



Adult Brain and Central Nervous (CNS) System Tumour Service (Neuro-oncology)





Operational Structure

The Adult Brain and CNS tumour service oversees the management of patients with primary tumours of the brain or spine of all types and grades, and advises on the management of that sub-group of patients with brain metastases (tumours which have spread to the brain from primary cancers elsewhere in the body e.g. breast or lung) who might benefit from neurosurgery or stereotactic radiosurgery. The service operates across 2 sites: The Christie NHS FT and Salford Royal Foundation Trust and is compliant with the NICE Improving Outcome Guidance for Brain and Spinal Tumours, published in 2006.

All brain and spinal tumour surgery (neurosurgery), new patient clinics and stereotactic radiosurgery take place at Salford Royal Foundation Trust. Subsequent treatment including chemotherapy, radiotherapy and follow-up occurs at The Christie. Supportive care and survivorship are addressed throughout the cancer journey via links from both Trusts with community teams. Clinical research in the form of drug and treatment trials take place predominantly at The Christie; other research e.g. drug penetration and imaging studies are carried out at SRFT or the Wolfson Molecular Imaging Centre (WMIC).

The comparative rarity and complexity of this group of diseases mean that all active treatment is centralised at SRFT or The Christie; there are no peripheral clinics or MDTs elsewhere. Acute Trusts are involved at the initial stages of the patients' journey at diagnosis (frequently following acute

presentation), in rehabilitation and supportive care and in the management of acute intercurrent medical problems e.g. seizures.

Oversight of the entirety of the service and its functioning is via the Manchester Cancer Brain and CNS Pathway Board. Chaired by Pathway Director Dr Catherine McBain, the Pathway Board includes representatives from each Acute Trust, each sub-specialised MDT, the specialist nursing and AHP services and a research lead; plans are ongoing for it also to include primary care and patient and carer representatives.

Although based across 2 sites, the team works cohesively as one whole. The neuro-oncology MDT includes 5 consultant clinical oncologists, 5 consultant neuro-surgeons, 3 clinical nurse specialists, 2 neuro-oncology AHPs, 3 specialist radiographers, a neurologist and several neuro-psychologists; there are further teams dedicated to base of skull and pituitary tumours. Christie staff work across both sites to undertake MDTs and clinics and facilitate patient-centred joined-up care.

The service also encompasses the Stereotactic Radiosurgery (SRS) service. Based at The Christie at Salford Royal, this operates as a collaboration between The Christie and Salford Royal FTs and uses a special Novalis Tx linear accelerator (radiotherapy machine) to deliver SRS (high-dose, small volume radiotherapy) to a subset of patients with brain metastases and some types of small benign brain tumours including meningiomas and vestibular schwannomas.



MDTs

There are four associated MDTs: 3 disease-specific MDTs (Neuro-oncology including the SRS MDT, Base of Skull and Pituitary) all hosted by SRFT, and 1 supportive care MDT (the Network MDT) which is hosted by The Christie.

These are:

- 1) Neuroscience (Neuro-oncology) MDT (held once weekly at SRFT):
Comprises neurosurgeons, neuro-radiologists, neuro-oncologists, neuro-psychologists, neurologist, CNSs, AHPs, SRS specialist radiographer and physicists. Oversees the management of patients with all grades of primary tumours (benign, low grade and malignant) of the brain and spine. All patients are discussed at time of initial presentation and diagnosis and again as necessary during subsequent treatment e.g. at time of disease relapse or progression. The neuroscience MDT also advises on the management of patients with brain metastases referred by their primary treating oncologist for consideration of surgery or SRS. Referrals are made via a web-based system accessible from across Greater Manchester and Cheshire and minutes are distributed within 24 hours of the meeting.
- 2) Base of Skull MDT (held fortnightly at SRFT):
Comprises neurosurgeons, ENT surgeons, neuro-oncologists, neuro-radiologists and specialist nurses dedicated to the treatment of tumours arising at the base of the skull. There are also close links with allied specialities including plastic surgery and ophthalmology. This MDT is one of the largest in the country with a catchment area beyond Greater Manchester and Cheshire. Referrals are made either directly or via local ENT services.
- 3) Pituitary MDT (held monthly at SRFT):
Includes endocrinologists, neurosurgeons, neuro-oncologists, radiologists and specialist nurses subspecialised in the diagnosis and treatment of tumours arising in the pituitary gland. Referrals are made either directly or via local endocrinology teams.
- 4) Cancer Network (Supportive Care) MDT:
Held fortnightly at The Christie, this brings together the teams of Specialist Nurses, AHPs, specialist radiographers, Neuropsychologists, Palliative Care nurses and oncologists to discuss the holistic, supportive care and rehabilitation needs of patients under the care of any of the 3 'treatment' MDTs. Patients receive a letter explaining the content of that discussion, referral plans e.g. community physiotherapy and details of their keyworker. All patients referred



to Christie along with any other patients with particular needs are discussed and referrals can also be accepted from community teams.

