



Clinical Case Report Competition

Utopia Academy

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First Place Winner

Alison Bowcock

The effects of regular massage therapy
during treatment for breast cancer

The Effects of Regular Massage Therapy
During Treatment for Breast Cancer

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Abstract

Objective: The objective of this study is to provide information on the effectiveness of massage therapy to maintain and/or improve quality of life in breast cancer patients undergoing medical treatment.

Methods: A treatment plan consisting of 10 one hour massage treatment sessions spanning two months was followed. Swedish, trigger point release, myofascial, stretching, passive range of motion, muscle energy and craniosacral techniques were used to address treatment goals. Quality of life questionnaires, daily journals, shoulder range of motion, manual muscle tests and girth measurements were used to assess changes.

Results: All measurements taken were maintained or improved from the initial assessment. Mobility of the axilla and surgical scars increased in all directions including superior/inferior, medial/lateral and anterior/posterior. Shoulder range of motion was maintained within normal range and improvements seen in abduction, extension, internal and external rotation. Arm girth measurements maintained constant levels and muscle strength improvements were seen in the deltoids, pectoralis major and minor, biceps brachii and tricep brachii.

Conclusion: Results indicated that massage therapy can manage common complications of breast cancer treatment including decreased shoulder range of motion, arm lymphedema, decreased muscle strength, postural changes and pain.

Keywords: breast cancer, massage therapy, range of motion, lymphedema, scar tissue, radiation therapy.

Introduction

Breast cancer is the most common type of cancer in women today, with approximately 23,000 new Canadian cases in 2006 (Olivotto, Gelmon, McCready, Pritchard & Kuvsk, 2006). Today, through increased awareness and the use of regular mammograms, breast cancer is being detected two to five years earlier, improving the prognosis for breast cancer survivors and placing increased importance on rehabilitation and recovery (Olivotto, et. al, 2006; Karki, Simonen, Malkia & Selfe, 2005).

Medical treatment of breast cancer involves surgical removal of the tumor and possible removal of muscle tissue and/or lymph nodes (Olivotto, et. al, 2006). Starting four to twelve weeks post surgery radiation is often used to ensure that any cancer that

may have been missed during surgery is destroyed (Olivotto, et. al, 2006). Without the addition of radiation treatments the likelihood of reoccurrence within 10 years is 10-40% (Olivotto, et. al, 2006). Surgical and often radiation treatments, are necessary in the management of breast cancer but cause many side effects that impair the functional ability of the upper extremity and significantly alter activities of daily living, the capacity to work and quality of life for a breast cancer survivor (Johansson, Ingar, Albertsson & Ekdahl, 2001)

Impaired shoulder function and upper extremity lymphedema are widely researched and documented as complications to breast cancer treatment (Johansson, et al., 2001; Kisner & Colby, 2002; Olivotto, et. al, 2006). Upper extremity lymphedema can be attributed to the removal of axillary lymph nodes and the formation of fibrotic scar tissue from a surgical incision and/or radiation therapy (Johansson, et al., 2001; Kisner & Colby, 2002; Olivotto, et. al, 2006). Impaired shoulder function can be attributed to incisional pain, delayed wound healing, muscle weakness and muscle guarding (Kisner & Colby, 2002). Fibrotic and non-functional surgical scars can also play a role in creating postural changes and restrictions in underlying tissue that prevents proper shoulder mobility (Kisner & Colby, 2002). In combination with impaired shoulder function and upper extremity lymphedema the other side effects of radiation include skin changes, breast firmness, shortness of breath, neuropraxia, muscle soreness, electrical shocks or shooting pains and fatigue (Olivotto, et. al, 2006; Love, 1991).

This paper looks at how massage therapy can positively impact and manage the side effects of medical treatment for breast cancer, improving functional ability and quality of life in breast cancer survivors.

Case History

Participant was a 50-year-old female, working full time as an executive director in her profession. She was in good health with only general postural concerns of aches and pains in her shoulders, neck and low back. Other health conditions included celiac disease and hypothyroidism.

Participant was diagnosed through a mammogram check in October 2008. Eight samples were taken from under the breast through a core biopsy. On January 21, 2009 results of the core biopsy showed the tumor was imbedded in the pectoralis major chest muscle. On March 11, 2009 the participant had surgery in which more of the breast and muscle was taken than first expected. On the same day the sentineal lymph node was removed and tested negative for metastasis.

