

**UCSF**

**UC San Francisco Electronic Theses and Dissertations**

**Title**

The relationship between visual acuity, tactile sensation, and mobility of the upper extremities and proficient breast self-examination in women 65 and older

**Permalink**

<https://escholarship.org/uc/item/64v6z52g>

**Author**

Baulch, Yvonne Suzanne

**Publication Date**

1991

Peer reviewed|Thesis/dissertation

The Relationship Between Visual Acuity, Tactile Sensation,  
and Mobility of the Upper Extremities and Proficient  
Breast Self-Examination in Women 65 and Older

by

Yvonne Suzanne Baulch

THESIS

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF SCIENCE

in

Nursing

in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA

San Francisco

Date

University Librarian

Degree Conferred: . . .

6/16/91

## ACKNOWLEDGEMENTS

This thesis is dedicated to the older women who assisted me in gaining knowledge about their needs and concerns in relation to performing proficient breast-self examination for early detection of breast cancer.

Grateful acknowledgement is given to Dr. Patricia J. Larson for many hours advising me and her expertise in the research process, to Dr. Marilyn Dodd for her expertise in self-care and research, to Carole Deltrich for her valuable suggestions and expertise in geriatrics, and to all of them for their encouragement, faith, and support.

I would like to thank my family and friends for their practical help in many ways. Thanks to Dr. Suzanne L. Dibble for her statistically significant assistance. Recognition is also given to my typist, Angelica DeAngelis, for her patience and excellent workmanship.

Finally, very special thanks to my husband, Michael, for his constant belief in me, without whom my endeavors would not have been possible.

TABLE OF CONTENTS

TITLE PAGE . . . . . i

ACKNOWLEDGEMENTS . . . . . ii

LIST OF TABLES . . . . . iv

LIST OF APPENDICES . . . . . v

INTRODUCTION . . . . . 1

CONCEPTUAL FRAMEWORK . . . . . 2

BACKGROUND . . . . . 3

METHODS . . . . . 5

Setting and Sample  
Design and Procedure

RESULTS . . . . . 8

Visual Acuity and the Visual Component  
of Proficient BSE  
Tactile Sensation and the Tactile Component  
of Proficient BSE  
Upper Extremity ROM and the Mobility Component  
of Proficient BSE

DISCUSSION . . . . . 10

Limitations of the Study  
Nursing Implications  
Research

BIBLIOGRAPHY . . . . . 13

TABLES . . . . . 17

APPENDICES . . . . . 29

## LIST OF TABLES

- Table 1: Review of Research/Proficiency of BSE by Demonstration on Simulated Breast Models**
- Table 2: Self-Reported Demographic Characteristics of Sample (N=32)**
- Table 3: Self-Reported Breast Health Characteristics of Sample (N=32)**
- Table 4: Self-Reported Health History Characteristics (N=32)**
- Table 5: Comparisons Between Visual Acuity and the Visual Component of Proficient BSE (N=32)**
- Table 6: Comparisons Between Tactile Sensation and the Tactile Component of Proficient BSE (N=32)**
- Table 7: Comparisons Between Upper Extremity ROM and the Upper Extremity Mobility Component of Proficient BSE (N=32)**

**LIST OF APPENDICES**

**Appendix A: University of California, San Francisco  
Consent to Be a Research Subject  
-CHR Approval #H1875-05882-01**

**Appendix B: Demographic and Health Questionnaire**

**Appendix C: Proficiency Check Off Tool**

## Introduction

Breast cancer will be diagnosed in approximately 175,000 women and it is estimated that 44,500 will die from this disease in 1991 (Boring, Squires, & Tong, 1991). Although women age 65 years and older comprise less than 12% of the population, they will account for more than 40% of all these breast cancers (Langlands, 1990). Evidence suggests that older women are more likely than younger women to be diagnosed with breast cancer that has metastasized (Goodwin et al., 1986), which has a 19% five-year survival rate, as compared with 91% for localized breast cancer and 70% for regional breast cancer that has spread to the lymph nodes (Boring, Squires, & Tong, 1991). Unfortunately at the present time, breast cancer cannot be prevented, therefore, early detection and treatment appear to be the best defense. Breast self-examination (BSE) together with mammography and clinical breast exam (CBE) are recommended by the American Cancer Society (ACS) for a complete early breast cancer detection program (ACS, 1988). As a screening tool, BSE is a self-care approach that requires proficiency of technique.

To perform proficient BSE, a woman must have adequate visual acuity to inspect her breasts in the mirror for changes in contour, color and texture of the skin and nipple, and evidence of discharge from the nipples. She must also have sufficient tactile sensitivity to palpate lumps within her breast tissue less than 2 cm, which is predictive of stage I disease (Beahrs, Henson, Hutter, & Myers, 1988), and upper extremity mobility of her hands, wrists, elbows, and shoulders. It is important that women have all these abilities to perform all components of BSE skillfully.

Older women often have decreased visual acuity, tactile sensation, and upper extremity mobility, which may affect their ability to perform BSE proficiently. The most common causes of decreased visual acuity in older women are cataracts, senile macular degeneration, retinal pathology, and/or open angle glaucoma (Meisami, 1988).

Decreased tactile sensation may be related to the decrease in the number of Pacinian and Meissner's corpuscles necessary for the sensation of pressure and light touch (Ballin & Pratt, 1989). The prevalence of rheumatoid arthritis, osteoarthritis, and osteoporosis, which can affect the mobility of the upper extremities also increases with age (Matteson, 1988).

Thus, it may be that women over the age of 65 have a limitation in their ability to perform the components of proficient BSE in these three areas. The purpose of this study is to describe the relationship between visual acuity, tactile sensation, and mobility of the upper extremities and the performance of proficient BSE in women 65 and older.

#### Conceptual Framework

Health maintenance at the primary level of prevention is composed of practices to maintain and promote health and prevent disease (Orem, 1985). Breast cancer is a disease that presently cannot be prevented, therefore, early detection becomes a primary goal for health maintenance. The earlier breast cancer is detected, the greater the chance for survival. BSE is a self-care approach essential for health maintenance to assist women in early detection of breast cancer.

Self-care, as defined by Orem (1985), is taking care of one's total being in order to preserve one's health. The purpose of self-care at the primary level of health maintenance, as explained by Orem through the universal self-care requisites, is "common to all human beings during all stages of the life cycle, adjusted to age, developmental state, and environmental and other factors. The universal self-care requisites are associated with life processes, with the maintenance of the integrity of human structure and functioning, and with general well-being" (p. 90). Therapeutic self-care demands are the self-care actions needed to meet known self-care requisites. The self-care agency is the *ability* of the individual to provide self-care. In this study, early detection of breast cancer to maintain health is related to Orem's universal self-

care requisite, "the prevention of hazards to human life, human functioning, and human well-being" (p. 91). Proficient BSE is the self-care action or therapeutic self-care demand needed to meet the universal self-care requisite. The self-care abilities necessary to perform proficient BSE include visual acuity, tactile sensation, and upper extremity mobility to detect changes in one's breasts. However, as noted, aging women may have decreased visual acuity, tactile sensation, and upper extremity mobility, possibly affecting their ability to perform BSE proficiently.

