The Diagnosis of Breast Cancer

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Breast cancer is the most common neoplasm in women. One out of every 13 women, or about seven percent, will develop breast cancer during her lifetime. In 1975 there were nearly 90,000 new cases in the United States alone. Breast cancer is also the leading cause of cancer death in women, as well as the leading cause of death from all causes in women 40 to 44 years old. Every 15 minutes, one woman dies of this disease. Nearly 33,000 deaths in the United States during 1975 can be attributed to breast cancer.1

These startling statistics clearly call for an immediate attack against breast cancer, the leading cancer in women. Obviously, the most direct approach would be to find its cause and eradicate it. Unfortunately, the etiology of breast cancer seems to be multifactorial, due to a constellation of risk factors rather than a single factor. Among the most important causes of breast cancer are: genetic predisposition; loss of the host's immunological defense mechanism; viruses, as well as other carcinogens. Hormones, especially estrogens, were once considered to be primary carcinogenic agents, but are now believed to act more as powerful promoters in carcinogenesis.1,2,3 Therefore, despite all the research aimed at finding the cause of breast cancer, this avenue does not seem to hold great promise for the near future.

Next to finding the cause of breast cancer, the most important aspect in combatting the disease is to diagnose it in an early stage when the prognosis for cure with appropriate therapy is excellent. The physician by instructing his patient in the art of monthly breast self-examination, by performing careful periodic breast examinations in his office and by the judicious use of diagnostic aids, especially in those patients with an increased risk of the disease, has a golden opportunity to detect breast cancer at an early and highly curable stage.

IMPORTANCE OF EARLY DIAGNOSIS

The importance of early diagnosis is emphasized in our series of 1,859 patients with primary breast cancers treated with a moderate selective surgical approach at New York Medical College-Flower and Fifth Avenue Hospitals from 1950 to 1975. Of these patients, 1,380 were followed for five or more years, and 929 for 10 or more years. In patients followed for 10 or more years, 711 had potentially curable breast cancers (Stage 0, I and II).1

The absolute (gross) 10-year survival rates based on pathologic staging for these patients were: 97.1 percent for patients with Stage 0 cancers (less than one cm. in size, diagnosed by breast X-rays); 70.2 percent for those with Stage I disease (clinically palpable lesions, without nodal involvement); and 38.4 percent for patients with Stage II cancers (nodal metastases present). (Table 1.) Obviously, although there are always

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some exceptions, the earlier the diagnosis the higher the long-term survival rate. In addition, not only does early diagnosis offer a better chance for cure, it also allows for less extensive surgery with better cosmetic and functional results and with a chance for breast reconstruction.

**BASIC FACTORS IN DIAGNOSIS**

To make an early diagnosis of breast cancer, the physician must have a high degree of suspicion regarding all breast lesions, as well as a basic knowledge of the following factors: (1) the common types of breast lesions and their relative frequency; (2) the age periods at which these lesions usually occur; (3) the characteristic symptom complexes; and (4) the various risk factors that increase a patient’s chance for developing breast cancer.

**Common Breast Lesions and Relative Frequency**

The most common breast lesions in the female are: fibrocystic disease, carcinoma, fibroadenoma, intraductal papilloma and duct ectasia; in the male, gynecomastia is by far the most common lesion. Fibroadenoma, which ranks second to fibrocystic disease as the most frequent benign female breast lesion, is rarely seen in the male.

Benign lesions are far more common than malignant ones in both females and males. Depending on the type of hospital reporting, benign lesions account for about 65-80 percent of breast operations, with an average of about 70 percent.

In our series of 5,604 breast operations at New York Medical College—Flower and Fifth Avenue Hospitals between 1960 and 1975, 4,084 or 72.9 percent were for benign lesions and 1,520 or 27.1 percent were for malignant lesions. Of the malignant lesions, 99 percent occurred in the female; 99.1 percent of these were carcinomas and only 0.9 percent were sarcomas.

