

Breast Cancer-Related Lymphedema

Essential knowledge for: personal trainers · fitness instructors · yoga teachers · Pilates teachers



BigStock

Why you need to know about lymphedema / **Exercise** benefits and risks for lymphedema / **What is lymphedema**, and how does it happen? / **Guidelines** for working with breast cancer survivors / **Resources** for clients and to learn more about breast cancer-related lymphedema

Step Up, Speak Out: *Together We Can Make the Difference in Lymphedema*

www.stepup-speakout.org

Copyright ©2013 Step Up, Speak Out · Revised 04.01.13

Why you need to know about breast cancer-related lymphedema

Your clients include breast cancer survivors (whether you know it or not).

One in eight

Do breast cancer patients or survivors work out in your gym? Are you teaching fitness or movement classes to, or providing personal training to breast cancer survivors? If you don't think so...*think again*. The National Cancer Institute estimates that one in eight women will be diagnosed with breast cancer during her lifetime. That simple statistic means that if you train, teach, or work out with women, you are working with breast cancer survivors, many of whom choose not to disclose that fact to casual acquaintances.

Breast cancer survivors are at risk for lymphedema (and may not know it).

Some forty percent of breast cancer patients will develop Lymphedema (pronounced LIMF-ed-DEE-ma), a common side effect of breast cancer treatments including surgery, radiation to the breast and/or the axillary lymph nodes, and chemotherapy.¹ Known as breast cancer-related lymphedema (BCRL), the condition often brings visible arm, hand, and/or truncal swelling. It is uncomfortable, can be quite painful, is unattractive, and for most breast cancer survivors, the most feared long-term treatment side effect. Survivors with BCRL will often say that they would rather go through chemotherapy all over again than have lymphedema. Lymphedema symptoms can be managed, but the condition has no cure.

40%

Surprisingly, *few patients or survivors receive information about lymphedema* and how to lower their risk. Reasons for physicians' reluctance to educate their patients include fear that disclosing lymphedema risk may prompt a patient to forego one or more elements of her cancer treatment plan, especially when a treatment element is in a 'gray area.' Or, viewing BCRL as not preventable, doctors may choose not to add to the already crushing emotional burden of a breast cancer diagnosis.

The lack of patient education means that many breast cancer survivors you work with are unaware of their lymphedema risks, and they may be exercising in ways that can increase those risks. Survivors with and at-risk of lymphedema often do not realize that you can help them become strong and fit in ways less likely to trigger lymphedema or cause existing lymphedema to 'flare,' or worsen.

Exercise: Benefits & risks to those with, or at-risk for lymphedema.

Besides the obvious benefits for health and wellbeing, exercise helps minimize and manage lymphedema in a few special ways: Muscle movements provide the pumping action that moves lymph through the lymphatic system, and deep breathing stimulates lymph flow. In addition, strong muscles help protect against a lymphatic response when a limb or torso must support unaccustomed weight, which the body interprets as a stress event. These are compelling reasons for breast cancer survivors to exercise and lift weights, but in a maddening contradiction, exercise and strength training can also create lymphedema risk. Exercise raises body temperature, stimulating lymph flow, and the very process of strength training—progressive resistance—loads the arm with unaccustomed weight that can trigger a lymphatic stress response. Yoga and Pilates movements that require the arm to support body weight can have the same effect.

Physicians and surgeons have traditionally focused on the risk side of this dilemma, advising breast cancer survivors to avoid heavy lifting and repetitive arm motions. Many physicians consider *heavy* to be as little as five to ten pounds. That advice generally rules out strength training and many 'core' strengthening exercises, not to mention placing limits on functional strength needed to lift groceries or babies.

Fortunately, recent research shows that women at risk or who already have BCRL can enjoy the health and quality-of-life benefits of strength training, but they should do so only under expert guidance: yours!

What exactly is breast cancer-related lymphedema?

Breast cancer-related lymphedema is the build-up of fluid in soft body tissues when the lymph system is damaged or blocked. This fluid build-up causes swelling, which in the breast cancer patient usually occurs in the arm, hand, or anywhere on the trunk, including the shoulder and back. Breast cancer treatments that can damage or block the lymph system include surgery, such as lumpectomy or mastectomy; axillary node dissection, including sentinel node biopsy; and radiation therapy. Chemotherapy may also play a role.