Participant sought continual care from a registered massage therapist throughout the duration of the study.

Assessment Measures

A plumb line was used following the protocols outlined in *Muscles: Testing and Function with Position and Pain, 4th ed.* to monitor postural changes.

Shoulder range of motion was measured through the use of a goniometer, Whitehall Manufacturing Hydrotherapy and Health Care Products Model G300. Protocols for measuring shoulder flexion, extension, abduction, internal rotation and

external rotation were followed as per outlined in *Measurement of Joint Motion, A Guide to Goniometry*.

Arm girth measurements were taken bilaterally at three locations. Measurements of the arms were taken at the level of the midpoint between the acromion and olecranon processes with the arm relaxed and hanging by the side. Measurements of the forearm were taken at the point of maximal girth with the arm held in anatomical position. Measurements of the wrist were taken at the distal end of the radial and ulnar styloid processes with the arm held in anatomical position.

Manual muscle tests were performed bilaterally following the protocol outlined in *Muscles: Testing and Function with Position and Pain, 4th ed.* Muscles tested included anterior deltoid, middle deltoid, posterior deltoid, serratus anterior, pectoralis major, pectoralis minor, biceps brachii and triceps brachii.

Surgical scar characteristics were documented through the use of photos, measurements of the length and width of the scars and mobility of the scars using fascial assessment. Mobility assessment included superior/inferior, medial/lateral and anterior displacement of the scars. Photos were taken to record changes in skin health and color and shape of breast.

A daily journal was kept by the participant recording energy levels, sleep, appetite, headaches, activity levels and pain. The participant also completed a pain and lifestyle questionnaire upon each assessment. The pain and lifestyle questionnaire was based on two different multidimensional quality of life instruments. The functional assessment of cancer therapy-breast is a simple questionnaire that includes subscales assessing physical, emotional, social and functional well-being (Brady, Cella, Mo,

Bonomi, Tulskey, Lloyd, Deasy, Cobleigh, & Shiamoto, 1997). The European organization for research and treatment of cancer quality of life questionnaire is a self-reporting questionnaire developed to assess quality of life in cancer patients (Brady, et al., 1997). Both have been used in clinical research and in clinical practice. See Appendix A.

Treatment Goals/Precautions/Modalities

The study consisted of 10 one hour treatment sessions conducted over a two month period. Treatments consisted of a 15 minute initial assessment, a one hour treatment session and a 15 minute follow up including instructions for home care exercises. Treatments were done approximately 5-7 days apart. A 2 week break between treatments #5 and #6 was taken due to participant illness. Initial assessment was taken prior to treatment #1. Reassessment was taken post treatment #5, prior to treatment #6 and post treatment #10.

Treatment goals were prioritized according to the day and presenting condition of tissue health and the participant's constitution. Goals included promoting circulation and drainage in and around the affected area, promoting functional scar tissue formation, promotion of functional range of motion in shoulders, maintenance of proper function in compensatory structures and promotion of relaxation and balance to the autonomic nervous system. Treatment precautions included restricted use of oil on the right breast during radiation treatment, tissue integrity and positioning of client due to shortness of breath.

Treatment modalities included general Swedish techniques such as effleurage, stroking, petrissage and trigger point release. Dr. Vodder manual lymph drainage was used for the neck, back and arms. Craniosacral assessment protocol, cervical spine muscle energy, myofascial intermuscular, extramuscular, reshaping and crosshand techniques were used as well as shoulder and neck passive range of motion and stretching. Instruction in home care exercises was given to support treatment goals. These included stretching the major muscle groups of the upper extremity and torso, isometric strengthening of the pectoralis major muscles, isotonic strengthening of the deltoids, rhomboids, biceps brachii and triceps brachii, functional range of motion exercises for the shoulder and diaphragmatic breathing.

Outcomes

Postural assessment was done upon initial assessment, pre-treatment #6 and post-treatment #10. Slight changes were seen between the three dates that included a decrease in head forward posture and improvement of hip and shoulder alignment.

