

ARE THERE ANY SPECIAL PRECAUTIONS OR DRUG INTERACTIONS WITH *LARVE* TREATMENT?

There have been no reports of adverse interactions between maggot treatment and any form of medication, although it is recommended that patients receiving anticoagulant therapy should be carefully monitored during treatment. It has been shown that maggots are unaffected by antibiotics at the concentration that occur in blood and tissue fluid and studies carried out by ZooBiotic Ltd have shown that they are also unaffected by X-rays.

It has been shown that maggots are adversely affected by the presence in wounds of hydrogel residues containing propylene glycol as a preservative so it is important to remove all such gels prior to the application of *LarvE*.

Maggots should not be applied to patients with clotting disorders, or individuals receiving anticoagulant therapy unless they are under constant medical supervision in a healthcare facility.

WHAT IF SOME MAGGOTS ARE LEFT IN THE WOUND AFTER TREATMENT?

In the unlikely event that some maggots will remain undetected within the depths of a wound, these will certainly be found the next time the dressing is removed. The maggots will not pupate within the wound and therefore cannot turn into flies.

HOW DO YOU DISPOSE OF MAGGOTS THAT HAVE BEEN REMOVED FROM A WOUND?

It is recommended that maggots and the associated dressing residues be double-bagged in the appropriate clinical waste bags and sent for disposal in the usual manner. Incineration is the preferred method, but if this is not possible the bags may be disposed of in accordance with local practice. If the bags are not incinerated, and the maggots complete their life cycle and turn into flies, these will soon die within the plastic bags. Given the fact that wild green bottles normally lay eggs on carrion, it is not considered that flies that develop from maggots removed from wounds will represent an additional health hazard. ZooBiotic Ltd also provide an approved disposal container with each batch of maggots supplied.

LarvE[®] Frequently asked questions

HOW DO *LARVE*[®] COMBAT WOUND ODOUR?

Slough and necrotic tissue support the proliferation of proteolytic bacteria. The metabolic processes of these organisms result in the formation of volatile amines that are responsible for the unpleasant smell associated with some types of wounds. By removing the necrotic material and the associated bacteria, the maggots help to reduce or eliminate wound odour.

WHAT ARE THE EFFECTS OF *LARVE* ON WOUND PAIN?

The literature suggests that the application of *LarvE*[®] can sometimes reduce wound-related pain. This is probably due to the elimination of infection, which is responsible for the formation of inflammatory mediators that cause pain in the surrounding tissue.

In some wounds, however, pain may be *increased* by the presence of maggots. Some patients who have leg ulcers with a significant arterial component or other ischaemic wounds, complain that their wounds become more painful on the second or third day of therapy. The reason for this is not certain, but it may be associated with pH changes within the wound. In such situations it is recommended that the maggots be removed after two days instead of three, and that the patient's analgesia be reviewed.

WHAT ARE THE EFFECTS OF *LARVE* ON WOUND HEALING?

Numerous papers have reported that the presence of maggots within a wound appears to promote the formation of granulation tissue. Some support for this observation may be drawn from the work of Prete who demonstrated that maggots' secretions appear to contain an agent that promotes the growth of fibroblast cells *in-vitro*.

WHAT ARE THE RISKS ASSOCIATED WITH THE USE OF *LARVE*?

A review of the literature has revealed no significant risks or adverse events causally linked with the clinical use of sterile larvae of *Lucilia sericata* in the manner described. It should always be remembered, however, that larval therapy is a potent therapeutic tool and as such it must be used with caution by staff that have been properly trained in its use. Maggots produce very powerful enzymes, which although primarily directed at dead or necrotic tissue, have the potential to cause irritation of healthy tissue if the larvae are applied in excessive numbers or left in place for too long after debridement has been completed. The use of large numbers of larvae in the immediate vicinity of exposed or damaged blood vessels is also probably best avoided.

CAN LARVÆ CAUSE WOUND INFECTIONS?

LarvE supplied by ZooBiotic Ltd, are sterile and therefore will not introduce pathogenic organisms into a wound. It is possible, though considered unlikely, that accidental infestations of wounds by maggots could represent a source of infection.

