

Health

Light fantastic

A radical, one-hit cancer treatment saved his daughter's arm. Now David Longman hopes to make it available to all, reports **Julia Stuart**

Louise Longman was horrified when doctors suggested amputating her arm. The 16-year-old's first thought was that she would never again be able to hug anyone. She had developed a vascular tumour in her left forearm 10 years earlier. It had been cut out; but when it returned and she was plagued with pain, doctors suggested removing the limb.

"They couldn't perform surgery again because the tumour was going through my bone and was wrapped around it," says the student, now 22. "I'd also had a lot of muscle taken away the first time, because it had eaten into my muscle and tendons. During surgery, my radial nerve was severed, so I have limited feeling in my hand and arm. The next best option was amputation because they were worried it would take over my whole body."

But Louise's father refused to allow the amputation and they set about looking for other treatments. Louise underwent sclerotherapy, which involved using a chemical in an effort to make the tumour shrink, but it failed.

Then her father heard about photodynamic therapy (PDT), which can kill cancer cells by cutting off the oxygen supply to the tumour. Patients are given a drug – topically, orally or intravenously – which is retained by cancer tissue because of its



different metabolism. "If you apply light [usually laser] to the tissue where there is oxygen, the light excites the drug and the drug in its excited state triggers the generation of very active oxygen molecules, which kills the tissues. It's like releasing a little bomb in each cell," explains Colin Hopper, a senior research fellow at the National Medical Laser Centre at University College London, who treated Louise.

"You can shine the light on the surface; but if the tumour is deeper within the body, you have to put things like needles through the skin and deliver light through fibres into the tumour directly," says the maxillofacial surgeon, whose main expertise is

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PDT treatment of head and neck cancers and any tumours around the body.

Louise was given the drug and, four days later, her tumour was localised using ultrasound. Needles were put into her arm, through which fiberoptic cables were passed. The light was turned on and the tumour was killed.

"I woke up and just had this tiny plaster over the spot where they had put the needle in my arm. I had a scan immediately after and the tumour had gone. I had another scan last October and there's still nothing there. It's a miracle, really," says Louise.

PDT is licensed in the UK as a palliative technique for advanced oesophageal, mouth and lung cancer. It's also used for pre-malignant changes in the oesophagus and skin tumours, mainly basal cell carcinomas. In the US, it's approved for early lung cancer.

Unlike surgery, it doesn't damage nerves, so it can be beneficial for head and neck cancers. Some patients have also been spared having their jaw or nose removed. It's also repeatable (only one course of radiotherapy can be given and that may damage the blood supply). And unlike chemotherapy, it doesn't cause nausea or interfere with bone marrow.

There are hopes that PDT will be used to treat other localised cancers such as lung, bile duct, breast, prostate, pancreatic, cervical and brain. "Anything you can cut out surgically, you can treat with PDT. At least that's the dream. We're still working on the technology," says Mr Hopper. "It's the most exciting new therapy for cancer in the past 50 years. If developed to its full potential, it could save thousands of lives."

So why is it that fewer than

10 UK hospitals provide PDT? Stephen Bown, director of the National Medical Laser Centre, says that one of the reasons is that getting official approval is complex when more than one medical discipline is involved. "It's a combination of the drug and the light, which makes the regulatory hurdles more difficult. It would also mean treating these conditions by different groups of people and there's a bit of conservatism in the medical profession."

Preliminary trials for prostate cancer are going ahead at the centre, and it's hoped that trials for pancreatic cancer will start this year. "Only a small number of pancreatic cancer patients have been treated [during trials], but it looks promising," says Professor Bown. "I don't know if we're going to cure anybody; but if we can give them a simple treatment that doesn't upset them, and makes them live longer, then that's worthwhile."

Encouraged by his daughter's successful outcome, David Longman set up a charity, Killing Cancer, three years ago to make PDT more available. He hopes to raise £50m with a letter-writing campaign targeting the wealthy. "We'd been trying to find a solution to Louise's problem for years," he explains. "I hit the internet and found people in the UK who do PDT. I started to meet the other patients and thought: 'Why do I not know about this?' My dad had died about a year before from skin, mouth, head and neck cancer. He had six hours of surgery at the age of 88 and died after he came off the operating table." Finding that there was something that could have kept his father alive, David gave up his career in advertising to start his campaign. "We can't get the money from traditional drug company routes because they haven't been interested. We can't get support from the NHS. Nobody else is going to do it unless I do."

"About 8,000 people a year get Barrett's oesophagus [a pre-cancerous condition in the gullet]. When they're treated with surgery, they remove much of the oesophagus and stomach, and they then remould the stomach lining into a new swallowing tube. The cost on the NHS is about £26,000. If they had PDT, it would be done for £6,000, there would be no surgery and they'd go home the next day."

"PDT isn't a miracle cure for cancer. But having lost both of my parents to cancer, and then seeing how my eldest daughter survived her tumour with just a single PDT treatment, I can only hope that there is a PDT option if and when cancer comes my way."

www.killingcancer.co.uk



Helping hand: Louise Longman with her father, David; the PDT treatment (inset)

JOHN LAWRENCE

PDT: the facts

- **Only one treatment needed.**
- PDT doesn't require open surgery so recovery times are much quicker.
- **There is no nausea, weight loss, skin burns, hair loss or damage to immune system.**
- Costs between a quarter to half the price of current conventional treatments.
- **Approved for skin, head and neck, mouth cancers and Barrett's oesophagus.**
- PDT treatments in development: early lung cancer (which is already approved in some countries), bile duct cancer, pancreatic cancer and prostate cancer and arterial disease.
- **Potential future treatments: breast cancer, brain tumours, MRSA, cervical cancer, heavy periods and birthmarks.**