

# Toxins

Toxins are noxious or poisonous substances which can be harmful to the body. Although mostly of plant or animal origin toxins can also include inorganic elements or compounds some of which are essential and form the mineral constituents of cells. These compounds or trace elements include aluminium, calcium, phosphorus, potassium, sulphur, sodium, chlorine, magnesium, iron, fluorine, iodine, copper, manganese, and zinc. Whilst they mostly exist in a harmonious stability, an excess of one element, such as aluminium, can be harmful to the body.



**Photograph 1:** With the intermittent pressure technique the lymph vessels are gently compressed and stretched in two directions

The most common form of toxins to occur are those produced by bacteria. Such poisons are either released by the micro-organisms (exotoxins) or occur as a result of the bacteria being destroyed (endotoxins). Toxins can be found within the cells or in the interstitial spaces. They can also be transported in the blood. Poisonous substances which are produced by a bacteria growing in a local or focal site can be distributed throughout the body via the blood (toxaemia). This results in generalised symptoms, e.g. fever, diarrhoea, vomiting, changes in the pulse rate and in respiration.

A distinction can also be made between toxins that are endogenic i.e. generated within the body as a result of infection or during the normal process of metabolism, and those which are exogenic and therefore introduced into the body. Toxins can enter the body through the skin as in the case of a bee sting, a snake bite or an open wound. They can also be taken in through the mouth with the intake of fluids like alcohol (intoxication), foods, drugs, chemicals, preservatives, additives etc. A high protein diet can result in highly toxic products including ammonia, phenols and hydrogen sulphate. Toxins can also result from poor digestion of protein.

Some toxic materials are released into the body by dentistry and, to an extent, conventional medicine. Typical examples are metals such as mercury, palladium and nickel; also chemicals such as formaldehyde (a colourless poisonous gas, made by the oxidation of methanol - alcohol). Allergic material such as pollens are also poisonous and cause a hypersensitivity Assay Test, the Saliva IgA test for immune function, and the urine test for liver function (Hall G. and Winkvist L., 1996). Stress weakens the body's immune system and consequently exacerbate the effects of toxins. The conditions which can be associated with toxins are numerous. Some of these however go undiagnosed as their symptoms are mistakenly contributed to other disorders and not to toxicity.

### **Treatment of toxicity**

Toxins which are circulating in the blood are normally eliminated through the colon, the kidneys, the lungs, by the liver via the bile, the mucus membranes, and the sweat glands in the skin. Other toxins like bacteria and minute particles such as coal dust are taken up and neutralised by the lymphatic system. Toxic substances can bind to proteins in the interstitial tissues and are then broken down by the action of phagocytes.

In treating toxicity it is first necessary to identify all the substances which cause the accumulation in the first place. Whilst it is imperative to avoid such harmful products it is not always feasible to remove them entirely from the diet or the environment. A bigger problem concerns medication which is used to treat some conditions. This cannot and indeed must not be stopped without the approval of a doctor or without appropriate substitutes or treatment. Some diet changes are easy to implement albeit that they are best carried out under the guidance of a naturopath or clinical dietician. Fasting is one of the best methods of getting rid of toxins, but this too requires similar supervision when it is undertaken for more than a day or two. Supplementation with nutrients, especially sodium-ascorbate (Vitamin C), and with herbs are also effective. All these factors must be taken into consideration prior to or alongside the massage treatment.

### **Effects and application of massage**

Massage is very beneficial in the treatment of toxicity. It helps to relieve the symptoms such as headaches, myalgia and fatigue and improves the function of the organ or system affected. The utilisation of massage for detoxification dates back to the origins of Swedish massage. The 'Movement Cure' was advocated for general health and included exercises as part of the treatment. It proposed great benefits were to be gained from good circulation, good oxygen, drainage of the colon, reduction of oedema, and stimulation of the organs such as the liver and kidneys.