Photo courtesy LymphedIVAS,
www.lymphedeivas.com

It is very common for BCRL patients to have swelling, pain, a feeling of heaviness, and/or a tingling feeling in the affected areas. Some patients will first suspect a problem if they find jewelry is tight, and they have not gained weight. Fortunately, if diagnosed and treated in its earliest stages, BCRL is readily managed. With vigilance, BCRL can be well controlled, but patients are always at risk of severe swelling, permanent tissue damage, and infections that can be life-threatening.

BCRL treatment involves manually draining excess lymphatic fluid from swollen areas of the body, applying compression, and adhering to daily gentle exercise and skin care regimens. Fluid reduction relies principally on manual lymph drainage (MLD—a very gentle treatment using the hands to sweep excess fluid toward undamaged lymphatic vessels), followed by wrapping with special bandages. These bandages provide a firm support for muscles, whose contractions against the lymphatic vessels enhance lymph flow. Compression garments, such as the sleeve and gauntlet pictured at left, discourage subsequent fluid build-up.

Your role is *not* to diagnose BCRL, but being familiar with its symptoms may enable you to help a client realize when a medical evaluation is needed. If a client comments about tingling or ache in an affected arm, for example, your knowledge of BCRL can help steer her toward appropriate help from her medical team.

The lymphatic system & how breast cancer treatment can damage it

The lymphatic system performs several critical bodily functions: It removes bacteria, viruses, and other waste and impurities from body tissues; it helps the body fight infection; and it helps to regulate the balance of body fluids. The lymphatic system operates through a network of lymph vessels, tissues, and organs, including lymph nodes, transporting *lymph* throughout the body. Lymph is a clear fluid containing lymphocytes—a type of white blood cell—whose role is to produce antibodies that fight infection and viruses. Lymph also contains bacteria, other waste products, and plasma, and it is very rich in protein.

When breast cancer treatments mentioned above remove or damage lymph nodes, the body loses some of its lymph filtration and transport capacity. Lymph production does not diminish, however, placing significant stress on the remaining lymphatic vessels. The vessels themselves can be damaged through treatment, which commonly happens when there is surgical or radiation-induced scarring. When a diminished lymphatic system can no longer keep pace with lymph production, fluid builds up at what we might call logjam points, and swelling results. This swelling is lymphedema.

Exercise plays an important role in lymphedema treatment

BCRL patients are prescribed gentle lymphedema remedial exercises, both during initial intensive treatment and for life-long maintenance. These exercises include stretching and range-of-motion exercises that encourage lymph flow. All exercise, including lymphedema-specific, dance-like exercise routines called the Lebed Method™, moves lymph through the action of muscles exerting pressure on the lymphatic vessels.

As mentioned earlier, exercise raises body temperature and may increase lymphatic flow, so BCRL patients should wear compression garments during vigorous and/or strenuous exercise, except swimming.



Courtesy LymphedIVAS www.lymphedivas.com

Research has shown that improved upper body and limb strength can reduce the risk of getting or worsening lymphedema. The landmark 2009 PAL Trial (Schmitz 2009) (**Physical Activity and Lymphedema**) concluded that ‘In breast-cancer survivors with lymphedema, slowly progressive weight lifting had no significant effect on limb swelling and resulted in a decreased incidence of exacerbations of lymphedema, reduced symptoms, and increased strength.’ⁱⁱ A follow-up study concluded that slowly progressive weight lifting did not increase the lymphedema risk of breast cancer survivors not yet diagnosed with BCRL.ⁱⁱⁱ

The focus of this guide is on lymphedema, but it is worth mentioning that other breast cancer side effects can make exercise difficult. Cancer surgeries and treatments often bring unfortunate side effects that can challenge a patient’s ability to exercise. For example, osteoporosis and peripheral neuropathy (nerve damage to the extremities) can follow chemotherapy, and many women on hormone-suppressants such as Tamoxifen gain weight, possibly to the point of obesity. Breast reconstruction may cause permanent changes to the trunk and core, including relocating the latissimus dorsi or some or all of the rectus abdominis. Please keep these conditions in mind and help your clients modify as needed. For example, with osteoporosis of the spine, there should be no trunk rotation or flexion, nor any lateral flexion. Neuropathy of the feet or hands will require adjustments to ensure safe balance and grip. Reconstruction may require adaptations or substitutes for core and arm-extension work.