If the individual's self-care abilities--visual acuity, tactile sensation, and/or upper extremity mobility--are not sufficient to meet the self-care demand--proficient BSE--a deficit in self-care results and the assistance of a nurse is needed (Orem, 1985). The goal of nursing, according to Orem, is to eliminate the deficit between self-care agency and therapeutic self-care demand. Nursing can assist individuals toward the goal of health maintenance if their self-care deficits or limitations are known.

#### Background

Earlier studies of BSE focused on the frequency of performance and related factors to BSE practice including health beliefs, fears, anxiety, misconceptions about breast cancer treatment, lack of confidence in ability to perform BSE, and lack of knowledge about BSE (Alagna & Reddy, 1984; Hallal, 1981; Hirshfield-Bartek, 1982; Huguley, Brown, Greenberg, & Clark, 1988). Recent studies have looked at these issues in older women, finding increased frequency of the practice of BSE related to increased knowledge about BSE and breast cancer, more positive attitudes toward BSE, and a greater perception of the importance of BSE (Lierman, Kasprzyk, & Benoliel, 1991; Williams, 1988). It has also been found that frequency of practice is not highly related to competency of BSE (Haughey et al., 1988; Howe, 1980; Mamon & Zapka, 1985). Other research has addressed the measurement of proficient BSE to determine its efficacy as an early breast cancer detection tool through self-report of BSE technique (Baker, 1989; Mamon & Zapka, 1985; Zapka & Mamon, 1986), and demonstration of BSE on a

simulated breast model (SBM) (Alagna & Reddy, 1984; Assaf, Cummings, Graham, Mettlin, & Marshall, 1985; Haughey et al., 1988; Howe, 1980; Richardson et al., 1987). Table 1 outlines five studies that measured proficient BSE by demonstration of BSE on SBMs for comparison of the samples, setting, and criteria used to measure proficient BSE, and the pertinent findings.

Mamon and Zapka (1985) tested the congruence between self-report and demonstration of BSE technique in a subsample of 91 college women, ages 17-34. The criteria for proficient BSE consisted of 19 steps from the ACS and National Cancer Institute guidelines: eight components in the lying down position, seven in the upright position, and four in the mirror position. The self-report of proficient BSE was found to be congruent ( $r = .62$ ) with the scores obtained by demonstration of BSE technique by the students on themselves over their clothes. The mean score from the self-report was 4.9 and demonstration of proficient BSE was 9.2 out of a possible 19.

Zapka and Mamon (1986) used an interview format in a telephone survey of undergraduate ( $N = 468$ , ages 17-22) and graduate students ( $N = 153$ , ages 23-45). They used the questionnaire from their 1985 study and found the mean proficiency score to be 3.4 for the undergraduates and 4.5 for the graduates out of a possible score of 19.

Self-report of BSE technique was also used by Baker (1989) to measure proficient BSE in her quasi-experimental study of 134 older women, ages 60-96. In the interview, only 16.7% of the women in the control group and 32.4% of the women in the experimental group reported a high posttest BSE quality score. High BSE quality was achieved by the women who reported four out of five items on the BSE proficiency questionnaire and performed BSE no more than monthly and at least yearly. The five item questionnaire was derived from the 19 steps used in Mamon and Zapka's (1985) study and included use of the lying down position and the upright position, use of a mirror, squeezing the nipple, and axillary examination.

The reliability and validity of the questionnaire used in each of these studies was limited due to its validity being tested against demonstration of BSE by students over their clothes, and then again in Baker's (1989) study where she used the questionnaire on women who were much older than the sample the questionnaire had originally been tested on. In these studies, scores for proficient BSE were very low for all ages. Therefore, there exists a self-care deficit in women of all ages in relation to BSE.

These studies primarily assessed proficient BSE by self-report of BSE technique or by demonstration of BSE on SBMs (see Table 1) and are limited in their assessment of the visual, tactile, and upper extremity mobility components necessary for proficient BSE. They exclude assessment of the motor skills needed by the shoulders for visual inspection of the breasts while standing in front of the mirror, palpation of the breast tissue while in a supine position, and axillary examination. Also, visual and tactile skills needed to perform proficient BSE are not directly assessed. The women had to rely on their memory of the BSE components while being tested for proficiency of technique. The ability to perform proficient BSE in these studies was generally low and self-care limitations and/or deficits were not discussed.

## Methods

### Setting and Sample

Women 65 and older from four retirement centers in the San Francisco Bay Area were recruited for the study through an ACS approved Breast Health Program given at each center. The centers provide retirement where the residents are able to care for themselves and live what is commonly referred to as "active retirement". First, an educational program, consisting of a lecture on breast health, video presentations on mammography and BSE, and BSE practice on SBMs was given by the investigator to familiarize the women to BSE procedures and the importance of early detection of breast cancer. Following a question and answer period, an explanation of the research project was given, and those interested in participating signed consent forms indicating their

understanding of the study and their willingness to participate (see Appendix A). Human subject approval had been obtained from the investigator's institution's Committee on Human Research. Thirty-two women agreed to participate.

### Design and Procedure

A descriptive, correlational design was used to describe the relationship between visual acuity, tactile sensation, upper extremity mobility, and proficient BSE in women 65 and older. After the consent form was signed and a copy was given to the subjects, individual 45 minute appointments with the investigator were set to: 1.) answer demographic, breast health, and related health history questions (see Appendix B); 2.) have their visual acuity, tactile sensitivity, and upper extremity mobility tested, and; 3.) have their ability to perform the visual, tactile, and upper extremity components of proficient BSE tested (see Appendix C). Because ACS guidelines (1988) encourage practice of BSE with feedback for optimal learning, an optional opportunity was offered to each subject to do BSE on herself while unclothed with feedback from the investigator, a certified ACS BSE instructor. No research data were collected during this optional opportunity.

Demographic, breast health, and related health history data were obtained through structured interviews. Breast health history included frequency of BSE, CBE, and mammograms. Related health history included questions associated with age-related changes and diseases that could alter one's visual acuity, tactile sensitivity, and upper extremity mobility.

Visual acuity was measured with a standard Snellen hand-held visual acuity chart at 14 in in a well lit room. Subjects wore their own glasses or contact lenses and were tested with both eyes open. The line with the smallest numbers that they could read with 75% accuracy (Fonda, 1987) was recorded as an equivalent Snellen fraction at 20 ft.

