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We are grateful to our advertisers and sponsors whose support allows us to provide this handbook free of charge.

The Rehab Group has made every effort to ensure the accuracy of the information provided in this handbook and has endeavoured, to the best possible extent, to reflect best practice and the most current data. However, in view of the continuous changes in the healthcare arena, and in rehabilitation in particular, readers are urged to use the handbook only as a guide to help inform their discussions with professionals. It is no substitute for the advice and guidance given by healthcare and rehabilitation specialists, and the information provided must be considered alongside their recommendations. If you read anything that confuses or concerns you, please talk it over with your medical team.

We hope you will find *The Brain Injury Handbook* invaluable reading and a great source of help. A copy of the handbook can also be accessed online at: www.rehab.ie/about/braininjuryhandbook.aspx

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Front cover
Therapy assistant, Hannah Bradley and Chaseley Trust resident, Nicola Hinkley, enjoying the Open Day in June, 2015. The Chaseley Trust is a member charity of Rehab Group in the UK. Photo taken by Phil Burrowes.
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Rehab
Investing in People, Changing Perspectives
A strong network of specialists on your side

“Thompsons were brilliant, absolutely brilliant, nothing was too much trouble. Patrick’s solicitor would come and visit Patrick every week at the hospital.”

Maisey, Patrick’s mother. Thompsons’ brain injury client

At Thompsons, we have helped thousands of people to adapt and enhance their lifestyles following a brain injury.

Our serious injury team brings together the most dedicated serious injury solicitors from across the UK, offering expert advice wherever you are.

Our solicitors are members of Headway and UKABIF, and have close working links with charities, including The Child Brain Injury Trust, dedicated client support co-ordinators, case managers and occupational therapists.

You can trust Thompsons to access the specialist information, rehabilitation support and legal advice that you need.
If we, or people we love, suffer brain injury we enter a wholly new and frightening world. The human brain is the most complex structure in the known universe and when it is damaged a bewildering variety of problems can result, such as paralysis or partial blindness, or difficulty talking or personality change – the list is almost endless.

To make matters even worse it can be very difficult to predict how much recovery will occur and often it is not clear what kind of treatment is available or might be helpful. Once the acute phase of the injury has passed patients and their families often feel lost, abandoned and confused.

This excellent Handbook goes a long way to meeting the very real need for help and guidance, written by people with intimate personal knowledge of all the problems that can, and do, arise.

I cannot recommend it strongly enough.
Case management is one of the specialist services provided by Proactiv Rehabilitation & Reintegration Services, to actively assist and support clients and their families as they navigate and progress through the complex, difficult, frustrating and often overwhelming consequences of a complex Personal Injury.

Not everyone needs case management services; however, if you do, our Case Managers will assist you in dealing with the challenges you are facing. Some examples when you might need case management include rehabilitation and community re-integration following a catastrophic injury, coping with serious illness or adjusting to a loss such as a career or a loved one.

Ideally you are in hospital or prior to discharge one of our Complex Injury Managers will meet with you and your family, and discuss the services and programs we can offer or access for you, and at that time we discuss whether you and your family may need case management services.

Our aim to begin the case management process as soon as possible following injury - it is important for us to get to know you and for you to get to know us.

Through the process you and your Complex Injury Manager will discuss many aspects of your life, identify your goals and what may be a barrier to you achieving your goals.

Your Complex Injury Manager will develop a plan with you for you, and be an active participant throughout the process.

Proactiv Rehabilitation & Reintegration Services Complex Injury Managers are rehabilitation specialists who work collaboratively with your treating team.

We also have access to doctors, nurses, physiotherapists, occupational therapists and mental health specialists, and have extensive expertise and knowledge of national and local programs and service providers. Throughout the course of the case management process your Complex Injury Manager will monitor and evaluate your progress and adjust the plan as necessary to assist you and your family reach your goals, and optimise your level of independence and wellbeing.

Remember you may not need case management services today, but in the future if you and your family feel you do need help you can contact us and we will be happy to meet with you whether to provide information and direction on to provide case management services.

Compensation is only the beginning following a brain injury and often life changing effects are felt not only by the injured person but also by friends and family too.

We work to achieve the best possible outcome on the best possible terms and this goes far beyond financial compensation. Treatment and care are our primary focus when representing our clients in the wake of a serious injury.
Welcome to the 11th edition of *The Brain Injury Handbook*.

This free and comprehensive resource provides advice and information on acquired brain injury, and details on the support available in the United Kingdom. Whether it is you or a family member who has been affected, the Handbook aims to help you to learn more about brain injury and how to access the appropriate services.

The Rehab Group is a charity which provides health and social care, education, training and employment services in England, Scotland, Wales, Ireland and Poland. We provide services to people with disabilities and others who need additional supports to live their lives in their communities.

In the UK, the Rehab Group comprises four organisations – Momentum, TBG Learning, Acorn Training and The Chaseley Trust – each dedicated to assisting people in fulfilling their goals.

Rehab has 25 years’ experience in providing vocational rehabilitation services that support people with acquired brain injuries to return to employment, training and further education. Our bespoke services offer support to people with a wide range of disabilities, including those with acquired brain injury.

The brain injury rehabilitation programmes that we offer are centred on providing coping strategies, as well as the support to overcome the unique challenges a brain injury can present. Our focus is on supporting each person to determine what they want to achieve and to support them to live with their brain injury and move on with their lives. We do this through working with each individual to understand what they can and want to do in life, and supporting them to accomplish that. We understand the effects of brain injury and the most effective ways they can be managed.

Our specialised services offer comprehensive assessment, working towards dedicated employability training and job coaching. The information and advice in *The Brain Injury Handbook* is compiled by experts, many of whom have given their time and services free to provide up-to-date advice on acquired brain injury.

The foreword to last year’s edition of *The Brain Injury Handbook* was written by our late Chairman, Seán Egan, who spoke of his own experience with brain injury and how he had found many of the resources contained here to be useful. He passed away suddenly in early November of 2015, as we were preparing this edition. I would like to pay tribute to Seán for his inspirational, dedicated effective and entirely voluntary work with Rehab. His legacy is enormous and the impact of his contribution to our organisation will be felt positively for a very long time to come.
Legal support to build your future

After a brain injury, you know life will change; and you want to build a positive future. Our teams understand the uncertainties you face, and will work with you in a long term relationship. We guide you through the legal process to secure financial security for the future.

Leigh Day has 25 years’ experience of helping brain injured clients to achieve the financial security needed to rebuild their lives. Our expert lawyers are dedicated to your case, committed to securing the best for you, and will always give you an honest assessment.

You will have a free initial consultation; we visit you at home and in hospital; we can assist with housing adaptations and equipment and are always there to support you throughout your case and beyond.
As regular readers of *The Brain Injury Handbook* will know, my role as Editor is qualified in part by first-hand experience of severe brain injury and the subsequent longer-term consequences of the condition. I am gratified to be able to find benefit from reflecting on brain injury from a personal and professional perspective; a benefit which I hope will transfer over to you as the reader.