In all series, fibrocystic disease is the most frequent lesion in the female and gynecomastia, the most frequent one in the male. Twenty-five years ago, fibrocystic disease accounted for about 50 percent of breast operations in many reports but now, with the aspiration of cysts, the relative incidence of fibrocystic disease has decreased. (Figs. 1A and 1B.) In our 5,604 breast operations,
1,899 or 33.9 percent were for fibrocystic disease, 1,520 or 27.1 percent for malignant lesions, 1,037 or 18.5 percent for fibroadenomas, 319 or 5.7 percent for intraductal papillomas, 241 or 4.3 percent for duct ectasia and 588 or 10.5 percent for other lesions such as lipomas, fat necrosis, residual inflammatory masses, gynecomastia, fibroadenomas, angiomas and granular cell myoblastomas. (Table 2.) Funderburk, Rosero and Leffall reported that fibroadenomas occur about twice as frequently in blacks as in whites.  

Age Periods
The patient’s age is extremely important in the differential diagnosis of breast lesions. Benign lesions usually occur in the premenopausal woman, while breast cancers develop chiefly in the menopausal and postmenopausal woman, increasing in incidence throughout the patient’s life-span and reaching the highest incidence peak in patients over 85 years of age. The common age periods and the median age for our 5,604 breast operations was: fibrocystic disease, 20-49 years, with a median age of 30; fibroadenomas, 15-39 years, with a median age of 20; intraductal papillomas and duct ectasia, 35-55 years, with a median age of 40.  

Although gynecomastia occurred in a wide age-group, extending through the neonatal, prepubertal, adolescent and adult periods, patients subjected to surgery were most commonly in puberty, with a median age of 14, or from 50-65 years old, with a median age of 55. Over 80 percent of breast cancers are clinically detected in patients over 40 years old. Less than 1.5 percent occur in those under the age of 30; in patients less than 21 years old, breast cancer is a medical curiosity. In our patients, 66 percent were clinically detectable over the age of 50, 83 percent over the age of 40, 98.6 percent over the age of 30, and 99.85 percent over the age of 25. There were no breast cancers in patients...
under 21 years old. Thus, most breast cancers in our series occurred in patients between the ages of 40-71 years, with a median age of 54 in the female and 60 in the male. (Table 3.)

**Characteristic Symptom Complexes**

**Fibrocystic Disease**

The lesions are commonly bilateral and multiple. They are characterized by dull, heavy pain, a sense of fullness and tenderness. These symptoms increase premenstrually as does lump size. In the case of a cyst, the patient will often report that there was a sudden appearance of a tender lump and that she or her doctor recently examined her breasts and did not notice a lump. The lumps are cystic to palpation (like a balloon filled with water), tender, well-delineated, slightly mobile and transilluminate clear. Aspiration reveals a typical turbid, non-hemorrhagic, yellow, greenish or brownish fluid. (Figs. 1A and 1B.)

Deeply imbedded cysts, a cluster of cysts or dominant areas due to sclerosing adenosis or dense fibrous dysplasia can produce a mass that clinically mimics cancer.

**Fibroadenoma**

Fibroadenomas are very mobile, solid, firm, rubbery, regular, well-delineated, non-tender, painless lumps usually in young women. They are multiple and bilateral in about 14 to 25 percent of patients. (Fig. 2.)

**Intraductal Papilloma**

Intraductal papillomas present with a serous (yellow), serosanguineous (pink), sanguineous (bloody) or watery type of nipple discharge. The discharge is usually spontaneous and from a single duct and is commonly unilateral. In most patients no lump can be palpated. (Fig. 3.)

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Table 3.

| Type of Breast Lesion                  | Age Period (Median Age) |
|---------------------------------------|-------------------------|
| Fibrocystic disease                   | 20-49 years (30)        |
| Fibroadenoma                          | 15-39 years (20)        |
| Intraductal papilloma and duct ectasia| 35-55 years (40)        |
| Gynecomastia                          | Puberty (14) or 50-65 years (55) |
| Cancer                                | 40-71 years (54, female; 60, male) |

*Performed at New York Medical College — Flower and Fifth Avenue Hospitals from 1960-1975.*
Duct Ectasia
Duct ectasia (comedo mastitis) also commonly manifests with nipple discharge. However, this discharge is usually multicolored and sticky, bilateral and from multiple ducts. Frequently the patient experiences a burning, itching or dull drawing type of pain around the nipple and areola and there are palpable tortuous tubular swellings under the areola. When more advanced, a mass can develop that may resemble a locally advanced Stage III breast cancer (plasma cell mastitis). (Fig. 4.)

