

## ORIGINAL ARTICLE

IJPHY

## IMPORTANCE OF STANDARDIZED AND ONLINE INSTRUCTIONS FOR WOMEN AFTER BREAST CANCER SURGERY WAS EMPHASIZED BY THE LOCKDOWN DURING THE COVID-19 CRISIS- A CLINICAL LETTER

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## ABSTRACT

**Background:** Patients after breast cancer (BC) surgery have expressed the need for better care and instruction. This need is presently more evident than ever, with post-surgical hospitalization shortened to a minimum due to the Covid-19 pandemic. Online instruction may improve care for these women.

**Purpose:** To develop a standard physical therapy instruction sheet for women after BC surgery, which can also be made available online.

**Methods:** This clinical letter presents instructions based on a literature review, on recent recommendations to reduce the risk of side effects after BC surgery, and on the content of existing instruction forms. Appropriate versions were prepared for patients with high and low risk for side effects after surgery. The first drafts were validated by four experienced physical therapists certified in lymphedema treatments (PTCLTs). Then, pictures illustrating the exercises were added. The instruction forms were posted on physical therapy, BC, and lymphedema organization websites.

**Results:** Information content includes the right of every patient to receive instruction after BC surgery followed by three sections: 1. exercise and early risk reduction for the first two days post-surgery; 2. instruction on exercise progression for the third day until the drains are removed, and the surgical scar has healed; 3. lifelong risk reduction recommendations.

**Conclusion:** The development of standardized instruction forms up-dated to current evidence for patients after BC surgery answers a need expressed by patients and by physical therapists working in the field. The coincidence of the Covid-19 pandemic emphasized its relevance.

**Keywords:** Breast cancer, Patients, Instructions, Covid-19, Side-effects, Physical Therapy.

Received 20<sup>th</sup> July 2020, accepted 03<sup>rd</sup> October 2020, published 09<sup>th</sup> October 2020



www.ijphy.org

10.15621/ijphy/2020/v7i5/783

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## INTRODUCTION

Several studies show that rehabilitation after breast cancer (BC) surgery is commonly described as insufficient and that patients have expressed the need for better care [1-6]. The need to provide written patient information [7] was further emphasized during the Covid-19 lockdown, with hospitalization being shortened to a minimum (24 hours or less) and post-discharge isolation. Professionals were required to provide telephone and online information and instruction. Post-surgical instruction has been shown to reduce side effects from surgery. However, in the current situation with Covid-19 limitations still in place, many patients receive insufficient or no side effect risk reduction instruction after surgery. They may be at higher risk of developing side effects such as shoulder movement limitation, seromas, axillary web syndrome, and breast and arm lymphedema, all limiting and long-lasting conditions. Existing treatment guidelines for these patients include a need to provide both oral and written instructions for risk reduction for respiratory, trunk, shoulder, and arm side effects [8-10]. However, these guidelines are designed for clinicians and not intended for patient distribution.

In Israel, some BC patients may be provided with brief pre-discharge risk reduction instruction (written or verbal) by either nurses or hospital physical therapists according to individual hospital policy. All patients post BC surgery would benefit if they were provided with updated, easy to understand, easy to perform, written instructions. Thus, this project aimed to develop a standard instruction sheet for women after BC surgery, which can be distributed by hospital staff and made available online.

## METHODOLOGY

During a previous study, we obtained existing instructions regarding post-operative and risk reduction for patients after BC surgery from 12 large medical centers, from the site of the Israeli Lymphedema Association and the website of the Israel Cancer Association. The instructions differed with most including a list of exercises; only some included a brief explanation about lymphedema risk reduction behavior; not all were updated with current research, and none were patient risk specific. These findings emphasized the need to develop a new updated instruction form for this patient population.

