Lymphoedema Management Strategy for Patients with a Body Mass Index (BMI) Equal to or Greater than 30kg/m²

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Date: 20.01.2014

Version: 1.0
Purpose:
To provide clear guidance for lymphoedema health care professionals on the management of patients with lymphoedema and a BMI of 30kg/m² and over.

Introduction:
National Statistics released from the Welsh Government in September 2012 from the 2011 Welsh Health Survey, showed that 57% of adults were classified as overweight or obese (including 22% obese). This has enormous implications on people’s health and lifestyle, as well as increasing financial burden for the National Health Service. These figures are considered worse than England, and even though the USA still has the highest rate for obesity, Wales is not far behind. Despite the government’s investment in promoting healthier lifestyles including taking on more active lifestyle obesity statistics remain high.

Lymphoedema is a chronic, incurable condition and it is essential that treatment is coordinated and standardised following the All Wales Lymphoedema Operational Framework (2012); patients are assessed, advised, encouraged and supported to engage in a programme of self management on a daily basis. Since the establishment of lymphoedema services throughout Wales at the end of 2011, there has been a gradual increase in the number of referrals made with obesity related co-morbidities. These lymphoedema obese patients require access to specialist services and equipment, as well as identifying other services that can collaborate in the ongoing management.

There were a number of recommendations made in the Welsh Government Lymphoedema Strategy2009) and key actions in the Operational Framework Document (2012) the two most pertinent to this policy include:

- All lymphoedema services in conjunction with physiotherapy and dietetics will offer an active management programme for obese patients
- Individual patient care plans must include a category for self management, for access to weight reduction programmes and signposting patients to Expert Patient Programmes

The National Institute for Health and Clinical Excellence (NICE) Obesity Guidelines published in 2006 (Office of Health Economics (OHE) 2010) recommend that:
Bariatric surgery is recommended as a treatment option for people with obesity if all of the following criteria are fulfilled:

- they have a BMI of 40 kg/m² or more, or between 35 kg/m² and 40 kg/m² and other significant disease (for example, type 2 diabetes or high blood pressure) that could be improved if they lost weight
- all appropriate non-surgical measures have been tried but have failed to achieve or maintain adequate, clinically beneficial weight loss for at least 6 months
- the person has been receiving or will receive intensive management in a specialist obesity service
- the person is generally fit for anaesthesia and surgery
- the person commits to the need for long-term follow-up

Bariatric surgery is also recommended as a first-line option (instead of lifestyle interventions or drug treatment) for adults with a BMI of more than 50 kg/m² in whom surgical intervention is considered appropriate.

However, from the Department of Health’s website, patients are encouraged to see their GP for advice on diet, exercise and medication. Bariatric surgery is only available on the NHS to treat people with potentially life-threatening obesity that will not respond to non-surgical treatments, such as lifestyle changes. Potentially life-threatening obesity is defined as:

- having a body mass index (BMI) of 40 kg/m² or above
- having a BMI of 35 kg/m² or above and having another serious health condition that could be improved if you lose weight, such as type 2 diabetes or high blood pressure

In Wales, the All Wales Obesity Pathway (AWOP) (2010) recommends which services should be made available to manage obesity, but is not intended to inform individual clinical treatment plans. The document states that bariatric patients should have access to specialist medical and surgical services including bariatric surgery. The Welsh Institute of Metabolic and Obesity Surgery have a strict set of criteria before a patient is considered for bariatric surgery.

Bariatric surgery is not readily available across Wales; however there are a few lymphoedema services within the UK who have initiated a formal protocol for the super-
obese (commonly BMI >60kg/m²) lymphoedema patient. At St George’s, a London NHS Trust they coordinate a ten day in-patient programme for lymphoedema management which includes cardiac, respiratory, and metabolic/endocrine, infection, genetics and bariatric assessment. The Northern Ireland Lymphoedema Network (LNNI) (2011) has produced guidance for the management of lymphoedema for patients with a BMI of 40kg/m² or above. In Wales bariatric lymphoedema patients are treated as any other patient with lymphoedema; however based on the mixed complexities a specific protocol has been developed.