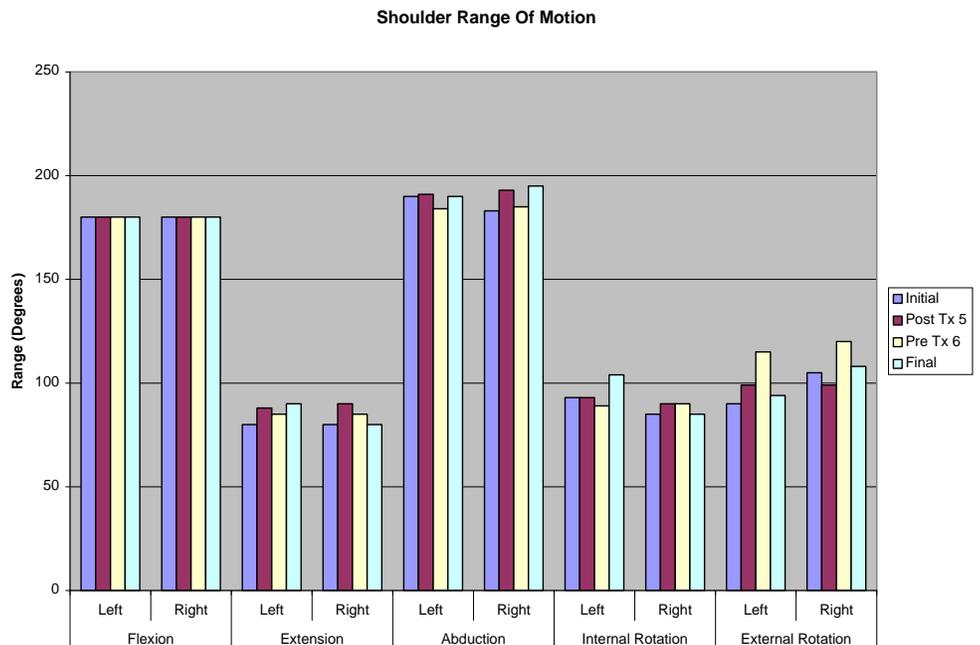
Breast observations were recorded at each assessment. Skin changes were seen under the right breast. Upon initial assessment skin was slightly red in colour progressing to dark brown/black and red and then returning to normal skin color with slight brown discoloration under the breast. A pocket of brawny edema, located superior to the surgical scar under the right breast, remained for the duration of the study however decreased in size from 3 cm wide and 4.5 cm long to 2 cm wide and 4 cm long. Tenderness was most prevalent during second reassessment post treatment #5. Upon

reassessment prior to treatment #6 palpation yielded increased number of palpable lumps bilaterally.

The axilla scar was 4.2 cm long and 0.3-0.1 cm wide. Initially there was limited mobility, no lift and restricted movement towards 4-2 in fascial assessment. Scar mobility improvements were seen with each consecutive assessment. Post treatment #5 and pre-treatment #6 the axilla scar exhibited restricted movement from 9-12 with slight lift and no pucker on the axilla side of the scar. Upon final assessment the axilla scar could be lifted and restricted movement was recorded from 8-11. The surgical scar under the right breast was 4.9 cm long and 0.1 cm wide. Initially there was no lift and restricted movement in all directions. Post treatment #5 and pre-treatment #6 the scar showed restricted movement from 8-12 and no lift. Upon final assessment the scar could be lifted at its lateral edges and restricted movement from 8-11. See Appendix B.

Initial assessment yielded shoulder range of motion for both the right and left to be within or above the normal range of motions according to *Orthopedic Physical Assessment, 5ed.*

