THE WALTON CENTRE: EXCELLENCE IN NEUROSCIENCE 2014/2015
Our mission is to provide a high quality of treatment, care and patient experience in the most appropriate place for the needs of our patients.

The Walton Centre is unique - the only specialist hospital trust in the UK dedicated to providing comprehensive neurology, neurosurgery, spinal and pain management services.

Our specialist staff offer a world-class service in diagnosing and treating injuries and illnesses affecting the brain, spine and peripheral nerves and muscles, and in supporting patients suffering from a wide range of long-term neurological conditions.

As you will read in the following pages, we are at the forefront of many treatments and technologies in this field:

- Our Neurosurgery Department is one of the biggest and busiest in the UK, performing around 3,000 elective surgical cases, 2,000 emergency surgical cases and 400 day case procedures each year.

- Our Neurology Department operates a ‘hub and spoke’ care system via a network of almost 50 satellite clinics at hospital and GP practice sites around the region, bringing our services closer to the homes of the 3.5 million people in our catchment area.

- We are the region’s specialist centre for spinal services, and also one of the largest in the country.

- Our neuroradiology service is the most comprehensive in the UK, with four MRI scanners, including an open scanner for claustrophobic or bariatric patients; 2 biplane intervention rooms and the most advanced CT scanner available.

- Our Pain Management Programme - the first in the UK and Europe when it was established in 1983 - is regarded as a model of best practice for helping patients with severe and chronic pain.

- We run the rehabilitation network for Cheshire and Merseyside, ensuring that patients receive rehabilitation services at the location and level of care most appropriate to their need; and we are one of only four hospitals in the country to provide hyper acute rehabilitation care, ensuring very early commencement of rehabilitation, reducing complications and improving outcomes.

- We have a dedicated Neuroscience Research Centre which runs a range of research studies, linking with partners in industry, academia and the NHS.

These are some of the reasons why I am very proud to be chief executive of The Walton Centre, and to work with skilled, dedicated and compassionate staff who make such a difference in saving and improving the quality of the lives of our patients.

I hope you enjoy reading about The Walton Centre and I invite you to get involved with our Trust and to support our work, in any capacity you can.

With best wishes

Chris Harrop
Our vision is to provide our patients with excellent neurosurgery, neurology, pain, spinal and rehabilitation services, built on research and education and delivered with care, dignity and compassion in line with the Walton Way.

The ‘modern’ Walton Centre was created in 1992, and was initially known as the Mersey Regional Neurosurgical Department.

In 1998 we moved to our current purpose-built complex next to Aintree University Hospital in Fazakerley, and we gained Foundation Trust status in 2009 when we were renamed The Walton Centre NHS Foundation Trust.

Today around 1,300 staff work for The Walton Centre, and we treat more than 100,000 patients each year with conditions including:

- Head and spinal trauma injuries.
- Tumours of the central nervous system, both cranial and spinal.
- Neurovascular diseases.
- Epilepsy (including a full surgical programme).
- Movement disorders (including the provision of a deep brain stimulation service).
- Pain, with a particular focus on trigeminal neuralgia.
- Multiple sclerosis and motor neurone disease.
- Chronic neuropathic pain, facial pain, headache and migraine.

The ‘hub and spoke’ model of care for neurology and neurosurgery takes our specialist services as close to patients as possible, meaning that many people are able to access our outpatient consultations and a range of tests at one of our many satellite sites close to where they live. Inpatients in our linked hospitals can be seen on the ward by a visiting Walton consultant neurologist, often allowing care to be provided in their local hospital nearer to home, while for patients needing specialist inpatient facilities, transfer to the centre is arranged. All our linked hospitals can access specialist advice at any time from our neurological and neurosurgical staff.

Meanwhile, highly specialist assessments, neurology and neurosurgery in-patient care are all undertaken at The Walton Centre.

We are a teaching hospital, with close links to the University of Liverpool Faculty of Medicine and Edge Hill University.

In recent years we have increased capacity in order to treat more patients more efficiently, using new technologies and new ways of working to improve patient care and safety.

This has included a new three-storey building housing an expanded Complex Rehabilitation Unit, with 30 beds and state-of-the-art facilities for people in need of intensive rehabilitation as they recover from injury and illness.