Baseline materials for the updated instruction were existing guidelines [7-10], and the content of existing instruction forms in Israel. The principle investigator prepared the first draft of two versions of the instruction and sent it to four experienced physical therapists certified in lymphedema treatment (PTCLTs) (three of them are co-authors of this article) for feedback (In Israel, all CLTs are PTs). One version addressed patients who underwent axillary lymph node dissection (ALND) and are considered to be at relatively high risk for side effects, and the other one addressed patients who underwent sentinel lymph node dissection (SLND). And are considered to be at relatively low risk for side effects. The instruction sheet was finalized

after two rounds of corrections. Later, pictures illustrating the recommended exercises were added. One of the co-authors was the model for the pictures and gave her consent to publish them un-masked. The completed instruction sheet was again sent to the previously mentioned PTCLTs for the final review.

## RESULTS

The forms for post-ALND and post-SLND begin with a brief introduction to the history, necessity, and rationale behind their development and the need for every patient to receive rehabilitative and risk reduction instructions after breast cancer surgery. Three sections follow the introduction: 1. exercise and early risk reduction for the first two days post-surgery; 2. instruction on exercise progression for the third day until the drains are removed, and the surgical scar has healed; and 3. lifelong risk reduction recommendations: in particular, for lymphedema, how to return to daily life routines and how to maintain fitness and a healthy lifestyle. The text addresses the patient and is written informally in the first person for easy reading and user-friendly accessibility to important information (Appendix 1,2).

The instruction forms were supported by the Physical Therapy Department at Ariel University, the Israeli Physiotherapy Society, the Israeli Cancer Association, and the Israeli Lymphedema Association. They were published on the websites of these organizations, distributed via email to heads of physical therapy departments at all general hospitals in the country and all practicing PTCLTs.

## CONCLUSION

The development of comprehensive instruction forms updated to current evidence for patients after BC surgery answers a need expressed by patients, physical therapists, and others working in the field [1-5]. It can be adopted by hospitals in which written instruction was not updated or lacking. Besides, online and media publication enables its accessibility to large groups of therapists and patients. The relevance of this last advantage was emphasized by the coincident timing of the late development and early distribution stages of the recommendations with the lockdown period of the Covid-19 pandemic.

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## Appendix 1

### Instruction sheet for patients after breast cancer surgery and axillary lymph node dissection (ALND) – before and after hospital discharge (2020)

Dear Patient,

The agreement exists between members of the professional staff that, following breast cancer surgery, instructions need to be provided for the immediate and later recuperation periods. We have written these detailed instructions for you. They are based on research we performed over the past two years, which enabled us to develop instructions to help prevent or reduce the risk for side effects from breast cancer surgery. We hope these instructions will help you during your recuperation period and wish you a speedy recovery.

During your recent surgery, some axillary lymph nodes were removed. The surgery and treatments which will follow contribute substantially to your recovery from breast cancer. However, some women develop immediate or later side effects from the surgery, such as pain, shoulder movement restriction, and swelling.

It is important to adopt certain behaviors to help your recovery process and reduce your risk for side effects in the future.

The instructions contain our recommendations to you for the immediate period after your surgery (until the surgical wound heals) and for the time following.

All information in this instruction sheet is our recommendation only, and your treatment program should be chosen in consultation with your medical practitioner or physical therapist.

The instructions are divided into three sections:

- Section 1: instructions for the recovery period after surgery
- Section 2: recommendations for exercises for the recovery period
- Section 3: instructions for risk reduction for arm lymphedema and other side effects

#### **Section 1: Guidelines for the recovery period after surgery (up till the drain is removed and the surgical wound healed)**

##### **Exercise instructions:**

You may have received some exercise and other instructions before you were discharged from the hospital. The following are some basic exercise instructions that you can include in your existing regime.

##### **Breathing exercises**

Breathing exercise is essential for the first few days to prevent complications as a result of the anesthetic.

- **Deep breathing:** every two hours, take 5 – 10 deep breaths
- **Coughing and expectoration:** it is important to avoid excess phlegm collecting in your lungs. If necessary, the physical therapist working in the surgical department

will give you instructions on how to cough more easily and less pain.