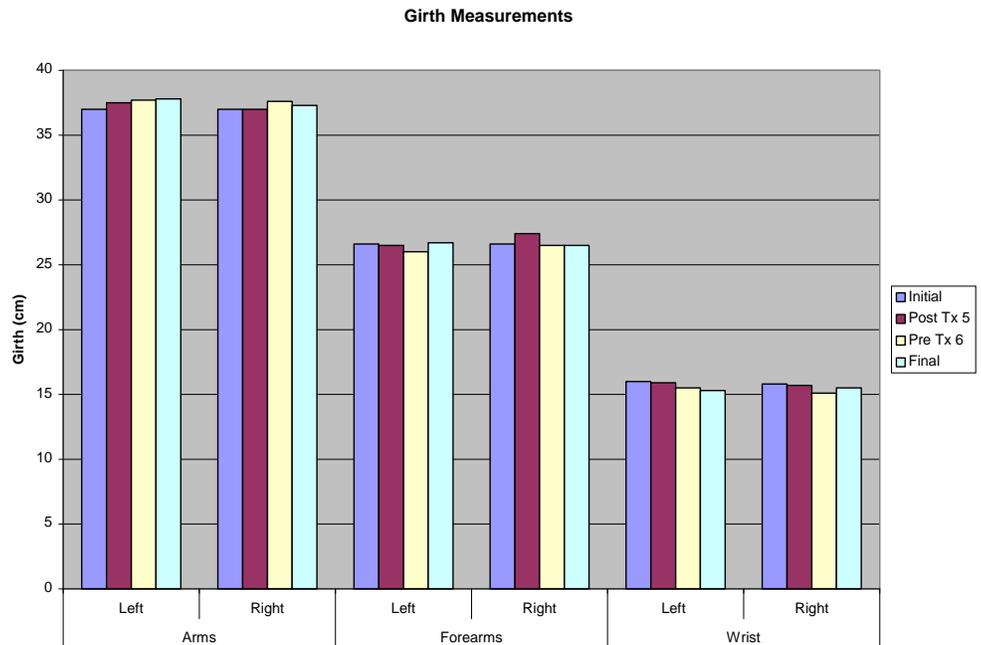
Normal functional ranges are flexion 170-180°, extension 50-60°, abduction 160-180°, external rotation 80-90° and internal rotation 60-100°. Bilaterally



flexion was maintained at 180°. Extension was maintained at 80° for the right shoulder and increased 10° for the left shoulder. Abduction was maintained at 190° for the left shoulder and increased 12° for the right shoulder. Internal rotation was maintained at 85° for the right shoulder and increased 11° for the left shoulder and external rotation was improved in the right shoulder by 3° and in the left shoulder by 4°. Despite overall maintenance and improvement of shoulder range of motion assessment pre-treatment #6 showed decreases in extension, abduction and left internal rotation.

Arm girth maintained approximately constant levels compared to themselves and to each other over the course of the study.

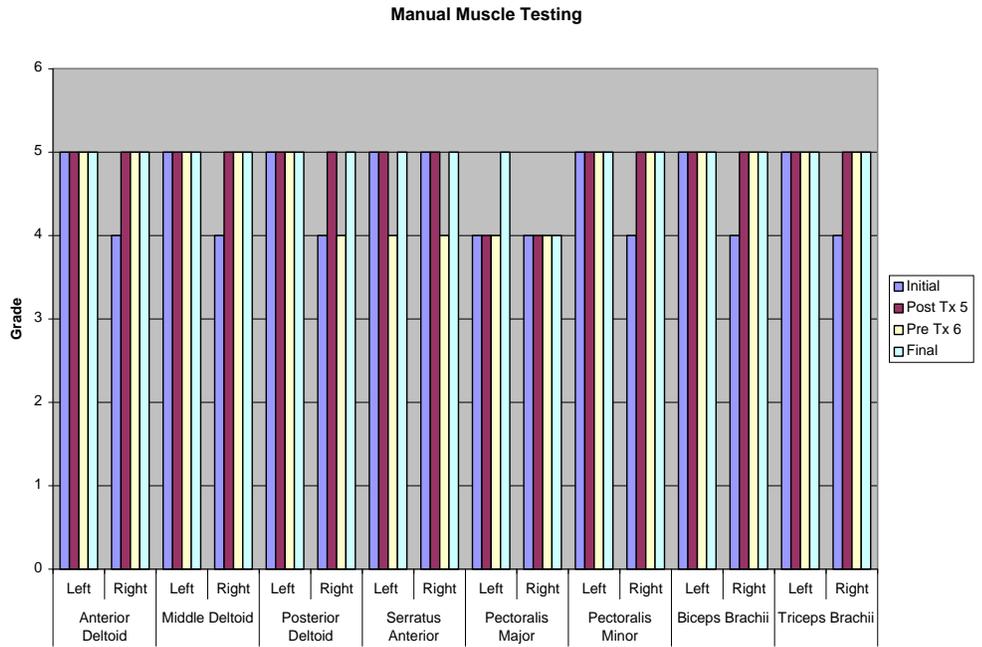
Arm girths ranged from 37 to 37.8 cm for the left and 37 to 37.6 cm for the right. Forearm girth ranged from 26 to 26.7 cm for the left



and 26.6 to 27.4 cm for the right and wrist girth ranged from 15.3 to 16cm for the left and 15.1 to 15.8 cm for the right.