Whether you are reading this *Handbook* as a person directly living with a brain injury or as a concerned family member, carer or friend, the fundamentals of your life will have recently undergone a series of changes. It is likely that you find yourself in a world somewhat different to that you were used to. Experiencing brain injury and its consequences may be very new to you. The role your future takes is most likely to have changed significantly. Direction for your family and loved ones will, to differing extents, have altered. This is likely to be new ground for you.

With that in mind, the *Handbook* is designed to offer vital reference and advice surrounding recovery and rehabilitation, both in the short and long-term. Professionals, people with brain injuries, their families, carers and friends, should all find the *Handbook* of interest and, I hope, find it of use both now and for as long as you may need it.

I am delighted that on this occasion the Foreword on page 5 was written by recently retired and internationally respected Consultant Neurosurgeon, Henry Marsh CBE MA FRCS, and my sincere thanks go to him for taking the time to review this publication and comment on it.

The information and advice provided throughout the *Handbook* is always drawn from an updated number of sources. It has come from detailed research; from Rehab’s own experience; from a number of professionals working in the area and from people who have personal experience of the trauma surrounding brain injury who have chosen to share their experiences.

The *Handbook* is structured into sections to allow easy access to the information most relevant to you at any particular time.

There is no doubting the level of trauma that a brain injury can inflict on a person be that physically, mentally, emotionally, or – as is common – all three. However, the trauma experienced by a family and loved ones can be of equal significance. A brain injury requires everyone involved to become immediately familiar with a whole new reality associated with the recovery and rehabilitation process that will lie ahead of them.

Research has highlighted the need for the family unit – which often provides support – to have information in writing about brain injury to enable a more clear understanding of the likely consequences. This *Handbook* has been designed to provide that, as well as offering a reference book for those who have experienced a brain injury first-hand – to ensure them that they are not on their own. However, it is not a definitive guide to the condition and it may not answer all questions. It should nonetheless provide a useful overview. To widen the provision of relevant disability-linked information available in 2015, Section 7 now includes up-to-date news on the power of the web and reflects on the impact made by social media on the lives of people with disabilities. It includes the latest news on such matters as understanding employment and support allowance, improving the work and capability assessment, welfare reforms as well as a look at the top 10 accessibility apps, making Section 8 the closing section: useful contacts and resources.

In line with critical acclaim received from an increasing number of professionals in the field of brain injury, we hope that you will find this issue of *The Brain Injury Handbook* invaluable reading and a great source of help.

*The Brain Injury Handbook* is online at www.rehab.ie/uk/publications.aspx
Rehab in the UK and Ireland

Rehab is a charity that champions the value of diversity and inclusion for people with a disability or disadvantage in their communities.

Our mission is to help the people we serve to be more independent and to contribute to and be more included in their communities; empowering them with the skills and confidence to be active in the workforce, and supporting them to be in charge of their health and wellness. Over 30,000 people use Rehab’s services – children and adults with disability, people on the autism spectrum, people with mental health difficulties and people who are disadvantaged in some way in the labour market. Thousands more benefit from the services provided by our supply chain partners through our joint venture Rehab JobFit. More than 3,200 employees deliver Rehab’s services in over 200 locations in Ireland, Scotland, England and Wales.

Under the leadership of the new Rehab Board, we have undertaken a significant strategic review and comprehensive consultation process with the people we support, their families, our employees and our funders in Ireland and the UK. The result is a new five-year strategic plan, and a new vision, mission and values and set of strategic goals that reflect the views of stakeholders and give clear direction for Rehab’s future as a sustainable, transparent organisation which strives for excellence.

From a network of centres across the UK, Rehab provides health and social care, training and education, rehabilitation, employment services and supported businesses. These services are principally provided by Momentum, The Chaseley Trust, TBG Learning, Acorn Training and through a partnership with Interserve, Rehab JobFit. For further information, visit www.rehabgroup.co.uk

Momentum provides rehabilitation and care services for disabled and socially excluded people in Scotland, and through its brain injury centres in the North East and Midlands. Momentum’s services help a wide range of people, including those with a Brain Injury, Spinal Injury, Mental Health difficulty, Physical or Learning disability, in the areas of employment and training, job retention and community rehabilitation. The organisation also provides social care and supported living services. Momentum comprises Momentum Skills, Momentum Care and Haven.

Momentum Skills offers vocational rehabilitation and training services, empowering people to gain the skills and confidence that they need to live independently and to fulfill their employment goals.

Momentum Care provides a variety of social care services for people with a wide range of needs, including older people and those who are disabled. Staff teams support people in their communities, enabling them to live independently and to take part in community-based activities.

Haven Enterprises is the name of Momentum’s supported businesses centred in Scotland with locations in England and Wales. Haven Enterprises businesses offer its customers a range of garment, manufacturing, document scanning and storage, recycling, packaging, fulfilment, component assembly, print and finishing, signage manufacture and promotional materials to some of the country’s largest blue chip companies and major public sector organisations such as the NHS. Haven is on the UK and Scottish Government’s Supported Business Frameworks. Approximately 85 per cent of its 300 staff members are people with disabilities, many of whom are supported through the Department for Work and Pension’s Work Choice programme.

For further information, visit www.momentumuk.org.uk

The Chaseley Trust supports people with physical disabilities and is based on the seafront in Eastbourne. Chaseley Home offers residential respite/holiday care as well as rehabilitation
programmes in addition to day care and outpatient therapy services for non-residents. It has also recently opened Activate, a wheelchair-accessible gym. For further information, visit www.chaseley.org.uk

**TBG Learning** has centres in England and Wales and delivers the Work Programme as part of the Rehab JobFit supply chain. TBG Learning supports hundreds of unemployed people each year, the majority from disadvantaged groups such as long-term unemployed, people with disability and those who are judged unable to work or attend interviews. Through its network of centres, the organisation seeks to improve people’s lives by helping them to secure long-term, sustainable employment and an active role in their communities. For more information, visit www.tbglearning.com

**Rehab JobFit** is a third sector-led partnership of the Rehab Group and Interserve Plc which delivers training, support and employability services across the UK. Rehab JobFit is a prime provider to the Department for Work and Pensions (DWP) and currently delivers employment contracts for the DWP in Wales and South-West England – including the government’s flagship welfare-to-work programme, the Work Programme. Rehab JobFit has a network of around 20 providers within its supply chain, each delivering a tailored package of support, training, qualifications and advice to help long-term unemployed people get back to work; with activity focused to that which is most likely to result in a positive outcome of sustainable employment. For more information, visit www.rehabjobfit.com

**Rehab outside the UK – Ireland and Poland.**

In Ireland, Rehab’s services are provided through National Learning Network, RehabCare and Rehab Enterprises. National Learning Network is an internationally recognised world leader in the provision of high-quality training with specific expertise in assisting people who need additional support to enable them to build lasting careers in jobs that suit their interests. National Learning Network is Ireland’s largest non-governmental training organisation, with over 50 purpose-built training, education and employment facilities catering for over 10,000 people each year. In partnership with State bodies, National Learning Network offers over 40 different training programmes, which are provided via centres, employers’ workplaces or by blended learning; it also provides a range of assessment and learning supports to students in further education colleges. For more information visit www.nln.ie