1. Classification of Overweight or Obesity

1.1. The degree of overweight or obesity in adults is defined as follows:

<table>
<thead>
<tr>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe thinness</td>
<td>Moderate thinness</td>
<td>Mild thinness</td>
<td>Pre-obese</td>
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</tbody>
</table>

(WHO 2004)

1.2. Assessment of the health risks associated with overweight and obesity in adults should be based on BMI and waist circumference as follows:

<table>
<thead>
<tr>
<th>BMI classification</th>
<th>Waist circumference</th>
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<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Overweight</td>
<td>No increased risk</td>
</tr>
<tr>
<td>Obesity I</td>
<td>Increased risk</td>
</tr>
</tbody>
</table>

For men, waist circumference of less than 94cm is low, 94-102cm is high and more than 102cm is very high.

For women, waist circumference of less than 80cm is low, 80-88cm is high and more than 88cm is very high.

(NICE 2006)
2. Obesity and Lymphoedema Evidence

There is limited robust research on lymphoedema in general but there is a good scientific link between lymphoedema development and obesity. A BMI over 25 kg/m\(^2\) is associated with greater risk of developing lymphoedema (Park, 2008 & Silberman., et al, 2004).

BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m\(^2\)) (WHO, 1995) (see diagram in section 1.1.)

Johansson, (2002) demonstrated a link between BMI and occurrence of lymphoedema following treatment for breast cancer. Those with a BMI outside the normal range had a higher risk of developing lymphoedema following treatment. Additionally, Ahmed (2006), reported that a higher BMI and poorer general health at baseline are risk factors for developing lymphoedema following treatment for breast cancer.

Helyer, et al., (2009) studied one hundred and thirty-seven patients who had undergone sentinel node biopsy with or without a completion axillary lymph node dissection, with the aim of establishing the risk factors for developing lymphoedema. They found that the development of post-operative lymphoedema was primarily and significantly related to a person’s BMI and that a BMI >30kg/m\(^2\) was a risk factor for developing lymphoedema following treatment for breast cancer. Beasley, et al., (2007) reported that those receiving treatment for uterine and ovarian cancer treatment with obesity had higher risk of developing lymphoedema following treatment. Silberman, et al., (2004) found 54 out of 94 participants were classified as overweight and obese at the time of surgery (BCRL) and established an association between obesity and lymphoedema. Ridner and Dietrich, (2008) found raised BMI, orthopaedic issues, cardiac medication and diabetes were common among women with BCRL; whilst Clarke, et al., (2005) identified skin puncture, mastectomy and obesity as risk factors to BCRL.

The relationship between obesity and breast cancer related lymphoedema was explored by Petrek et al (2001); 263 women were assessed at a single point 20 years following
surgery to determine predictive factors influencing the development of lymphoedema. Using weight categories: 1) No change; 2) Gain of 10lbs; and 3) Gain greater than 10lbs. The data demonstrated 38% had lost weight or remained stable, 30% had gained less or equal to 10lbs and 32% had gained weight greater than 10lbs. When comparing these numbers against those who had developed lymphoedema, the data confirmed out of 128 participants classified as suffering from moderate to severe lymphoedema 70% had gained weight after diagnosis and treatment. Obesity at diagnosis was also proved to be of significance (P=0.01) in those with severe lymphoedema compared to women without lymphoedema. Participant recall admitted those individuals heavier at diagnosis continued to weight gain throughout the 20 years.

Mak, et al., (2008) looked at predictors for development of lymphoedema in those who underwent treatment for breast cancer and found that greater BMI and increasing BMI, even in the lower BMI population, was a risk factor for developing lymphoedema. Wannapa, et al., (2008) found a greater risk of developing lymphoedema in those with a BMI >30kg/m² and Park, et al., (2008) also found a greater risk of development of lymphoedema with a BMI > 25 kg/m². Fife and Carter, (2008) reported that in those with obesity and lymphoedema, lymphoedema treatments were useful provided patients were able to follow treatment guidelines, especially with regard to weight control. They found that massive localized lymphoedema reoccurs unless the primary issue of obesity is addressed. They recommended establishing clear criteria and patient participation guidelines before initiating comprehensive treatment in order to improve outcomes.