- **Walking:** helps to ventilate your lungs and ease general mobility. Make sure to walk and sit out of bed often during the day and avoid lying in bed for long periods when standing and walking, try to relax the arm and shoulder on the operated side and allow them to move more freely.

### Early mobility to improve range of movement

- To return early to full mobility, it is recommended to follow the instructions you have received on the first day after your surgery. Different exercises are performed at different stages of recovery, and it is essential to remember to progress gradually from stage to stage.
- The exercises are designed to improve the elasticity of the scar tissue in the axilla and mobility of the trunk, chest, shoulder, and arm.
- The exercises are graded according to difficulty, and you can progress in movement range and muscular effort gradually.
- Avoid strenuous activity involving the arm on the side of the surgery for three weeks after the surgery (lifting heavy weights, sudden and painful movements).
- Perform the exercises slowly up to the point of pain only, 5-10 repetitions for each exercise. The exercises should be performed 1-3 times each day.





### Section 2 – Recommended exercises for each stage of recovery

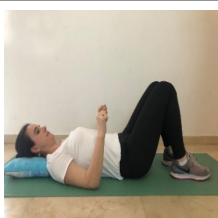

#### General recommendations

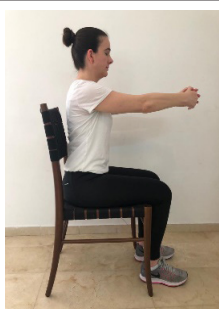


- If a feeling of fatigue or heaviness appears in the arm of the surgical side, rest it on a pillow, so the arm is raised slightly above the shoulder and bend and straighten your fingers repeatedly.
- After the surgical wound is healed, the pliability of the scar can be improved by gentle massage over the entire area of surgery with an emphasis on the scar. Showering/bathing is a good time.
- Should any sign of inflammation appear, such as redness, swelling, discharge from the surgical wound, a temperature higher than 38<sup>o</sup> or pain increase, which does not improve with regular treatment, you should consult with your doctor or be seen in a hospital emergency room.
- Ask the hospital surgeon to refer you to for lymphedema physical therapy two to three weeks after discharge for a follow-up evaluation, even if there are no side effects.

In this section, you will find examples of exercises for the different stages of recovery. You and may prefer to choose different exercises.

### Stage A – Exercises starting the day after the surgery.


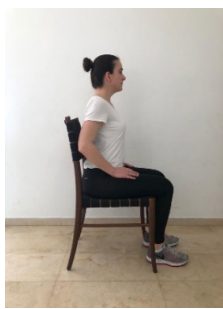
	Starting position	Goal	Exercise performance	Exercise illustration
1	Lie on your back with your knees bent and feet slightly apart on the mat. Rest your head on a small pillow. Your hands will be on the lower part of your chest or on the mat as in the picture. Some of the exercises may be done while sitting on a chair with a back support, feet on the floor. And hands resting on your knees.	Improved lung ventilation through deep breathing	Take a deep breath in (through your nose), expand the base of your chest, exhale via your mouth.	
2		Trunk mobilization	Roll one knee to the side, then slightly lift the opposite hip. This helps lower the other knee closer to the mat. Lower your hip and bring your knee back to the starting position. Repeat the exercise on the opposite side.	
3		Neck mobilization.	Slowly turn your head from side to side (perform the exercise with your eyes open then closed).	
4		Scapular (shoulder blade) mobilization	Lift your shoulders towards your head and return to starting position. Bring both shoulders forward and return them to the starting position.	

5	Elbow and finger mobilization	Alternately bend and straighten your elbows. Make a fist when you bend your elbows and straighten your finger when straightening your elbows.	
6	Early shoulder mobilization	Clasp your fingers together above your abdomen. Straighten your elbows towards your knees and then lift them towards the ceiling in a pain free range.	