Upon initial assessment the right anterior, middle and posterior deltoid, the left and right pectoralis major and right pectoralis minor, biceps brachii and triceps brachii all received a grade 4, meets resistance but fails the break test. Gains were seen upon

reassessment post
 treatment #5 and pre-
 treatment #6 with the
 final reassessment
 yielding
 improvements in the
 right anterior, middle
 and posterior deltoid,
 left pectoralis major



and right pectoralis minor, biceps brachii and triceps brachii all improving to a grade 5, normal. The right pectoralis major muscle maintained its grade 4 status. Despite overall maintenance and improvement of muscle strength assessment pre-treatment #6 showed losses in the right posterior deltoid and serratus anterior muscles.

Respiration was measured post treatment #5, pre-treatment #6 and post treatment #10. The number showed changes between subsequent measures. This may have been due to changes in the way the client inhaled and exhaled during the measurements. Future research and testing should be done using both girth measurements and spirometry to assess lung function post breast cancer treatment.

The functional assessment of cancer therapy-breast questionnaire showed varying results in the each of its subscales. Emotional well-being was constant throughout the study while functional well-being was seen to remain fairly constant from initial to final assessment but dropped during the first reassessment which coincided with the last weeks of radiation treatment. Social well-being showed a steady drop while physical well-being

and overall rating of quality of life increased. The European organization for research and treatment of cancer quality of life questionnaire showed overall improvement but also a drop in the first reassessment which coincided with the last weeks of radiation treatment.

Discussion

Restoring shoulder range of motion, muscle strength and the prevention of upper extremity lymphedema are the primary goals of rehabilitation and recovery for breast cancer survivors (Kisner & Colby, 2002). Addressing these concerns can break the negative cycle that creates a decreased quality of life for many breast cancer survivors (Rattray & Ludwig, 2005). Pain, increased stress, worry and anxiety, decreased sleep, decreased self-esteem and a decrease in function, when experienced by a breast cancer survivor, can lead to avoidance of shoulder movement, activities of daily living, feelings of isolations and decreased socialization that again can lead to more pain, increased stress levels and anxiety, decreased sleep, decreased function and so on (Sturgeon, Wetta-Hal, Hart, Good & Dakhi, 2009). These side effects, which feed the cycle, can be addressed through the use of massage, breaking the cycle and improving quality of life for breast cancer survivors.

Sturgeon, Wetta-Hal, Hart, Good & Dakhi (2009) reported that massage once a week for three weeks had a positive influence on subjects perceived quality of life. During this study it was reported, through questionnaires, that perceived quality of life improved from 1/10 to 4/10 along with perceived levels of physical well-being increasing from a 16/28 to a 23/28. Functional well-being and emotional well-being remained

constant while perceived social well-being decreased from 23/24 to 18/24. Massage therapy was effective, despite the perceived decrease in social support from her partner, friends and family in improving perceived quality of life and functional ability. Massage therapy was able to provide support through the therapeutic relationship while using manual modalities to address orthopedic concerns.

Kari, et al. (2005) investigated upper body and limb impairment six and twelve months post treatment for breast cancer in 96 subjects. They reported that at six months post treatment axilla edema, neck and shoulder pain and breast axillary scar tightness were present and at twelve months breast axillary scar tightness and axilla edema remained leading to significant restrictions in lifting, carrying and reaching with the upper extremity, abandonment of leisure activities and decreased work capacity. Johansson, et al. (2001) also investigated 90 subjects over two years to monitor changes in shoulder range of motion, arm girth and muscle strength. They reported that at one month post treatment there was a decrease in range of motion, by the second month there was also an increase in arm girth and by six months post treatment there were deficits in muscle strength. These changes in range of motion, girth and strength were constant throughout the two year study. Through the use of massage therapy at two through four months post treatment none of the above restrictions or pains were documented. Shoulder range of motion was maintained within normal standard ranges, arm girths measurements fluctuated minimally and muscle strength increased. Mobility of both the surgical scars increased addressing tightness that may present and limit function. Neck and shoulder pain was not reported by the subject in her daily journal. Intense and brief electrical shocks or shooting pains were noted in the right breast during radiation

treatment but decreased in intensity and frequency when radiation treatments finished. By the end on the study and the fourth month post treatment the subject was able to drive, run errands, perform activities of daily living and return to work on reduced hours.

