

## **OEDEMA AND PREGNANCY**

### **Is it safe to massage the pregnant client who has oedema?**

Oedema is a common problem in pregnancy, although there does not seem to be substantial information about this topic in relation to massage therapy. Massage has been recommended as a method of manual lymphatic drainage, to assist with the discomfort the pregnant client may be experiencing due to the accumulation of interstitial fluid. Physiologically however there are some issues that warrant further investigation.

Although oedema in and of itself, may be a benign condition during pregnancy, it may also be symptomatic of other more serious conditions, such as pre-eclampsia, and eclampsia. Oedema can also result from cardiomyopathy, hypertension, and mechanical obstruction from a deep vein thrombosis and or the pressure on blood vessels caused by the developing fetus.

In this article I will discuss some of the conditions relating to oedema and pregnancy and the implications of these conditions for the massage therapist.

### **Why is it important for massage therapists to be informed about pregnancy and Oedema?**

Many massage therapists treat clients who at some time in their life may become pregnant. Some of these clients may have been treated by the therapist in the past for oedema or swelling of some kind. If these clients should notice some swelling or oedema formation during their pregnancy they may, once again return to their massage therapist for treatment.

There is also the possibility that regular clients who become pregnant may not notice the formation of oedema. These clients may continue to have regular massages, oblivious of any potential hazard.

Oedema is a common occurrence in pregnancy and the therapist needs to be aware of the special significance of oedema during this time if they are to continue in the appropriate management of their client.

### **Fluid balance in the body**

Within the human body there are dynamic systems that must be kept in perfect harmony to maintain the health of the organism. To maintain a perfect balance of fluid between the circulatory system and the tissue, the circulation must be operating normally, both in the structure of the carrying vessels and the constituents of the blood itself. The pressure of the blood being pumped by the heart must be maintained within a specific range or excessive plasma can be forced through the capillary walls to accumulate in the interstitial tissue. The action of contracting skeletal muscles form a strong dynamic pump by squeezing veins and forcing blood back toward the heart. Strong active muscles will make the system extremely efficient, and weakened muscles or immobility will decrease its effectiveness. A delicate balance is maintained between the volume of blood being returned to the heart and the volume being pumped by the heart. A system of fluid balance maintenance must also operate successfully at the arterio-venous capillary loop. Fluid forced from the capillaries will in time, form lymph and through the lymphatic system, eventually be returned to the blood stream. Any excessive fluid in the blood stream will stimulate additional activity by the kidneys, resulting in the formation of urea, which is expelled from the body, effectively lowering blood volume and restoring homeostasis.

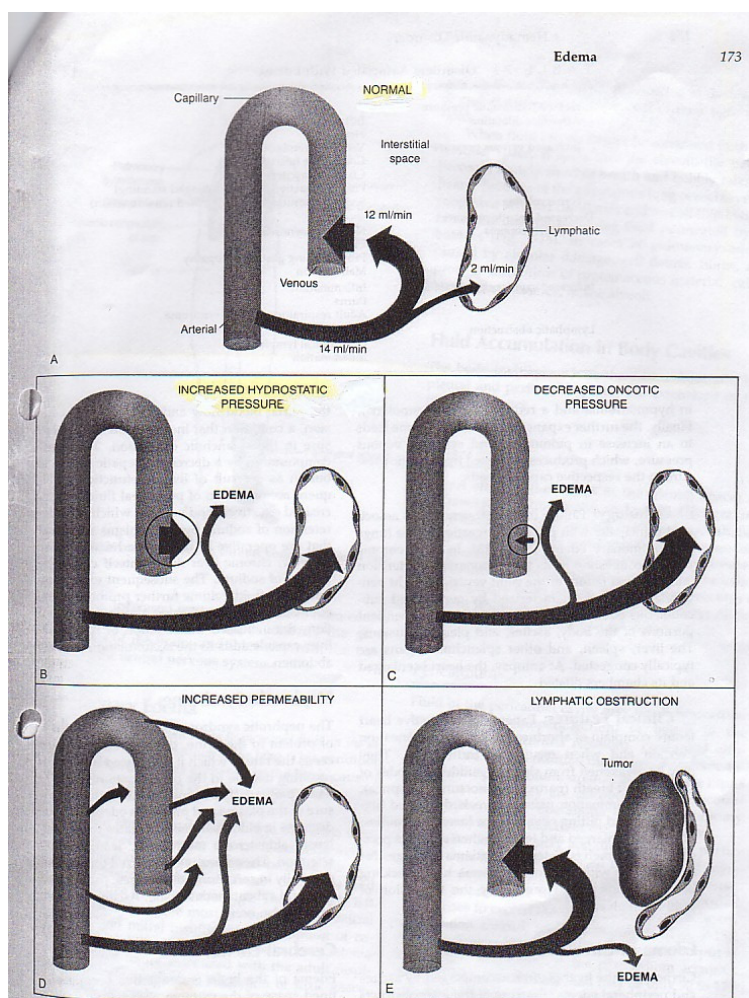
### **What is Oedema?**

Oedema is the abnormal accumulation of fluid in the interstitial spaces of tissues. ( Mos dic.) It may be associated with inflammation or poor circulation. It can have several causes, generally a combination of chemical and mechanical factors.

