SONODYNAMIC/PHOTODYNAMIC THERAPY

What is the difference between PDT and SPDT?

**PHOTODYNAMIC THERAPY (PDT)**

PDT involves the use of a light sensitive substance, which can be preferentially absorbed by tumour cells. When exposed to light of a specific wave-length the affected cells become agitated, releasing cytochrome C from their mitochondria which then initiates tumour cell death by the breakdown of oxygen (O₂) within the cell membrane into singlet oxygen (O₁), which is a highly reactive oxygen species.

Different types of PDT and light sensitive agents have been used worldwide with varying results. The agents used are generally derived from porphorin or chlorophyll and can vary in their production method and effect.

**SONODYNAMIC/PHOTODYNAMIC THERAPY (SPDT)**

SPDT involves the administration of a specific light sensitive substance (the oral agent), which is not only light sensitive but also ultrasound sensitive. The low intensity ultrasound is administered via a skin probe to the affected tumour areas.

In particular, it enables the treatment of deeper tumours normally untouched by superficial light exposure.

At the Dove Clinic, the SPDT is additionally enhanced with the use of Ozone Auto-haemotherapy. Tumours generally tend to be hypoxic (lacking in O₂) and by increasing oxygen levels in the tumour cells at the time of treatment, the effect of SPDT can be enhanced.

SPDT therefore, may have several advantages compared with Photodynamic Therapy and may be a valuable adjunct to conventional treatment or possible alternative to surgery, radiotherapy, or chemotherapy depending on tumour staging. It is an experimental therapy in this country, offered on an informed consent basis.

There have been very good observational study outcomes in both the UK and China where the treatment was first developed some years ago and further research is planned.
SPDT is generally well tolerated with minimal damage to healthy tissue. Side effects are generally related to the staging of disease and tumour load within the body.

You are likely to experience an inflammatory response with the treatment which can continue for some weeks following therapy and be associated with increased pain, general tiredness and low energy. Your normal analgesia may need to be increased or reviewed during this period. If the inflammatory response is troublesome or anticipated to be so, Dexamethasone (low dose steroid) may also be prescribed to temporarily manage the symptoms.

Tumours occurring within the abdominal cavity can produce ascites (fluid within the peritoneal cavity). This may worsen during the inflammatory period and the ascites may need to be drained away. Similarly, tumours within the lung can produce fluid known as a pleural effusion which may need to be drained.

If the tumour is attached to a major blood vessel, bleeding can occur as a result of tumour breakdown. If this is known at the time of consultation, SPDT would not be recommended, as the consequences of a major haemorrhage could be life threatening.

You will be assessed by the nursing/medical team prior to the commencement of therapy. If your condition has worsened significantly between consultation and the commencement of therapy, it may not be possible to proceed with SPDT. The light sensitive agent is given orally and there have been no reported side effects other than temporary green staining of the oral cavity which can be removed by brushing. No photosensitivity from normal ambient light has been observed, but as a precaution our advice is not to go out into direct sunshine for prolonged periods of over 10-20 minutes for 1 week following therapy.

The Ozone Autohaemotherapy is an intravenous treatment and as with all cannulation procedures there may be some tenderness at the needle insertion site. If venous access is difficult, ozone can also be administered via the rectum by insufflation. This option can be discussed with the Doctor and nursing team. Our nursing team are very skilled in cannulation practice, but the condition of veins can be variable particularly after chemotherapy. These issues will be taken into consideration at the nursing assessment when you will also have the opportunity to voice any concerns that you may have and ask questions.
THE SPDT PROCESS

- The doctor will prescribe either a one, two or split week programme for you depending on your stage of disease and general condition. The nursing team who carry out the therapy, will liaise with you regarding therapy dates.

- All patients are required to attend the Dove Clinic in Twyford, Hampshire for a pre-therapy nursing assessment which includes blood tests. Please note that you need to be well enough to receive therapy and have a haemoglobin level greater than 9.5 in order to proceed. In addition, there should be no pre-existing ascites, pleural effusion or ankle/leg oedema.

- You will need to sign an informed consent form before therapy can start.

- Payment for the therapy needs to be made before commencement and before the oral Agent drops are supplied. Please contact our reception team for details of treatment costs.

- See page 7 for information about the storage and administration of your oral agent drops.

- Please bring any recent hospital blood test/scan results with you.

(1) NB: Patients travelling from overseas will need to have a ‘Fitness to Travel’ certificate signed by their home physician before commencing their journey.

(2) Please note that the final decision regarding treatment will only be taken by the clinical team following nursing assessment.