9	Elbow straightening and self-assisted shoulder movement	Join your fingers together, elbows straight and lift your arms to the level of your shoulders – do not lift further to avoid interrupting the surgical scar healing.		
10	Sit on a chair with a back support, feet on the floor. Rest your hand on the opposite shoulder, elbows resting on your body.	Shoulder mobilization with neck and trunk movement.	Lift your elbows a little and turn your head and trunk to one side and then to the other side. Do the movement in the pain free range only.	
11	Sit on a chair with a back support, feet on the floor.	Neck and trunk movement.	Bend your neck and trunk to the side, hold for a few seconds and repeat on the other side.	


If you have had breast reconstruction surgery, you should consult with your surgeon before performing trunk movements.


### Stage B – Exercises for the second to the sixth day after surgery

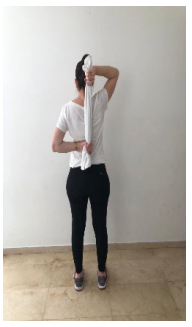

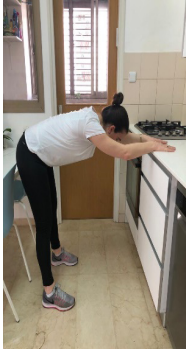

	Starting position	Goal	Exercise performance	Exercise illustration
Continue doing all the exercises for stage A				
7	Sit on a chair with a back support, feet on the floor. And arms relaxed next to your body.	Shoulder relaxation and neck and shoulder blade tension release	Lift your shoulders towards your ears, hold for a few seconds and release. You can add breathing in while lifting your shoulders and breathing out when you release your shoulders.	
8			Pull your shoulders backwards without lifting them, keep your elbows straight (or slightly bent) and your back upright. Hold for a few seconds and release. Move your shoulders in circles – up, back, down and return to original position.	

### Stage C – Exercises for the seventh day after surgery and after (when the surgical wound has closed)

	Starting position	Goal	Exercise performance	Exercise illustration
Continue doing all the exercises from Stages A and B				
10	Lie on your back with your knees bent and feet slightly apart on the mat. Rest your head on a small pillow.	Improve shoulder mobility	Join your hands above your abdomen and lift them above your head. Check the distance between them and the mat. You may rest your hands on a pillow behind your head at the end of the movement range.	

11			<p>Join your hands. Lift your arms up and place your hands behind your head. Open your elbows out to the sides. Note the distance of your elbows to the mat.</p> <p>Bring your elbows forward to meet in front of your face and then open them out to the sides. Repeat this movement a few times.</p> <p>Bring your arms up so the elbows point to the ceiling and then bring them to your abdomen. Release them to the sides of your body.</p>	
12		Improve shoulder and trunk mobility	<p>Roll one knee to the side then slightly lift the opposite hip. This helps lower the other knee closer to the mat. Lower your hip and bring your knee back to the starting position. Repeat the exercise to the opposite side.</p>	

	Starting position	Goal	Exercise performance	Exercise illustration
13	Stand facing the wall.	Improve shoulder mobility	<p>Using your fingers "climb" up the wall until your elbows are straight. Keep looking at your hands.</p> <p>Bring your feet closer to the wall and try to lift your hands higher on the wall.</p> <p>Remain at the point where you feel the stretch for a few seconds.</p> <p>Then move your feet slowly backwards and let your arms slide slowly down the wall.</p> <p>Repeat this movement but make sure to work in a pain free range.</p>	

14	Stand with a slight space between your feet.	Improve shoulder mobility	<p>Holding a small rolled up towel. Lift your affected arm above your head. The other arm behind your back grasps the lower end of the towel.</p> <p>Pull the towel down and up. Change hands after a few repetitions.</p>	
15	Stand facing the kitchen counter. Rest your forearms on the counter-top, with your head between your upper arms	Improve shoulder, trunk and leg range of movement	<p>Take small steps away from the countertop until you reach a comfortable stretch of the shoulders, back and legs. Hold the position for a few seconds and walk forward to the starting position.</p>	
16	Stand facing the kitchen counter. Rest your forearms on the counter-top, with your head between your upper arms		<p>Place your palms flat on the countertop, walk backwards with small steps until you feel your chest opening and widening and your arms lengthening. Feel how your chest opens when you breath. Walk back to the countertop.</p>	
17	Stand with your back to the counter-top, your pelvis touching, each hand holding the counter-top on the same side.		<p>Without moving your feet, place one hand over the wrist of the other hand, following the movement with your eyes. Stay there for a few seconds. Repeat on the other side. You should feel a pleasant twist in your shoulder girdle and in your trunk.</p>	