Normal formation and retention of interstitial fluid depends on filtration and reabsorption at the level of the capillaries. The determining influences on this filtration and reabsorption dynamic, are called Starling forces (essential pathol). The Starling Equilibrium states that the forces that cause fluid to leave blood capillaries should *almost* equal the forces that cause fluid to be reabsorbed by blood capillaries, and that anything left over (which should be about 10%) should be taken in and absorbed by the lymph system. Lymph capillaries are perfectly designed to pick up excess interstitial fluid, each squamous cell is anchored to surrounding tissue by a collagen filament. When excess fluid accumulates in any area, these anchoring filaments pull back on the squamous cells, thus increasing the lymph capillary's ability to take in fluid. (Mass th pathol)

When more fluid builds up in the tissues than the circulatory and lymph systems can accommodate, this is termed Oedema.

Oedema isn't generally noticeable until the interstitial fluid volume has increased approximately 30% above normal. Some mechanisms responsible for this excess accumulation of fluid in Oedema are:



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Mechanical factors which, may be from an obstruction of some kind to the circulatory and lymph system:

An increase in hydrostatic pressure will result in greater filtration of fluid into the interstitial space and its retention as Oedema, as with back-pressure caused by venous obstruction in the lower extremity from the weight of the fetus.

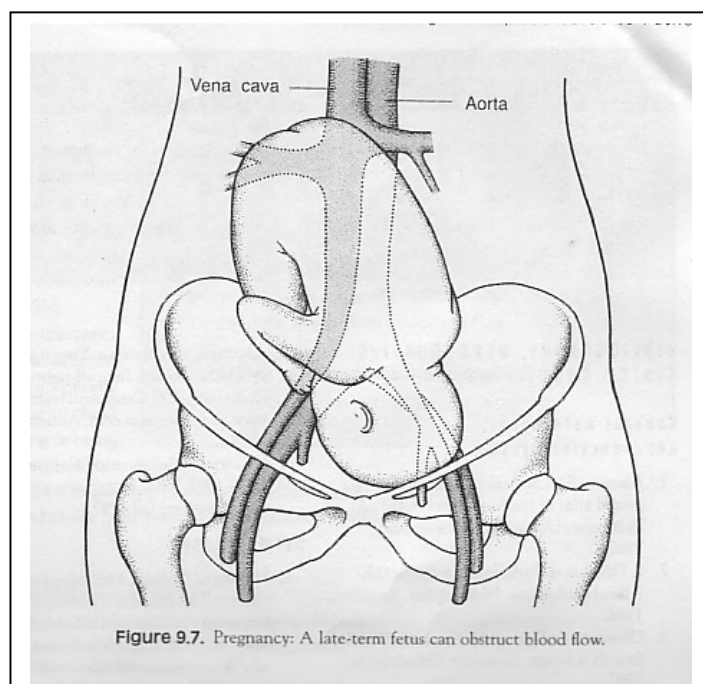
Increased venous pressure from venous thrombosis.

A weakened heart. (mass ther pathol) or kidney problems – leading to a reduced filtration rate. With cardiomyopathy for example the heart is unable to effectively resist the forces of gravity and lift blood from the lower extremities. This leads to blood pooling and increased capillary pressure. The increased capillary pressure upsets the balance of filtration and

reabsorption, causing an additional amount of plasma to leave the capillaries than can be reabsorbed and oedema occurs.

Obstruction to the lymphatic system caused by a tumor, fibrosis resulting from inflammation, or surgical removal of lymph nodes, reduces the effectiveness of lymphatics to remove even normal amounts of interstitial fluid and can therefore result in the formation of oedema.