General exercise guidelines for those with and at-risk of BCRL

This guide for reducing exercise-related lymphedema risk addresses weight training, Pilates, cardio, water exercise, and yoga. These guiding principles generally apply to all types of exercise, however.

Incorporate guiding principles for all forms of exercise

Clients who had recent surgery or radiation therapy must have a doctor's clearance to begin exercise. Some will need physical or occupational therapy to regain function before starting to exercise, depending on the scope of surgery and other breast cancer treatment.

BCRL patients should consult with their lymphedema therapists before starting an exercise program, to ensure the exercise is compatible with their treatment plans and to verify baseline arm measures. Their lymphedema *should be stable* before starting any exercise program. Please read the weight-training discussion for an explanation of what is meant by 'stable' lymphedema.

At-risk breast cancer survivors should learn about BCRL, including its risks and symptoms, and if possible, get baseline arm measures from a qualified lymphedema therapist.

Those with BCRL should wear compression garments during exercise. Survivors at risk should consult with a qualified lymphedema therapist to determine if compression is needed.

During exercise programs, individuals with and at risk of BCRL should:

- Start conservatively, and add resistance / exertion slowly and in small increments, and only if there has been no new presentation or worsening of lymphedema symptoms after exercise to date. Avoid adding repetitions and resistance at the same time.
- Include slow warm-ups and cool downs in their workouts, as well as post-workout stretching to minimize muscle soreness.
- Rest muscle groups in between sets.
- Stay well hydrated and if exercising outdoors, use sunscreen and insect repellent.
- Take periodic deep abdominal breaths, which facilitate lymphatic drainage.
- Avoid temperature extremes in the exercise venue. Keep exercise rooms cool. Clients can dress in layers for comfort as needed.
- Practice vigilant self-surveillance for lymphedema symptoms; stop exercising and consult a qualified lymphedema therapist if any new/worse symptoms are noted following exercise.

Bring up breast cancer survivorship and lymphedema

When introducing a class, explain that you realize there may be special needs requiring individuals to adapt what you are teaching. Encourage those with needs to let you know, either in class or privately, so you will understand why they may not be following along to a 'T' and so you can suggest appropriate adaptations.

However, some breast cancer survivors, and even those already diagnosed with lymphedema, may not be aware of exercise precautions they should take. Most fitness, Pilates, and yoga instructors remind their participants to avoid or discontinue any movement that hurts, and that is of course very good practice. Unfortunately, exercise does not need to hurt in order to provoke a lymphatic response that might cause swelling or pain in a person who has or is susceptible to lymphedema. Lymphedema may be triggered, or existing BCRL may worsen, hours or even a day or so after exercise that was too strenuous or repetitious. A client may not know to minimize repetitive arm movement, or to add resistance or weights slowly and in small increments. That is why it is so important to make sure that those with or at risk of BCRL know about the condition and its safe exercise precautions.

General guidelines, cont'd

You may need to start by explaining lymphedema risks for breast cancer survivors. Some yoga teachers begin their classes with a presentation about body systems (bones, joints, muscles, ligaments, nerves, blood, breath) that students need to pay attention to in their yoga practice. Including the lymphatic system in such an introduction to *any* fitness class would be a great way to start a conversation about lymphedema's relationship to breast cancer treatment. You can remind the class that one in eight women will get breast cancer in her lifetime, and approximately forty percent of breast cancer survivors will develop lymphedema...but there are precautions that can help reduce the lymphedema risk while exercising.

Have copies of the *Step Up, Speak Out* exercise handout (see *Resources*) with you and offer them to those interested. Please stress that despite exercise's many benefits to breast cancer survivors, there are some important guidelines that women should follow to reduce their risk of exercise triggering lymphedema. Invite class members who are not breast cancer survivors to take a copy of the handout for friends and loved ones who are survivors, and who may not be working with an instructor knowledgeable about lymphedema.

Encourage breast cancer survivors to seek lymphedema education by visiting the *Step Up, Speak Out* website (www.stepup-speakout.org), and to meet with a qualified lymphedema therapist for advice regarding exercise benefits and risks, and whether to wear compression garments during exercise.