In 1860 George H. Taylor, who practised in New York, published a booklet 'Sketch of The Movement Cure' (Massage Therapy Journal, 1993) as Swedish Massage was then called. The cure in this case referred to a 'system of treatment' and not a claim for complete alleviation of symptoms. In this publication Taylor elaborates on the effects of the movement cure and goes on to describe how massage and the improved respiration have an effect of removing toxins.

### **Improving the digestion**

Regular emptying of the bowels is an all-important element in the treatment of toxicity. Diet changes may be needed to improve the function of the bowel. In addition massage movements to the abdomen and in particular to the colon will reduce constipation and in so doing speed up the elimination of toxins. Digestion is also improved with the massage and with this the metabolism of nutrients and antioxidants which are needed to neutralise the toxicity. Further assistance is provided by the transportation of lymphocytes and phagocytes which takes place with the enhanced blood circulation and lymph flow.

### **Improving the circulation**

Massage is first of all applied to improve the circulation systemically in order to secure a good nutritional supply to all tissues. It is also utilised to enhance the venous return which is essential for the removal of toxins. To this end massage movements like effleurage and petrissage are applied to the superficial tissues and to muscles. Circulation to the visceral organs can also be enhanced; using similar techniques and, in some cases, by more specific methods such as compression massage for the liver and for the kidneys (described further on).

Toxins can lodge around joints and form crystals. Gout is one example, albeit an extreme one, where there is a toxic build up in the periarticular soft tissues such as the ligaments and tendons. A 'gouty-joint' is too painful to massage but otherwise effleurage is utilised to increase the venous return and the arterial flow to and around joints. Transverse friction movements are equally suitable for improving the circulation to the periarticular structures.

Muscle tissue can likewise be affected by toxic substances. Muscle contractions require adenosine triphosphate (ATP) energy which is produced by glycolysis (the breakdown of the glucose molecule). In this process pyruvic acid is produced which is catabolised by the mitochondria into carbon dioxide and water or, in the presence of oxygen, into carbon dioxide and ATP. If oxygen is not available the pyruvic acid turns into lactic acid (some energy is also produced in this anaerobic process). Eighty per cent of the lactic acid is drained through the venous return whilst some accumulates in the muscle tissue (to be subsequently converted into calcium and water). Muscles therefore produce toxic by-products including lactic acid, carbon dioxide and water. Their elimination is speeded up when the circulation through the muscles is improved.

Massage techniques such as effleurage and petrissage are indicated. The venous blood flow in muscles has been measured using a technique called the 'Xenon washout rate'. In this procedure a fluid containing xenon (a radioactive isotope) is injected in the blood vessels and the movement of the xenon is then monitored by detectors. This technique was used in a study carried out to test the effect of massage on the venous flow of muscles. Petrissage has been shown to cause a significant increase on the 'Xenon washout rate' when there is venous stasis of skeletal muscles (Peterson, 1970). As the vascular bed is mechanically emptied by massage it refills with a fresh blood supply and the stasis is reduced.

### **Enhancing the lymph flow**

The lymphatic system is given considerable attention in the treatment of toxicity. As well as reducing oedema lymph massage is applied to increase the actual flow of lymph in the interstitial spaces. Stagnation in the interstitial spaces can impair the lymph flow through the lymph vessels. Circulation to the tissue cells is also diminished which in turn slows down their nutritional supply and metabolism.

The congestion has the additional effect of preventing the removal of toxic wastes from the interstitial spaces. Increasing the lymph flow with massage on the other hand has the benefit of delivering nutrients to the cells and transporting building materials to restore the tissues. In addition massage carries lymphocytes to combat and neutralise toxins and bacteria.

Research has indicated that massage creates sufficient pressure to mechanically push the lymph through the gaps between the endothelial cells of the collecting lymph vessels. It has also been observed that raising the temperature of the skin forces more junctions between the endothelial cells to open. Both of these factors increased the drainage effect of massage on the lymph. (Xujian).

Lymph flow can be increased by the general strokes for circulation such as effleurage. It can be enhanced further with more specific techniques like lymph effleurage and intermittent pressure technique. These can be applied on most regions of the body and are repeated several times and alternated with one another. Two examples are described for the thigh.