Gynecomastia
In the prepubertal or adolescent boy, gynecomastia usually presents as a firm circular disk-like circumscribed tender mass beneath the areola, usually unilaterai at onset. A diffuse type of swelling or enlargement can occur; in the adult, diffuse gynecomastia is most common. There is an increase in size usually of one breast, first accompanied by pain and tenderness. The breast hypertrophy may be progressive or remain relatively the same size. (Fig. 5.)

Cancer
Cancer usually presents as a solitary, unilateral, solid, hard, irregular, poorly-delineated, non-mobile, painless and non-tender lump, most often in the upper outer quadrant of the breast. As the cancer becomes more advanced, other symptoms such as firm to hard irregular axillary nodes, nipple retraction, elevation or discharge, skin dimpling, signs of local advancement or distant metastases can occur.

Certain cancers of the breast, however, do not conform to this clinical picture: Paget’s carcinoma presents with

Table 4.
Patients at High Risk of Breast Cancer

- Women.
- Those over 40 years of age.
- Patients with a familial history of breast cancer.
- Nulliparous women or those with first parity after age 34.
- Patients with a previous cancer in one breast.
- Those with a precancerous mastopathy type of fibrocystic disease.
- Women with an adverse hormonal milieu.
- Patients with lowered immunological competence.
- Those with excess exposure of the breast to ionizing radiation.
- Patients exposed to carcinogens.
- Those with other organ cancers, especially the endometrium.
- Patients with high dietary intake of fat.
- Patients with chronic psychological stress.
- Those living in the Western hemisphere or a cold climate, belonging to the upper socioeconomic group and of the white race.
Fig. 1A. Appearance of a cyst opened during formal biopsy.

Fig. 1B. Aspiration of a cyst.

Fig. 2. Fibroadenoma.

Fig. 3. Intraductal papilloma.
Fig. 4. Lump.

Fig. 5. Gynecomastia.

eczema of the nipple; inflammatory carcinoma presents with redness of the skin and an underlying induration, but without any signs of infection; medullary, colloid, papillary and intracystic carcinoma can present with a well-delineated mass that is not hard and can give the impression of slight mobility; sarcoma also presents as a well-delineated mass and closely resembles a fibroadenoma; sweat gland carcinoma, epithelioma and melanoma present with the same clinical picture as elsewhere on the body.

Risk Factors in Breast Cancer

While one out of every 13 women, or seven percent, will develop breast cancer during her normal life expectancy, breast cancer is not a chance event that occurs randomly throughout the population. There is a group of patients who have an increased risk of breast cancer. (Table 4.) Once this higher-risk group is defined, the full armamentarium of diagnostic studies can be directed toward them, rather than toward the entire population.

Patients with an increased risk for developing breast cancer are listed below.1,5,6,12

- Women. Over 99 percent of breast cancers occur in the female.
- Those over 40 years of age. More than 80 percent of breast cancers are clinically detected after this time.
- Patients with a familial history of breast cancer. Emphasis is on mothers and sisters, premenopausal and bilateral cancers (other genetic factors such as a wet type of cerumen may be of significance).
- Nulliparous women or those with their first parity after the age of 34. Stress is placed on age of the first parity; protection seems to be against postmenopausal breast cancer.
- Patients with a previous cancer in one breast.1,7,13,14
- Those with a mastopathy type of fibrocystic disease.15,16
- Women with an adverse hormonal milieu, for example, prolonged menstrual activity, lowered estriol fractions, sub-normal levels of aetiocholanolone and/or androsterone, nulliparous or late parous women re-
receiving exogenous estrogens, hypo-
throid patients and those with the 
triad of obesity, diabetes and hyper-
tension.

- Patients with lowered immunological 
competence, including older patients 
with thymic atrophy and others with 
decreased thymus dependent T-
lymphocytes, those exposed to excess 
ingionizing radiation or those on chem-
otherapy or immunosuppressant drugs.

- Those who have had an excess expo-
sure of the breast to ionizing radia-
tion, such as patients who have had 
multiple fluoroscopies, radiation 
treatments of the breast (for mastitis, 
gynecomasia or cancer) or of the skin 
of the breast (for keloids or acne).

