This report has been developed by the Pharmaceutical Industry Neurology Group (PING). Its members are AbbVie, Genzyme, Merck Serono and Novartis
ABOUT PING

The Pharmaceutical Industry Neurology Group (PING) was established in 2013 to help address some of the overarching issues that affect patient care for people with neurological conditions. The group is committed to working in partnership across the neurology community to help translate positive policy developments into measurable improvements for patients. Its current members are AbbVie, Genzyme, Merck Serono and Novartis.
EXECUTIVE SUMMARY

Estimates of the number of people with a neurological condition vary but the National Audit Office has said that there were around 11.5 million neurological cases in England in 2014.¹ Neurological conditions range from very rare to very common conditions, including headache and migraine, multiple sclerosis (MS), Parkinson’s disease, epilepsy, motor neurone disease (MND), Huntington’s disease, ataxia and acquired brain injury.²

Despite the prevalence of these conditions, the National Audit Office’s recent review into neurological care underlined that there are still significant variations in services and patient outcomes for neurology.² These findings were echoed in the telephone interviews undertaken to inform this report, with almost unanimous agreement that significant progress is still required to bring neurology services and outcomes in line with services in other areas such as cancer, stroke and heart disease.

People with neurological conditions will have different requirements, depending on the nature of their condition, but there are overlapping needs. Many people with a neurological condition will need to access a range of professionals for diagnosis and to support day-to-day management and rehabilitation. As a result, the boundaries of neurology services can be challenging to delineate: neurology patients might require treatment, care and support in general practice, A&E, inpatient, outpatient and community settings, alongside social care.

For some time, experts in neurology have acknowledged that a networked approach to care delivery would facilitate greater efficiencies, co-ordination and, most importantly, better patient outcomes. National guidance on networked approaches to care was published by the Association of British Neurologists (ABN) and Royal College of Physicians (RCP) in 2011.³ Since that time there have been developments in relation to integration within the NHS, the introduction of a new health and social care system and moves towards greater devolution of commissioning responsibilities, which need to be taken into account.

Although there are some examples of networks and innovation, such as The Walton Centre’s regional network in the North West, and the NeuroResponse service for people with MS at London’s Queens Square; these remain exceptional. Furthermore, some otherwise effective networks have been decommissioned for failing to demonstrate particular benefits to commissioners.

Limited interest from commissioners in neurology, confusion in relation to commissioning responsibilities and challenges in establishing appropriate payment mechanisms for new care models are just some of the barriers that have prevented broader introduction of managed care networks for neurology.

¹ People with stroke and dementia may also need to access neurology services but these conditions will not be actively considered in this report as they are generally managed by different commissioning teams.
Despite this, there is still wide support within the neurology community for managed care networks to be a major component of neurological services. NHS England’s clinical reference group (CRG) for neurosciences service specification recommends whole system management of patients and recent commissioning intentions for specialised services set out plans to support the new models of care including emergent provider networks, one of which is The Walton Centre’s specialist neurosciences centre.

Networks may take different forms depending on the geography of an area and access to tertiary services. However, they should provide a forum for the sharing of expertise and be focused on providing an efficient service which helps patients to self-manage and supports referral for specialist input when required. The report sets out what the key elements of a networked service might be, as summarised in Figure 1.

Network services provided

<table>
<thead>
<tr>
<th>Phase</th>
<th>Diagnosis</th>
<th>Ongoing support</th>
<th>Interventions</th>
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<tbody>
<tr>
<td>Presentation</td>
<td>Primary care: Neurologist email support re. symptoms and referral</td>
<td>Key worker appointed to coordinate care (specialist nurse, GPwSI)</td>
<td>Access to acute rehabilitation services and community rehabilitation</td>
</tr>
<tr>
<td></td>
<td>A&amp;E: Neurologist on call to answer questions on phone and/or visit patients</td>
<td>Telephone/email triage service: self-management support, referral to therapists, GP, social services</td>
<td>Specialist input on relevant interventions such as surgery for epilepsy or DMT for MS</td>
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<tr>
<td>Referral and diagnosis</td>
<td>Referral to secondary care neurologist</td>
<td>Visit from specialist nurse or another general assessment</td>
<td>Ambulance: link into neurologist expertise to advise on hospital admission</td>
</tr>
<tr>
<td></td>
<td>Referral to tertiary care neurologist, if required</td>
<td>Timely referral to neurologist if required to hospital or community-based support (via triage service)</td>
<td>A&amp;E: Neurologist on call to answer questions on phone and/or visit patients</td>
</tr>
<tr>
<td></td>
<td>Monitoring and testing to reach diagnosis in timely manner</td>
<td>Managed admission to hospital to relevant department with neurologist oversight</td>
<td>Support provided to help patients and carers to understand the options available</td>
</tr>
<tr>
<td>Care planning</td>
<td>Multidisciplinary team (MDT) meets to discuss patient needs</td>
<td>Appointments in tertiary centre, district general hospital or community available</td>
<td>End of life care plan developed and followed</td>
</tr>
<tr>
<td></td>
<td>Care plan developed and ongoing support programme identified</td>
<td>Teleconference assessment available for some patients in the community</td>
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Information sharing between professionals: access to neurologist opinion and support and input from other relevant professionals such as geriatricians, respiratory consultants etc.