### **Lymph massage technique - Intermittent pressure**

This movement is applied using an intermittent pump-like pressure, applied with the fingers and the palm of the hand (the thenar and hypothenar eminences do not make contact). A small degree of pressure is applied for about a second and reduced completely for the same period. The on-and-off cycle is repeated several times on one region. In unison with each compression, the superficial tissues (and with them the lymph vessels) are stretched in two directions as described here.

To massage the anterior upper thigh take up a comfortable standing position close to the treatment table. Place your hands next to each other and across the upper thigh and the medial region. Angle the fingers so that they point slightly toward the inguinal ligament (between the pubic bone and the anterior superior iliac spine). Without tensing the hands, exert a very light pressure with the fingers and palm of each hand. As you gently compress the tissues apply also a gentle stretch, downward toward the treatment table and in a cephalad direction toward the inguinal nodes. The two-way stretch forms an arc movement in the direction of the inguinal nodes. Prevent the hands from sliding during this manoeuvre as this hinders the 'pump-like' action of the technique. Next release the pressure and the stretch altogether and allow the tissues to 'recoil' back to their normal relaxed state. Repeat the same procedure several times on the same region. Then re-position the hands on a different region and repeat the technique. See Photograph 1 above

### **Lymph massage technique - effleurage**

Lymph effleurage is applied with a minimum of pressure, the weight of the hand alone exerts sufficient pressure to move the lymph through the superficial vessels.

The direction of the stroke is always towards the proximal group of nodes and performed at a very slow speed, to match that of the lymph flow. An example is given here for the anterior region of the thigh.

Sit close to the treatment table and adjust your posture to face toward the patient's head. Place one hand on each side of the knee closest to you. Make contact with the fingers and palm of each hand. Keeping the hands relaxed and flat to the skin surface, apply a uniform pressure with both hands. Use only a very light pressure, the weight of the hands is sufficient enough to move the fluid forward. Starting below the knee itself, effleurage in a cephalad direction. Trace your hands on each side of the knee, then allow them to meet just above the knee. Continue the stroke toward the inguinal nodes with the hands next to each other. When you reach the proximal end of the thigh, remove the hands and return them to the knee area. Repeat the same stroke several times. A tiny amount of lubrication may be necessary to facilitate a smooth movement. See Photograph 2 below



**Photograph 2:** Lymph effleurage is carried toward the proximal group of nodes

### **Additional techniques to assist the lymph flow**

Exercise and the contraction of muscles play an important role in the movement of lymph, particularly in the deeper vessels. When the muscles contract they exert an external force which directly pushes the lymph forward. In addition the compression stimulates the mechanoreceptors within the wall of the lymph vessel, creating a reflex contraction of the vessel itself. The action of petrissage mimics that of muscle contraction and in so doing exerts a similar type of compression. Gentle mobilisation of joints, particularly those of the limbs, is also of benefit. A study showed that massage and passive movements both raised the proximal lymph pressure in dogs (Caener et al, 1970).

**Note:** It is important to bear in mind that whilst toxins can be present during a viral or bacterial infection the lymph drainage treatment is contraindicated during such an attack and can only be carried out once the inflammation has subsided.

### **Improving kidney function**

The nephrons of the kidneys are the physiological filters which remove toxins from the blood. These include uric acid which is a naturally occurring product of catabolism, nucleic acids which are derived from food or cellular destruction, and benzoic acid which is a toxic substance in fruits and vegetables and believed to be eliminated from the body in the form of hippuric acid. Massage, systemic and local on the kidney area, increases the circulation to and from the kidney thereby improving the filtration and elimination process. Systemic lymph massage as already noted has a similar function.

### **Massage technique to increase elimination by the kidney**

Stand close to the treatment table and reach across the abdomen to massage the kidney area on the contralateral side. Insert the caudal hand (the one nearest to the feet) under the contralateral side of the trunk, in the loin area below the rib cage and with the fingertips close to spine. Rest the cephalic hand (the one nearest to the head) on the anterior side of the rib cage. Apply some pressure with the caudal hand on the kidney area in an anterior direction. This is easily achieved if you lean backward and let your body weight exert a pull through the arm.