Due to the nature of this case study more research needs to be done in order to fully understand how massage therapy enhances the rehabilitation and recovery of a breast cancer survivor. More research needs to be conducted using bigger sample sizes and a comparison group. Measures of grip strength, lung capacity and neck range of motion may also be valid measures to report on. More studies monitoring the immediate changes along with the long term effects of massage therapy on functional ability and the most effective time to introduce massage therapy in breast cancer treatment. Finally, future research could look at how massage therapy affects healing rates, immune system function and the emotional well-being of the patient.

Conclusion

Results indicated that massage therapy can manage common complications of breast cancer treatment including decreased shoulder range of motion, arm lymphedema, decreased muscle strength, postural changes and pain. Massage therapy therefore can be effectively used in rehabilitation and recovery for breast cancer survivors to increase functional ability and improve quality of life.

Appendix A

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no “right” or “wrong” answers. The information that you provide will remain strictly confidential

Date: _____

Part 1

1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or suitcase?
NO YES
2. Do you have any trouble taking a long walk?
NO YES
3. Do you have any trouble taking a short walk outside the house?
NO YES
4. Do you have to stay in bed or a chair for most of the day
NO YES

During the past week:

1. Were you limited in doing either your work or other daily activities?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
2. Were you limited in pursuing your hobbies or other leisure time activities?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
3. Were you short of breath?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
4. Have you had pain?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
5. Did you need to rest?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
6. Have you had trouble sleeping?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
7. Have you felt weak?
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

8. Have you lacked appetite?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
9. Have you felt nauseated?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
10. Have you vomited?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
11. Have you been constipated?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
12. Have you had diarrhea?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
13. Were you tired?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
14. Did pain interfere with your daily activities?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
15. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
16. Did you feel tense?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
17. Did you worry?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
18. Did you feel irritable?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
19. Did you feel depressed?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
20. Have you had difficulty remembering things?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
21. Has your physical condition or medical treatment interfered with your family life?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH
22. Has your physical condition or medical treatment interfered with your social life?
 NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

23. Has your physical condition or medical treatment caused you financial difficulties?

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

For the following questions please circle the number between 1 and 7 that best applies to you

1. How would you rate your overall health during the past week?

VERY POOR 1 2 3 4 5 6 7 EXCELLENT

2. How would you rate your overall quality of life during the past week?

VERY POOR 1 2 3 4 5 6 7 EXCELLENT

Part 2

Below is a list of statements that other people have said are important. By circling one number per line, please indicate how true each statement has been for you during the past 7 days.

Physical Well-being

1. I have a lack of energy

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

2. I have nausea

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

3. I have trouble meeting the needs of my family

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

4. I have pain

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

5. I am bothered by side effects of treatment

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

6. I feel ill

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

7. I am forced to spend time in bed

NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

Social Well-being

1. I feel distant from my friends

3. I am able to enjoy life
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

4. I have accepted my illness
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

5. I am sleeping well
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

6. I am enjoying the things I usually do for fun
NOT AT ALL A LITTLE QUITE A BIT VERY MUCH

I am content with the quality of my life right now

Not at all 2 3 4 5 6 7 8 9 10 Very much

Appendix B

Anterior View
Initial Assessment



Post Treatment 5



Final Assessment



Anterior View – Right Breast
Initial Assessment



Post Treatment 5



Final Assessment



Axilla Scar
Initial Assessment

Post Treatment 5

Final Assessment



Surgical Scar – Under Breast
Initial Assessment

Post Treatment 5

Final Assessment



Axilla Scar Mobility
Initial Assessment

Post Treatment 5

Final Assessment



Surgical Scar Mobility – Under Breast

Initial Assessment

Post Treatment 5

Final Assessment



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