When you have regained full and pain-free movement, you can gradually reduce the exercise to twice a day, then once a day, and then twice a week. At this stage, we recommend joining a beginner's exercise class, such as Feldenkrais, Vini-yoga, Pilates, or Body Cognition exercises. Besides, we recommend doing gentle aerobic exercises such as walking outdoors or on a treadmill. At a later stage, after consulting a therapist certified in lymphedema treatment, you should return to your regular fitness activities.

### Section three – recommendations to reduce the risk of later side effects

A small number of women may develop side effects at any time after the surgery and treatments. These side effects may be localized to the surgery (trunk, shoulder, breast,

or arm), or they may be more generalized. Examples of local side effects are arm lymphedema (swelling), shoulder movement limitation accompanied by arm and shoulder pain. Examples of general side effects are fatigue, sleep, and mood disorders. The following recommendations help to reduce the risk of developing all side effects. For example, the recommendation to exercise reduces the risk of arm lymphedema and fatigue, mood, and sleep disorders.

### **Lymphedema**

The lymphatic system, in addition to being part of the immune system, plays a vital role in the transport of body fluid and proteins. After surgery with axillary lymph node removal, fluid drainage may be impaired with resulting arm or breast swelling.

In most cases, the drainage function of removed nodes is successfully taken over by neighboring nodes, and no problems arise.

Lymphedema (swelling) occurs when fluid collects in the tissues under the upper skin layer. It may appear months or years after the surgery and becomes a chronic condition. Physical therapy helps to reduce lymphedema swelling but does not cure it. Lymphedema prevention is very important.

### **General recommendations for risk reduction for arm lymphedema and other side effects.**

1. Maintain arm hygiene and prevent infections. Any small injury to the skin of your affected arm should be immediately cleaned with an antiseptic.
2. Maintain full shoulder and trunk range of movement.
3. Return as soon as possible to routine daily activity, including using your arm.
4. Do aerobic and arm strengthening exercises for both arms.
5. Maintain your normal BMI (correct bodyweight for your height).
6. Request a referral for follow-up by a physical therapist certified in lymphedema treatment 2-3 weeks after surgery. Many women are not attentive to new information at the time of their surgery. At a follow-up appointment, you can get detailed instructions regarding risk reduction behaviors and answers to other questions.
7. Be alert to possible early symptoms such as hand or arm swelling, signs of infection (skin heat, irritation or redness, pain, a flu-like feeling, temperature or chills), or new pain and movement limitation of the shoulder. Early signs of infection need to be seen immediately by a doctor (treating doctor or emergency room). For the other signs and symptoms, you should request a referral to a therapist certified in lymphedema treatment.

### **Recommendations to reduce the risk of developing lymphedema and other side effects**

#### **Skin hygiene and infection prevention**

- Prevent direct skin injury such as burns, excess sunburn, cuts, animal scratches, insect stings, etc. If a

skin injury occurs, it is important to wash the area with soap and water and disinfect with antiseptic agents such as iodine or 70% alcohol.

- Opinions differ regarding blood drawing and needle pricks on the arm of the affected side. Thus, recommendations to avoid these are not justified.
- Remove skin hair with an electric razor.
- Take care to wash your hands with soap after working in the garden or doing housework. Consider using gloves mainly if there is a risk of a skin injury.
- Avoid damage to the base of the nails during manicures.
- Keep your skin moist and soft.

### **Prevent maintained circumferential pressure**

- Prevent maintained circumferential pressure on the arm of the operated side. This pressure may be caused by tight clothing and jewelry.
- Wear a bra with a supportive cup that does not cause pressure areas on the breast, broad and padded shoulder straps, and a long profile to avoid circumferential pressure around the chest.