Vasileiou, et al., (2011) examined lymphatic function by means of lymphoscintigraphy. They looked at 49 female subjects with pitting oedema and divided them into 3 groups, one being severely obese patients where cardio-respiratory causes had been excluded. This group showed fewer and milder lymphoscintigraphic abnormalities than the other groups, perhaps indicating that with weight reduction and appropriate lymphoedema treatment, lymphoedema could have been reversed. Pillar, (2008) proposed that often when pts with lymphoedema lose weight, the lymphoedema appears to resolve acknowledging the relationship between lymphatics and adipose tissue. Khan, et al., (2012) looked at the impact of bariatric surgery on obesity related lymphoedema in the super-obese. They noted that intra-gastric balloon insertion in super-obese individuals
with lymphoedema resulted in excess weight loss as compared with case matched non-lymphoedematous patients, suggesting that weight loss also improves lymphoedema.

Co-morbidities such as cardiac failure sleep apnoea, diabetes and arthritis should be recorded, as well as a record of patient’s medication (Stigant, 2009, Fife, et al., 2008, Fife & Carter, 2009, Todd, 2009)

Patients with obesity can present with low mood, depression, low self-esteem, low body image, lack of motivation and many other negative emotions about themselves and their health status (Woods, 2002, Green, 2008). More recently, Manduch, et al., (2009) retrospectively studied 22 cases of Massive Localised Lymphoedema (MLL) with a mean body weight of 186kgs (116-247kgs), conclusions emphasized the challenging nature of MLL, when those suffering showed ambiguousness towards the condition, with many only seeking medical attention when their daily life and mobility were affected. This upholds Sitzia, et al., (1998) viewpoint that the longer the swelling has been present the more complex it is to treat. Stigant, (2009) highlighted how management options narrow with the presence of a large abdominal girth resulting in the individual’s inability to reach their feet, so inevitably the ability to perform foot and skin care unaided is compromised, as is the ability to don and doff their compression stockings effectively.

It is clear from the literature that being overweight or obese has a negative impact on lymphoedema. This suggests that as lymphoedema practitioners we should be advising patients to keep their weight within normal limits. For those who are morbidly obese it appears that with clarification of objectives, intensive treatment can be beneficial. However, to maintain any changes obtained during treatment, the patient will need to adhere to the management goals including the maintenance of any weight reduction.

3. Assessment of Oedema in the Obese Patient

All patients with lymphoedema who are obese will be offered a full lymphoedema assessment so that a differential diagnosis can be distinguished between chronic oedema, lymphoedema, lipoedema and obesity. Co-morbidities such as cardiac failure, sleep apnoea, diabetes and arthritis should be recorded, as well as a patient’s medication. Assessment should be made of the duration and extent of the oedema, the areas affected; the condition of the skin and subcutaneous tissues; the presence of pitting, skin folds and
any complications that may present secondary to their oedema. In this group of patients both legs are usually affected, however one may be worse than the other.

Assessment techniques used will include:

3.1. **Measure Limb Volumes**

There are different methods for assessing swelling of the limbs. The most commonly practiced method in Wales is circumferential volume measurements using a tape measure every 4cm and recording the data on the Lymcalc programme. The therapist repeats the measurements on follow up appointments which then translates this into a volume for the area(s) measured.

![Graph showing volume measurements over time]

It is recognised that in the obese patient mobility may be severely restricted thus making it very difficult for the therapist to take accurate volume measurements for the Lymcalc programme. However, without some basic measurements such as ankle, mid-calf and below knee circumferences being recorded, there is no measureable means of establishing outcomes measures demonstrating effectiveness.