The new building is also home to our Pain Management Programme; Neurorehabilitation Department; a Brain Injuries Unit run by Mersey Care NHS Trust; and improved training facilities including a 100-seat lecture room.

New and refurbished state of the art neurology and day case wards were opened in 2013. We have also opened a new Neuroscience Research Centre to provide improved facilities for clinical trials and a ‘clean air’ operating theatre with state-of-the-art ‘Buzz’ imaging technology.

The Walton Centre is the only NHS trust in the UK dedicated solely to neuroscience. The organisation can trace its origins back to the neurological service provided by Liverpool’s former Walton Hospital in the 1940s.

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The Walton Centre is renowned for providing high-quality care to patients with neurological problems and long-term conditions.

The Trust’s large-scale, hub-and-spoke operation delivers this care as close to patients’ homes as possible across our large catchment area. So, while 75 per cent of outpatients are seen in our Liverpool hospital, the remainder are seen by the consultant neurologists who run satellite clinics and ward referral services at hospital and GP practice sites around the region.

As well as being more convenient for patients to visit their local hospital for treatment, this way of working ensures that the quality of care they receive is equitable, irrespective of where they live in our catchment area.

Meanwhile, our consultants can also be contacted by GPs and consultants at other district general hospitals about patients with neurological problems. Our clinics cover the full range of neurological conditions:

- Epilepsy - we enjoy a world-class reputation for our epilepsy treatment having organised - with the University of Liverpool - the largest ever randomised controlled trials of treatment. Our comprehensive epilepsy services include video-telemetry diagnostics, a full epilepsy surgery programme and specialist neuropsychological support for patients.
- Parkinson’s disease, dystonia and movement disorders - therapies include oral medications, skin patches, subcutaneous infusions (apomorphine pumps), transdermal intestinal infusion (delivery of dopamine into the intestine) and deep brain stimulation surgery.
- Neurogenetic disorders - diagnosis and treatment of a wide range of genetic and non-genetic ataxias affecting the nervous system and causing problems with movement, balance and speech.
- Multiple sclerosis (MS) and other demyelinating disorders of the nervous system including transverse myelitis and neuromyelitis optica - we provide a comprehensive range of hospital-based treatments for MS, the most common disabling disease of the central nervous system for young adults. Our neuromyelitis optica service is one of only two nationally designated centres in the UK for this disease, which affects the optic nerves and spinal cord.
- Dementia (cognitive neurology) - outpatient clinics and research into Alzheimer’s and other diseases that affect memory and other cognitive faculties such as language and perception.
- Neuromuscular disease - diagnosis and monitoring of disorders of the central and peripheral nervous system and muscle disease, including myasthenia gravis.
- Motor neuron disease - multidisciplinary clinics, a helpline and an educational programme for patients with this neurodegenerative disease and their families.
- We are an accredited Motor Neurone Disease Association Care Centre.
- Headache and migraine - treatments for severe refractory headache can include detoxification, nerve blocks and intravenous drug and caffeine infusions.
- Infectious disorders of the central nervous system.

MULTIDISCIPLINARY WORKING

A feature of the Neurology Department’s work is strong multidisciplinary working, with specialist nurses in epilepsy, Parkinson’s disease, MS, headache, myasthenia and deep brain stimulation. The Neuropsychology Department also provides input into multidisciplinary clinics such as pre-assessment for deep brain stimulation for the treatment of pain and the neuromyelitis optica clinic. A new service provides a multi-disciplinary approach to assessing and treating NEAD, non epileptic attack disorders.

Meanwhile, our Advanced Neurology Nurse outreach service has been rolled out across Merseyside and is proving very successful. Advanced Neurology Nurses work in local hospitals, community settings and also visit patients’ homes. Their role is to support people living with a long-term condition who often have complex needs.

They liaise with physiotherapists, occupational therapists, speech and language services, dieticians, learning disability services, community nursing services, social services, mental health teams and carers to ensure that patients have all the support they need.

The Walton Centre Neurological Department places great importance on training future medical and nursing staff and allied health professionals; and expanding the neurological knowledge of Liverpool medical students.

We have close links with Edge Hill University’s School of Health Studies and the University of Liverpool’s Department of Neurological Sciences, with whom we also work on a number of research programmes.