Tactile sensitivity was measured by the static two-point discrimination test using a Compass-Type Caliper (Braden, 1988) on the finger pad of the second, third, and fourth

digit of each subjects' hand. Two points were applied at a beginning distance of 15 mm (1.5 cm) altering with one point. The distance between the two points was decreased by increments of 2 mm until 3 mm was reached or the subject could no longer discriminate between one and two points, determined by more than one out of three touches being incorrectly identified (Jones, 1989). The closest distance the subject could determine between one and two points was recorded. Measurement of the distance between the two points of the caliper was done with each testing using a ruler.

Mobility of the hands, wrists, elbows, and shoulders was measured by active range of motion (ROM) using standardized physical assessment criteria suggested by Bates (1987). ROM of the hands was determined by the subjects' ability to make a fist and extend and spread the fingers with each hand. Wrist ROM was assessed by the subjects' ability to flex and extend the wrists, and turning hands, palms down, move the wrists laterally and medially. ROM of the elbows was tested by the subjects' ability to bend and straighten the elbows, and with arms at the sides and elbows flexed, turn palms up (supination) and down (pronation). Shoulder ROM was measured by the subjects' ability to raise arms to a vertical position, place hands behind the neck, with elbows extended (external rotation and abduction), and place hands behind the small of the back (internal rotation). The subjects were considered to pass or fail each ROM exercise by ability or inability to do the described criteria.

The visual, tactile, and upper extremity mobility components of proficient BSE were assessed by the subjects' ability to visually and tactilely detect abnormalities on SBMs, demonstrate BSE on a SBM, and ability to place arms in the starting position of BSE. Subjects were observed for their ability to: 1.) visually detect a deviated nipple, dimpling of breast tissue, and a lump on a SBM developed by the investigator held 14 in in front of them; 2.) tactilely detect five lumps--one 3 mm, two 5 mm, one 7 mm, and one 1 cm--in a MammaCare SBM (Mammatech Corp., 1986); and, 3). demonstrate upper extremity mobility of the hands, wrists, elbows, and shoulders required to

perform BSE. This was determined by their ability to use the pads of three fingers in a circular motion, three levels of pressure during palpation, a systematic pattern of search to assess the nipples and cover the perimeter of the breast model, and place their arms in the starting position of BSE. This position requires one arm up with the elbow bent and the hand behind the head and the other arm reaching across the chest with the fingers at the axilla region. The upper extremity mobility component was observed while the subjects were examining the SBM for lumps. Subjects were considered to pass or fail each of the proficient components according to the ACS BSE criteria.

The consistency of each of these tests was supported by following the established criteria and testing conditions including having one investigator gather the data. The two-point discrimination test consistency was verified with an expert Neurology Clinical Nurse Specialist. Additionally, content validity of the visual acuity chart, two-point discrimination test, upper extremity ROM tests, and BSE was verified from the literature review (Bates, 1987; Bear-Lehman & Abreu, 1989; Pitts, 1982) and by consensual validation of two expert oncology nurses and one expert geriatric nurse. The investigator is a certified ACS BSE instructor.

### Results

A convenience sample of 32 women from four retirement centers participated in the study. Of the 491 women living in the four centers only 41 attended the Breast Health classes, and only 32 consented to participate in the study. Nine (28%) of the 32 study participants additionally participated in the optional BSE feedback session. The self-reported demographics, breast health, and related health history are described in Tables 2, 3, and 4. The sample consisted of 32 highly educated, middle class, caucasian women between the ages of 66-89 ( $\bar{X} = 79$ ; s.d. = 6.3). Thirty-one (97%) of the women had heard of BSE, only eight (25%) had reported ever being taught, and 14 (44%) reported that they practiced BSE. Even though 30 (94%) of the women reported having a CBE sometime in their lifetime, only 25 (78%) reported having one done within the last

year and five (16%) reported never having a mammogram. Thirty-one (97%) of the women wore glasses and 19 (60%) of them reported that they have one or more of the following eye diseases: cataracts, glaucoma, senile macular degeneration, and diabetic retinopathy. Rheumatoid arthritis, osteoarthritis, and/or osteoporosis was reported to be diagnosed in 25 (79%) of the sample.

Nominal and ordinal data from the questionnaire and the measurements of the variables were analyzed for frequencies, percentages, and correlations using the Crunch Statistacal Package (Crunch Software Corp., 1987) .

#### Visual Acuity and the Visual Component of Proficient BSE

Visual acuity measurement revealed that 30 (94%) of all participants had visual acuity equal to or better than a 20/40 Snellen fraction (20/20 perfect visual acuity; 20/70 adequate visual acuity [Bates, 1987]). The two women who had visual acuity less than 20/70 Snellen fraction reported that they were legally blind. A significant relationship was found between Snellen tested visual acuity and detection of one lump ( $r = .53$ ,  $p = .001$ ) on the SBM (see Table 4).

#### Tactile Sensation and the Tactile Component of Proficient BSE

Thirty (94%) of the women had tactile sensitivity of 10 mm (1 cm) or greater on the two-point discrimination of the second, third, and fourth digit of each hand. Only 41% (13) of the women were able to locate the 1 cm lump on the SBM, only 12 (37%) were able to locate the 5 mm lumps, and no one located the 3 mm lump. The subjects' inability to tactilely locate lumps in the SBM was not related to a deficiency in tactile sensitivity (see Table 6).

#### Upper Extremity ROM and the Mobility Component of Proficient BSE

Older women, as compared to younger women, reported more osteoarthritis ( $r = -.45$ ,  $p = .01$ ) and demonstrated decreased mobility of the left shoulder ( $r = .46$ ,  $p = .007$ ). Decreased mobility of the right shoulder was related to osteoarthritis ( $\chi^2 = 4.61$ ,  $p = .01$ ) and osteoporosis ( $\chi^2 = 5.57$ ,  $p = .01$ ). Eleven subjects failed the upper

extremity ROM criteria and 15 did not pass the upper extremity mobility component of BSE. Five (16%) women were unable to put their arms in the starting position of BSE. ROM of the right hand ( $X^2 = 2.67$ ,  $p = .05$ ) and left hand ( $X^2 = 4.14$ ,  $p = .02$ ), the right elbow ( $X^2 = 17.21$ ,  $p = .002$ ), right shoulder ( $X^2 = 22.72$ ,  $p = .00$ ) and left shoulder ( $X^2 = 15.82$ ,  $p = .00$ ), and left wrist ( $X^2 = 2.97$ ,  $p = .05$ ) were found to be related to their counterpart of the upper extremity mobility component of BSE. The right shoulder ( $X^2 = 6.40$ ,  $p = .008$ ) and left shoulder ( $X^2 = 2.74$ ,  $p = .05$ ) ROM were significantly related to the ability of the women to put their arms in the starting position of BSE. Table 7 presents the specific data of this testing.