**RehabCare** offers a variety of health and social care services including community-based resource centres, residential and supported accommodation, respite, outreach and home care services to more than 3,000 people of all ages and from all walks of life. For more information, visit www.rehabcare.ie

**Rehab Enterprises** is Ireland’s largest single non-governmental employer of people with disabilities. Through its various companies, Rehab Enterprises manages the delivery of recycling, logistics, packaging and retail services. In Poland, Rehab Enterprises provides logistics, computer keyboard printing and electronic equipment repair services. At its core, Rehab Enterprises provides employment opportunities for 400 people, almost half of whom have a disability. For more information, visit www.rehabenterprises.ie

Our role goes beyond simply providing services that enable people to make the most of their skills and talents in the workplace and in the wider community. We are also a leading campaigner for reforms to remove barriers preventing equal opportunities. The Group participates actively in a number of international and European organisations, including the Economic and Social Council of the United Nations where we have consultative status as a nongovernmental organisation. For more information, visit www.rehab.ie
Brain Injury Support Services

VP Community Care provides specialist support and rehabilitation for people with acquired brain injury, mental health difficulties and physical disability. With our specialist knowledge and highly skilled team, we successfully work with clients experiencing overwhelming difficulties, enabling them to live a full and valued life.

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Section 1
Understanding brain injury and the brain

Acquired brain injury (also known as ABI) is damage to the brain that was not present at birth but has occurred since, and which is non-progressive. An acquired brain injury can result from either traumatic brain injury or non-traumatic brain injury. The most common causes of traumatic brain injury are road traffic accidents, assaults and falls.

Non-traumatic brain injury has a variety of causes. The most common causes are: stroke and other problems within blood vessels supplying the brain; tumours; infections; poisoning through ingestion or inhalation of toxic substances; metabolic disorders such as liver and kidney disease; or diabetic coma and lack of blood flow (ischemia) or oxygen (hypoxia) to the brain.

Acquired brain injury therefore excludes brain injury that was present at birth (congenital brain injury) and brain conditions that are degenerative, such as dementia, multiple sclerosis or Parkinson’s disease. Some forms of acquired brain injury, e.g. stroke or tumour, tend to cause localised damage to the brain, whereas others, e.g. hypoxia and meningitis, usually cause widespread brain damage. The effects of acquired brain injury upon the individual can therefore vary dramatically from person to person.

Given the diverse nature of acquired brain injury, it is understandable that in this area of rehabilitation various terms are often used to describe it, e.g. head injury, brain injury, traumatic brain injury, acquired brain injury. To avoid confusion and for the sake of consistency, this handbook will refer to “brain injury” throughout to denote any form of acquired brain injury as defined here.
The brain is the control centre for all of the body’s functions, such as walking, talking, swallowing, breathing, tasting, smelling, heart rate and so on. It also controls all of our thinking functions, our emotions, how we behave and all of our intellectual (cognitive) activities, such as how we attend to things, how we perceive and understand our world and its physical surroundings, how we learn and remember, and so on. It follows, therefore, that damage to the brain for whatever reason can impair some or all of these functions or activities. How much impairment a person will have will depend on the type, location and severity of the injury. To understand this, we will have a look at the structure of the brain and the functions of the different areas within it.

What does the brain do and how does it work?

The brain is the control centre for all of the body’s functions, such as walking, talking, swallowing, breathing, tasting, smelling, heart rate and so on. It also controls all of our thinking functions, our emotions, how we behave and all of our intellectual (cognitive) activities, such as how we attend to things, how we perceive and understand our world and its physical surroundings, how we learn and remember, and so on. It follows, therefore, that damage to the brain for whatever reason can impair some or all of these functions or activities. How much impairment a person will have will depend on the type, location and severity of the injury. To understand this, we will have a look at the structure of the brain and the functions of the different areas within it.

The brain is protected by three layers of membrane that lie between it and the skull. If the brain is shaken about, these membranes and blood vessels can tear and bleed. If enough blood escapes, blood clots will form and can press on the brain and cause damage. In addition, there can be damage if the blood vessels become weakened and burst, as in the case of a brain haemorrhage. Damage will also occur if the blood supply to the brain is interrupted for any reason.

The brain is made up of billions of cells, blood vessels, fluid, and nerve cells called neurons. These have delicate nerve fibres that radiate from the cell body and connect to millions of other nerve cells to form highly complex communication systems between different parts of the brain. It is believed that each individual neuron network connects with approximately 1,100 other neurons. Nobody really knows how many neurons there are in the brain, but the favoured estimate by neuroscientists is 12 billion.

Professor Susan Greenfield, an eminent neuroscientist, has suggested that we think of neurons as trees in the Amazon rainforest and the leaves on those trees as the connections between the neurons. If the brain is shaken about, these delicate nerve fibres get disrupted and damaged, resulting in a breakdown of the communication pathways and the consequent disruption of certain skills and abilities.

There are three main areas that play a vital part in our ability to function:

- The cerebral cortex
- The brain stem
- The cerebellum
The cerebral cortex

The cerebral cortex (see Figure 1) is the largest part of the brain and is the area that is responsible for all of our thinking activities. It is divided into two connected halves – the left and right cerebral hemispheres. The left hemisphere controls the right side of the body and the right hemisphere controls the left. For example, if a person sustains a brain injury (such as a stroke) to the left hemisphere in the area of the cerebral cortex that controls movement, this may result in weakness or even paralysis of the right arm and leg. In most people, the left hemisphere primarily controls verbal functions such as speech and language while the right hemisphere primarily controls visual spatial (non-verbal) functions such as those involved in drawing, rhythm or finding one's way in unfamiliar surroundings. The hemispheres are known to process material in different ways, with the left cerebral hemisphere specialising in processing material in a sequential and logical manner and the right cerebral hemisphere processing information in a holistic and intuitive way.

The cerebral cortex is further divided into four areas, or lobes, each of which controls specific functions and skills (see Figure 2):

- Frontal
- Temporal
- Parietal
- Occipital
The frontal lobes
The frontal lobes have been termed the “executive” of the brain. This is where all our higher-level thinking goes on, allowing us to reason logically, make decisions, plan, organise and problem-solve, exercise good judgement and monitor or manage our actions. It is considered to be the home of our personality and the control centre for our emotions and behaviour. The frontal lobes allow us to apply our knowledge and adapt our behaviour so that it is appropriate to the situation that we are in. The frontal lobes also contain the motor cortex, a vital part of the brain system controlling movement.

The frontal lobes are extremely vulnerable to injury due to their position at the front of the skull. Studies have found that the frontal area is the most common region of injury, even following mild brain injury. Damage can cause many cognitive problems and can dramatically change social behaviour and personality. Physical problems can include the loss of fine movements, lack of strength in the arms, hands and fingers, little spontaneous facial expression or difficulty in speaking.