- Patients exposed to carcinogens, for 
example, viruses (possibly by nursing 
from a mother with a family history 
of breast cancer or with sub-clinical 
cancer), the rauwolfia alkaloid (reser-
pine), alcohol excess, methyldopa, 
phenothiazine, d-amphetamine, some 
antidepressants and antihistamines.

- Those with other organ cancers, espe-
cially the endometrium.

- Patients with a high dietary fat intake.

- Patients undergoing chronic psycho-
logical stress.

- Those living in the Western hemi-
sphere or in a cold climate, those be-
longing to the upper socioeconomic 
group and members of the white race, 
compared to black, Oriental and Jew-
ish women.

CLINICAL AND HISTOLOGIC 
DIAGNOSIS OF BREAST CANCER

Based on these known statistical facts 
about benign and malignant breast le-
sions combined with a careful history, 
a systematic and thorough breast exa-
mination, and the judicious and selective 
use of diagnostic aids, a tentative diag-
nosis of a given breast lesion can usually 
be made.

However, it must be remembered that 
biopsy with histologic examination is 
the only definitive way of determining 
whether a lesion is benign or malignant. 
Biopsy is mandatory in patients with: (1) 
true three-dimensional dominant lumps, 
even if diagnostic aids are negative, ex-
cluding cysts which can be safely 
aspirated under control conditions; (2) 
suspicious lesions found by diagnostic 
aids, even if there are no clinical find-
ings; (3) serous, serosanguineous, 
bloody or watery nipple discharge, even 
if there is no palpable mass and cytology 
and breast X-ray are negative; (4) other 
adverse signs, for example, eczema of 
the nipple, unexplained retraction or ele-
vation, suspicious axillary adenopathy, 
redness of the skin of the breast, under-
lying induration without signs of infec-
tion, unexplained skin dimpling or a per-
sistent dominant area of unexplained 
thickening in the breast.

History

The differential diagnosis of breast le-
sions should start with a careful his-
tory. First, the age of the patient is 
elicited, since different breast lesions 
have common age periods in which they 
occur. Next, the patient's chief com-
plaint with all pertinent and relative de-
tails is obtained.

The chief complaints of patients with 
breast lesions include: lump or mass; 
pain; nipple symptoms (discharge, re-
traction, elevation, eczema); skin symp-
toms (dimpling, redness, edema or peau 
d'orange, ulceration); other signs or sym-
ptoms, such as suspicious axillary 
nodes, evidence of local advancement or 
distant metastases. (Table 5.)

A lump or mass is the most common 
complaint of patients admitted to the 
hospital for breast surgery, and the 
primary complaint of about 90 percent 
of women with breast cancer. Today, 
despite the multitude of diagnostic cen-
ters and screening programs, nearly 90 
percent of lumps are still discovered by 
the patient, emphasizing the importance
of breast self-examination.

Pain and tenderness are not common complaints of patients admitted to the hospital for breast surgery but they are very common in patients seen in the office or clinic. The most frequent cause of breast pain is fibrocystic disease. Here the pain and tenderness are cyclic, increasing in the premenstrual phase, usually bilateral, although often more pronounced on one side, and most marked in the upper outer portions of the breast.

However, not everyone with pain and tenderness has fibrocystic disease and there is a difference in the type of pain depending on its etiological basis. The pain in fibrocystic disease is cyclic and often described as “heavy as if full of milk,” in cervical or dorsal radiculitis as “sharp and radiating,” in Tietze’s syndrome as “aching,” in the post-traumatic group as “sore, bruised or stabbing,” in infections as “throbbing,” and in duct ectasia as “itching, burning, or drawing.” "19 Cancer has been credited as causing pain in 11 percent of patients but careful questioning and examination will usually reveal that the pain, except if the cancer is locally advanced, is due to some cause arising outside the breasts.

Nipple discharge ranks second to a lump as a chief complaint of patients admitted to the hospital for breast surgery.1,7-9,20-22 In our 5,604 breast operations, 432 or 7.7 percent had nipple discharge: 382 or 9.4 percent in benign lesions and 50 or 3.3 percent in cancer.1,21 In the male, nipple discharge had a more serious prognostic import, occurring in 20 percent of male breast cancers in our series. Others have reported similar findings.23,24

Differentiation into one of the seven basic types of discharge (milky, multicolored and sticky, purulent, watery, serous, serosanguineous or bloody) is usually quite simple by observation of the color, by palpation to feel if it is sticky, and by examination of a Wright’s stained smear for blood or pus. (Figs. 6A, 6B, 6C, 6D, 6E, 6F and 6G.) A simple test to determine the presence of blood is to place the discharge on white gauze. A reddish color with lighter shades of red extending to the periphery will be seen if blood is present, but will not occur in discharges without blood. (Figs. 7A and 7B.)