Personnel

Consultants	<p>Dr Catherine McBain (Neuro-oncology, Base of Skull and Network MDTs)</p> <p>Dr Rao Gattamaneni (Neuro-oncology and Pituitary MDTs)</p> <p>Dr Gillian Whitfield (Neuro-oncology, and Base of Skull MDTs)</p> <p>Dr Anna Tran (Neuro-oncology and Pituitary MDTs)</p> <p>Dr Rovel Colaco (Neuro-oncology and Base of Skull MDTs)</p>
Clinical Nurse Specialists	<p>Elizabeth Molloy (Christie)</p> <p>Sarah Cundliffe and Alison Gilston-Hope (SRFT)</p>
Neuro-Oncology AHPs	<p>Julie Emerson</p> <p>Sara Robson</p>
Specialist Radiographer	<p>Charlotte Smith</p>

SRS Specialist Radiographers	<p>Rachael Edwards</p> <p>Kathy Kyllilis</p>
Research Nurses	<p>Nita Smeeton</p> <p>Shona Brophy</p>
Patient support	<p>Complementary Therapy 'CALMS' team</p>

Activity

In 2013-14, the neuro-oncology MDT discussed a total of 1545 new cases (an increase from 1320 in 2012-13)

The diagnoses of patients undergoing neurosurgical resection or biopsy of brain tumours were:

High grade glioma: 143

Low grade glioma: 44

Meningioma: 58

Metastasis: 64

Lymphoma: 12

The diagnoses of patients undergoing neurosurgical resection or biopsy of spinal tumours were:

High grade glioma: 1

Low grade glioma: 22

Meningioma: 6



Metastasis: 45

Lymphoma: 5

325 new patients were seen in the neuro-oncology clinic (this figure includes only patients with primary tumours brain and spinal tumours; it excludes metastases, base of skull and pituitary tumours, primary CNS lymphoma and patients managed only with post-operative surveillance).

Details of the numbers, diagnoses, treatments and outcomes of patients referred can be found on the [Clinical Outcomes](#) section of The Christie website

Stereotactic Radiosurgery:

A total of 94 patients received stereotactic radiosurgery (61 for brain metastases, 31 for vestibular schwannomas and 2 for meningiomas). These figures were significantly higher than 2012-13, when 45 patients were treated in total (37 brain metastases, 7 vestibular schwannomas and 1 meningioma) and reflects the growth of this service.

Service Development 2013/14

The Neuro-oncology service has well-developed referral pathways and the majority of patients with malignant disease are seen within a few days of MDT discussion, with radiotherapy commencing within 4 to 6 weeks of surgery. The service has been NICE IOG

compliant for some years and service development can therefore focus on improving outcomes via state of the art care and research into new treatments.

Significant recent achievements and future plans include:

- The opening and continued growth of the SRS service. This opened in December 2011 and numbers continue to increase. This means that patients with brain metastases or other tumours which might benefit from SRS treatment can have this treatment locally and promptly.
- The introduction of Fluorescein 5ALA guided resections – this has increased the proportion of an individual high grade tumour which can be removed at surgery and has been shown in trials to improve outcomes.
- The offering of a nationally-competitive portfolio of clinical trials, including trials of novel agents and new drugs particularly for relapsed glioblastoma.
- Continued improvements in the delivery of radiotherapy. We plan to increase the use of more accurate radiotherapy techniques such as VMAT and IMRT for the sub-groups of patients who would benefit.
- The opening of the proton service in 2018 will provide a new option particularly for patients with tumours of the skull base and for selected patients with other types of brain tumours.
- Developments in holistic care including patient held records and the introduction of a Holistic Needs Assessment Tool (the Distress Thermometer) into routine practice.



[Outcomes – click here](#) for information on clinical outcomes

Research

The group offers entry into the majority of treatment trials available on the NCRN portfolio and to some additional industry sponsored trials. In 2012-13 we were the UK's highest recruiter to NCRN portfolio studies and are consistently in the top 5. Recruitment numbers may seem low compared to other more common cancer sites, but many of our studies are complex and intensive trials in rare tumours; our rates are in line with expectations and are kept under ongoing and close review by the research team.