The recommendation for measuring limb volume is that every person being assessed for lymphoedema has a baseline measurement of their oedema taken, preferably the Lymcalc method, but at the very least the 3 basic measurements must be recorded (All Wales Limb Volume Measuring Policy, 2013).
3.2. **Weight, Height (BMI) and Waist/Neck Circumference measurements**

Weight and height measurements should be taken at the first assessment to determine a patient’s BMI. The weight measurement should be repeated at each review assessment to monitor any change in BMI. Circumference measurements of either the waist or neck can be taken to monitor change in weight.

3.3. **Photographic Evidence**

Photographs are a useful tool to monitor any change in limb and/or body shape and skin integrity. Care should be taken to ensure that the position of the patient and then angle of the camera is replicated. Alternatively utilising medical photography may be of value. Patient consent must be achieved prior to photography being taken.

3.4. **Stemmer’s Sign**

This is an indicator for the presence of oedema in the foot (or hand). The skin is pinched and lifted up at the base of the second toe (or middle finger for hand oedema).

A positive Stemmer’s sign is when a skin fold cannot be raised. It is important to remember that a negative sign may occur in proximal descending lymphoedema and does not exclude lymphoedema.

3.5. **Pitting Nature of Oedema**

This indicates the staging of the lymphoedema; in acute oedema the tissues are soft and pitting on light pressure, in more chronic cases the tissues may have undergone fibrotic changes which may present as a negative pitting oedema test,
even though oedema is visible. The test is done by pressing firmly, but without causing pain, on the area to be examined with a finger or thumb for a count of at least 10 seconds. If an indentation remains after releasing the pressure, then pitting is present (ILF, 2006).

### 3.6. Skin Assessment

A thorough examination and inspection of the skin and underlying tissues is required to detect any signs and symptoms of lymphoedema and its complications. Skin changes may include dryness, pigmentation, fragility, hyperkeratosis, peau d’orange (orange peel skin), papillomatosis, eczema, dermatitis, cellulitis and fungal infection. The presence of any wounds - superficial or deep - ulcers (venous and/or arterial) and lymphorrhoea should also be made. A thorough medical history may provide more information regarding dermatological conditions, vascular disease and history of repeated cellulitis.

### 3.7. Condition of Nails

The status of the patient’s nails can give an indication as to their ability to self-manage their lymphoedema. Check for signs of fungal infection, inspect the length of the nails and their cut edges. Ask whether or not the patient is managing to maintain their own nails, and if not, what access to support they may have.

### 3.8. Presence of skin folds/creases

This is a complication of lymphoedema that if left untreated will progress over time. These folds are usually found around the ankles, but may be present at the forefoot, toes and above the knee. Skin folds may also be present around the wrist and elbows. In severe cases numerous skin folds may be present especially in the thigh, abdominal and supra-pubic regions. Skin folds may limit joint movement and prohibit application of garments at the time of assessment. Depending on the severity of the skin fold(s), planning for a course of bandaging may be required.

### 3.9. Mobility and Function

It is essential that a patient’s mobility is assessed as movement and exercise is vital for successful management of lymphoedema. Look at the joint range of movement of the ankle, knee and hip to assess how much any excess tissue may be impeding movement. Test the patients’ functional capabilities such as getting up from a bed or chair, taking off
or putting on their shoes, walking on a flat surface, climbing steps and getting onto a bed. Consideration of the patient’s mobility to perform daily activities needs to be addressed and referred on for further assessment and support if limitations are noticed.

Without bed rest, the patient’s oedema will not be able to reduce and they are at increased risk of skin breakdown and wounds.

3.10. Psychological and Emotional Status

Patients with obesity can present with low mood, depression, low self-esteem, low body image, lack of motivation and many other negative emotions about themselves and their health status. They report lack of support and understanding from family, friends, health professionals and the general population in accepting them or helping them to change their lifestyles as reasons behind their negative emotional status. It is important to understand where the patient is on their journey towards improving their health so that an appropriate management plan can be agreed, which may include referral on to other services.