The types of discharge of surgical significance are watery, serous, serosanguineous and bloody. These are usually unilateral and commonly come through a single duct. These discharges are most often the result of: intraductal papillomas, usually without a palpable mass; fibrocystic disease, especially of the papillomatosis type and frequently with-
Fig. 6A. Nipple discharge—milky.

Fig. 6B. Multicolored and sticky.

Fig. 6C. Purulent.

Fig. 6D. Watery (clear).

out a mass; cancer, generally with a palpable mass; duct ectasia of the advanced type, also commonly with a mass; and engorgement in near-term pregnancy. These discharges are most often due to intraductal papillomas, but in patients over the age of 50, cancer becomes an increasingly common cause.

While cytologic examination should be a routine part of the examination of any patient with nipple discharge, it is unsafe to rely on cytology to determine
if the discharge is caused by a benign or malignant condition since the percentage of false-negatives is quite high. In our series of 432 patients operated on for nipple discharge, nine out of 50 patients with cancer or 18 percent had false-negative cytologies, 10 out of 382 patients with benign lesions or 2.1 percent had false-positives, and 43 or 11.3 percent had atypical cells.\textsuperscript{1,21}

In our opinion only spontaneous discharges have a pathologic significance, but Sartorius has reported that occasionally an abnormal cytology, indicating an underlying cancer, will be obtained with a special breast suction kit from an asymptomatic woman.\textsuperscript{25}

Retraction or elevation of the nipple (Figs. 8 and 9) and skin dimpling (Figs. 10A, 10B and 10C) can be due to a benign lesion, but are usually indicative of cancer. Dimpling of the skin accompanied by a string-like band is probably the result of a superficial thrombophlebitis called Mondor’s disease. (Figs. 11A and 11B.) Eczema of the nipple is pathognomonic of Paget’s carcinoma. (Figs. 12A and 12B.) Edema of the skin (peau d’orange) is usually caused by carcinoma, but can occur in plasma cell mastitis and infection. (Fig. 13.) Redness of the skin is commonly due to infection. However, when redness and edema are present without any evidence of infec-
tion and underlying induration, the probable diagnosis is inflammatory carcinoma. (Fig. 14.)

Today, despite all the publicity about breast cancer, patients are still seen with signs and symptoms of locally advanced disease (Stage III), such as supravacular nodes, fixation of the tumor to the
chest wall, edema of the arm, edema or redness over more than one-third of the breast, ulceration (Fig. 15), satellite nodules (Fig. 16) or peristernal nodes. Furthermore the patient may present with complaints indicative of distant metastases to the bones or viscera.

Finally, after eliciting the patient’s age and chief complaint it is important to determine if the patient has any factors related to an increased risk of breast cancer so that the full armamentarium of diagnostic studies can be employed.

Physical Examination

A careful physical examination of the breasts should be a routine part of every complete examination of a patient. This is especially important in the pregnant patient for whom breast examination and evaluation are notoriously difficult.

Physicians have an obligation to instruct their patients in the proper technique of breast self-examination. If the patient is still menstruating, examination should be performed monthly after her period. If not, it should be done at a routine time each month, such as her birth date or the first day of the month. Pamphlets and films are available on breast self-examination through the American Cancer Society and other medical centers and organizations, but
the average patient is not apt to practice breast self-examination unless she is taught the procedure by her physician and strongly encouraged to do it on a monthly basis. (See the pictorial review on “Breast Self-Examination,” pages 226-227, Figs. 17-24.)

The physician must develop an orderly, routine method of breast examination in order to avoid overlooking any important details. The procedure should always be conducted with the patient in both the sitting and the supine positions, combining critical inspection and careful palpation.