The temporal lobe
The temporal lobe lies just behind our ears and contains the auditory cortex. This allows us to interpret sound. The temporal lobe stores most of our memories and is involved in aspects of language, including our ability to use language and understand what we hear. Like the frontal lobes, the temporal lobe is involved in regulating certain aspects of personality.
Deep inside the temporal lobe are the structures of the hypothalamus and limbic system. The hypothalamus is involved in instinctive behaviours such as aggression, sexual arousal, appetite, thirst and temperature control. The limbic system is in control of emotional reactions. Damage to these areas can severely disrupt our emotions, resulting in sudden and dramatic mood swings, and can also lead to inappropriate social behaviour such as hyper-sexuality and impulsiveness.

The parietal lobe
The parietal lobe contains the somatosensory cortex, which receives and analyses information from the skin concerning touch, pressure, temperature and some aspects of pain. The parietal lobe is vital to our spatial understanding of the world. For example, it enables us to understand where we are in relation to our surroundings and where our body parts are in relation to each other, as well as the spatial relationships between the things we perceive in our environment. Damage to the parietal lobe can impair reading, writing and mathematical skills, drawing and construction tasks, as well as self-care abilities such as washing and dressing.

The occipital lobe
The occipital lobe analyses what we see and is, therefore, responsible for sight. If it is damaged, blindness or partial blindness can result.

The brain stem
The brain stem (see Figure 1) is connected to the spinal cord and from there to the whole of the central nervous system in the rest of the body. The brain stem controls movements of the throat, so damage to this area may result in impairments in speech and swallowing. It also controls consciousness, alertness and functions that are not under conscious control, such as breathing, body temperature, heart rate and blood pressure. It is therefore an extremely critical area.

The cerebellum
The cerebellum (see Figures 1 and 2) is located just behind the top part of the brain stem and controls fine muscle co-ordination, balance and posture. Damage to this area can affect our ability to move quickly and with ease or to perform such functions as climbing up a ladder or buttoning up a jacket.

In summary, damage to a particular part of the brain can produce impairment in the function that it controls. If the damage is limited to a small area, then it is likely that only a few functions will be impaired. If, however, it is more widespread, then this can produce a complex range of physical and psychological problems.

The frontal lobes are extremely vulnerable to injury due to their position at the front of the skull. Studies have found that the frontal area is the most common region of injury, even following mild brain injury.
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www.teambraininjury.co.uk
Section 2

The brain injury itself

Traumatic brain injury (also known as a TBI) is not usually caused by one event but by a series of events. These are generally classified as “primary” and “secondary” events. The primary event is direct damage to the brain at the point of impact. The secondary event refers to the complications that may arise in the minutes, hours and days following the impact – these are caused by a lack of oxygen and the reaction of the brain to the initial injury.

It is important to remember that the injuries described cover a range of possibilities. They will not apply to everyone who has sustained a traumatic brain injury.

Primary injury

There are two main types of primary injury:
(i) penetrating or open head injury and
(ii) closed head injury, which is much more common.

Penetrating or open head injury

A penetrating or open head injury is caused when an object fractures the skull and penetrates the brain – resulting in direct damage to the soft tissue. Examples include colliding with a sharp edge of a brick wall or a bullet piercing the skull and entering the brain. In this type of injury the damage is usually localised and confined to the immediate area of the injury, resulting in quite specific problems similar to those caused by a stroke. However, there are times when the head is also badly shaken, which may result in more widespread injury to the brain.

Closed head injury

A closed head injury involves rapid acceleration and deceleration or rotation of the head. The damage occurs when the head quickly changes speed of motion and is stopped abruptly, for example, by hitting the dashboard of a car. The sudden and violent movement causes the brain to shift and rotate within the skull. This stretches and shears the delicate connecting nerve fibres, resulting in extensive damage called a “diffuse axonal injury”.

With the violent movement, blood vessels tear and the surface of the brain – mainly the frontal and temporal areas – is lacerated as it rotates across the bony ridges inside the front of the skull. Further damage and bruising can be caused to the front and back of the brain as it rebounds backwards and
forwards against the rough inside surface of the skull. Additionally, the skull may be fractured in the area where the head hit the fixed surface. If the fracture causes a piece of bone to exert pressure on the brain, this is called a “depressed fracture”. This can cause significant problems. The diffuse axonal damage may result in permanent disabilities.

**Secondary injury**

Unfortunately, a number of complications after the initial injury can cause secondary injury damage. These often include a disruption of the oxygen supply to the brain, which can occur at the time of the accident if the airways are blocked (e.g. by a chest injury), or may occur if there is excessive bleeding from other injuries, which can reduce blood pressure. Later, blood clots may form as a result of small blood vessels being torn in the initial injury. These can press on the brain and cause further damage, though they can sometimes be removed in surgery.

In addition, the brain may swell in the days following the accident and cause pressure, called “intcranial pressure”, as the brain is forced against an unyielding skull. This again can cut off the blood supply to the brain and cause additional injury to its surface.

The complications described here will not occur with all brain injuries. Be assured that the paramedics at the scene of an accident and the medical teams monitor the person with the injury very closely. They do all that they can to prevent these complications from happening, or at least to minimise the damage that might be caused should complications arise.

There are two further factors when considering the extent of brain damage: the depth and duration of coma and period of post-traumatic amnesia. These are both early indicators and can provide only an educated guess about eventual recovery. As with the primary and secondary injuries previously described, there are likely to be individual differences in eventual outcomes.

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**What is a coma?**

When we hear the word “coma” many of us think of a person in a state of complete unawareness. In reality, coma simply means unconsciousness, of which there are varying levels.

The person may be in a deeply unconscious state where no amount of stimulation will elicit a response. However, in other cases, a person who is in a coma may move, make noises or respond to stimulation.

The process of recovery from coma is gradual. The individual will typically emerge over time rather than suddenly from this state, becoming progressively responsive to their environment and eventually regaining full consciousness.

A person who remains unconscious for over 6 hours is likely to have sustained a severe brain injury. Loss of consciousness for 15 minutes or less suggests a mild brain injury and the period between the two suggests a moderate brain injury (see Table 1).
While a person is in a coma, the medical team may conduct a number of assessments. The Glasgow Coma Scale (or GCS) is universally used to assess the level of consciousness (or unconsciousness) and later used to determine the level of recovery or deterioration. The scale has three categories:

(i) Eye opening;
(ii) Best motor response (physical movement;
(iii) Verbal response.

Each of these categories is scored from 1 to 15. The lower the total score on admission, the more severe the injury is assumed to be.

**What is post-traumatic amnesia?**

Amnesia refers to any memory disorder caused by brain damage, disease or physical trauma. Post traumatic amnesia (PTA) is a specific type of amnesia in which the person, for a period after their traumatic brain injury and after they have regained consciousness, cannot form new memories. Despite this they will generally appear lucid and be able to engage in conversation and everyday activities. However their PTA means they will not be able to remember anything new to them, such as a conversation they had minutes ago or activities they did earlier that day.