4. Management of Lymphoedema

A plan of care needs to be agreed and set with the patient at the time of assessment. This should be regularly reviewed to ensure that the patient remains motivated with the management plan and that it is still pertinent.

The management plan should include:

4.1. Skin Care

This is fundamental in lymphoedema management. Skin care includes washing the skin with warm water and soap or soap substitute, drying the skin especially between the digits and, applying an appropriate emollient to the skin. If a patient is unable to independently wash, dry and moisturise their body and limbs, access or referral to support is necessary.

If the patient presents with dermatological problems and/or wounds it is essential that they be referred to the appropriate service for advice and management of their skin condition and/or wounds. Working collaboratively with these teams provides the best care for the
patient until they are able to self-manage, or until support is in place to continue with the management plan. Patients should be encouraged to bring any prescribed ointments and dressings to their lymphoedema appointments to ensure continuity of prescribed care.

The condition of the patient’s nails must also be included in the management plan; if the patient is unable to cut and care for their nails then a referral to podiatry or chiropody must be made. If this service is unavailable to the patient, then access to alternative resources needs to be sourced.

It is recommended that should a patient not be concordant to their basic skin care plan of washing and applying emollients by the time of their next review, they are to be discharged from the lymphoedema service. This is due to their lack of concordance. They can be re-referred to the service if they feel ready to comply with the treatment plan.

4.2. **Activity, Exercise and Movement**

There are a variety of exercises that patients can do to improve their movement. Regardless of the patient’s health status there is a form of exercise they can do regularly.

- Abdominal breathing exercises can be done lying down, sitting or standing up. It will not only help siphon fluid from the limbs, but is a great way to promote relaxation.
- Circulatory exercises such as flexing and dorsi-flexing the foot, rolling circles with the foot and/or wrist, tapping toes and heels when sitting with feet down.
- Chair exercises will include straightening and bending the knee, extending the knee and flexing the foot, lifting arms one at a time upwards, bending down and sitting up etc.
- Practice sitting down and standing up from the chair.
- Walking – stepping on the spot, take short walks and progress to longer walks.
- Step up and down on a low step or the first step on the staircase.
- Resistance exercises using different elastic bands to perform exercises to strengthen muscles such as straightening the knee, bicep curls etc.
- More active forms of exercise include swimming, aquarobics, cycling, Tai’ Chi, Yoga, power plate, gardening, golf, to mention but a few.
Lymphoedema exercise information leaflets provide guidance and suggestions for activities to promote the muscle pump action in lymphoedema management. Access to different exercise schemes needs to be sourced and patients encouraged to attend programmes such as the National Exercise Referral Scheme (NERS), community exercise programmes and other activity schemes like walking or rambling groups.

The patient needs to agree to increase their current level of activity at assessment to promote better muscle pump activity on the lymphatics. If the patient has not altered their level of activity after a year, the therapist should consider discharging the patient from the service. This is due to their lack of concordance. They can be re-referred to the service if they feel ready to comply with the treatment plan. All patients can perform gentle exercises.

### 4.3. Weight Loss Management

It is well documented that fat and obesity has a negative impact on lymphoedema. It is therefore critical that patients are instructed to actively take control of their weight management. There are a number of programmes and resources available to patients to assist them in reducing their weight.

Suggestions may include:

- Keeping a food diary
- Commercial weight loss programme
- GP surgery
- British Heart Foundation Weight Management
- Food Standards Agency
- Food Plate guide

Patients should be encouraged to increase their fluid intake, preferably water, and to eat three meals per day. Literature is available from the Lymphoedema Support Network (LSN), Macmillan and Change for Life to support, advise and motivate patients.

The patient must pledge to a weight loss plan as part of the lymphoedema management plan. If after a year from their first assessment the patient has lost or maintained their weight, the treatment plan should be reviewed and the patient supported to continue with the plan. If however, the patient has increased their weight after the year and their
lymphoedema remains uncontrolled, the patient is to be discharged from the lymphoedema service; however, if their weight has increased but their lymphoedema is controlled, the therapist can make the clinical decision not to discharge the patient, but on condition that the patient renews their pledge to lose weight.