If you offer individual instruction or training, encourage breast cancer survivors to engage you for at least one session, where you can go over exercise guidelines and precautions, as well as adapt moves and routines you will include in the classroom.

Encourage clients and class participants to modify moves as needed

At each session:

- Remind everyone that they should modify moves to accommodate their own needs, including managing lymphedema risk if they are breast cancer survivors.
- Explain that if you are unaware of special needs, you may suggest a form correction that's not appropriate for someone—so it's best to let you know of issues in advance.
- Some breast cancer survivors may disclose their status but ask you not to mention it in class. You can help those individuals by providing alternate moves in a general way, such as 'for those who may have some upper body or shoulder issues, here's an alternate you can do.'
- Correct form as you would for any participant having difficulty with a move, but of course, do not insist on a move that is not appropriate for someone's special needs, including lymphedema considerations. A simple 'are you adapting?' before offering a correction can help you avoid singling out for correction someone who is simply customizing a move to meet her needs.
- Give a quick reminder that plenty of water and some extra deep breathing benefit everyone, but are essential for individuals with compromised lymphatic systems.

Of course, you are not a mind reader! If a person has not let you know she is a breast cancer survivor, or that she has been diagnosed with lymphedema, you may not realize that she is taking risks you could help her minimize. A woman who has been diagnosed with lymphedema may be wearing a compression sleeve and glove or gauntlet, which you certainly can ask about (privately) to start a conversation about appropriate exercise precautions. But many breast cancer survivors prefer to keep their survivorship to themselves, which is why it is so important for you to introduce breast cancer-related lymphedema to your classes, and to make the *Step Up, Speak Out* exercise handout available.

What does the research mean for weight training in the gym?

The PAL Trial and subsequent studies have endorsed weight lifting for those with (and at risk for) lymphedema, but only if breast cancer survivors adhere to guidelines developed as part of the research outcomes. *When you are weight training with breast cancer survivors, it is critical that you adhere to the research-based guidelines, ensuring that your clients understand what the guidelines are and why they matter.* The guidelines presented here are drawn from the PAL study.^{iv}

Compression

BCRL patients should always wear a well-fitting compression sleeve and hand protection (a compression glove or gauntlet) while lifting weights. BCRL patients who normally wear compression all day should re-do their garments after showering.

Survivors not diagnosed with BCRL may also wish to wear compression. The National Lymphedema Network supports the use of compression while exercising for patients at risk for BCRL; these women should consult a qualified lymphedema therapist to evaluate preventive compression wear during exercise. (Some lymphedema therapists suggest that breast cancer survivors at risk for BCRL wear their compression garments for at least an hour after completing their exercise program.) Compression garments should be replaced after six months.



BigStock

Lymphedema status

BCRL patients' lymphedema must be stable before starting a strength training program. In the PAL research, this meant that in the three months prior to beginning strength training, women with diagnosed BCRL:

- had no cellulitis (infection) requiring antibiotics.
- had no more than one 'flare' (swelling episode) requiring therapy.
- had no fluctuations in arm volume greater than ten percent.

Education

BCRL patients and breast cancer survivors at risk of BCRL should receive information that will enable them to spot symptoms of lymphedema (or worsening of their lymphedema), and to know how to respond. If possible, a certified lymphedema therapist should provide an education session that your clients can attend prior to starting a strength training program. You can also refer your clients to <http://stepup-speakout.org/> for a comprehensive source of accurate information about breast cancer-related lymphedema.

(Weight-training guidelines continue on the next page.)

Weight-training guidelines, cont'd

Supervision, resistance and progression

Personal trainers should supervise the initial weeks of a strength training program.

Survivors should use dumbbells or weight machines instead of bodyweight exercises or resistance bands, so that the amount of weight (resistance) is known with accuracy and can be increased in very small increments.

The program should start with 1- to 3 pound dumbbells, or with the lightest possible weight if using machines.

Your clients should progress to a higher weight only:

- after 2-4 sessions of doing the exercise with proper form, under your supervision.
- if there have been no changes in existing lymphedema, or no lymphedema symptoms in a breast cancer survivor at risk for lymphedema.

If a change in symptoms lasts a week or longer, stop upper-body training (and lower-body lifts that require holding weight in an affected or at-risk arm); your client should see a certified lymphedema therapist to evaluate symptoms.