PTA is measured from the time of the brain injury to the recovery of continuous memory - that is the accurate recall of new material on three consecutive days.

In contrast, the individual is very often, but not always, completely able to remember information that was familiar to them before their brain injury. If those caring for the person with a brain injury do not understand the nature of PTA, they will typically be perplexed as to how the individual can accurately remember events and details from many years ago but not what they were told and what they did only moments earlier.

After regaining consciousness following a traumatic brain injury, the individual may remain in a state of PTA for minutes, hours or days and, more rarely, weeks or months. It is important for those treating the person to establish how long PTA lasts. This is because PTA duration is a good predictor of the severity of the brain injury in that it has consistently been found that the longer the duration of PTA, the greater the likelihood the person will experience long term effects from the brain injury – particularly cognitive problems, emotional difficulties and adverse changes in behaviour and personality.

### Table 1
**Severity of injury according to PTA, loss of consciousness and coma**

<table>
<thead>
<tr>
<th>Severity</th>
<th>PTA</th>
<th>Loss of Consciousness/Coma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>Less than 1 hour</td>
<td>Less than 15 minutes</td>
</tr>
<tr>
<td>Moderate</td>
<td>1–24 hours</td>
<td>15 minutes–6 hours</td>
</tr>
<tr>
<td>Severe</td>
<td>More than 24 hours</td>
<td>More than 6 hours</td>
</tr>
</tbody>
</table>
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Section 3
The consequences of brain injury

Depending on the nature and severity of the brain injury, the consequences can range from quite subtle, e.g. temporary impairments in thinking and behaviour, to permanent cognitive impairments and personality changes that can be extremely challenging for both the injured person and their family and friends.

In the early weeks following a brain injury, there will almost certainly be profound physical difficulties. Some of these will be overcome in the following months, some will take much longer and some will be permanent.

Research indicates that around 90% of people with a severe brain injury overcome most of their physical difficulties within the first year.

Although physical difficulties can present problems, it is the cognitive difficulties and personality changes that are the most distressing, as these have a greater impact on social, work and family life. Remember, the nature of brain injury is unique and not all of these problems will be experienced by everyone.

In the early days, the injured person is likely to find that they will tire easily after any activity, even chatting to friends or watching television, but particularly after tasks that require concentration or physical effort.
Section 1 outlined how localised damage can produce specific problems, i.e. where only the skills controlled by a particular area are affected. However, a closed head injury can produce additional difficulties for the injured party, caused by the rapid acceleration and deceleration of the brain inside the skull.

Physical problems usually result from localised damage either caused by a blood clot putting pressure on the brain or by a penetrating or open injury.

Physical problems include difficulties with movement, e.g. weakness or semi-paralysis on one side of the body; balance and co-ordination issues; speaking and swallowing disorders; and loss of taste, smell or regulation of body temperature. Problems common to all brain injuries include headaches and fatigue. Post-traumatic epilepsy will be referred to in more detail on the next page.

**Headaches**

Headaches, which can continue for many months, are common following even a mild brain injury. They can vary in intensity from fairly mild to extremely severe, and stress and worry about the future can aggravate them.

Additionally, the headaches themselves can produce great anxiety because of the perceived fear that there is something else wrong with the brain. They may also be a warning sign that the injured person is doing too much.

A stress-management programme can help, as can systematic muscle relaxation exercises. However, while stress and tension are usually the main triggers, a doctor should always examine persistent headaches as they can have many causes and a thorough check-up is recommended.

**Fatigue**

Fatigue is one of the most debilitating consequences of a brain injury, as it influences everything that the injured person does, both physically and mentally. A person’s emotions can also become raw when they are tired.

In the early days, the injured person is likely to find that they will tire easily after any activity, even chatting to friends or watching television, but particularly after tasks that require concentration or physical effort. This can be very upsetting, particularly if the injured person is aware of this change.

They will often try to push themselves to complete a task in the belief that they might overcome their fatigue. This is seldom the right thing to do as it can lead to increased fatigue in the long-term. It takes time to build up energy. Taking rest periods is essential both in between activities and when feeling tired.

A useful strategy to help cope with fatigue is to keep a diary of energy levels throughout the day and evening over a week or two.
A useful strategy to help cope with fatigue is to keep a diary of energy levels throughout the day and evening over a week or two. The differing periods of high and low energy can then be monitored and tasks can be organised accordingly. Often the family has to ensure that the injured person doesn’t overdo things. Tell-tale signs of fatigue can be a drawn, tense look, a pale or greyish pallor, glazed eyes, irritability and a tendency to be more distracted or more talkative and, ironically, becoming restless and undertaking too much activity, making an increased number of mistakes.

**Post-traumatic epilepsy**

Epilepsy is a neurological condition where a person can experience seizures that are a result of activity in the brain. It can develop at any time following a traumatic brain injury but most commonly does so within a year of the event. The possibility of this happening depends on various factors, including the type of injury and the location and extent of the damage.

Epileptic seizures occur when the normal activity of the brain is disrupted suddenly. This disrupted or epileptic activity may be localised to one particular area of the brain or it may involve all parts of the brain. The seizure that is witnessed as an outward sign of this activity will vary depending on the part, or parts, of the brain in which it is occurring. Seizures are most often classified according to where the seizure activity begins, and fall into three main categories: partial, generalised and secondarily generalised.

**Partial seizures**

Partial seizures occur when the epileptic activity begins in just one area of the brain. The person may be fully or partially aware of what is happening and may be confused. The nature of the seizure itself depends on the area of the brain affected by the activity and may include unusual tastes or sensations, automatic movements such as fiddling with objects or clothes, wandering around, mumbling or making chewing motions. If a person is experiencing this type of seizure, gently guide them away from anything potentially dangerous. Speaking gently and calmly can help to reorientate them as the seizure ends. Stay near them until they have recovered.
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Generalised seizures
In generalised seizures, the whole brain is affected by the activity and the person becomes unconscious. There are different types of generalised seizures depending on the effect of the seizure upon the body. The main types of generalised seizures are as follows:

Absence seizures
An absence seizure takes the form of a staring spell: The person suddenly seems to be “absent”. An absence seizure involves a brief loss of awareness, which can be accompanied by blinking or mouth twitches. Individuals who experience such a seizure in potentially hazardous situations should be gently guided away from the source of danger. An absence seizure in which there is also a sudden loss of muscle tone is called an atonic seizure.

Myoclonic seizures
A myoclonic seizure is one characterised by a brief episode of lightning-like jerks to the limbs or other parts of the body, which then recover immediately.

Tonic seizures
Tonic seizures involve powerful and involuntary muscular contractions that last up to about 30 seconds. In this tonic phase no respiratory movements occur and the individual may bite their tongue and clench their teeth.

Clonic seizures
Clonic seizures are distinguished by alternate involuntary muscular contraction and relaxation in rapid succession. Uncontrolled muscular jerking and convulsions of the limbs are therefore the primary features of clonic seizures.