### **Use of compression**

Opinions vary regarding bandaging and wearing a compression sleeve or bra to prevent swelling. Wearing a compression sleeve during flights and vigorous physical arm exercise may be recommended. In all cases, the recommendation should come from a certified lymphedema therapist. The garment should be appropriately fitted, and instruction is given regarding correct use.

### **Early signs of lymphedema**

There are some common early signs of lymphedema:

- A sensation of fullness or heaviness in the breast, hand, or arm.
- Tingling, pain, or sensitivity in part of the arm.
- Swelling, which may disappear.
- Signs may appear from a bra, ring, bracelet, watch, clothing, which have become tight. You should check that the cause is not weight gain.
- When pressing on the arm, a dent may appear in the skin.
- The skin may be tight or hardened.
- Numbness or a sensation of pins and needles in the arm.

### **Recommendations for physical exercise and return to a normal routine**

- When the surgical wound has healed, you should start an exercise routine. Start with daily activities such as hair brushing, applying make-up, cooking, washing dishes, and doing laundry.
- Exercise programs should be individually suited and gradual. If you were doing exercise before the surgery, you should return gradually to the same exercise.
- We recommend that the exercise should include aerobics and strengthen the arms. Examples of aerobic exercise are walking for fitness, running, swimming, and dancing. Choose an activity suitable for you and

do it at least three times a week for 50 minutes.

- Arm muscle strengthening – we recommend consulting with a physical therapist certified in lymphedema treatment and then working under the guidance of a certified gym coach. They will help you build a gradually increasing exercise program customized to your needs and ability.
- If hand or arm swelling appears during exercise, you will need to exercise with a compression sleeve. Similarly, if breast swelling appears, you may need to exercise with a compression bra. A suitable compression garment can be ordered by a physiotherapist certified in lymphedema treatment.

### Maintain normal body weight

If you have difficulty maintaining your normal body weight, you should consult a dietician to guide you in adopting healthy eating styles.

## Appendix 2

### Instruction sheet for patients after breast cancer surgery and sentinel lymph node dissection SLND – before and after hospital discharge (2020)

Dear Patient,

The agreement exists between members of the professional staff that, following breast cancer surgery, instructions need to be provided for the immediate and later recuperation periods. We have written these detailed instructions for you. They are based on research we performed over the past two years, which enabled us to develop instructions to help prevent or reduce the risk for side effects from breast cancer surgery. We hope these instructions will help you during your recuperation period and wish you a speedy recovery.

During your recent surgery, one or more sentinel lymph nodes were removed. The surgery and treatments which will follow contribute substantially to your recovery from breast cancer. However, some women develop immediate or later side effects from the surgery, such as pain, shoulder movement restriction, and swelling.

It is important to adopt certain behaviors to help your recovery process and reduce your risk for side effects in the future.

The instructions contain our recommendations to you for the immediate period after your surgery (until the surgical wound heals) and for the time following.

All information in this instruction sheet is our recommendation only, and your treatment program should be chosen in consultation with your medical practitioner or physical therapist.

The instructions are divided into three sections:

- Section 1: instructions for the recovery period after surgery
- Section 2: recommendations for exercises for the recovery period
- Section 3: instructions for risk reduction for arm lymphedema and other side effects

### Section 1: Guidelines for the recovery period after surgery

Exercise instructions:

You may have received some exercise and other instructions before you were discharged from the hospital. The following are some basic exercise instructions that you can include in your existing regime. **Early mobility to improve lung ventilation and general mobility**

- Make sure you sit up and walk around often and avoid lying down for long periods. While walking, you should relax the affected shoulder and arm and allow them to move freely.