If your client takes an exercise break of one week or longer (for any reason), reduce the weight being lifted. After one month's absence from weight lifting, re-start with 1-3 pound weights and rebuild from there.

At the start of each workout, it is your job to ask your client if she has had any symptoms that would suggest she should not progress to a higher weight, or that mean you should put a hold on strength training until she has been evaluated by a qualified lymphedema therapist.

Key points to keep in mind...

There is no evidence that weight training prevents lymphedema. The research does demonstrate that performed safely, weight training can be included in a woman's fitness program, to provide the benefits of strength training while minimizing its lymphedema risks.

It may be possible to eventually introduce bodyweight and resistance-band exercises to a breast cancer survivor's fitness program, but this should be reserved for clients who have demonstrated development of considerable strength through slowly progressive weight additions, and whose weight lifting has not triggered lymphedema symptoms or flare-ups.

A weight-lifting program should be designed to avoid injury as well as avoid delayed onset muscle soreness (DOMS), because pain can trigger a lymphatic response. Appropriate warm-up and cool down, gentle stretching, slow resistance progression, proper form, ending the session with aerobic exercise, and hydration are strategies to avoid injury and DOMS.

How does the exercise research apply to Pilates?

In one study of Pilates and lymphedema risk, which did not modify the exercises in any way, some participants experienced lymphedema swelling after exercising.^v Fortunately, we can use common-sense to adapt a Pilates program for those with and at risk of lymphedema, following the weightlifting guidelines.

Clients must pay close attention to the amount of exertion and resistance they place on the arms and upper body when participating in a Pilates program. Clients should be encouraged to think about the amount of weight they lift and the amount of grip strength they exert during a typical day, and to work with their Pilates instructors to determine a safe starting point for each load-bearing Pilates exercise. If possible, meet with the breast cancer survivor for an individual evaluation session prior to having her join one of your classes.

Mat Pilates can be similar to a gym workout, and therefore *the PAL guidelines apply directly (guidelines are on page 6)*. In addition, there are special considerations when working on Pilates equipment:

- When starting a Pilates mat or equipment program, upper body movement should be limited to few repetitions with little to no weight or spring resistance. If a class uses weights, including toning balls, begin without the weights to learn form and work on range of motion, and then add the lightest weight possible, and not more than one pound. Resistance bands and upper body weight bearing and planking should be avoided at first, because progression or resistance is difficult to assess.
- Take care to alternate upper-and lower-body exercises, so arms and torso can rest between sets.
- Keep in mind that some Pilates exercises are too rigorous at first for a post-mastectomy patient.
 - Examples are mat work that includes weight bearing on arms such as planks/push-ups and side planks. Mat movements such as swan, swimming, and double leg kick are important to promote back strength and improve posture, and they can be modified by placing arms in diamond position with arms in front. Alternately, the arc barrel or foam roller can be used by placing the upper back on it with arms behind ears, and extending the chest to the ceiling, promoting lung capacity, back extension and shoulder and chest stretching.
 - Reformer exercises to limit are any upper body work that uses strap resistance, including but not limited to: hundred, rowing series, hug a tree, salute, pulling straps, kneeling arms. In addition, use caution with reformer upper weight-bearing exercises such as long stretch series, swan and side stretch series.
- The affected (or at-risk) arm should be lowered when performing side-lying exercises, such as side leg lifts or side kicks. If this is not comfortable, the exercise should be eliminated.
- Avoid any exercise that requires upper body exertion to which the client is unaccustomed. Limit repetitions to the client's comfortable endurance, and never to the point of pain. Keep in mind that pain triggers a lymphatic response that can cause swelling.
- Maintain clean equipment and instruct clients on proper technique on changing springs, to avoid injury.

Clients should progress gradually. Do not increase repetitions the same time as spring resistance. Move to more repetitions and light spring resistance only:

- After 2-4 sessions of doing the exercise with proper form, under your supervision.
- If there have been no changes in existing lymphedema, or no lymphedema symptoms in a breast cancer survivor at risk for lymphedema. Clients should practice vigilant self-surveillance to monitor for adverse changes in the hours and days following a Pilates session.

Pilates guidelines, cont'd

Naomi Aaronson, occupational therapist and certified cancer exercise trainer, has generously shared the following Pilates program designed for individuals with and at-risk for BCRL.^{vi} The program has three goals: promote lymphatic drainage, open up the chest and axillary region, and strengthen the back and shoulders.