Tonic–clonic seizures
Tonic–clonic seizures may last for a few seconds or several minutes. If a tonic–clonic seizure does not resolve after 5 minutes, or if such seizures follow each other in rapid succession, the person may be entering a life-threatening state known as “status epilepticus” and emergency medical help should be called.

In the case of tonic, atonic and myoclonic seizures, there is little that can be done to assist the person, other than checking if they have hurt themselves and staying with them until they recover.

It has been suggested that the risk of suffering from an epileptic fit following a brain injury is increased by up to 12 times. For those people who have suffered a mild injury or skull fracture, it is thought that the risk of post-trauma epilepsy is increased by three times.

All seizures can occur without warning and vary in length. However, most last for a specific time related to each person and do stop naturally. Many people with epilepsy take anti-epileptic drugs. Although such drugs do not cure epilepsy, they do stop the seizures from occurring in up to 80% of cases and may be prescribed as a preventative measure following a severe brain injury.

The law states that if you have a seizure of any type, you must stop driving and inform the Driver and Vehicle Licensing Agency (DVLA) whether or not those seizures are epileptic, including nocturnal seizures (asleep seizures). To be able to drive a car again, you have to be free of all seizures for 1 year. The regulations are slightly different for driving a larger vehicle, such as a bus or a lorry. (See Section 8, p125, for contact details for the National Society for Epilepsy.)

Secondarily generalised seizures
If the seizure activity spreads from a partial seizure to the rest of the brain, it is known as a secondarily generalised seizure.
Cognitive problems

When thinking of cognitive problems, it is useful to remember that no human skills operate in isolation.

We depend on a combination of several skills to carry out individual tasks. For example, if we want to remember what someone is saying to us, we first have to be able to focus on what they are saying (concentration), understand what they are saying (comprehension) and keep up with the flow of conversation (speed of thought).

Similarly, a loss of one skill can affect another. For example, a memory problem can actually be the result of an attention problem. It is important for the injured person to have a neuropsychological assessment, which will identify more precisely the areas of difficulty.

A neuropsychological assessment is also vital to determine which rehabilitation strategies are most likely to be useful to the individual in terms of enabling them to compensate for their acquired cognitive difficulties.

The most common issues, for which strategies have been listed here are, attention, speed of information-processing and memory.

Attention

There are three interrelated areas of attention difficulty that can lead to frustration after brain injury. These are difficulties with concentration, selective attention and dividing attention.

Concentration

Concentration is the ability to keep attention to a task or an idea. Concentration therefore involves maintaining attention to a subject over time. Concentration also involves being able to ignore distractions when you want to get on with a task. For example, being able to ignore people walking past your office window when you are working.

In the weeks following brain injury, a person’s ability to maintain concentration is likely to reduce dramatically. However, this usually improves greatly in time and with sufficient stimulation. It is important to be aware of how long the person’s attention span is and to try to work within it.

Selective attention

Selective attention is the ability to attend to information when there is a lot of similar information also available to you at the same time. An example of selective attention is being able to take in what a friend is saying to you across a busy restaurant where there are a lot of other people talking. After a brain injury the person may find it more difficult to select out what their friend is saying to them from the other conversations going on in the restaurant. When such selective attention difficulties are experienced it is common for the individual to avoid busy, public places as they have problems communicating with others against the background noise.
Dividing attention
Divided attention is the ability to split our attention between competing items of information. This might be displayed in an inability to write a message while simultaneously talking on the telephone, or to make a cup of tea while actively following a conversation.

Speed of information-processing
Many people have difficulty absorbing new information, whether it is presented verbally, visually or in written form.

A reduction in speed of thought is common even after a mild injury. Difficulties include being slow to respond to conversation, inability to understand instructions and problems adding up figures. Slowed thinking makes activities such as decision-making very hard. Before any conclusions can be reached, the reasons for those conclusions might have been forgotten.

How to help
The best way to help with concentration and attention problems is to keep all possible distractions and interruptions to a minimum. Try to ensure that only one task is attempted at a time. Talk slowly and clearly so that the injured person can keep track of what is being said and do all that is possible to minimise competing demands on their attention.

For example, if the injured person is making a cup of tea, do not distract them. Try to encourage them to attempt tasks that require concentration in the morning when they will be feeling relatively fresh and capable of completing such tasks without difficulty.

Attention span can be increased with practice. One way of doing this is to pick a task that requires concentration, e.g. looking through a telephone directory for a particular name, and set a time to be spent on the task. Initially, the task should be easy and the allocated time should be within or slightly above the person’s attention span. The complexity of the task can gradually be increased and the time allocated shortened. It might also be appropriate to introduce a reward for successful completion of a task.

How to help
There are various ways that we can help with information-processing problems. Ask the injured person to repeat what has been said to them to make sure that they fully understand the information given. Talk at a slow, steady pace. If a person talks too quickly, the individual may still be trying to digest the first pieces of information received. Anything that follows may be lost.

Frequently confirm that the person understands. Order the information, because it can be digested more easily when broken into manageable units. Any rehabilitation team will be able to help and advise on how to do this.

Physical reactions will often be slowed and the injured person may take much longer to complete everyday tasks. These reactions are usually beyond their direct control and allowances will need to be made. It is important to plan ahead, allowing plenty of time for tasks to be completed.
Memory

Memory problems are, for many, a main area of difficulty. Short-term memory and working memory problems are especially common after brain injury. In contrast, the ability to remember long-term memories formed before the brain injury is often well preserved, except sometimes after more severe brain injury.

Short-term memory is the part of the memory system where information is temporarily stored for up to about 30 seconds. If information is to be retained for longer it must be consolidated into long-term memory. The capacity of short-term memory is very limited. In general people can only hold between five and nine pieces of information in short-term memory, with the average being seven pieces of information. Writing down a telephone number, as we are told it, is an example of a mental task reliant upon short-term memory.

Working memory is related to short-term memory. It is the memory system which allows us to temporarily hold in mind and process multiple pieces of information. Working memory is therefore crucial to many other mental abilities such as reasoning, comprehension and problem solving. Mental arithmetic is a good example of an activity highly dependent upon working memory.

Human memory is a complex phenomenon and there are various aspects of memory that may be impaired, to some degree, by brain injury. Some of the areas of memory that may be affected by brain injury are:

- Verbal (spoken or written information)
- Visual (pictures, faces, designs and patterns)
- Episodic (past personal events and experiences)
- Semantic (meanings, concepts, factual information and general knowledge)
- Prospective (future events such as appointments, meetings and social/leisure activities)

Commonly reported difficulties include:

- Remembering what has been said
- Remembering names
- Getting details mixed up
- Following the storyline/plot of a television programme
- Keeping track of a conversation
- Remembering where things have been put

To understand memory impairment and ways of addressing it, it may help to understand how memory works. Learning and remembering involves three stages:

- Absorbing information
- Storing information
- Retrieving information

Brain injury can cause a breakdown in any of these stages.