The examination with the patient in the sitting position must be performed in a good light with nothing obstructing the view and the patient disrobed from the waist up. The following orderly technique is advised: (1) patient’s arms at the side; (2) arms raised over the patient’s head; (3) hands pressed against the hips; (4) forward bending with the patient’s hands resting on the doctor’s shoulders (palpation is done between both hands using the flat of the fingers); (5) palpation for supraclavicular nodes; and (6) palpation for axillary nodes.

After completing the same type of examination on the opposite breast the physician then stands at the head of the table and examines both breasts simultaneously. This allows for a comparison of the consistency and texture of both breasts and often focuses attention on an area that might have been missed with unilateral palpation. (See the pictorial review on “Breast Examination by the Physician,” pages 228-229, Figs. 25-32.)

Transillumination either in the sitting or supine position should always be done with a good light in a dark room. Cancers usually transilluminate opaque while benign lesions transilluminate clear or semi-opaque. (Fig. 33.)

Black and Leis have developed an alcohol sponge test that seems to be of value in identifying various types of...
breast pathology. Using an alcohol soaked sponge the breasts are gently wet with alcohol. In most control individuals there is either no change or a blanching of the skin. In patients with breast cancer the skin over the tumor shows a discrete blush, which appears in a few minutes and then starts to fade. This test seems to correlate well with an increase in thermal pattern and might be termed "a poor woman's thermogram." (Fig. 34.)

Benign Lesions Simulating Cancer
Certain benign lesions can clinically simulate breast cancer in one or more of its signs and symptoms. Intraductal papillomas and the papillomatosis type of fibrocystic disease can produce a watery, serous, serosanguineous or bloody type of nipple discharge, as does carcinoma. However, these benign lesions are commonly not associated with a palpable mass, while in carcinoma there is usually a mass. Fibrous tumors, sclerosing adenosis, calcified fibroadenomas, granular cell myoblastomas, posttraumatic fat necrosis, residual inflammatory mass, deeply imbedded cysts with thick walls and multiple small cysts clustered together can produce a mass clinically simulating a cancer. In addi-

Fig. 12A. Early eczema of the nipple (Paget's disease).

Fig. 12B. Late Paget's disease.

Fig. 13. Skin edema (peau d'orange).
Fig. 14. Inflammatory carcinoma.

...tion, plasma cell mastitis and, to a lesser extent, granular cell myoblastoma, post-traumatic fat necrosis and a residual inflammatory mass can produce a clinical picture that mimics locally advanced breast cancer.

Diagnostic Aids
While monthly breast self-examination and careful periodic breast examinations by the physician are of great importance in early breast cancer diagnosis, they can only detect palpable lesions. However, breast X-rays (mammography or xerography) can detect some breast cancers in a preclinical stage, one to two years before the lesions reach a clinically palpable size of one cm. In addition, it does not offer localization for biopsy and it produces a high percentage of false-positives. However, thermography is a valuable risk indicator for breast cancer. Byrne has reported that a woman with an abnormal thermogram has a 15-fold increased risk of breast cancer.

Breast X-rays offer excellent additional help in confirming or denying the clinical impression of whether a lesion is benign or malignant. When cancer is suspected, breast X-rays are an accepted part of the complete diagnostic work-up for women of any age. However, the accuracy of breast X-ray is not 100 percent and biopsy of a suspicious lesion must never be deferred on the basis of a negative result.

Recently a great deal of concern has been expressed regarding the possible risk of inducing breast cancer by radiation exposure. The predictions of risk for developing breast cancer from exposure to radiation were based on a study by the Advisory Committee on the Bio-

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logical Effects of Ionizing Radiation of the National Academy of Sciences, covering three groups of women previously exposed to high levels of radiation. These women included survivors of the Hiroshima and Nagasaki atomic bombings, patients who had undergone repeated fluoroscopies for tuberculosis and a third group irradiated for mastitis.

Extrapolating from these very large doses to very small doses, it was postulated that there could be a very small chance of risk in the routine use of mammography. Strax has reported on the value of breast X-rays along with physical examination and thermography in screening techniques for the earlier detection of breast cancer. However, Bailar estimated that yearly breast X-rays over a 30-year period could produce as many breast cancers as would be cured by early detection. Simon and Silverstone also raised a serious question on the advisability of population screening by breast X-rays.

