

# Proton therapy set

**R**adiotherapy is the controlled use of high energy x-rays to treat many different types of cancer.

Proton beam therapy is a different type of radiotherapy. It uses a high energy beam of protons (small parts of atoms), rather than high energy X-rays, to deliver a dose of radiotherapy for patients with cancer. The protons can be directed at a tumour more precisely than X-rays and, unlike conventional treatments, the beams stop once they hit the target, rather than carrying on through the body.

As a result, proton beam treatment can be a more effective form of therapy because it directs the all-important radiation treatment to precisely where it is needed with minimal damage to surrounding tissue, and a reduced risk of late side effects. This highly specific action may also allow an increased dose to be delivered, thereby increasing local control

**Proton beam therapy hit the news very dramatically last year when the parents of Ashya King removed their son from Southampton General Hospital so he could receive treatment for a brain tumour abroad. So what is proton beam radiotherapy and why might it be useful in the treatment of some cases of retinoblastoma? CHECT information officer PETRA MAXWELL explains...**

this, patients may still experience similar side effects and risks to those experienced by other forms of radiotherapy. Strong evidence of the clinical benefit of proton beam therapy is currently limited and because the service has only been nationally commissioned since 2008 there is relatively little long-term side effect and survival time follow-up data.

High energy proton radiotherapy is not currently available in the UK. However, since 2008 selected paediatric cases, for whom there was no detrimental effect, have had treatment approved and funded at selected proton centres in Switzerland and the US. A clinical panel reviews individual

and, if so, confirm back to the patient's doctor that a referral overseas can be made, which will then be funded by the NHS. The referral is co-ordinated through the NHS Proton Overseas Programme.

PBT is a highly complex and expensive form of radiotherapy. The indication for treatment abroad in any individual patient has to take into account the complex medical pathways of rare cancers such as retinoblastoma, and the likelihood of any improved clinical outcome. High cost treatments have to be justified based on whether the patients are likely to benefit, and where there is a sufficient evidence base available.

In 2013 a total of 99 cases were accepted for treatment with PBT. Retinoblastoma is one of the 18 paediatric cancers listed under the specific diagnostic criteria in the Policy.

As with other paediatric cancers, children with retinoblastoma are considered by specialist multi-disciplinary teams. Treatment may consist of a mix of surgery, chemotherapy and radiotherapy in complex pathways. There may be good medical rea-

**'The Government is planning to spend £250million to open PBT facilities in Manchester and London by 2018'**

and cure rates. The treatment is therefore particularly suitable to complex childhood cancers. Proton beam therapy specifically targets cancer cells, reducing the radiation dose to certain normal tissues or cells. Despite

cases. If a patient's consultant feels that proton beam therapy might be a suitable treatment for one of their patients, they submit a form to the panel. The panel will then decide whether the case is suitable for proton beam therapy

# to beam into Britain



**Ashya King, aged five, with his mum Naghemeh**

Wales or Northern Ireland, funding has to be agreed by local health boards.

A treatment course is usually delivered daily (Monday to Friday) and may last up to seven or eight weeks. Each day the child may spend up to an hour in the treatment room. During this time, the child is fitted into an immobilisation device to make sure they are in the same position every day. Daily positioning checks are taken prior to delivering radiation treatment. For those children who require daily anaesthesia, total time spent at the proton centre is typically 3-3.5 hours. For those treated awake, average time spent there is approximately 1-1.5 hours. Since radiation is used for the treatment the child must be alone in the proton beam therapy room but they are monitored closely at all times by a specialist team.

● For more information go to [uclh.nhs.uk](http://uclh.nhs.uk)

sons why PBT is not considered to be possible or the best treatment pathway.

The Government has committed £250million to developing high energy proton beam therapy services in the UK. Two facilities are currently being planned as part of a national procurement that will be located at The Christie NHS Foundation Trust (Manchester) and University College London Hospital (UCLH) NHS Foundation Trust. The services are expected to start in 2017, and it is hoped they will treat eye tumours.

for proton beam radiotherapy and should be considered for it by specialised multidisciplinary teams.

Proton beam therapy is now centrally funded. If you are an NHS patient living in England, the medical costs are paid for by the NHS in England. The medical costs for patients in Scotland, who are approved for treatment, are paid for by NHS England with costs recharged to the NHS in Scotland. For patients living in

In November 2014 NHS England released clinical Commissioning Policy: Proton Beam Radiotherapy (High Energy) for Paediatric Cancer Treatment. This policy considers the place the treatment has in current clinical practice; whether scientific research has shown the treatment to be of benefit to patients (including how any benefit is balanced against possible risks) and whether it represents the best use of NHS resources. Patients who meet the clinical criteria outlined in this policy are eligible