#### Discussion

This study assessed the ability of older women to perform the major components of proficient BSE: visual, tactile, and upper extremity mobility by determining their relationship to direct measures of visual acuity, tactile sensation, and upper extremity ROM. Most of the women in this sample had adequate visual acuity and tactile sensitivity, but were unable to perform the visual and tactile components of BSE proficiently. The upper extremity mobility component of proficient BSE revealed limitations and deficits mostly of the hands and shoulders. These limitations were due to the subjects' inability to use their hands correctly and/or complaints of pain and fatigue in their hands and/or shoulders during demonstration of BSE on the SBM. Five women were unable to reach across their chest to examine the upper outer quadrant of their breast tissue, where 45% of breast cancers occur (Goodman, 1987), because of shoulder pain or obesity.

Only 41 of the 491 women residents participated in the Breast Health Program and of those only 32 consented to participate in the study. Why more elderly women from these active retirement settings did not participate is unclear. Issues such as appropriate promotion of the educational classes or co-morbid conditions may prevent women from participating in Breast Health Programs. The women who attended the educational

classes and participated in the study stated several reasons for their interest: "I came as a favor for a friend," "I wanted to help you with your study," or "I am interested in learning all I can about breast cancer and what I can do to protect myself." There may be subgroups of older women that could assist health professionals to reach the older women not attending these Breast Health Programs.

#### Limitations of the Study

The small self-selected sample may not be representative of the population of older women, limiting the generalizability of the results. The reliability of mobility tests and BSE on SBMs has not been established. The use of two investigators and determining interrater reliability would enhance reliability (Woods, 1988). Use of a SBM instead of actually having the subjects perform and be observed doing BSE on themselves did not assess *actual* ability to perform BSE.

#### Nursing Implications

The nursing systems described by Orem (1985) can be utilized to define how nursing can intervene to decrease the deficit between the self-care abilities--visual acuity, tactile sensitivity, and upper extremity mobility--and the therapeutic self-care demand--proficient BSE. The partly compensatory system can be used when the nurse and individual perform health maintenance measures together, for example, those women with senile macular degeneration would need assistance performing the visual portion of the exam. The educative supportive system can be used when the individual has the ability to perform proficient BSE, but needs education on how to apply her capabilities, as would be the case for most of the women in this study. The women with visual acuity impairment could be taught to use a magnifier for close inspection with emphasis on using good lighting and a large mirror. The women with upper extremity mobility limitations would need education on how to decrease fatigue and pain during the exam by doing part of it over several days, taking analgesics prior to doing the exam, and using talc or lotion to help the fingers glide more smoothly and increase mobility.

The role of nursing in retirement center health care promotion is an arena that needs greater exploration and emphasis. Nursing can have a great impact on the education of health professionals and older women concerning breast health. Nursing must approach teaching breast health with an awareness of older women and their unique concerns and needs. Nursing has the responsibility when teaching BSE to older women to assess their limitations and/or deficits in their ability to perform proficient BSE and intervene with alternatives. Clearly, further research in this area is indicated to improve assessment and education of older women in regards to using BSE proficiently to detect breast cancer early.

### Research

Research addressing proficiency of BSE needs to include assessment of the ability of the subjects to perform the major visual, tactile, and upper extremity mobility components of proficient BSE on themselves, after visual acuity and tactile sensitivity have been evaluated, especially in older women who are at greater risk of breast cancer and have a greater chance of having limitations or deficits in their ability to perform BSE proficiently. Research assessing the limitations of proficient BSE performance of women in other age groups also needs to be done to better determine their educational needs. The ability to detect lumps in a SBM does not evaluate all the major components needed to detect breast changes and indicates other areas of needed research. Also, the emphasis of measuring proficient BSE needs to be on the ability to perform the exam rather than on the subjects' memory of the steps of BSE. The ACS pamphlet can be used during monthly BSE as well as during testing of proficient BSE performance. Research looking at how to increase the involvement of older women in breast health activities is also needed. Until mammography and CBE are widely used and available, proficient BSE should continue to be promoted as a self-care practice for early detection of breast cancer.

## Bibliography

- Alagna, S. W., & Reddy, D. M. (1984). Predictors of proficient technique and successful lesion detection in breast self-examination. Health Psychology, 3(2), 113-127.
- American Cancer Society. (1988). Breast self-examination: Proficiency criteria and guidelines. California Division: Author.
- Assaf, A. R., Cummings, K. M., Graham, S., Mettlin, C., & Marshall, J. R. (1985). Comparison of three methods of teaching women how to perform breast self-examination. Health Education Quarterly, 12(3), 259-272.
- Baker, J. A. (1989). Breast self-examination and the older woman: Field testing an educational approach. Gerontologist, 29(3), 405-407.
- Balin, A. K., & Pratt, L. A. (1989). Physiological consequences of human skin aging. Cutis, 43, 431-436.
- Bates, B. (1987). A guide to physical examination and history taking (4th ed.). Philadelphia, PA: J. B. Lippincott.
- Behrs, O. H., Henson, D. E., Hutter, R. V. P., & Myers, M. H. (1988). Manual for staging of cancer (3rd ed.). Philadelphia, PA: J. B. Lippincott.
- Bear-Lehman, J., & Abreu, B. C. (1989). Evaluating the hand: Issues in reliability and validity. Physical Therapy, 69(12), 1025-1033.
- Boring, C. C., Squires, T. S., & Tong, T. (1991). Cancer statistics, 1991. Ca-A Cancer Journal for Clinicians, 41(1), 19-36.
- Braden, J. (1988). Measuring skin integrity. In M. Frank-Stromborg (Ed.), Instruments for clinical nursing research (pp. 379-390). Norwalk, CT: Appleton & Lange.

- Crunch Software Corp. (1987).
- Fonda, G. (1987). Test charts for distance preferred for low-vision. Annals of Ophthalmology, 19(5), 178-180.
- Goodman, M. S. (1987). Breast malignancies. In S. L. Groenwald (Ed.), Cancer nursing principles and practice (pp. 442-469). Boston, MA: Jones & Bartlett.
- Goodwin, J. S., Samet, J. M., Key, C. R., Humble, C., Kutvirt, D., & Hunt, C. (1986). Stage at diagnosis of cancer varies with the age of the patient. Journal of the American Geriatrics Society, 34, 20-26.
- Hallal, J. C. (1981). The relationship of health beliefs, health locus of control, and self concept to the practice of breast self-examination in adult women. Nursing Research, 31(3), 137-142.
- Haughey, B. P., Marshall, J. R., Nemoto, T., Kroidart, K., Mettlin, C., & Swanson, M. (1988). Breast self-examination: Reported practices, proficiency, and stage of disease at diagnosis. Oncology Nursing Forum, 15(3), 315-319.
- Hirshfield-Bartek, J. (1982). Health beliefs and their influence on breast self-examination practices in women with breast cancer. Oncology Nursing Forum, 9(3), 77-81.
- Howe, H. L. (1980). Proficiency in performing breast self-examination. Patient Counselling and Health Education, 2, 151-153.
- Huguley, C. M., Brown, R. L., Greenberg, R. S., & Clark, W. S. (1988). Breast self-examination and survival from breast cancer. Cancer, 62, 1389-1396.
- Jones, L. A. (1989). The assessment of hand function: A critical review of techniques. The Journal of Hand Surgery, 14, 221-228.