**NEUROLOGY**

**CLINICIAN FOCUS**

**DR PETER Enevoldson**
Dr Peter Enevoldson has been a consultant since 1993 and The Walton Centre’s Medical Director since 2008. He is also Medical Director for the Cheshire and Wirral Neurorehabilitation Network. Peter specialises in neuro-ophthalmology and strokes - particularly in young people; and his research interests include carotid artery disease. He has been an Honorary Senior Lecturer at the University of Liverpool since 2003. The Human Rights and Royal College of Physicians Standards Setting Group for Neurology and sits on the Adult Neurosciences Clinical Reference Group for NHS England.

**DR NICK FLETCHER**
Dr Nick Fletcher has been The Walton Centre’s Clinical Director for Neurology, Neurorehabilitation, Neuropsychology and Rehabilitation since 2008. His specialist areas of practice include Parkinson’s disease, stroke, dementias, frontotemporal dementia, Huntington’s disease and Tourette’s syndrome. As well as being more convenient for patients to visit their local hospital for treatment, this way of working ensures that the quality of care they receive is equitable, irrespective of where they live in our catchment area.

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**DR MARTIN WILSON**
Clinical Director for Neurology Dr Wilson has been a consultant at The Walton Centre since 2003. Tony completed his specialist training at Nottingham and Manchester. He subsequently worked with patients with multiple sclerosis and related inflammatory (MSO) disorders, with post-doctoral training in immunomodulating therapies (DMTs). In addition to MS clinics at Chester and The Walton Centre, Dr Wilson runs weekly general neurology clinics at both sites. He is currently lead clinician for the MS service at The Walton Centre, and also supports Dr Anu Jacob in the national NMO service for deep brain stimulation for the treatment of pain and the neuromyelitis optica clinic. A new service provides a multi-disciplinary approach to assessing and treating NEAD, non epileptic attack disorders.

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**PROFESSOR TONY MARSON**
Professor Tony Marson has been a consultant neurologist in the Parkinson’s Centre since 2005. Tony has a specialist interest in epilepsy. He leads the Complex Epilepsy Research Group, which he joined in 2003. He is currently lead clinician for the Dystonia MSO service at The Walton Centre, and also supports Dr Anu Jacob in the national NMO service for more than 20 years. He is currently lead clinician for the MS service at The Walton Centre, and also supports Dr Anu Jacob in the national NMO service for more than 20 years. He is currently lead clinician for the MS service at The Walton Centre, and also supports Dr Anu Jacob in the national NMO service for more than 20 years.

**PROFESSOR CAROLYN YOUNG**
Professor Carolyn Young co-ordinates major clinical research programmes in multiple sclerosis (MS) and motor neurone disease (MND). Following her appointment as Consultant Neurologist in 1992, she set up The Walton Centre’s MS and MND services. Nationally, she is Deputy Director of the UK SRMS Clinical Studies Group and the Association of British MS Research Units. Internationally, Professor Young is a principal investigator in more than 20 clinical trials, and has worked with a number of charities and organisations including the MS Society, the Motor Neurone Disease Association and the Multiple Sclerosis Society.

**PROFESSOR TOM SOLOMON**
Professor Tom Solomon specialises in neurological infections including encephalitis and meningitis. As well as his Walton Centre role he is the Chair of Neurological Sciences, and Director of the Institute of Infection and Global Health at the University of Liverpool. Professor Solomon has also acted as an advisor to the World Health Organisation and the National Institutes of Health in America.

**DR JANINE WINTERBOTTOM**
Dr Janine Winterbottom manages a team of nurses supporting people living with neurological problems. The Walton Centre and its outreach clinics in Chester, North Wales, Bromborough and parts of Lancashire. Janine established a national group in 2007, and acts as an advisor to the Walton Centre and its outreach clinics in Chester, North Wales, Bromborough and parts of Lancashire. Janine established a national group in 2007, and has been involved in work on a number of areas including adult health services, family planning services, adult mental health services, community-based health services and social services.