### Exercises

- Mobility exercise is recommended for trunk, chest, shoulder, and arm movement.
- Shoulder movement should be started gradually on the first or second day after surgery according to the instruction received from the hospital staff
- Shoulder movement should be gradually increased until the full range can be performed.
- The hospital staff may offer instruction in additional exercise after the surgery. Different exercises are recommended during progressive stages of recovery.
- Progress from one stage to the next should be gradual regarding the increasing range of movement and muscular demand.
- Avoid effort on the arm on the side of the surgery for three weeks after the surgery (lifting heavy weights, sudden and painful movements).
- Perform the exercises slowly **up to the point of pain only**, 5-10 repetitions for each exercise. The exercises should be performed 1-3 times each day.

### General instructions





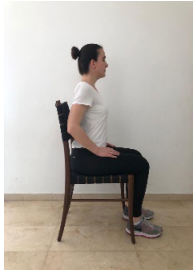
- After the surgical wound is healed, the pliability of the scar can be improved by gentle massage over the entire area of surgery with an emphasis on the scar. Showering/bathing is a good time.
- Should any sign of inflammation appear, such as redness, swelling, discharge from the surgical wound, a temperature higher than 38<sup>o</sup> or pain increase, which does not improve with regular treatment, you should consult with your doctor or be seen in a hospital emergency room.
- If, after three weeks from the surgery, you still have limited shoulder movement, ask your doctor to refer you to a certified lymphedema physical therapist.



### Section 2 – Recommended exercises for each stage of recovery

In this section, you will find examples of exercises for the different stages of recovery. You and your treating physical therapist may prefer to choose different exercises.


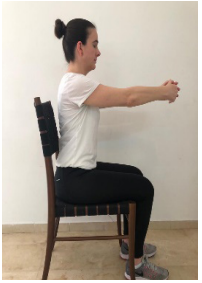


### Stage A – Exercises starting the day after the surgery.


	Starting position	Goal	Exercise performance	Exercise illustration
1	Lie on your back with your knees bent and feet slightly apart on the mat. Rest your head on a small pillow. Your hands will be on the base of your chest or on the mat as in the picture. Some of the exercises may be done while sitting on a chair with a back support.	Improved lung ventilation through deep breathing	Take a deep breath in (through your nose), expand the base of your chest, exhale through your mouth.	
2		Trunk mobilization	Roll one knee to the side then slightly lift the opposite hip. This helps lower the other knee closer to the mat. Lower your hip and bring your knee back to the starting position. Repeat the exercise on the opposite side.	
3		Neck mobilization.	Slowly turn your head from side to side (perform the exercise with your eyes open then closed).	
4		Scapular (shoulder blade) mobilization	Lift your shoulders towards your head and return to starting position. Bring both shoulders forward and return them to the starting position.	
5	Sit upright on a chair, with your hands resting on your thighs.	Shoulder girdle mobilization.	Pull your shoulders back without lifting your shoulders closer to your ears. Keep your elbows slightly bent and your back straight. Hold this position for a few seconds before releasing.	


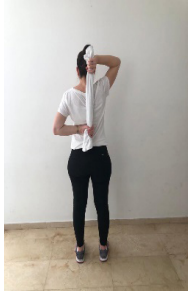
6	Sit upright on a chair. Place your hands on the opposite shoulder.	Trunk and neck mobilization combined with shoulder movement	Turn your head and arms to one side, then to the opposite side. The movement should be performed in the pain free range only.	
7			Bend your neck and trunk to one side, hold them there for a few seconds and return them to the starting position before repeating on the other side.	

### Stage B – Exercises for the second to the sixth day after surgery

	Starting position	Goal	Exercise performance	Exercise illustration
Continue doing all the exercises for stage A				
8	Lie on your back as for stage A exercises.	Improve shoulder range of movement	Join your hands in front of you and lift them in the direction of the ceiling. Up to day 7 limit the movement to shoulder level.	
9	Sit on a chair with your feet on the floor, your back supported and your arms resting next to your sides.	Self-assisted elbow and shoulder movement	Join your hands and lift your arms with elbows straight. Lift up to shoulder level only.	