Based on the possibility that there is no clear-cut benefit and a very small chance of risk in the routine use of mammography for symptom-free women between the ages of 35 and 49 years old, the National Cancer Institute and the American Cancer Society on August 23, 1976 issued an interim guideline to the directors of the 27 NCI-ACS Breast Cancer Detection Demonstration Projects. The guidelines advised annual screening for all women over 50 years of age since, in this group, there is no question that the benefits clearly outweigh any minimal long-term risk from radiation. The guidelines did not recommend routine screening in women 35 to 49 years old. Rather, they stressed the possible benefits of screening women in this age-group who are at special risk for breast cancer. The guidelines also emphasized that mammography is an accepted part of the complete diagnostic work-up for women of any age with a suspected breast neoplasm.

A recent editorial in this journal gave a concise perspective of the benefits of mammography versus its risk, and defined which women should receive
BREAST SELF-EXAMINATION

Fig. 17. Observe the breasts in front of a mirror. Fig. 18. Arms elevated.

Fig. 19. Hands pressed against hips. Fig. 20. Bending forward.
Fig. 21. Palpate the breast while standing, starting in upper outer portion.

Fig. 22. Palpate the breast while standing, progressing medially downward.

Fig. 23. Examine the breast while supine.

Fig. 24. Examine the breast while supine, progressing medially downward.
Fig. 25. Observe the patient with her hands at the side.

Fig. 26. Arms elevated.

Fig. 27. Hands pressed against hips.

Fig. 28. Bending forward and palpating breast between flat of fingers.
Fig. 29. Supraclavicular node palpation.

Fig. 30. Axillary node palpation.

Fig. 31. Systematic examination, with flat of fingers. Squeeze nipple for discharge.

Fig. 32. Symmetrical examination.
mammograms. The following facts were emphasized. (1) The only recognized approach to saving more lives from breast cancer is early diagnosis, hopefully before the cancer becomes large enough to palpate. (2) Mammography is the only means available today to detect cancer at such an early stage. (3) Mammography should be used on a selective basis. (4) Modern mammogram techniques allow for much better diagnostic accuracy, especially in patients under 50 years of age, compared to the results obtained in the 10-year-old Health Insurance Plan Study that found no reduction in case fatality rates for screened women under 50 years old. (5) New equipment has reduced radiation exposure to extremely low levels that are only a small fraction of the dosage used 10 years ago.

The New York Metropolitan Breast Cancer Group has outlined their position on mammography in a newsletter report. They conclude that despite the great advance that mammography has offered in early detection of breast cancer, and the resulting excellent life expectancy for such patients, it should not be used indiscriminately but rather on a selective basis. They further emphasize that it is mandatory to separate the issue of mammography for screening from mammography for evaluation of symptomatic patients.

Breast X-rays are such a valuable clinical diagnostic aid in the serious problem of breast cancer that confidence in their use must be restored. They should not be done on every woman but judicious use in properly selected patients is extremely important.

We do not advise breast X-rays in patients under 25 years old. Between 25 and 34 years, they are used only when there is a diagnostic problem and never on a periodic basis. X-rays are advised on a yearly basis for all patients over the age of 50. For patients 35 to 49 years old, two baseline breast X-rays are done.
Fig. 34. Alcohol blush test. Upper right: alcohol applied. Upper left: beginning blush. Lower right: alcohol blush. Lower left: red color fading.

on a yearly basis between the ages of 35 and 40. Further X-rays of the breasts are then performed in patients with the following indications: (1) symptomatic breasts that are difficult to diagnose clinically; (2) breast X-ray parenchymal patterns indicating an increased risk for developing breast cancer or an abnormal thermogram also indicating increased risk; (3) factors related to an increased risk of breast cancer. If the patient has none of these indications she is followed by monthly breast self-examination and periodic breast examinations by the physician. On the other hand, if the patient is at risk, the number of mammograms is based on the number and importance of these factors. Some patients could, therefore, be advised to have mammograms on a yearly basis and others much less frequently.

Breast X-rays are routinely advised in the following situations, unless the patient is under 25 years old: (1) preoperatively; (2) after cyst aspiration; (3) multinodular breasts; (4) large pendulous breasts; (5) areas of thickening without a true mass; (6) breasts with dense scar formation due to previous biopsies or trauma; and (7) patients in the higher-risk group for breast cancer.

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