Epilepsy Nurse Specialist Dr Janine Winterbottom manages a team of nurses supporting people living with neurological problems. The Walton Centre and its outreach clinics in Chester, North Wales, Bromborough and parts of Lancashire. Janine established a national group in 2007, and acts as an advisor to the Walton Centre and its outreach clinics in Chester, North Wales, Bromborough and parts of Lancashire. Janine established a national group in 2007, and has been involved in work on a number of areas including adult health services, family planning services, adult mental health services, community-based health services and social services.
As well as emergency care for victims of cranial and spinal trauma our services include the treatment of:

- Primary and secondary brain tumours. Our team of neurosurgeons, oncologists, speciality nurses and palliative care staff treat more than 500 new patients a year.
- Surgery is usually the first line of attack for treating tumours, using advanced techniques such as image-guidance systems, neurophysiological monitoring, intra-operative ultrasound and intra-operative fluorescence-guided surgery.
- For certain patients, awake surgery is used to allow intraoperative mapping of language, motor and sensory functions. Awake craniotomy for glioma and surgery for intraventricular, meline and pineal tumours.

Our neurosurgeons also have expertise in stereotactic radiosurgery using the sophisticated Novalis TX machine located at the adjacent Clatterbridge Cancer Centre Liverpool.

This allows us to treat previously inoperable deep-seated tumours using navigation technology to target and destroy cancerous cells without damaging surrounding healthy tissue. Patients with brain and spinal tumours receive the specialist support of our neurooncology nursing team.

We are involved in an active brain tumour research programme, in collaboration with the University of Liverpool, and all patients undergoing surgery are invited to take part.

- Hydrocephalus (‘water on the brain’), cerebrospinal fluid (CSF) disorders and spina bifida. CSF accumulations causing increased pressure in the brain can be treated by removing the cause (for example tumours), inserting a shunt to divert the fluid elsewhere or surgically re-establishing the CSF circulation by an alternative route.
- Epilepsy surgery - the Walton Centre has one of the country’s oldest and largest epilepsy surgery services. Using our range of specialist tests we locate the source of a patient’s seizures and that area of the brain can often be removed by surgical resection or a disconnection procedure. Epilepsy can also be treated by neuro modulation techniques including vagal nerve stimulation and deep brain stimulation.

- Vascular neurosurgery to tackle disorders of the blood vessels of the brain and spine including ruptured aneurysms (bulges in the walls of blood vessels), aneurysmal malformations (abnormal connections between the high pressure arteries and low pressure veins) and cavernomas (clusters of abnormal blood vessels).
- Pituitary surgery for patients with disorders of the pituitary and hypothalamus glands, close to the optic apparatus. Although many tumours in this area are benign and slow growing, surgery is required for tumours producing too much growth hormone or cortisol, or those that threaten a patient’s vision.
- Skull base surgery, most commonly to treat tumours but also infections, congenital abnormalities and other bone disorders such as fibrous dysplasia.
- Functional neurosurgery for movement disorders including Parkinson’s disease, tremor and dystonia.
- Neurosurgical treatment of pain including trigeminal neuralgia through spinal cord stimulation, intrathecal drug delivery and deep brain stimulation.

Most of our patients come from the 3.5 million population of our normal catchment area, but we also take referrals from further afield, as well as offering second opinions when requested.

To provide the care these patients need, we have a 24-hour on-call emergency service, a 20-bed critical care facility, six operating theatres and a separate suite for interventional neuroradiology procedures.

All our consultant neurosurgeons take part in the on-call emergency service as well as degenerative spinal work. In addition, they all have areas of subspecialist interest.

Excellent team work is vital in the work of our subspecialties which all incorporate multidisciplinary teams including neuroradiologists, neurologists, oncologists and other allied health professions including physiotherapy, occupational therapy, speech and language therapy and dietetics.

A wide range of neurosurgery takes place at The Walton Centre, using the latest techniques and technologies and often, pioneering new methods.
The Trust provides one of the largest and most comprehensive spinal services in the UK, and in terms of our volume of spinal work, we are in the top 10 per cent of spinal units in Europe. However, spinal conditions are also tackled by pharmacological, physical and injection therapies.

Our specialist team – including consultant neurosurgeons, specialist nurses, physiotherapists and rehabilitation programme staff – deals with the full range of spinal conditions causing disability and pain, from tumours and trauma to slipped discs and scoliosis.

We have a particular expertise with tumours of the spinal cord, using all the latest diagnostic and surgical technology.