Remember that clients recovering from breast cancer surgery must have a doctor’s clearance to start exercising. Generally, you should work with clients who had mastectomy, axillary node dissection, or sentinel node biopsy beginning with Phase 3, encouraging the client to work with a qualified therapist on Phase 1 and Phase 2 exercises or their functional equivalents before joining your class.

Integrated Rehab and Fitness / 3 Phase Pilates Exercise Program

For 2 weeks ,following doctor clearance	PHASE 1 / Medically Supervised Post Surgery Protection	PHASE 3 / Pilates Classes Regaining Strength and Power	Continuous, after medically supervised completion of Phases 1 and 2
	<p><i>3-5 repetitions each:</i></p> <ul style="list-style-type: none"> • Breathing • Neck rotations • Pelvic Tilt Imprint/Release • Scapula Elevation/Depression • Scapula Protraction/Retraction • Elbow Flexion/Extension • Bridging • Marching • Toe Taps 	<p>Upon completion of Phase 2:</p> <p>Can do any of the traditional Pilates exercises from Phase 2, plus the following:</p> <ul style="list-style-type: none"> • Side-lying Rotator Cuff Push • Side-lying Chest Opener Part 2 • Swimming • Double leg kick • Side-lying leg series <p>Toning Balls</p> <ul style="list-style-type: none"> • Floating Arms • Arm Scissors • Mermaid • Side Lying: Chest Opener Part 2 • Side Lying: Rotator Cuff Push <p>Magic Circle</p> <ul style="list-style-type: none"> • Shoulder Flexion & Extension • Elbow Flexion/Extension <p><i>For all exercises: 5-8 repetitions maximum</i></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Some of these exercises are adaptations of traditional Pilates. The author welcomes questions and can be reached via her website.</p> </div>	
For 4 weeks , after completing Phase 1	PHASE 2 / Medically Supervised Return to Function		
	<p>For two weeks, all of the above, plus:</p> <ul style="list-style-type: none"> • Cane Raises • Floating Arms • Arm Scissors • Mermaid • Side Lying: Chest Opener Part 1 • Side Lying Shoulder Flexion/Extension • Back Stretch <p>Next two weeks, add:</p> <ul style="list-style-type: none"> • Traditional Hundred feet down—modified (only arms move and decrease reps) • Criss-cross (feet down) – modified • Leg Circles • Single Leg Stretch • Single leg kick • Baby swan <p><i>Repetitions as tolerated, avoiding pain</i></p>		

©Aaronson, Turo, 2012 <http://www.recovercisesforwellness.com> (used with permission)

How do exercise guidelines apply to cardio, core, & flexibility work?

The research is generally silent on guidelines for BCRL patients and those at risk who wish to engage in cardio, core and flexibility work. Many of the PAL guidelines on page 6 can apply here, plus some common-sense guidelines you can give to your clients:

- Be sure that lymphedema is stable before beginning or continuing an exercise program. The weight-training guidelines on page 6 explain what is meant by 'stable' lymphedema.
- Women with lymphedema should wear compression garments while and for at least an hour following exercise. Those at risk of BCRL should meet with a qualified lymphedema therapist before starting an exercise program, to be screened for lymphedema, learn about risk-reduction strategies, and to discuss the advisability of wearing preventative compression.
- Be aware of the effects of exercise on body temperature: Restrict outdoor exercise in hot seasons/climates.
- Avoid repetitive arm motions. Do not allow the arm to hang down unsupported while walking; put affected hands in pockets, or use Nordic walking poles to support the hands and arms.



BigStock

Be very careful with planks or other core strengthening exercises that require arms or torso to support body weight. Those who have not developed arm and torso strength by following guidelines for slowly progressive strength training may be at particular risk of triggering a lymphedema event if they place bodyweight on their arms, shoulders, and torso. Many survivors cannot wait to get back to planks! However, they may be unaware of the related lymphedema risks, so please explain the risks and suggest modifications, such as wall pushups and wall planks.

- Stay hydrated and breathe deeply! Drinking lots of water thins and promotes the flow of lymph throughout the body. Frequent deep (belly) breaths work very effectively to improve lymph flow.
- Clients should practice vigilant self-surveillance to monitor for adverse changes in the hours and days following exercise.