- Langlands, A. O. (1990). Breast cancer. In F. I. Caird, & T. B. Brewin (Eds.), Cancer in the elderly (pp. 87-95). Boston: Wright.
- Lierman, L. M., Kasprzyk, D., & Benoliel, J. Q. (1991). Understanding adherence to breast self-examination in older women. Western Journal of Nursing Research, 13(1), 46-66.
- Mammatech Corp. (1986).
- Mamon, J., & Zapka, J. G. (1985). Determining validity of measuring the quality of breast self-examination. Evaluation & the Health Professions, 8(1), 55-67.
- Matteson, M. A. (1988). Age-related changes in the musculoskeletal system. In M. A. Matteson, & E. S. McConnel (Eds.), Gerontological nursing concepts and practice (pp. 170-191). Philadelphia: W. B. Saunders.
- Meisami, E. (1988). Aging of the nervous system: Sensory changes. In P. S. Timiras (Ed.), Physiological basis of geriatrics (pp. 156-178). New York: Macmillan.
- Orem, D. E. (1985). Nursing concepts of practice (3rd ed.). New York: McGraw-Hill.
- Pitts, D. G. (1982). The effects of aging on selected visual functions: Dark adaptation, visual acuity, stereopsis, and brightness contrast. In R. Sekuler, D. Kline, & K. Dismuller (Eds.), Aging and human visual function (pp. 131-159). New York: A. R. Liss.
- Richardson, J. L., Marks, G., Solis, J. M., Collin, L. M., Birba, L., & Hisserich, J. C. (1987). Frequency and adequacy of breast cancer screening among elderly hispanic women. Preventive Medicine, 16, 761-774.

- Williams, R. D. (1988). Factors affecting the practice of breast self-examination in older women. Oncology Nursing Forum, 15(5), 611-616.
- Woods, N. F. (1988). Assessing nursing research measures: Reliability and validity. In N. F. Woods, & M. Catanzaro (Eds.), Nursing research theory and practice (pp. 246-259). St. Louis: Mosby.
- Zapka, J. G., & Mamon, J. A. (1986). Breast self-examination by young women: II. Characteristics associated with proficiency. American Journal of Preventive Medicine, 2(2), 70-78.

Table 1

Review of Research/Proficiency of BSE by Demonstration on Simulated Breast Models

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Howe, 1980	Correlations between the number of BSE criteria completed correctly and the number of lumps found in the simulated breast model	Women, N=161, ( $\bar{X}$ age 32), visiting health-care providers either at a hospital clinic, health center, or private physician's office	<ol style="list-style-type: none"> <li>1. Use of finger pads</li> <li>2. Use of a circular motion</li> <li>3. Firm pressure</li> </ol>	<p>BSE proficiency was low:  <u>Criteria used/No. of Women</u>                      -No criteria/28 (17%)                      -One criteria/54 (34%)                      -Two criteria/40 (25%)                      -Three criteria/39 (24%)</p>
				(Which of the three criteria used was not specifically indicated)
				Efficiency of BSE was also low, only 30 (19%) women could find four or more lumps out of seven and 45 (28%) found no lumps.

Table 1 continued

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Howe, 1980 Continued				ANOVA revealed a positive relationship between the number of BSE criteria performed correctly and the number of lumps detected:
				no criteria used/ $0.36 \bar{X}$ number of lumps detected compared to three criteria used/ $3.79 \bar{X}$ number of lumps detected.
Alagna and Reddy, 1984	Correlations between the total number of lumps found in the breast model and the overall BSE proficiency score	Women, (N=73), ages 18-73, ( $\bar{X}$ age=34, s.d.=14), attending a health fair	<ol style="list-style-type: none"> <li>1. Use of one hand to do the exam</li> <li>2. Use of the finger pads</li> <li>3. Use of a circular motion</li> <li>4. Systematic examination</li> <li>5. Coverage of an adequate area</li> </ol>	<p>BSE proficiency scores were not given, use of BSE criteria was discussed only in general. Efficiency of BSE was low, the median number of lumps found was three out of seven. Overall proficiency was the sum of the number of correct BSE criteria demonstrated (0-5)</p>

Table 1 continued

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Alagna & Reddy, 1984, Continued				Stepwise regression analyses revealed a significant correlation between total lumps detected and overall proficiency scores ( $r^2=.62$ , $p<.000$ ).
Assaf et al., 1985	Quasi-experimental posttest only evaluated three methods of teaching women how to perform BSE. Proficient BSE was used to evaluate learning.	Women being seen at a prevention detection clinic were assigned to one of three groups: ( $N=387$ , ages 18-70) A. Pamphlet only, $n=143$ , $\bar{X}$ age=50 B. Pamphlet and video, $n=123$ , $\bar{X}$ age=51 C. Breast-model trained, $n=121$ , $\bar{X}$ age=51	<ol style="list-style-type: none"> <li>1. Coverage of an adequate area</li> <li>2. Accepted pattern of search</li> <li>3. Use of the finger pads</li> <li>4. Firm pressure</li> <li>5. Start exam at top of breast</li> <li>6. Assessment of the nipple area</li> </ol>	<p>BSE proficiency was low, 81 (21%) of the women failed to perform any of the six BSE criteria and only 35 (9%) performed more than eight of the possible 12 BSE criteria (six times two trials). Efficiency of BSE was also low, overall, only 22 % of the women detected four lumps out of four in the breast model.</p>

Table 1 continued

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Assaf et al., 1985, Continued				Overall BSE proficiency score was determined by the sum of the number of correct BSE criteria demonstrated (0-6). Overall BSE proficiency score correlated with lump detection ( $r = .59$ , $p < .01$ ).
Richardson et al., 1987	Correlations were done to examine the regularity of screening for breast cancer among elderly Hispanic women.	Hispanic women, N=600, ages 55-92 (median age=71), residing in publicly subsidized housing projects in Los Angeles.	<ol style="list-style-type: none"> <li>1. Circular motion of the fingers</li> <li>2. Use of the finger pads</li> <li>3. Correct pressure during palpation</li> <li>4. Assessment of the nipple area</li> </ol>	Proficiency of BSE was low, only between 54-108 (10-20%) of the women performed each of the four BSE criteria. Efficiency of BSE was also low, 60 women refused to touch the model and out of the 540 who did examine the model, 270 (50%) did not find any lumps out of a possible 5.