As well as dealing with spondylotic (wear and tear) disease at all levels, and spinal cord tumours, we are increasingly involved in areas of work such as acute spinal trauma and fractures, vertebroplasty (injecting cement into spinal bones fractured by tumour or osteoporosis) and spinal vascular (blood vessel) malformations.

We also run a metastatic spinal cancer service in conjunction with Clatterbridge Cancer Centre. This has formed the regional specialist service for patients with cancer that has spread to the spine, offering urgent surgical assessment and often intervention. This service also incorporates a spinal nurse and physiotherapists. For patients for whom surgery cannot provide a solution, our Pain Service is often able to relieve distressing symptoms.

Looking to the future of spinal services, new techniques involving minimally invasive ‘keyhole’ spinal surgery are currently being developed.

The Walton Centre is the region’s specialist centre for spine services and half of all the surgery carried out at the hospital is spine related.

The Crucial Care Unit looks after The Walton Centre’s most seriously ill patients, including those with traumatic injuries or people recovering after major surgery.

These patients require constant close attention in a specialised, controlled environment.

We are part of the Cheshire and Merseyside Major Trauma Centre, along with Aintree University Hospital and the Royal Liverpool University Hospitals as the receiving emergency departments.

We are also the regional designated unit for acute spinal cord injured patients, including those needing either surgical spinal decompression or surgical stabilisation, or both.

These patients are looked after in our Horsley Intensive Care Unit, which has 16 beds, and our High Dependency Unit which has four beds.

They are treated by a multidisciplinary team of neuro-intensivists, neurosurgeons and allied health professionals including neurosurgical specialist nurses, physiotherapists, occupational therapists, speech and language therapists, dieticians and an ITU technician.

Patients with severe head injuries receive state-of-the-art invasive monitoring and neuro-protection treatments.

Surgery may be an early option for head injured patients with a blood clot pressing on the brain. For patients with no obvious blood clots, sedation is often used to allow time for brain pressure and swelling to reduce, preventing avoidable secondary brain injury.

If normal medical and surgical therapies do not achieve the required result an experimental procedure - decompressive craniectomy - can be used, removing part of the skull to allow space for brain swelling.

The Crucial Care Unit regularly participates in national and local research projects.

Twenty per cent of patients with a serious head injury also have a spine injury. Isolated spinal cord injuries are managed with closed reduction of the fracture using applied traction. More complex fractures and dislocations often require urgent surgical decompression and spinal stabilisation with screws and rods.

We run a consultant intensivist-led follow-up clinic for intensive care patients.

ANAESTHESIA

The Walton Centre carries out about 4,000 procedures under general anaesthesia every year. We offer a consultant anaesthetist-led preoperative assessment service. Our anaesthetists have expertise in anaesthesia for awake craniotomy, very prolonged surgical procedures, anaesthesia in complex environments like MRI and management of the difficult airway.

MR SANDEEP LAKHANI

Dr Lakhani, The Walton Centre’s Clinical Director of Anaesthesia and Intensive Care, trained at Guy’s in 1989 after completing his training at the Royal College of Anaesthetists and the University of Mumbai and obtaining a Clinical Fellowship in Neuroanaesthesia. Dr Lakhani has a special interest in head injury and spinal anaesthesia and also serves as a Clinical Standards Reviewer for the Royal College of Anaesthetists and Specialist Adviser to Care Quality Commission (CQC).
The Walton Centre’s pioneering Pain Service uses specialist techniques to cure or ease pain. In addition, we help people to come to terms with chronic pain, and improve their quality of life, with our Pain Management Programme which is the largest and longest running in the UK.

The service is provided by a large multidisciplinary team of 25 whole time equivalent clinical staff and there is close liaison with neurosurgery, specialist pain psychology, palliative care, urology and gynaecology.

In terms of advanced treatments, we are a major UK centre for neuro modulation which involves implanting medical devices - stimulators and pumps - to relieve chronic pain. This involves implanting medical devices which is the largest and longest running in the UK.

The Pain Service is also regarded as a centre of excellence for its:

- Pain Management Programme - the first in the UK and in Europe when it was established in 1983. The programme is a group-based rehabilitation treatment, giving patients an understanding of chronic pain and the wider impact it can have on their lives. The advice, guidance and support provided on the five-day - and more intensive 16-day - programme is designed to help people manage pain more effectively and, by doing so, to improve their quality of life.