4.4. Compression Therapy

In the presence of lymphorrhoea and/or wounds, lymphoedema bandaging should be performed in collaboration with primary and secondary care until garment application is appropriate. Where possible, patients presenting with skin conditions, skin folds or misshapen limbs, can be fitted into a suitable garment if available. The therapist is to follow the All Wales Lymphoedema Operational Framework until a scheduled course of lymphoedema bandaging is available (must be within 6 months from assessment). Should the limbs have an adequate shape, they can be immediately garmented and reviewed as per the All Wales Lymphoedema Operational Framework.

*If the patient's lymphoedema is controlled, their weight managed and the garment available on FP 10, the patient can be discharged to primary care.*

4.5. Simple Lymph Drainage

This is a self massage aimed at promoting lymphatic drainage away from a swollen site. It can be performed by the patient and/or their carer and is best done daily. The massage involves deep breathing exercises and a sequence of slow, stroking and pumping techniques to stimulate lymph nodes to take up fluid that is drained towards them. The advantage of this massage is that patients are encouraged to touch their skin and body which helps them to recognise their own body shape; thus raising self-awareness of the tissues that may hinder flow of lymph.

4.6. Service Resources

Each lymphoedema service in Wales should have a patient information board. The information on this board needs to include information on:

- weight loss
- NERS / community exercise programmes
- local / national support groups
Lymphoedema services need to work collaboratively with other partners in both primary and secondary care and should look to develop links with:

- Tissue Viability Nurses, Dermatology Nurse Specialists
- Leg Clubs or Complex Leg Clinics
- Dietetics
- Physiotherapy
- Occupational Therapy
- Psychological Services
- Podiatry
- Manual Handling Teams
- Bariatric Service Teams
- Community Teams, District Nurses, GP
- Other Specialist Teams
- This list is not exhaustive and where possible links are encouraged with other teams involved in the patients care.

5. Risk Assessment

When managing patients with obesity and lymphoedema, considerations regarding Health & Safety, Manual Handling and the Disability Discrimination Act need to be taken for both the patient and the therapist(s). Risk reduction measures must be implemented, and where necessary Risk Assessment Forms completed to identify areas of concern to management.

Areas where risk may be identified include chairs, plinths, access to clinics, bandaging and the disabled patient.

<table>
<thead>
<tr>
<th>Risk Identified</th>
<th>Guidance</th>
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<tbody>
<tr>
<td>Waiting area</td>
<td>Provision needs to be made for chairs to accommodate larger patients.</td>
</tr>
<tr>
<td>Treatment chairs</td>
<td>Chairs are available with weight mass of up to 40 stone (254kg).</td>
</tr>
<tr>
<td>Weighing scales</td>
<td>Scales to accommodate up to 250kg; if scales unavailable or if patient’s weight exceeds scales, it is recommended that waist or neck</td>
</tr>
</tbody>
</table>
**Summary**

From the evidence presented, all patients in Wales with a BMI of 30 kg/m² or more will benefit from a comprehensive assessment of their lymphoedema. An individual treatment plan will be agreed with the understanding that the patient will engage fully with the management of their condition. Self-management is integral and lymphoedema services will offer intensive treatments as per the patient’s needs that are identified. Kroger, (2008) states that it is inevitable when two or three of the prescribed treatments are absent from the lymphoedema treatment regime, compliance is affected and optimum limb volume reduction and reshaping fails; the end result being an unsuccessful and futile treatment outcome (Todd, 2009).

The patient needs to understand that they will be entering into a lifelong commitment for their lymphoedema management and that they will be discharged from the lymphoedema service should they prove to be non-concordant.

The advice in this document will give lymphoedema patients a fair chance to live a full and healthy life. Lymphoedema is a life-long condition and with correct consistent self-management, and support from a lymphoedema specialist, it can be managed successfully.
References


All Wales Lymphoedema Network (2013). *All Wales Lymphoedema Guidance: Measuring Limb Volumes to Determine Lymphoedema Outcome*