Table 1 continued

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Richardson et al., 1987, Continued				Each of the four BSE criteria correlated positively with the number of lumps detected in the breast model ( $r=.30-.42$ , $p<.001$ ).
Haughey, 1988	Correlations between proficient BSE and stage of breast cancer at the time of diagnosis	Women, N=130, ages "<46->65" p. 317, who had been diagnosed with breast cancer.	<ol style="list-style-type: none"> <li>1. Adequate area covered</li> <li>2. Use of the finger pads</li> <li>3. Length of time spent completing the exam</li> </ol>	Proficiency of BSE was low, 43 (33.1%) of the women did not use the pads of their fingers during palpation.
				Efficiency was also low, 53 (41%) of the women were unable to locate any lumps in the five lump breast model, and only two found all five lumps.
				Two of the proficient BSE criteria correlated with lump detection:

Table 1 continued

Research Study and Date	Design	Sample/Setting	Proficient BSE Criteria on Simulated Breast Models	Findings
Haughey, 1988 Continued				<p>-Use of the finger pads, <math>X^2=18.17</math>, <math>p&lt;.01</math></p> <p>-Length of time spent completing the exam, <math>X^2=23.08</math>, <math>p&lt;.01</math></p>
				<p>Lump detection skill was correlated to age: 45.7% of the women &lt;46 years old located two plus lumps compared to 6.3% of the women &gt;66 years old.</p>

Table 2

---

 Self-Reported Demographic Characteristics of Sample (N=32)
 

---

Characteristics	N	%
Age: $\bar{X}$ =79 (Range = 66-89; s.d.= 6.3)		
Race		
-Caucasian	32	100
Marital Status		
-Married	4	12.5
-Widowed	16	50
-Divorced	4	12.5
-Never Married	8	25
Education ( $\bar{X}$ = 14.8 yrs.)		
-High School Diploma or Less	16	50
-College Diploma or Graduate Degree	16	50
Economic Status		
-<\$10,000	2	6*
-\$10,000-\$29,999	20	63
-\$30,000-\$69,999	9	28

\*One did not respond

Table 3

## Self-Reported Breast Health Characteristics of Sample (N=32)

Characteristics	N	%
Heard of BSE Prior to Class	31	97
Had Been Taught BSE Prior to Class	8	25
Practice BSE	14	44
-Monthly	6	19
-Every Other Month	1	3
-Less Than Six Times	7	22
Ever had a Clinical Breast Exam	30	94
-Had a Clinical Breast Exam within the Last Year	25	78
Ever had a Mammogram	27	84
-Had a Mammogram within the Last Year	24	75
Diagnosis of Benign Breast Disease	4	13
Diagnosis of Breast Cancer	3	9
Had a Relative or Friend with Breast Cancer	30	94

Table 4

---

**Self-Reported Health History Characteristics (N=32)**


---

<b>Characteristics</b>	<b>N</b>	<b>%</b>
<b>Wears Glasses or Contact Lenses</b>	<b>31</b>	<b>97</b>
<b>Has one of more of the following eye diseases:</b>	<b>19</b>	<b>60</b>
-Cataracts/Received Treatment	8	25
-Cataracts Starting/Being Followed	5	16
-Glaucoma/Receiving Treatment	6	19
-Senile Macular Degeneration	5	16
-Diabetic Retinopathy	1	3
<b>Has one or more of the following:</b>	<b>25</b>	<b>79</b>
-Rheumatoid Arthritis	5	16
-Osteoarthritis	21	66
-Osteoporosis	16	50

Table 5

**Comparisons Between Visual Acuity and the Visual Component of Proficient BSE (N=32)**

Visual Acuity			Visual Component of Proficient BSE		
Snellen Fraction			Detected on Simulated		
20 ft Equivalent	N	%	Breast Model	N	%
≤20/40	30	94	Deviated Nipple	23	72
≥20/100	2	6	Lump	29	91*
			Dimple	27	84

\* $r = .53$ ,  $p = .001$

Table 6

Comparisons Between Tactile Sensation and the Tactile Component of Proficient BSE (N=32)

Tactile Sensation				Tactile Component of Proficient BSE					
Two-Point Discrimination of the Second Third, and Fourth Digit				Individual Lump Detection By Size of Lump					
Right Hand	N			%			Right Hand	N	%
	2nd, 3rd, 4th			2nd, 3rd, 4th					
3 mm	5	5	2	16	16	6	1 cm	12	38
5 mm	24	22	15	75	69	47	7 mm	25	78
7 mm	2	4	12	6	12	12	5 mm	10	31
9 mm	0	0	1	0	0	3	5 mm	2	6
11 mm	0	0	1	0	0	3	3 mm	0	0
15 mm	1	1	1	3	3	3			
Left Hand	N			%			Left Hand	N	%
3 mm	8	3	1	25	9	3	1 cm	13	41
5 mm	22	23	23	69	72	72	7 mm	27	84
7 mm	1	5	7	3	16	22	5 mm	9	28
11 mm	1	1	0	3	3	0	5 mm	3	9
15 mm	0	0	1	0	0	3	3 mm	0	0
Total Lump Detection									
				$\bar{X}$	Range s.d.				
Right Hand				1.5	0-3	1.02			
Left Hand				1.6	0-4	.94			
Right Hand False Lump Detection				0.88	0-2	.83	(No correlations were found between tactile sensitivity and the ability to tactilely detect lumps in the stimulated breast model.)		
Left Hand False Lump Detection				0.75	0-2	.80			

Table 7

Comparisons Between Upper Extremity ROM and the Upper Extremity Mobility Component of Proficient BSE (N=32)

Upper Extremity ROM/ Women Who Passed			Upper Extremity Mobility Component of Proficient BSE/Women Who Passed		
	<u>N</u>	<u>%</u>		<u>N</u>	<u>%</u>
Right Hand	28	88	Right Hand	23	72
Right Wrist	29	91	Right Wrist	26	81
Right Elbow	30	94	Right Elbow	30	94
Right Shoulder	24	75	Right Shoulder	23	72
Left Hand	27	84	Left Hand	22	69
Left Wrist	29	91	Left Wrist	27	84
Left Elbow	31	97	Left Elbow	30	94
Left Shoulder	25	78	Left Shoulder	22	69
			Able to Put Arms in the Starting Position of BSE	27	84

Correlations Between Upper Extremity ROM and the Upper Extremity Mobility Component of Proficient BSE Using Chi Square:

Variable	$\chi^2$	p
Right Hand	2.67	.05**
Left Hand	4.14	.02**
Right Wrist	2.12	.08
Left Wrist	2.97	.05**
Right Elbow	17.21	.002*
Left Elbow	3.37	.06
Right Shoulder	22.72	.00*
Left Shoulder	15.82	.00*
Right Shoulder and Starting Position of BSE	6.40	.008*
Left Shoulder and Starting Position of BSE	2.74	.05**

\* <.01; \*\*<.05

Appendix A  
University of California, San Francisco  
Consent to be a Research Subject-CHR Approval #H1875-05882-01

A. PURPOSE AND BACKGROUND

I am being asked to participate in a study by Yvonne S. Baulch, R.N., B.S.N., O.C.N., and Patricia J. Larson, R.N., D.N.Sc., Assistant Professor. Ms. Baulch has been certified by the American Cancer Society to educate about breast health and is a graduate student in the Oncology Program at the University of California, San Francisco. The study is being conducted to learn if there is a relationship between vision, sense of touch, and mobility of hands, wrists, elbows, and shoulders and proficient breast self-examination in women 65 years of age and older.

B. PROCEDURES

If I agree to be in the study, the following will happen:

First, I will participate in a group education program, given by Ms. Baulch, teaching me about general breast health. The program will consist of a lecture, two videos, and practice on artificial breast models. The program will be 45-60 minutes of my time and will be held at Martin Luther Tower.

Second, I will meet with Ms. Baulch during a scheduled private appointment that will require approximately 45 minutes of my time, at my convenience, at Martin Luther Tower after I have participated in the Breast Health educational program to:

1. respond to questions about my health
2. have my vision tested
3. test the sensitivity of my finger tips
4. test the mobility of my hands, wrists, elbows, and shoulders
5. visually identify abnormalities on an artificial breast model
6. identify lumps on an artificial breast model with my fingertips
7. perform a breast self-exam on myself while fully clothed

Third, I will also have the opportunity to practice breast self-examination using the American Cancer Society guidelines while unclothed from the waist up. This will require an additional 15 minutes of my time. This is an optional opportunity, however, if I decide not to participate in this aspect of the exam, I can still be a participant in the first two parts of the study. If a suspicious lump is found during the examination, I will be strongly encouraged to see my own private physician for follow-up.

**C. RISKS**

1. There are no known risks, however, I may find that the subject matter may cause minimal embarrassment.
2. Confidentiality: Study records will be kept as confidential as possible. Study information will be coded, and kept in locked files at all times in Dr. Patricia Larson's office at the University of California, San Francisco. Only study personnel will have access to the files. Any data that may be published in scientific journals will not reveal the identity of the participants. As far as possible, all information will be treated confidentially and anonymously.

**D. BENEFITS**

There will be no direct benefit to me from participating in this study. However, it is hoped that the information gained from the study will help nurses in the assessment and education of breast self-examination in women 65 and older.

**E. ALTERNATIVES**

My participation in this study is completely voluntary. I have the right to refuse to participate in any part or withdraw from the study at any time.

**F. COSTS**

There will be no costs to me as a result of taking part in this study.

**G. REIMBURSEMENT**

I will not be reimbursed for participating in this study.

**H. QUESTIONS**

This study has been explained to me by Ms. Baulch and my questions were answered. I have been given a copy of the consent form and Experimental Subjects Bill of Rights. If I have other questions about the study, I may call Yvonne S. Baulch at (415) 753-3516.

---

(Participant's Signature)

---

Date

---

(Signature of Person Obtaining Consent)

---

Date

## Appendix B

Demographic and Health Questionnaire

Subject No.: \_\_\_\_\_

1. Age: \_\_\_\_\_
2. Please circle the number of your current partner status:
 

Married.....1	Separated.....4
Widowed.....2	Never married.....5
Divorced.....3	Not married but living together..6
3. What is the highest grade or year you completed in regular school, vocational school, college or graduate professional training? (Circle highest grade or year completed and indicate if diploma/degree was obtained.)
 

No formal school:	0									
Grade school/junior high:	1	2	3	4	5	6	7	8		
High school/vocational/trade:	9	10	11	12....Diploma:						Yes/No
College/specialized training:					Degree or					
	13	14	15	16...Diploma:						Yes/No
Graduate professional training:					Degree: Yes/No					
	17	18	19	20 or more..						
4. Please circle the number that best describes your ethnic group:
 

Asian or Pacific Islander.....1	Caucasion/White.....4
American Indian.....2	Eurasian.....5
Black.....3	Hispanic.....6
Family has mixed ethnic background.....7	
Other (specify)_____.....8	
5. Please look at the list below and circle the number next to the amount that comes closest to your family's total income last year.
 

Less than \$10,000.....1	\$50,000-\$69,000.....4
\$10,000-\$29,999.....2	Over \$70,000.....5
\$30,000-\$49,999.....3	No Answer.....6
6. Have you ever heard of Breast Self-Examination (BSE) prior to this class: Yes/No

**Demographic and Health Questionnaire Continued--Subject No.: \_\_\_\_\_**

7. Have you ever been taught BSE prior to this class: Yes/No
8. Do you practice BSE: Yes/No  
If yes, how often?  
12 or more times a year-Yes/No  
Less than 12 times a year, but at least 6-Yes/No  
Less than 6 times a year-Yes/No
9. Do you experience pain when doing BSE (including during this class): Yes/No  
If yes, where?  
Hands-Yes/No  
Wrists-Yes/No  
Other part of upper body, specify \_\_\_\_\_
10. Have you ever had a Clinical Breast Exam (Breast Exam done by your doctor)? Yes/No  
If yes, have you had a Clinical Breast Exam done within the last year? Yes/No
11. Have you ever had a mammogram? Yes/No  
If yes, have you had a mammogram done within the last year? Yes/No
12. Have you ever been diagnosed with breast disease: Yes/No  
If yes, which of the following?  
Breast cancer-Yes/No  
Benign breast disease-Yes/No  
Did you receive any treatment? Yes/No
13. Has anyone in your family or a close friend been diagnosed with breast cancer?  
Relative-Yes/No  
Friend-Yes/No
14. Do you wear glasses? Yes/No  
If yes:  
Are they bifocals? Yes/No  
Used for reading? Yes/No  
Used for watching TV? Yes/No
15. Do you wear contact lenses? Yes/No
16. Do you have or have you had cataracts? Yes/No  
If yes: Did you have surgery? Yes/No  
Other treatment? Yes/No
17. Do you have glaucoma? Yes/No  
If yes: Are you getting treatment? Yes/No