How to help

Get the injured person to repeat out loud the information that is to be learned and then test their recall at intervals.
**Absorbing information**
Before we can remember anything, we first have to pay attention to what we hear, read or see and then absorb the information. This process can be problematic following brain injury because of the concentration and information-processing issues previously described. Problems can occur if too much information is offered at once or if the information being given is too complicated.

**Storing information**
Once we have received the information, it has to be stored either for immediate use or for recall later. People who have not sustained a brain injury, and who do not make a concerted effort to remember new information, may forget it. The same is true for those with brain injury, but it requires strategic thought to ensure information is recalled.

**Retrieving information**
Once stored, we have to be able to access information as and when needed. This can be problematic for all of us at times but more so for some people with memory impairment. Many of us have had the “tip of the tongue” experience or have needed prompting before recalling something. An exaggerated version of this situation is true for people with memory impairment.

**How to help**
There are various strategies that can help with this stage in the memory process, including simplifying information, particularly written information. For example, an injured person would better comprehend and remember how to operate a DVD player if short and easy-to-understand written instructions were given to them. Try to use word association – getting the injured person to link the information to something that they are already familiar with.

**How to help**
It can help to retrieve the information if a cue or prompt is given, e.g. the first letter or sound of a word, or by making a word connection. The injured person could go through the alphabet to give himself, or herself, a prompt. Similarly, if they have mislaid something, they could be encouraged to think of the last time or place they had it. Retracing one’s steps in this way often results in the lost item being found.
For any family the news that a loved one has suffered a head injury is devastating – as well as having to cope with the immediate crisis and the emotional trauma which such a diagnosis brings, families are faced with the challenge of coping with complex medical, legal, care, financial and other practical matters to support a family member usually whilst trying to juggle their own busy lives. Help is essential and if the injury has been caused by another person’s mistake, legal advice is vital.

You do need to make sure that the legal advisor used is an expert, experienced in managing claims involving a head injury to ensure that all the necessary steps are taken to secure compensation and to ensure that the necessary evidence is obtained to maximise the amount of compensation recovered. Claims for head injury are often highly complex, involving a number of different expert disciplines and require thorough and detailed evidence gathering to make sure that the injured person is properly compensated and has sufficient money to secure their lifetime care and other financial needs.

An experienced advisor will make sure that, if the Defendant accepts the blame for the accident, funding is secured as soon as possible to provide for interim treatment and care needs which can be highly significant in ensuring early, effective provision is made for the injured person to optimise their recovery and enhance their long term quality of life. Early intervention can be crucial.

A legal advisor with expertise in head injury cases will be able to support your family through what is a traumatic time and will relieve you of as much of the burden as they can to ensure your family member has a secure future and you are able to fulfil your vitally important role of caring for your loved one.

By Louise Baker
- Solicitor at Harris Fowler

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Among the many challenges after brain injury, it is especially distressing that there is often poor provision for social, emotional and cognitive consequences, sometimes referred to as ‘hidden’ neuropsychological disabilities. These problems make it difficult for survivors to identify their needs, or for those around them to discern what is needed. Injured individuals may be isolated and are often least able to advocate effectively for the help they need. It is often also very difficult to understand the variety of resources and agencies that may be able to help. There is much complexity to be faced by service providers because of the enormous variability of activity and ability to participate that people after brain injury present with. There is a need for support and compassion potentially for years beyond the initial injury.

Along the continuum of brain injury rehabilitation service types, one radical end is the approach provided by holistic intensive neuropsychological rehabilitation programmes. This clinical vignette might be a typical referral for an HNR programme because no one therapeutic approach will be sufficient to contain this complex array of problems caused by cognitive difficulties such as poor executive functions, poor decision making, lack of planning, impulsivity and social difficulties caused by emotional and behavioural dysregulation.

Background to the Oliver Zangwill Centre (OZC). The Centre was established from the outset as a collaboration between Health Service and academic colleagues at the Medical Research Council Cognition and Brain Sciences Unit. One of the advantages of this arrangement has been an ethos such that rehabilitation research has been one of the core functions of the team. This has meant...
over the history of the Centre, out of this small corridor have emerged some important innovations and papers that have been influential in moving the discipline forward.

The Holistic approach
Over the years the OZC team has strived to define what is meant by the holistic approach. This is not as simple as simply lifting directly from Prigatano’s and Ben-Yishay’s texts and implementing verbatim, but rather reflecting on the work of these leaders in the field and translating the ideas to fit the culture and organisational environment of the UK’s health services. The details of the OZC team’s approach have been described in a text Neuropsychological Rehabilitation Theory Therapy and Outcomes (Wilson et al 2009). This book has been well received as it provides details of how the programme operates including templates for group sessions and policies, in addition to articulating a theoretical position.

Six core components of rehabilitation have been outlined by the OZC team, echoing Prigatano’s (1999) components:

1. A focus on functional, meaningful activity.
2. Secondly, the role of the family as part of the rehabilitation programme who are recognised as (usually) being in need of support and education.
3. The establishing of a temporary therapeutic community – a safe space among peers that enables discovery and rehearsal of strategies. This requires some careful engineering of space and timetables. One example is a shared space used by staff and clients alike for making coffee/refilling from the water cooler. Rather than ‘staff room’ and ‘kitchen’, OZC’s common room affords those improvised conversations outside of formal therapy sessions.

4. Psychological therapy in the UK tends toward a Cognitive Behavioural Therapy approach, but because clinicians are likely to have diverse training programmes a range of ‘flavours’ of therapeutic stand point have been seen at OZC including emphases on Compassion Focussed Therapy (Ashworth Gracey and Gilbert 2012); Systemic Therapy (see Bowen, Yeates and Palmer 2010) and cognitive behavioural approaches (Wilson et al 2009). The important thing is that clients are encouraged work on questions of identity (“who am I now?”) adjustment, self-compassion and noticing their own fluctuating emotions.

5. Cognitive assessment and rehabilitation at OZC is tackled mostly from a compensatory approach. For example it is more likely that rehab time will be spent in training in enabling use of a date-book, a smart phone and tablet PC than any time spent on cognitive remediation exercises – it’s not that exercises are banned – it’s just that we have found that a focus on finding the correct strategy is worth the investment.

6. Finally, at OZC great value is put on developing a shared understanding. This core component refers to the procedures to ensure that each member of the interdisciplinary team’s stand points are represented in a single formulation about the patient. This repeated checking of understanding from different theoretical stances enables a rich debate about goals and plans of action for therapy between team members, and checking with the client and family that staff interpretation of client perspectives are accurate or at least evolving in the right direction. The language of formulation – a hypothesis about how the interacting issues are operating to describe the current situation – is a language that runs deep through all of the team’s thinking.
The rehabilitation programme has been revised since the descriptions provided in the 2009 book, it now runs over 18 weeks (it used to last 24 weeks). Nonetheless the fundamental experience of clients attending OZC has remained similar – perhaps one metaphor is one that maybe something akin to attending college. A small group of 4 or 5 clients start in ‘cohorts’ and work together of the next 18 weeks. Clients stay in local bed and breakfast lodgings, hotels or a self-catering apartment. The programme starts for clients each day at 10am with a community meeting. Clients and staff gather (to build the therapeutic community) sharing out chores and talking about issues in the news or other items of interest. The education work delivered to the small group (“cohort”) is themed, week by week on ‘understanding brain injury’; memory; executive functions; and communication & social cognition. There is also during the first six weeks a major focus on further assessment. During this intensive phase the cohort attend for four days per week and have a full timetable between 10am and 4pm. The integration phase is much as was described in 2009, entails a further 12 weeks of just 2 days per week contact with staff, while the remainder of the week is hopefully an experience of testing out strategies in the home or vocational environment. The contact during the 2 days is mainly 1:1 therapy with 1 session known as support group, led by the clients giving each other support and encouragement. One key source of evidence we turn to guide our work was the seminal review by Cicerone et al (2011).