Studies include:

BR14: EORTC randomised controlled trial investigating whether the addition of chemotherapy concurrently and / or adjuvantly improves outcomes in Grade 3 non-co-deleted gliomas. The Christie is the lead UK recruiter to this study. .

Oparatic: Phase I-II study investigating whether the PARP inhibitor Olaparib improves the efficacy of temozolomide in relapsed glioblastoma. Cohort study recruiting slowly.

Sativex: Placebo-controlled phase II study investigating whether the cannabinoid spray

Sativex improves the efficacy of temozolomide in relapsed glioblastoma. This study is anticipated to close in late Spring / Summer 2015.

TAMIGA: Industry sponsored trial investigating whether the addition of bevacizumab to standard treatment, and continued after progression, improves outcome. This study is now closed to recruitment; follow-up is ongoing.

NBT: Epidemiological study investigating possible causes in the development of gliomas. 152 patients recruited.





Peer Reviewed Publications 2013/14

Whitfield GA, Kennedy SR, Djoukhadar IK, Jackson A. Imaging and target volume delineation in glioma. *Clinical Oncology* 2014; <http://dx.doi.org/10.1016/j.clon.2014.04.026>

Whitfield GA, Price P, Price GJ, Moore CJ. Machine assisted delineation or automated segmentation of radiotherapy volumes – are we going in the right direction? *British Journal of Radiology* 2013; 86(1021):20110718. doi: 10.1259/bjr.20110718.

Presented Abstracts

Stereotactic Radiosurgery for Brain Metastases at The Christie at Salford Royal Hospital: Our Two-Year Experience.

Helbrow J, McBain C, Gattamaneni R, Tran A, McCarthy C, Edwards R, Redikin J, Handley J, O'Hara C, Kennedy J, Mills S, Soh C, Leggate J, Whitfield G. (British Neuro-oncology Society Meeting, 2014).

Management of Glioblastoma Multiforme in the Elderly: Variations in treatment pathways.

Briggs S, Wilson B, Benson S, Hope A, Karabatsou T, Whitfield G, Gattamaneni R, Tran A, McBain C. (Poster presented at British Neuro-oncology Society Meeting, Durham 10-12 July 2013).

Routine introduction of holistic assessment tools within the primary brain tumour population

S Benson, C McBain, J Bambrough, A Hope, K Karabatsou,

BNOS, Durham 2013



Clinical Audit

Audit of Stereotactic Radiosurgery for Brain Metastases at The Christie at Salford Royal Hospital.

Chow D, McCarthy C, Handley J, McBain C, Tran A, Leggate J, Gattamaneni R, Whitfield G.
(Submitted to Salford Royal Audit department; poster and oral presentation at Royal College of Radiologists' Audit Competition 2013)

Current Audits:

Management and outcomes in patients undergoing surgical resection of brain metastases

V Lavin, C McBain, G Whitfield

Use of MR imaging in craniopharyngioma patients receiving radiotherapy

C Smith, G Whitfield and C McBain

Educational Activity

In addition to ongoing delivery of education to Specialist Registrars within the FRCR teaching programme and to final year undergraduates, the following specific educational events have taken place:

“Brain metastases – frameless and fractionated ?”, and “Acoustic Neuromas – planning controversies”, presented by G Whitfield at Stereotactic Radiosurgery Meeting of current and planned UK Novalis centres, Manchester, 2013.

Brain Metastases Study Day 2013 – free and over-subscribed study day for community teams and anyone involved in the care of patients with Brain Metastases. Repeat event planned.

Optimising Epilepsy Management in Brain Tumour Patients, October 2013. Joint meeting between neuro-oncologists, neuro-surgeons, epileptologists and specialist nurses from both services to agree optimal epilepsy management for brain tumour patients. Meeting has resulted in the adoption of agreed joint guidelines.



Neuro-oncology Academic Away Day January 2014

Radical Treatment of Brain Metastases: The importance of a neuro-oncology multidisciplinary approach. C McBain, European Society of Medical Oncology Lung Cancer Course, 12-14th February 2014

“Use of steroids for brain metastases”, North West regional study day, Salford, Jan 2014.

“Clinical trials”, presentation by Dr Whitfield for Brain Tumour Charity patient information day, Liverpool, 12 Sep 2013.

“Foundation course in IMRT”, The Christie, April 2013 – Dr Whitfield was lead organiser in the North West for this one day course developed by the National Cancer Action Team / Royal College of Radiologists and presented several of the lectures.

“Stereotactic radiosurgery at The Christie at Salford: the first 16 months”, Invited presentation by Dr Whitfield to UK oncologists at Rad Society/51 Club, Manchester, April 2013.