- Pain training - we provide a variety of training courses for anaesthetic trainees across the North West and also training modules for Liverpool medical students. For the past 25 years we have run our nationally acclaimed, five-day ‘Clinical Management of Pain’ course. Most of the current pain consultants in the UK have attended this advanced practical course.

- Pain research - The Pain Service is very active in internationally acclaimed research, mainly carried out in collaboration with the Pain Research Institute, which is located next to The Walton Centre, and the University of Liverpool. Our main areas of research interest are nerve pain, pain due to inflammation, spinal pain, facial pain and transcranial magnetic stimulation (TMS), a technique which sees a powerful magnet being used to affect the brainwaves, eliminating pain when expertly directed.

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The Walton Centre Pain Service includes:
- Palliative care pain treatment for cancer patients - referrals to this service are received from all over the country and are seen in our combined Pain and Palliative Care Clinic, run in partnership with Woodlands Hospice. Treatment options include injections, implants and spinal surgical treatment such as spinal fixation. The Walton Centre also runs one of the leading UK cordotomy services which involve burning nerves in the spinal cord, just below the skull, to relieve intractable pain.
- Spinal pain treatment - we have a great deal of experience in managing spinal pain with medications, specialist pain physiotherapy or injections. Sciatica (pain in the leg from nerve pressure in the lumbar region) is often treated by surgery but we also treat the condition with steroid injections around the nerve within the spinal canal.
- Nerve (neuropathic) pain treatment - nerve pain, caused by nerve disease or nerve damage, can be treated by medication or advanced pharmacological procedures such as infusion therapy or the application of capsaicin (chilli pepper) patches. We also offer specialist neuro modulation treatment, including intrathecal pumps to deliver medicines directly to the spinal fluid or spinal cord stimulation with electrodes.
- Facial pain treatment - by a range of specific medications following assessment at a joint clinic held by four specialists - a neurosurgeon, a pain physician, an oral surgeon and a neurologist.
- Opioid pain relief. Strong opioids can be very useful in controlling chronic pain in carefully selected patients as part of their overall care. We also provide an Advanced Opioid Service for patients in chronic pain with addiction problems.
- Complex regional pain syndrome (CRPS) treatment. The Walton Centre is at the forefront of treatment and research into this difficult to diagnose and not well understood condition, the main feature of which is persistent pain in an arm or a leg, usually after trauma. Our team sees patients from across the UK, and they have recently published the first-ever guide for health professionals on how to manage the condition.
- Pelvic pain. This service is delivered in close collaboration with the Uro-gynaecology team at Southport Hospital. Closely linked with this service is a specialised Pelvic Pain Service which is run in partnership with Woodlands Hospice.

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The highly advanced and accurate scanning techniques used by the Neuroradiology Department are vital in terms of providing the information on which diagnoses and treatment decisions are made.

With the Trust’s continuous investment in the latest equipment, The Walton Centre now offers the most comprehensive neuroradiology service in the UK.

For example, we are the only neuro centre in the country to have four MRI scanners, including an open scanner for the benefit of claustrophobic or bariatric patients.

The Neuroradiology Department also leads the way nationally in advanced tumour imaging, including a functional MRI service which is used to assess whether surgery might affect parts of the brain which control specific functions.

Our equipment includes:

• A GE 3 tesla MR scanner offering state-of-the-art neuro imaging
• A Phillips 3 tesla MR scanner
• An open GE MR scanner without sides - the only one in the North West
• A GE 1.5 tesla MR scanner
• An ultra-fast, Toshiba Aquillion One 320-slice CT scanner - one of the most modern machines available
• 2 biplane intervention suites
• A single plane fluoroscopy suite

A fundraising campaign is under way, led by the Marina Dalglish Foundation, to purchase a fifth MRI scanner. This will be an intraoperative machine for use in theatre, which will allow surgeons to scan patients during an operation to improve the precision of surgery, especially for removing tumours.

Meanwhile, the interventional radiology service provided by the Walton Centre is one of the largest of its type in the UK.

Patients benefit from the use of advanced CT angiography, a minimally invasive method of medical testing which avoids the need for intrusive procedures.