The kidneys descend into the abdomen during inspiration. Accordingly this movement is best carried out as the patient inhales deeply. Effleurage over the kidney area and round to the lateral border of the trunk. Engage a gentle counter force with the cephalic hand in order to create a wringing action between the two hands. When you reach the anterior abdominal wall and as the patient exhales, ease off the pressure of both hands. Place the caudal hand in the loin area once more to resume the stroke. Repeat the procedure several times. See Photograph 3 below



**Photograph 3:** Massage technique to increase elimination by the kidney

### **Improving the liver function**

A major function of the liver is to destroy worn-out blood cells, bacteria and toxic substances. It also removes drugs like penicillin, ampicillin, erythromycin and sulfonamides. The liver is said to be a semi-solid organ which is encased by a fibrous capsule. As it is largely protected by the rib cage direct manipulation is limited to its lower borders. The organ is however influenced by external pressures such as those exerted by the diaphragm from above, an adjoining viscerus or indeed that of palpation.

With the squeezing massage movement described here sufficient pressure is exerted through the tissues to influence its circulation. Massage can also assist the portal circulation to the liver through the hepatic portal vein. It also increases the oxygenated blood supply to the liver via the hepatic artery. Circulation is also enhanced along the lobes of the liver, the central and hepatic veins, and to the superior vena cava. Secretion of bile is augmented to some extent by the advanced blood flow and by the mechanical pressure of the technique.

### **Massage technique to improve elimination by the liver**

Position yourself on the right side of the patient. Whilst sitting down is the most practical arrangement for this technique it can also be applied from a standing position. Place your left hand underneath the patient's lower ribs, pointing your fingers toward the spine. Rest the right hand on the abdomen, slightly inferior to the lower costal margin on the right side and with the fingers pointing toward the midline. As the patient takes in a deep breath, apply a squeezing action between the hands; pushing anteriorly with the left hand and posteriorly with the right. Then as the patient exhales carry out a pumping action with both hands by compressing and releasing the tissues repeatedly. During this movement maintain a constant grip on the liver between the two hands; therefore do not release the pressure completely as you apply the intermittent compression. Carry out the whole procedure a few times. See Photograph 4 below



**Photograph 4:** Massage technique to improve elimination by the liver

### **Assisting respiration**

Full movement of the rib cage and deep breathing are both necessary for the unrestricted uptake of oxygen and the elimination of gaseous toxins.

To this end massage movements are carried out on the muscles of respiration, in particular to the intercostals, the pectoralis minor, the sternocleidomastoid, the scalene group (scalenus anterior, medium and posterior), the rectus abdominis, the serratus posterior inferior and superior and the levator scapulae.



### **Elimination of toxins through the skin**

The skin is an organ of elimination and consequently skin eruptions are an indication of toxicity and the body's attempt to eliminate them. This process can be assisted by the massage movements which increase the circulation to the skin and de-congest the pores.

Effleurage movements are of particular use. Another effective method involves a compression and an upward stretch of the superficial tissues, primarily the skin and subcutaneous fascia.

### **Lift and stretch technique for the skin**

This technique is particularly useful on the back and has a similar effect to the cup-suction method. It can however be contraindicated if the skin is very spotty or if there is any 'bleeding'. In this situation vibration movements can be substituted for both the effleurage and the compression/stretch techniques. The compression/stretch technique is demonstrated here on the abdomen. Place both hands flat to the skin surface. Apply a grip to the superficial tissues with each hand, using the ball of the thumb and the pads of the fingers. Maintain this hold as you gently squeeze the tissues and stretch them upward. Hold this position for a second before releasing the pressure. Repeat the procedure a few times on the same area before moving your hands to another region. See Photograph 5 below



**Photograph 5:** The lifting and stretching technique encourages elimination through the skin

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