### Stage C – Exercises for the seventh day after surgery and after (when the surgical wound has closed)

	Starting position	Goal	Exercise performance	Exercise illustration
Continue doing all the exercises from Stages A and B				
10	Lie on your back with your knees bent and feet slightly apart on the mat. Rest your head on a small pillow.	Improve shoulder mobility	Join your hands. Lift your arms up and place your hands behind your head. Open your elbows out to the sides. Note the distance your elbows are from the mat. Bring your elbows forward to meet in front of your face and then open them out to the sides. Repeat this movement a few times. Rest your arms on your abdomen then at the sides of your body on the mat.	

11	Stand facing the wall.	Improve shoulder mobility	<p>Using your fingers "climb" up the wall until your elbows are straight. Keep looking at your hands.</p> <p>Bring your feet closer to the wall and try to lift your hands higher on the wall.</p> <p>Remain for a few seconds at the point where you feel the stretch.</p> <p>Then move slowly backwards and let your arms slide slowly down the wall.</p> <p>Repeat this movement but make sure to work in a pain free range.</p>	
12	Stand with a slight space between your feet.	Improve shoulder mobility	<p>Holding a small rolled up towel. Lift your affected arm above your head. The other arm behind your back grasps the lower end of the towel.</p> <p>Pull the towel down and up. Change hands after a few repetitions.</p>	

When you have regained full and pain-free movement, you can gradually reduce the exercise to twice a day, then once a day, and then to twice at this stage; we recommend joining a beginner's exercise class Feldenkrais, Vini-yoga, Patat, or Body Cognition exercises. Also, recommend doing gentle aerobic exercises such as walking outdoors or on a treadmill. At a later stage, after consulting a physical therapist certified in lymphedema treatment, you should return to your regular fitness activities.

### Section three – recommendations to reduce the risk of later side effects

At various times after the surgery, a small number of women may develop side effects. These side effects may be localized to the surgery (trunk, shoulder, breast, or arm), or they may be more generalized. Examples of local side effects are arm and or breast lymphedema (swelling), shoulder movement limitation accompanied by the arm and shoulder pain. Examples of general side effects are fatigue, sleep, and mood disorders. The following recommendations help to reduce the risk of developing all side effects. For example, the recommendation to exercise reduces the risk of arm lymphedema and fatigue, mood, and sleep disorders.

### General recommendations for risk reduction for arm lymphedema and other side effects.

- Maintain skin hygiene and prevent infections. Any small injury to the skin of your affected arm should be immediately cleaned with an antiseptic.
- Maintain full shoulder and trunk range of movement.
- Return as soon as possible to routine daily activity, including using your arm.
- Take part in physical exercise.
- Maintain your normal BMI (correct bodyweight for your height).
- Be alert to possible early symptoms such as hand or arm swelling, heaviness, prickling, early signs of

infection (skin heat, irritation or redness, pain, a flu-like feeling, temperature or chills) or new pain and movement limitation of the shoulder.

- Early signs of infection need to be seen immediately by a doctor (treating doctor or emergency room). For the other signs and symptoms, you should request a referral to a physical therapist certified in lymphedema treatment.

### Recommendations for physical exercise and return to a normal routine

- When the surgical wound has healed, you should start a fitness exercise routine. If you were doing exercise before the surgery, you can return to the same exercise and even increase the intensity while following specific guidelines and recommendations.
- We recommend that the exercise should include aerobics and strengthening exercise for the arms. Examples of aerobic exercise are walking for fitness, running, swimming, and dancing. Choose an activity suitable for you and do it at least three times a week for 50 minutes.
- Arm muscle strengthening – we recommend consulting with a therapist certified in lymphedema treatment and then working under the guidance of a certified gym coach. They will help you build a gradually increasing exercise program customized to your needs and ability.
- If hand or arm swelling appears during exercise, you will need to exercise with a compression sleeve. Similarly, if breast swelling appears, you may need to exercise with a compression bra. A suitable compression garment can be ordered by a therapist certified in lymphedema treatment.

**Disclaimer:** The authors declare that the views expressed in the article are their own and not the institutions.