findings. Of the 136 articles identified for selection, 12 pertaining to the purpose were selected for further review.

Conclusions: Barriers to skin examination by APNs have been infrequently and inconsistently measured. Limited time to conduct skin examination is the most consistent barrier. APN ability to recognize and refer suspicious skin lesions is inconsistent, but shows improvement after training. Few skin cancer training resources are available for APNs.
Types of Research Information
Tertiary Sources

• **Definition**
  – indexes, compiles or organizes citations to secondary and primary sources
  – Takes information from secondary sources and condenses or reformats it into an easy-to-read form

• **Examples**
  – Databases such as CINAHL, PubMed
  – Almanacs & guidebooks
  – Textbooks
  – Encyclopedias
  – Manuals and handbooks
  – Dictionaries
Examples of Tertiary Sources
Aging and Attentional Bias for Death related and General Threat-related Information: Less Avoidance in Older as Compared With Middle-Aged Adults

Rodi De Raedt, Ernst H. W. Koster, and Ruben Ryckewaert

Department of Experimental Clinical and Health Psychology, Ghent University, Belgium.

Objectives. The aging literature suggests that life satisfaction and affective well being stabilizes or even increases during the aging process, and that death anxiety would decrease with aging. Experimental psychology literature shows that emotions play a critical role in information processing. The aim of the current study was to investigate whether death-related versus content-related threat words would lead to less or more attentional processing in middle aged versus older adults.

Method. Twenty seven older adults between 74 and 90 year old and 31 middle-aged adults between 40 and 50 years participated in the study. We used questionnaire to assess death anxiety and an exogenous cueing task to measure attention toward death related versus general threat words.

Results. Our results showed no age-related differences in self-reported death anxiety, but less attentional avoidance of threat in older adults. We failed to demonstrate differences between general and death related threat.

Discussion. This is the first study investigating attentional processing of both death- and threat-related information in older versus younger adults. Less avoidance may suggest that with aging, death becomes less of a concern, which might be indicative of acceptance of the own imminent old age.

Key Words: Aging—Attentional bias—Death anxiety—Threat.
Quiz

Observer bias in randomized clinical trials with measurement scale outcomes: a systematic review of trials with both blinded and nonblinded assessors

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Abstract

Background: Clinical trials are commonly done without blinded outcome assessors despite the risk of bias. We wanted to evaluate the effect of nonblinded outcome measurement on pooled the differences in effect size using inverse variance random-effects meta-analysis and used metaregression to identify potential reasons for variation.

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