## A fetus in the last trimester of pregnancy can obstruct blood flow



**Chemical factors** such as the accumulation of proteins will change the osmotic pressure of the extravascular fluid and result in an increased movement of fluid from the vascular compartment and blood stream toward the protein rich fluid in the interstitial space. The normal movement of plasma which is rich in several proteins, the most common of which is albumin, means that the lymphatic system must also return these proteins as well as fluid to the circulatory system to maintain homeostasis. If blood protein levels should fall the plasma colloid osmotic pressure will not be sufficient to resist the pull of the more concentrated fluid in the interstitial tissue and fluid will be lost. A sluggish lymphatic system, or one impaired by physical immobility, obstruction or poor vascular circulation may also be unable to effectively remove protein rich fluid through its network of lymph channels. This poor lymph circulation will lead once again to a greater osmotic pressure in the extravascular space than exists in the intravascular compartment. Prostaglandin's released at the site of irritation and important in the inflammatory process can alter the permeability of the basement membrane of the capillary and allow greater movement of fluid to exit the blood stream. Prostaglandins are also released as part of the stress response.

## Disorders Associated with Oedema

Increased hydrostatic pressure Arteriolar dilatation	Inflammation Heat
Increased venous pressure	Venous Thrombosis Congestive heart failure Cirrhosis (ascites)
Hypervolemia	Postural inactivity (e.g. prolonged standing) Sodium retention (e.g., decreased renal function)
Decreased oncotic pressure Hyperproteinemia	Nephrotic syndrome Cirrhosis Protein-losing gastroenteropathy
Increased capillary permeability	Malnutrition Inflammation Burns
Lymphatic obstruction	Adult respiratory distress syndrome Cancer Postsurgical lymphedema Inflammation

### Pre-eclampsia

Pre-eclampsia occurs in approximately 5% of all pregnancies.

[http://content.health.msn.com/content/asset/adam\\_disease\\_eclampsia](http://content.health.msn.com/content/asset/adam_disease_eclampsia) It is an abnormal condition of pregnancy characterized by the onset of acute hypertension after the 24<sup>th</sup> week of gestation.

The three classic symptoms of pre-eclampsia, are hypertension, (high blood pressure) proteinuria (presence of high concentrations of protein in the urine) (Charles, Linda Ludwig) and pathologic oedema. The cause of the disease is unknown. It occurs in 5-7% of pregnancies most often in primigravida. It increases with gestational age, hydatidiform mole (placenta that has grossly swollen villi, resembling grapes, in which there are varying forms of trophoblastic proliferation. There is no embryo) (Encyclopedia and dictionary of Medicine nursing+allied health Miller-Keane) or hydraminas (excess amniotic fluid).

Pre-eclampsia commonly causes abnormal metabolic function, including negative nitrogen balance, increased central nervous system irritability, hyperactive reflexes, hemo-concentration, and alterations of fluid and electrolyte balance.

Complications include premature separation of the placenta, fetal malnutrition, lowered birth rate, cerebral hemorrhage, pulmonary Oedema. The most serious is eclampsia, which can result in fetal and maternal death. (mos,dic)

### Eclampsia

The cause of eclampsia as with pre-eclampsia is not known. Numerous theories of potential causes range from dietary, genetic, vascular and neurological factors.

([http://content/adam\\_eclampsia](http://content/adam_eclampsia)) Eclampsia is the gravest form of toxemia of pregnancy and is characterized by grand mal convulsions, coma, hypertension, proteinuria and oedema. (Mos dic) the symptoms of impending convulsions often include anxiety, epigastric pain, headache and

blurred vision. Maternal mortality in eclampsia is 10%, fetal mortality is 25%. Eclampsia occurs in 0.2% of pregnancies. (Mos dic)

### **Pregnancy and High Blood Pressure (Hypertension)**

Hypertension can be chronic, existing before pregnancy, or pregnancy induced (PIH) as with pre-eclampsia. With pregnancy hypertension can be very serious and lead to fetal and neonatal morbidity (mental and physical disabilities) and mortality. The baby is at risk when blood flow through the vessels supplying the placenta is cut by half or more depending on the severity of the pre-eclampsia. (The American College of Obstetricians and Gynecologists, 1996)

Increased blood pressure drastically reduces the efficiency of the placenta delivering nutrients to the baby. In (PIH) for some reason the pregnant women's vascular system is altered and does not respond to pregnancy in the normal way. The mother's blood vessels change, with altering lengths of dilation and constriction. Like a string of sausages. This is similar to what happens in pre-eclampsia. Because blood flow is restricted in the narrow portions, this creates more pressure in the blood vessels and forces fluid out into the interstitial space. This causes the three signs that are used to diagnose pre-eclampsia, oedema, proteinuria, and hypertension. (net 3172.10891) With decreased blood flow and volume in the vessels the placenta distributes less oxygen and nutrition to the fetus, this can interfere with normal growth and development of the baby. If blood pressure continues to get higher and higher, the kidneys may have trouble functioning. There can be changes in the makeup of blood, such as destruction of red blood cells (causing anemia), disturbed liver functioning and decreased platelets (blood cells involved in clotting). Too few platelets can increase the risk of bleeding uncontrollably during delivery or spontaneously. (net art 3608.990) Although this is not common, if the condition is undetected and untreated it can obviously cause severe problems.