As well as angiograms - looking at the blood vessels in the brain or the spine – coiling procedures are carried out to treat patients with cerebral aneurysms (bulges in the walls of blood vessels) and arterio-venous malformations (AVMs), a condition involving an abnormal connection between the high pressure arteries and low pressure veins.

Other procedures performed still include myelography and lumbar puncture under radiological control.

Clinical functional MRI is a specialised technique available in relatively few centres around the world. Our high field scanners and dedicated staff allows us to perform this investigation.

Functional MRI is a detailed study which involves mapping parts of the brain which move our body, produces and understands speech and processes visual information. Functional MRI can determine how close or far these important areas of the brain are from the lesion which may require surgery. This helps to predict the risks of surgical resection to these areas, and to determine the surgical approach as well as whether it would be safer to do the surgery whilst the patient is awake. The ultimate aim is to avoid any damage to eloquent areas of the brain while at the same time providing optimal management for our patients.

The Trust is involved in many radiology research studies and as such is at the forefront of pioneering new techniques.

CLINICIAN FOCUS

Dr Hans Nahser specialises in the minimally invasive treatment of conditions including blood vessel aneurysms, telangiectasia and arteriovenous malformations (an abnormal connection). He is an honorary lecturer at the University of Liverpool and a fellow of the Royal College of Radiologists, as well as a member of a number of national and international radiology professional bodies.

Dr Sacha Niven has been a consultant neuroradiologist at The Walton Centre since 2003. His specialist interests lie in the full range of diagnostic CT and MRI scans of the brain and spine, as well as interventional imaging with CT and MRI; myelography, bone marking prior to surgery, and spinal biopsy.

Many of the neurological and neurosurgical services offered by the Walton Centre have only been made possible by the huge advances in neuroradiology technology over the past 20 years.
The acute teams cover all wards and Critical Care and will accept referrals for any patients who require assessment and treatment to optimise their physical function and mobility, their speech function and their nutrition.

The aim is to ensure patients receive appropriate, individual treatment that will aid in their recovery and where appropriate, to support a safe and effective discharge home or transfer of care. Many of the patients continue their recovery through a Complex Rehabilitation pathway.

Specialist outpatient therapy teams are available for Pain Management Programmes (PMP), pain and neuromodulation, Multiple Sclerosis, Motor Neurone Disease, Neuromyelitis Optica, and neuromuscular disorders.

Our specialist neuro-diagnostic services harness the skills of consultants and trained scientific specialists who use a variety of technologies and techniques to provide data which supports the accurate diagnosis, treatment choice and monitoring of patients with the whole range of neurological illnesses.

These services include:
- Our Buxton Laboratories which play a key role in analyzing tissue, organs, body fluids and the immune and nervous systems. The service is divided up into three disciplines:
  - Neuropathology and neurocytology - the examination of tissue and organs as part of the diagnosis of conditions including inflammatory diseases, benign abnormal growths, infections and cancers. Tests include routine biopsies, intraoperative biopsies, muscle enzyme histochemistry, peripheral nerve biopsies, transmission electron microscopy, in-situ hybridisation and CSF cytology.
  - Neurobiochemistry - the study of the chemical and biochemical mechanisms of the body in relation to diseases of the nervous system through the analysis of body fluids. Tests include routine CSF tests, CSF spectrophotometry, electrophoretic assays and a wide range of common and exotic anti-epileptic drugs.
  - Neuroimmunology - the study of the interaction between the immune and nervous systems. The service’s specialist analyses include anti acetylcholine receptor antibodies, anti MuSK antibodies, anti neuronal/noradrenergic/pain neuromodulators antibodies, anti glutamic acid decarboxylase antibodies, voltage gated potassium and calcium channel antibodies, anti-glycolipid antibodies and anti MAG antibodies.
- Neuropsychology - our Department of Neuropsychology is recognised as one of the UK’s leading centres. Our team of Clinical Neuropsychologists specialises in the assessment and management of cognitive and psychological conditions associated with neurological disorders. The resulting neuropsychological or psychological assessment is used to inform diagnosis and to help clinicians fully understand a patient’s condition and thus the best way to treat it. Our neuropsychologists provide recommendations and guidance for appropriate treatment approaches and can help patients and families make use of appropriate strategies to minimise the impact of cognitive or psychological difficulties on day-to-day functioning.