SPDT PROTOCOL

The days for your light bed therapy will generally fall on Monday, Tuesday, Wednesday or Wednesday, Thursday, Friday. The oral drops will be given to you beforehand to administer at home. It generally takes about 2 hours to administer the drops sublingually and wait for proper absorption via the mucosal membrane. The administration should be completed allowing a 48-72 hour period for absorption into the system before light bed therapy commences.

On clinic therapy days you are advised not to eat for 2 hours before and 1 hour after therapy. Baseline observations will be recorded before the administration of intravenous Ozone Autohaemotherapy, followed by a rest period of 10-15 minutes before therapy on the light bed.

The length of time on the light bed increases gradually, according to prescription and patient tolerance.

The period on the light bed is followed by ultrasound to the tumour area. Generally the total therapy time is approximately 1.5 hours.

NB. In general, whilst on the light bed, no clothing is worn other than minimal underwear. Please discuss this with the nursing staff if you have religious or other objections.

IMPORTANT NOTE: If you have an open wound, please provide suitable sterile dressings which can be applied following the procedure. These should be obtained from your G.P. or Community Nurse.

Storage of the oral agent drops:

- Store the oral agent out of direct light and at room temperature.

- When administering the drops, keep them out of direct light as much as possible.
Administration of the oral agent drops:

- The drops are absorbed most effectively via the mucosal membrane underneath the tongue if the mouth is dry.
- In addition, absorption will be improved to the tumour site if nothing has been eaten or drunk for 2 hours prior to taking the drops. This is because when we eat and the stomach becomes full, the body’s blood supply normally becomes focused on the digestive tract. With SPDT we are trying to maximise uptake of the oral agent to the tumour site as much as possible.
- Make yourself as comfortable as possible sitting in an upright position. The process generally takes about 2 hours, although you can get up and move around whilst the drops are absorbing. It is helpful to use a hand mirror whilst placing the drops underneath the tongue and to check absorption.
- Using the dropper place 2 drops underneath the front of the tongue. Close the mouth and allow the fluid to absorb (approximately 1 minute).
- Check absorption by looking in the mirror, if there is visible pooling wait a little longer.
- Swallow hard after absorption has taken place so that the mouth is as dry as possible before repeating the process.
- Continue until all the oral agent in the bottle has been taken. It might be easier to tip out onto a spoon for the last few mls.
- Normal eating and drinking can commence 1 hour after the process is complete, thus enabling maximum uptake of the oral agent.

NB: It is normal for the drops to stain the tongue and oral cavity bright green. Do not be alarmed by this as it can be easily removed with a toothbrush.

DURING AND POST THERAPY CARE FOR SPDT PATIENTS

- On light bed therapy days, as a precaution, do not apply skin lotions or perfumes to the skin.
- Drink plenty of water during the therapy period to maintain good hydration and help the body flush toxins from the body. (water or unsweetened drinks).
- Stay out of strong sunshine.
- Patients are advised to rest during therapy and ideally not to drive or travel unaccompanied on public transport.
- After Ozone Autohaemotherpay keep the dressing on the cannulation site for approximately 4 hours and in order to reduce bruising, do not lift heavy objects with the affected arm. If you notice unusual pain, swelling or bruising afterwards, please contact the nurses.

INFORMATION ON FASTING WITH SPDT TREATMENT

On the day of taking Sonalux Drops:

- No food or sweet drink for 2 hours prior to taking Sonalux.
- Wait for 1 hour after completion of drops, then normal eating and drinking can resume.

On the days of SPDT Treatment:

- No food to be consumed 2 hours prior to treatment.
- Abstaining from food will make the uptake of the light and ultrasound more effective when it connects to the Sonalux.
- Drinks can be consumed – either water or unsweetened options i.e. Green Tea, Rooibos, Camomile, Black Tea/Coffee. Fluids are encouraged throughout the treatment process.
- Food can be consumed 1 hour after completion of SPDT.
INSTRUCTIONS FOR THE USE OF DEXAMETHASONE WHEN REQUIRED IN SPDT.

SPDT causes an inflammatory response at the tumour sites. However, if this response is particularly troublesome for you, you may have been prescribed Dexamethasone to moderate the symptoms.

- The usual dose for treatment is 2mg twice a day with food. We suggest taking it at 8am and 4pm as it can disturb sleep patterns when taken later in the evening.

- **Dexamethasone is a steroid given to reduce inflammation. When coming off the medication it needs to be reduced gradually** and you should **NOT** stop taking it without the doctor’s advice.

- If required, the cost of Dexamethasone will be included in your SPDT fee whilst you are undergoing your therapy. Repeat prescriptions, if required, can be obtained from the Dove Clinic, who will advise you about a reducing dose as necessary.