### **There is a greater chance of developing pre-eclampsia in:**

- ❖ Women giving birth for the first time
- ❖ Women with pre-existing hypertension
- ❖ Women with diabetes or obesity
- ❖ Women carrying twins
- ❖ Women who have had pre-eclampsia in a previous pregnancy
- ❖ Teenagers or over 40yrs
- ❖ Women that smoke
- ❖ Women that are suffering from malnutrition

### **What are the signs and symptoms that indicate the need for referral ?**

- ❖ Rapid weight gain, 1-2 pounds in a single week
- ❖ Swelling of feet, legs, face and arms
- ❖ Headache
- ❖ Vision changes (E.G. blurring, seeing double, seeing spots of light)
- ❖ Abdominal pain
- ❖ Ringing in ears
- ❖ Decreased production of urine
- ❖ Nausea vomiting, after 20<sup>th</sup> week
- ❖ Pain in the upper right side of the abdomen
- ❖ Confusion
- ❖ seizures

Once there is confusion and seizures with other stated symptoms you are considered to have eclampsia .A life threatening situation for mother and baby.

With pregnancy the mother might not feel different until blood pressure is dangerously high. The regular monitoring of blood pressure is of great importance in pregnancy.

Although the massage therapist is not qualified to make judgments on the relative significance of blood pressure readings for diagnostic purposes, they can assist there client to be aware of changes that may be occurring.

### **Blood Clotting and DVT**

Blood clotting capacity increases during pregnancy four time to that of the non pregnant state. Fibrinolytic activity (clot dissolving) decreases, so that women are protected from potential haemorrhage during child birth. This also however, increases the risk of the formation of blood clotts. The formation of clots is greatest in veins where blood is moving slowly or stagnant. These are generally the saphenous, iliac-femoral veins. This is due to the restriction of iliac and femoral venous return, caused by the weight of the enlarged uterus on the vessels and hormonal influences on vascular smooth muscle and on blood fluid volumes.

Massage is contraindicated with any mechanical blockage anywhere in the circulatory system because it can damage the delicate structures or detach a small portion of the obstruction which, may then become an embolus. The lodgment of an embolus in the lungs, heart or brain is a life threatening condition.

### **Is Massage safe for the Pregnant Client who has oedema?**

When a massage therapist is working with a pregnant client there are always special considerations that must be taken into account. Oedema in pregnancy may be completely benign an simply due to the increase in normal somatic fluid volume. The massage therapist must consider the more sinister conditions that may be associated with oedema and pregnancy however, and take extra precautions. It is impossible for the massage therapist to determine which states of oedema are benign and which may pose a significant threat to the health of their client and baby.

The therapist also needs to be aware that with the already extra load from pregnancy on the heart, liver and kidneys, from increased somatic fluid volume, additional weight gains and the energy requirements of the developing fetus, massaging clients with oedema has the potential to exacerbate an already overtaxed system.

Manual lymphatic drainage increases the volume and rate of return of lymph fluid to the vascular circulation. This in effect has the potential to temporarily increase blood volume. The heart copes with increased blood volume by decreasing contraction rate while increasing contraction force. This increased contractile force is necessary to circulate the greater volume of fluid around the body and can place the heart under an additional stress load. In the normal healthy client this is not a significant problem as the kidneys are quickly able to increase their level of activity, draw fluid from the blood to form urea, which is expelled and fluid balance is restored.

If the kidneys are not filtering blood fast enough because of chemical imbalance or mechanical obstruction, or an already overloaded system, massage that involves lymphatic drainage is likely to further stress the system by increasing blood volume further.

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Mass th path

Charles, linda Ludwig

[http://content.health.msn.com/content/asset/adam\\_disease\\_eclampsia\\_7/5/01](http://content.health.msn.com/content/asset/adam_disease_eclampsia_7/5/01)

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Essential Pathology

Modern Treatment for Lymphoedema. Judith.R.Casley Smith, J.R Casley Smith 1997Australia, Adelaide

(The American College of Obstetricians and Gynecologists, 1996)

([http://content.health.msn.com/content/article/3172.10891\\_7/5/01](http://content.health.msn.com/content/article/3172.10891_7/5/01))