How do exercise guidelines apply to swimming?

Swimming is an excellent exercise choice for BCRL patients. Buoyancy makes exercise more comfortable for those who find gym exercise or walking to stress the joints, and in a warm pool, range of motion and flexibility are enhanced. Water provides equal pressure from all directions, which is helpful for body areas that are difficult to reach with compression garments, such as the axilla and fingers.

Some researchers discount the idea that water pressure at the surface has any positive effect, suggesting that it is movement through the water that helps reduce swelling, through a gentle, lymphatic drainage action. However, the substantial water pressure provided by scuba diving makes that activity particularly beneficial for BCRL.

Common-sense extension of some of the weight-training guidelines can apply to swimming, as well as additional suggestions and precautions unique to water exercise:

- Be sure that lymphedema is stable before beginning or continuing an exercise program. The weight-training guidelines on page 6 explain what is meant by 'stable' lymphedema.
- Avoiding repetitive arm motions is difficult when swimming, but it is best if individuals with or at risk of BCRL change strokes frequently if swimming laps; they should try to incorporate variety in their pool exercises.
- To receive any potential benefit from water pressure, the arms must be in the water. Therefore, the crawl or breast stroke is possibly more beneficial than the butterfly stroke.
- Precautions for slowly progressive resistance apply to swimming. For example, the butterfly stroke places great force on the arms. As with other forms of resistance exercise covered in this guide, it is certainly possible that with slow, progressive conditioning, a person with BCRL could build up to the butterfly stroke as a form of exercise.
- Lap swimming should be performed in cool water, usually between 68°F (20°C) and 86°F (30°C), to minimize elevation of core body temperature from the combination of warm water and strenuous exercise. Water temperatures greater than 94°F (34.4°C) degrees may worsen lymphedema and should be avoided.
- Individuals with lymphedema are particularly susceptible to infections such as cellulitis, so proper pool maintenance to ensure water hygiene is essential. For the same reason, it is important to apply lotion after swimming, to counter the drying effects of chlorinated or salt water. Skincare, to help prevent minute skin breaks that allow bacterial infection, is essential for anyone with BCRL.

What precautions apply to yoga?

Loudon et al (2012) reviewed research findings concerning yoga and lymphedema and concluded that there has been inadequate research to date supporting firm guidelines for yoga teachers and their clients with breast cancer-related lymphedema. However, the study authors point to some studies where yoga therapy was used with lower limb lymphedema with beneficial results. They conclude that 'the use of yoga with slow breathing, gentle and progressive physical postures, mediation and relaxation, following guidelines for exercise and risk reduction, will not exacerbate lymphedema. Furthermore, it may improve overall physical movement as well as the stability and function of the shoulder girdle and thoracic spine. The movements may be beneficial in softening fibrous tissue across the chest and upper back. Research into the use of yoga in breast cancer demonstrates improvements in quality of life.' These authors call for additional research specific to yoga/BCRL and point out that guidelines from exercise research for BCRL can be incorporated into well designed yoga trials.^{vii}

These study comments do not extend BCRL/exercise research conclusions directly to yoga, but in the absence of research-based guidelines, we might draw from the exercise research to suggest some common-sense yoga guidelines and precautions for those with or at risk for breast cancer related lymphedema.

- Be sure that lymphedema is stable before beginning or continuing a yoga program (see page 6 for an explanation of 'stable' lymphedema).
- Women with lymphedema should wear compression garments while and for at least an hour following a yoga session. Those at risk of BCRL should meet with a qualified lymphedema therapist before starting a yoga program, to be screened for lymphedema, learn about risk-reduction strategies, and to discuss the advisability of wearing preventative compression.
- Be aware of the effects of exercise on body temperature: Avoid 'hot' yoga and ensure that yoga is performed in adequately cooled and ventilated premises.
- Slow, deep breathing with breath retention has been demonstrated to clear lymphatic pathways. Yoga breathing exercises are therefore highly recommended for the lymphedema patient, especially when performed both before and following the poses.
- Slow poses are believed to enhance lymph flow (Bose et al, 2011)^{viii}, and a rest following each series of poses, prior to starting the next series, may help empty lymph vessels (Telles et al, 2000)^{ix}.
- Incorporate appropriate warm up and cool down periods in the yoga session.
- Poses that include weight bearing on the arms should be introduced slowly and progressively over time (see the PAL Protocol-based weight training guidelines on page 6). In general, this precaution applies to arm balances, inverted poses, and headstands. Specific poses include:
 - Plank (Chaturanga)
 - Four-Limbed Staff Pose (Chaturanga Dandanasana)
 - Downward-Facing Dog (Adho Mukha Svanasana)
 - Upward-Facing Dog (Urdhva Mukha Svanasana)
 - Upward Bow Pose (Urdhva Dhanurasana)
 - Half-Moon Pose (Ardha Chandrasana)
 - Side Plank Pose (Vasisthasana)
 - Cobra Pose (Bhujangasana). A modification for Cobra is Low Cobra aka Baby Cobra.