WILL LARVÆ BURROW INTO HEALTHY TISSUE?

The maggots of *Lucilia sericata* will not attack or burrow into healthy tissue although the proteolytic enzymes that they produce can occasionally cause irritation to unprotected skin.

WILL LARVÆ TURN INTO FLIES WITHIN A WOUND?

It takes about 10-14 days for a newly hatched maggot to complete its life cycle and turn into a fly. Dressings should be changed every 3-4 days so the fully grown larvae should be removed well before they are ready to pupate. Furthermore the larvae like somewhere dry and warm to pupate so they will attempt to leave the moist environment of the wound in order to do so.

WILL LARVÆ LAY EGGS IN THE WOUND?

Only adult flies can reproduce or lay eggs.

CAN YOU FEEL LARVÆ MOVING IN A WOUND?

Most people are unaware of the presence of maggots within a wound, although a small number of patients claim that they can feel them. If full grown maggots are allowed to get onto intact skin surrounding a wound they may tickle but this can be easily prevented by the application of an appropriate dressing system.

CAN LARVÆ BE USED UNDER COMPRESSION BANDAGES?

In most instances, the application of a compression bandage should not interfere with the action of *LarvE* provided they receive sufficient air to breathe.

Most practitioners discontinue maggot therapy when the wound is clean and free of necrotic tissue, but there is some evidence to suggest that, for chronic wounds, it may be beneficial to continue treatment, possibly with smaller numbers of maggots, until granulation is well established.

CAN ONLY HOSPITAL PATIENTS HAVE TREATMENT WITH LARVÆ?

Provided that the patient and their family are in agreement, there is no reason why, with their GP's approval, maggot therapy cannot be given to patients in their own home assuming a community nurse is available to undertake the treatment and ensure that waste material etc. is safely disposed of.

ARE LARVÆ AVAILABLE UPON PRESCRIPTION?

LarvE can be prescribed by Registered General Practitioners on Form FP10 as an unlicensed medicinal product.

WHAT IS THE ETHICAL POSITION RELATING TO THE USE OF LARVÆ?

The use of maggots in wound management has a sound basis in the literature. It appears to be free of any serious or significant side effects, and may have major advantages over conventional treatments for certain types of wounds. Provided that a specific patient has no objection to the use of *LarvE* there appear to be no ethical barriers to their use.

DO I HAVE TO COUNT THE MAGGOTS INTO AND OUT OF THE WOUND?

Some practitioners have suggested that maggots should be counted into and out of a wound to ensure that they have all been removed. This is totally unnecessary and virtually impossible to do. Furthermore, it is not uncommon for a proportion of the maggots that are applied to a wound to fail to survive. This means that, even if it were possible to count large numbers of maggots into a wound, (an almost impossible task), this number would not correlate with the number of full grown maggots that were recovered after several days treatment.

DO I NEED TO 'WATER' THE MAGGOTS ON A DAILY BASIS?

Some practitioners recommend that the 'moistened gauze' that forms part of the completed dressing should be renewed on a daily basis to prevent the maggots from drying out as described previously. Although very young maggots are quite delicate and susceptible to desiccation, after the first 24 hours they become much more resistant to dehydration and generally do not require the application of any additional liquid.

HOW LONG SHOULD MAGGOTS BE LEFT IN THE WOUND?

It is normally recommended that *LarvE* should be left on the wound for three days, although they are sometimes changed after two days if the wound is painful, or left for four days if pain is not a problem and there are large quantities of slough present.

ARE THERE ANY ACTIVITIES THAT SHOULD BE AVOIDED DURING TREATMENT WITH LARVÆ?

Patients undergoing treatment with *LarvE* should not immerse their wound in water or sit with the affected area too close to a source of heat, particularly in the first 24 hours after application as there is a possibility that the maggots might dry out and die. Care should also be taken when maggots are applied to weight bearing areas such as the feet or buttocks. Ambulant patients receiving maggot therapy on a leg ulcer, for example, may continue to live normally and go about their daily business as usual.