The department has a longstanding track record of research excellence. Their research into the cognitive effects of medications and neurological conditions has directly influenced worldwide prescribing guidelines in epilepsy and their current research includes randomised controlled trials investigating the effectiveness of neuropsychological interventions in head injuries and multiple sclerosis. Ongoing research into the neuropsychological impacts of conditions is aimed directly at improving well-being and quality of life.

- Neuropsychology - a variety of diagnostic techniques to assess the function of the central and peripheral nervous system to help confirm or rule out clinically suspected conditions. Investigations and tests carried out in our Neuropsychology Department include EEGs (electroencephalograms), EMG (electromyography), nerve conduction studies, evoked potentials (tests of brain responses to stimuli such as light), intra-operative monitoring and - for longer-term monitoring - ambulatory and video telemetry EEG monitoring.

The Walton Centre Therapy Service provides specialist care for patients recovering from complex neurological injuries and illnesses, complex trauma and pain related conditions. The service provides support for patients living with newly diagnosed and with long term conditions.

The Walton Centre multidisciplinary rehabilitation team includes consultants, critical care rehabilitation nurses, physiotherapists and occupational therapists, speech and language therapists, psychologists, neuropsychiatrists, dieticians and information/ benefits advisors. The main aims of the team are to:
- Reduce the impact of any disabilities caused by injury or illness by treating symptoms, for example spasticity or bladder or bowel dysfunction.
- Enable patients with disabilities to live as independently as possible by helping them to acquire new skills and strategies.
- Maximise the opportunities for people with disabilities by working closely with social services, employment agencies and similar organisations.

Our physiotherapy team assesses each patient and draws up an intervention plan to help them achieve their maximum physical potential. Relatives and carers are encouraged to play an active role in this process, while patients are also encouraged to take part in group exercise sessions.

Our occupational therapy team assesses each patient’s functional and cognitive abilities and develops individual treatment plans covering each area of their life including daily living, work and leisure activities. A home visit may also be carried out to highlight any potential concerns and risks and to assess if any additional equipment is required.

Our speech and language therapy team works with patients who have communication, voice or swallowing difficulties, and our nutrition and dietetics specialists work with patients to achieve and maintain a normal nutritional status, supporting the rehabilitation process. Rehabilitation staff also provide physiotherapy and occupational therapy to all Walton Centre inpatients, as required.

They are also part of the multidisciplinary special investigation and motor neurone disease specialist therapy teams, and support people on the Trust’s Pain Management Programme.

The Walton Centre Therapy Service provides specialist care for patients recovering from complex neurological injuries and illnesses, complex trauma and pain related conditions. The service provides support for patients living with newly diagnosed and with long term conditions.

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Our Neuroscience Research Centre is involved in high quality research in all areas of clinical neuroscience, taking part in studies at local, national and international level.

These research studies are often collaborative, involving major research partners such as universities and commercial companies around the region, as well as researchers and clinicians from other parts of the UK and abroad.

Joint research working with is particularly important. Many of our consultants hold honorary professorial or senior lecturer positions at the University of Liverpool and we are keen to expand our work together.

The main areas of neurology study undertaken by our clinicians are conditions such as epilepsy, multiple sclerosis, neuromyelitis optica, Parkinson's disease, dementia, stroke and motor neurone disease.

In neurosurgery, the main areas include neuro-oncology and in particular brain tumour, subarachnoid haemorrhage and head injury. There is also research in pain and neuropsychology.

In addition to research led by consultants there is an increasing amount of high quality research undertaken by nurses, therapists and other non-medical colleagues.

At any one time there are up to 80 studies being undertaken within the Neuroscience Research Centre. Around 70 per cent of this work is commercially sponsored but the centre also facilitates non-commercial research projects including those funded by the Department of Health/National Institute for Health Research sources and charities.

The Trust is a member of the North West Coast Clinical Research Network, which involves NHS trusts working alongside university partners to support clinical trials; and of Liverpool Health Partners.

We also have good links with research networks including the Stroke Research Network and the Dementias and Neurodegenerative Diseases Research Network. The Neuroscience Research Centre was established in 1994 by Professor David Chadwick.

It is self-funded and any excess income is used to support pilot studies and other research projects undertaken by the Trust’s consultants.