REFERENCES AND RESOURCES

- ⁱ *Risk Factors for Lymphedema after Breast Cancer Treatment*. Cancer Epidemiology, Biomarkers & Prevention. 19(11):2734-46. Norman SA, et al. (2010)
- ⁱⁱ *Weight Lifting in Women with Breast-Cancer–Related Lymphedema*, August 2009 New England Jnl Med.
- ⁱⁱⁱ *Weight Lifting for Women at Risk for Breast Cancer–Related Lymphedema, A Randomized Trial*, December 2010, Jnl of Am. Med Assn.
- ^{iv} *Weight Lifting and Lymphedema: Clearing up Misconceptions*, by Schmitz, Kathryn. Article written for the National Lymphedema Network and available on the NLN website at http://www.lymphnet.org/pdfDocs/Weight_LE_Misconception.pdf.
- ^v *Pilates for Breast Cancer Survivors: Impact on Physical Parameters and Quality of Life after Mastectomy*, Stan et al, Clinical Journal of Oncology Nursing, Vol 16, No.2
- ^{vi} Aaronson, N. and Turo, AM, *Living Life after Cancer*, with permission from Naomi Aaronson MA OTR/L CHT CPI and Ann Marie Turo OTR/L, Yoga/Pilates instructor. Available at <http://www.recovercisesforwellness.com>
- ^{vii} *Using Yoga in Breast Cancer-Related Lymphoedema*, Jnl of Lymphoedema, Loudon et al, 2012, Vol. 7 No. 1.
- ^{viii} *An Integrative Treatment for Lower Limb lymphoedema in India*, Bose et al, Br. Jnl Lymphy 5(1): 46-55
- ^{ix} *Oxygen Consumption and Respiration Following Two Yoga Relaxation Techniques*, Telles et al, Appl Psychophysiol Biofeedback 25(4): 221-27.

Resources

Select page links from www.stepup-speakout.org:

- What is lymphedema: http://stepup-speakout.org/What_%20is%20Lymphedema.htm
- Reducing your risk of lymphedema: http://stepup-speakout.org/riskreduction_for_lymphedema.htm
- Finding a qualified lymphedema therapist: http://stepup-speakout.org/Finding_a_Qualified_Lymphedema_Therapist.htm
- Breast Cancer-Related Lymphedema and Exercise, a printable handout you can give to your clients and students: <http://www.stepup-speakout.org/Handout%20doc%20for%20SUSO-030113.pdf>

National Lymphedema Network exercise position paper: <http://www.lymphnet.org/pdfDocs/nlnexercise.pdf>

Recovercises for Wellness, <http://www.recovercisesforwellness.com/index.htm> Provides workshop and online resources for rehab and ongoing fitness after breast cancer treatment. Naomi Aaronson uses traditional rehabilitation techniques as well as Pilates-based methods. Owners are occupational therapists.

PALS for Life: www.cancersurvivorfitness.com . Provides provides PAL Trial-compliant workshops for personal trainers who would like a hands-on introduction to weight training guidelines and precautions for those with and at risk of BCRL.

Acknowledgment

Step-up, Speak-out gives sincere thanks to the following individuals who donated their time and expertise to research, write, and review this document: Naomi Aaronson, OT, Carol Doeringer, Mary Eno, Joy Hirsch, Judith Nudelman, MD and Martine Sarret-Talvela. Thanks as well to others who prefer to remain anonymous, but whose contributions were equally important to the project.