**Demographic and Health Questionnaire Continued--Subject No.:** \_\_\_\_\_

18. Do you have any other eye diseases? **Yes/No**  
If yes, which of the following?  
Senile macular degeneration - **Yes/No**  
Retinal Pathology including diabetic retinopathy-**Yes/No**  
Other-Specify \_\_\_\_\_
19. Do you have diabetes? **Yes/No**  
If yes, which type?  
Insulin-dependent-**Yes/No**  
Non-insulin-dependent-**Yes/No**
20. Do you have rheumatoid arthritis? **Yes/No**  
If yes, does it affect your:  
Hands-**Yes/No**  
Wrists-**Yes/No**  
Are you taking analgesics (pain medicine)? **Yes/No**  
Are you receiving any other treatment? Specify \_\_\_\_\_
21. Do you have osteoarthritis? **Yes/No**  
If yes, does it affect your:  
Hands-**Yes/No**  
Shoulders-**Yes/No**  
Are you taking analgesics? **Yes/No**  
Are you receiving any other treatment? Specify \_\_\_\_\_
22. Do you have osteoporosis? **Yes/No**  
If yes, does it affect your:  
Spine-**Yes/No**  
Sternum-**Yes/No**  
Ribs-**Yes/No**  
Are you taking analgesics? **Yes/No**  
Are you receiving any other treatment? Specify \_\_\_\_\_

**Appendix C**  
**Proficiency Check Off Tool**

Subject No.: \_\_\_\_\_

**Direct Measurements:**

**Findings:**

**Visual Acuity** at 14 inches, both eyes open, and  
glasses or contacts on if prescribed.

**Tactile Sensitivity-(15mm-3mm)**

Right hand-two-point discrimination test

Second digit finger pad

Third digit finger pad

Fourth digit finger pad

Left hand-two-point discrimination test

Second digit finger pad

Third digit finger pad

Fourth digit finger pad

**Mobility of Upper Extremities According to Criteria**

**Right**  
**Hand**

**Left**  
**Hand**

**Wrist**

**Wrist**

**Elbow**

**Elbow**

**Shoulder**

**Shoulder**

Proficiency Check Off Tool Continued--Subject No.: \_\_\_\_\_  
Direct Measurements:

Visual Detection of Abnormalities on Breast Model at 14 in

Deviated Nipple

Lump

Dimple

Tactile Detection of Lumps on Breast Model

Right Hand

Left Hand

3 mm

3 mm

5 mm

5 mm

5 mm

5 mm

5 mm

5 mm

1 cm

1 cm

False Lumps Detected

False Lumps Detected

Proficiency Check Off Tool Continued--Subject No.: \_\_\_\_\_

Direct Measurements:

Mobility of Upper Extremities During Structured Observation of BSE:

Right Hand

Right Wrist

Right Elbow

Right Shoulder

Left Hand

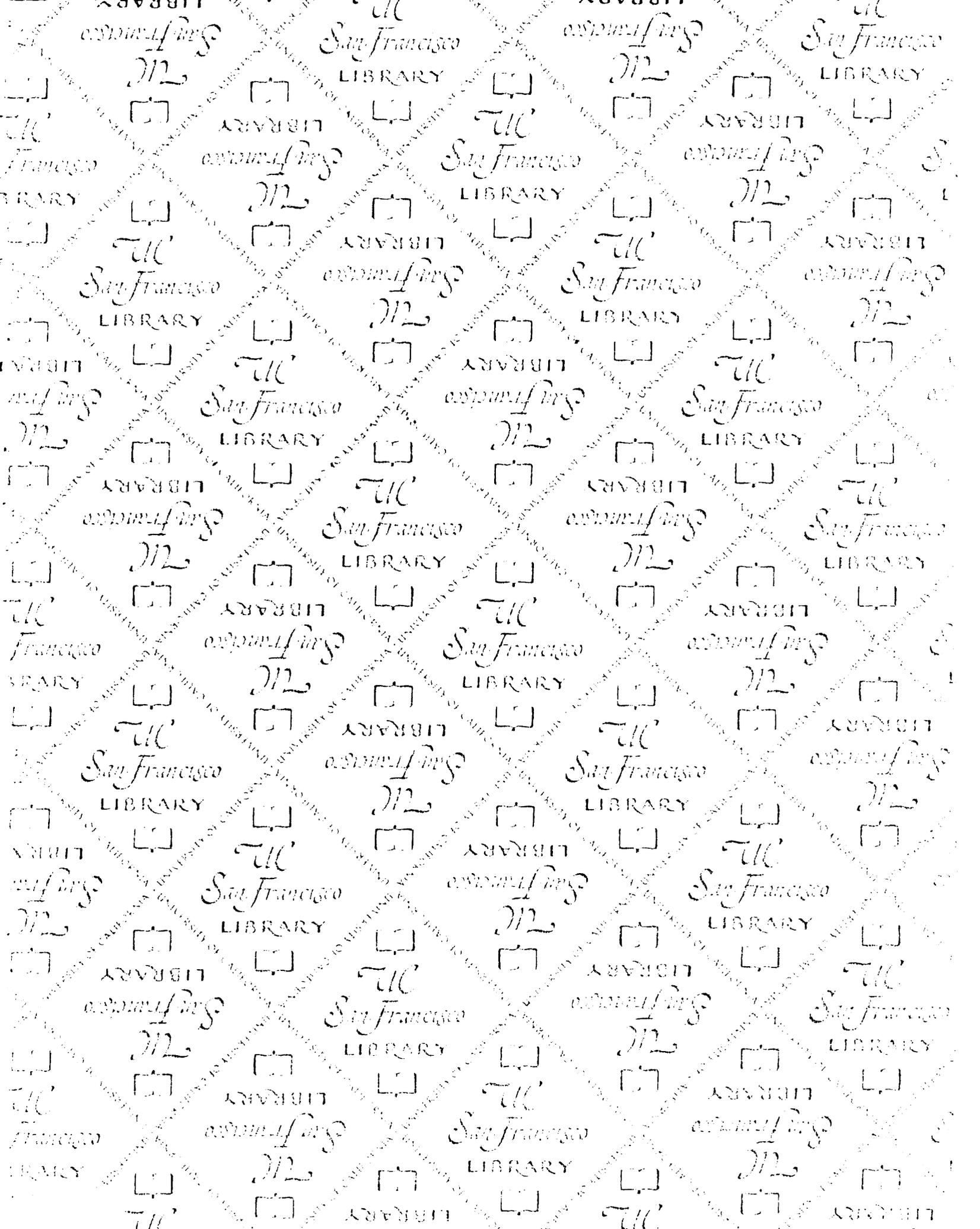
Left Wrist

Left Elbow

Left Shoulder

Mobility of Shoulders While  
Observing Breasts in Mirror

Able to Put Arms in the  
Starting Position of BSE



San Francisco LIBRARY

FOR REFERENCE

NOT TO BE TAKEN FROM THE ROOM

BO

CAT. NO. 23 012

PRINTED IN U.S.A.

San Francisco LIBRARY