When thinking about outcomes this often conjures the idea of a score on a given scale. However the OZC team of clinicians reflecting on these scores often find that the tests have not really captured the story of the patient. Wilson, Winegardner and Ashworth (2014) published a collection of narratives – written by the patients with interspersed commentaries by these three Clinical Psychologists. This volume illustrates the diversity and depth of individual experiences of brain injury. For example one of the contributors to this book, a young woman called Nat, a survivor of a significant intracerebral haemorrhage has gone on to talk to the press about her experience of attending the rehabilitation programme. A recent newspaper article extract written by Nat reads: “It’s a wonderful place where you get to meet other people who have acquired brain injury … it was just really lovely to talk to people that have had similar experiences, and to not feel on my own.” Nat completed an 18-week programme at the OZC, which taught her not only about how the brain works, but also strategies to help her keep well.

In very brief summary, some of the recent research work that has been happening at Oliver Zangwill Centre has included neuropsychological rehabilitation outcomes research, international collaborations and very early steps towards establishing a computerised self-help platform. The challenges to being able to deliver compassionate and comprehensive rehabilitation are great, so there is a great need to keep working on research in this field.

For further information about Holistic Neuropsychological Rehabilitation (HNR) and the work of the Oliver Zangwill Centre, contact www.ozc.nhs.uk
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As described in Section 1, executive skills are associated with the frontal lobes. People with damage to this part of the brain are often unable to reason things through logically. They may be inflexible in their thinking, becoming fixed on one particular thought and unable to consider alternatives or another person’s point of view. In conversation they may express one set opinion repeatedly, believing that theirs is the only correct view – even in the face of contradictory evidence. Conversely, they may lose their train of thought and go off on a tangent. Whichever of these may apply, conversations can be very frustrating and unrewarding for others, particularly if the injured person is unable to recognise this.

On a practical level, these reasoning difficulties contribute to poor planning and problem-solving because the person cannot analyse problems, consider options then think of possible solutions. In general, people with frontal lobe damage have difficulty in planning, monitoring and evaluating their performance and behaviour. They do not learn from their mistakes and cannot organise themselves. For example, extreme difficulty is often experienced in setting future goals and in organising steps to achieve those goals once set.

Executive skills

Executive skills involve reasoning, planning, problem-solving and organising.

How to help

It is very difficult for people with frontal lobe damage to function properly in unstructured situations. A guiding principle when trying to compensate for difficulties with executive skills is to impose structure on tasks or activities.

Insight and awareness

An extremely important area of cognition, again associated with the frontal lobes, is awareness of self and of others. After brain injury, many individuals are unaware of the effect their words and actions may have on others and so do not see the need to amend their behaviour in particular situations.

There is a lack of insight regarding difficulties, with the type and degree of insight varying from person to person as time passes post-injury. For example, some people may have a good understanding of their physical problems but limited understanding of their cognitive issues. Similarly, some are able to describe their cognitive difficulties but lack awareness of how these affect their ability to undertake activities in their everyday life.

Many people with a brain injury have a tacit understanding that they are not the people that they used to be. They experience difficulties at work and in social situations but may have minimal insight into their own contribution to these, perhaps tending to blame external factors.
Lack of insight can cause problems for the family if the injured person insists on trying to do things that they are now unable to do and which could prove detrimental. It is, of course, important to remain aware of such situations, for example, driving or working with potentially dangerous machinery. Again, the rehabilitation team will be able to advise on safety issues.

Someone lacking insight may not take on board compensatory strategies that would help them. People may never fully regain their awareness of self and others and may, as a result, continue to misread social and professional situations, displaying poor interpersonal and social skills.

**Language and communication skills**

Severe language problems may be experienced by someone who has sustained local damage to the language centres (e.g. a left hemisphere stroke) with difficulties expressing thoughts and understanding others, although this is less common following a closed head injury. Word-finding difficulties or inappropriate word selection are fairly common and some injured people may feel the need to provide lengthy descriptions or explanations to overcome their inability to find a word – or to buy time to think of the correct one. For example, they might seem to talk around a subject, using many words where only a few are needed. Some people may have difficulty in understanding sarcasm or multiple meanings in jokes or in identifying individual words or breaking down the structure of sentences to extract the meaning.

The injured person is often unaware of their errors and can become frustrated or angry, placing blame for communication difficulties on the person with whom they are speaking. Reading, writing and spelling are often more of a challenge than the capacity to speak and understand the spoken word. Simple and complex mathematical skills are also frequently affected.

**How to help**

One can help by making the injured person aware of what they can and cannot do. Lack of insight is sometimes referred to as “denial” and people who are confronted with their difficulties may well become anxious, depressed or angry. It is important to highlight the positives while addressing the negatives and to approach these in a supportive and non-judgemental way.

A speech and language therapist (SLT) will usually deal with problems arising with communication skills. (See Section 4, p62 for an account by Amanda Davis.)

The SLT may recommend specialist literacy classes for problems with written language skills and will advise on appropriate strategies and interventions.
Understanding and navigating our physical world
Perception involves interpreting information that we receive from our senses and this ability can be damaged following a brain injury. For example, some people with senses that have been damaged may not be able to recognise the smell or taste of food, or appreciate the difference between hot and cold. Problems with visual perception are the most common, whereby the injured person may not be able to recognise visual material such as shapes, objects or familiar faces. This may be complicated by problems with vision, including double vision, restricted field of view or difficulty co-ordinating the muscles that control eye movements. If visual perceptual problems are present, these should always be checked out.

Some individuals may not be able to judge the distance between themselves and objects. This can lead to all kinds of problems in daily life, such as trying to put a mug on the table and missing it, banging into pieces of furniture, not being able to judge when it is safe to cross the road, or confusion with left and right.

Occasionally, people have what is called “unilateral neglect”. This means that they ignore or neglect one side of their body – in practical terms, they are simply not aware it is there. This can result in accidents such as bumping into doorways or not shaving one side of the face properly.

A related difficulty is being unable to see things on one side. This is not because of poor eyesight. The problem lies with the part of the brain that makes sense of what is in the field of vision. There may also be difficulty with construction skills so the individual is unable to work out how to put things together, e.g. jigsaws, etc.

How to help
A person (and the objects that need attention) can often be seen clearly if placed on the individual’s good side.