Figure 1 Key components of a managed care network for neurology

ii Graphic developed by PING informed by desk research and telephone interviews.
With the current status of services and recent developments in mind, the report makes evidence-led recommendations to encourage greater roll-out of networked approaches to neurological care. It draws on a mixture of desk-based research and expert input from telephone discussions with stakeholders across the neurology sector. Full details of the methodology are included at the end of the report.

<table>
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<th>RECOMMENDATIONS</th>
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<td><strong>5</strong></td>
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CURRENT STATUS OF NEUROLOGICAL SERVICES

KEY FINDINGS

- Despite progress since the publication of recommendations from the Public Accounts Committee in 2012, there are ongoing challenges in neurology services that need to be addressed.
- To date, the impact of the National Clinical Director for neurology and SCNs has been relatively limited due to a lack of resources but some progress has been made in raising the profile of neurology and supporting a local focus on neurological services.
- There are, however, continued regional variations in services and outcomes.
- Commissioners have not tended to prioritise neurology, an issue that has been compounded by confusion in relation to commissioning responsibilities.
- Data on neurology has improved with the establishment of the neurological intelligence network (NIN) but there is far to go in order for it to inform commissioning decisions and support benchmarking of progress.

SERVICES FOR PEOPLE WITH NEUROLOGICAL CONDITIONS

In 2012, the Public Accounts Committee (PAC) made several recommendations to the Government, reflecting on the significant increase in expenditure and rise in admissions between 2006/07 and 2009/10. The Committee’s then Chair, Margaret Hodge stated that: “individual care is often poorly coordinated and the quality of services received depends on where you live. Some areas simply don’t have enough expertise, both in hospitals and the community…Health and social services are failing to provide an integrated range of services for people with neurological conditions”.

In July 2015, the National Audit Office (NAO) published a review of the PAC’s recommendations, highlighting that there have been some welcome developments in relation to neurology services since 2012. Most notably:

- The appointment of Dr David Bateman as National Clinical Director for adult neurological conditions.
- The introduction of Strategic Clinical Networks (SCNs) for neurology, as part of SCNs for Mental Health, Dementia and Neurological Conditions.
- The establishment of the National Mental Health, Dementia and Neurology Intelligence Network, hosted by Public Health England.

It is disappointing that the NAO identified that the impact of these initiatives may have been affected by the limited resources available to support the National Clinical Director and reduced budgets for and uncertainty around the future of SCNs.

The NAO’s review underlined that there are continued variations in services and patient outcomes in neurology. A recent analysis from the Neurological Alliance highlights the significant variation in neurological services, bringing together data from the NIN and ABN. There is variation in the availability of appointments close to people’s homes and significant disparities between CCGs in the rate of consultant adult neurology outpatient appointments, ranging from 2,531 per 100,000 population in Camden to 165 per 100,000 population in Doncaster.
In the telephone discussions held to inform this report, the sentiment was expressed that SCNs lacked the ‘teeth’ to have a significant impact and that CCGs continued to decide their own priority areas. Nevertheless, some people agreed that having an SCN for neurological conditions provided a good opportunity to raise awareness and undertake activity in relation to neurology services and that SCNs should be able to drive improvements.

Many interviewees highlighted that services varied depending on where people live and their proximity to specialist expertise in tertiary neurosciences centres.

Neurology has not been identified as a priority by commissioners and the lack of specific commissioning metrics in the CCG outcomes indicator set (CCG OIS) and other relevant outcomes frameworks is not encouraging commissioners to focus on these issues.11

There has also been confusion in relation to commissioning responsibilities which is having an impact on local approaches to neurological services. For example, at one point, all neurological services delivered in a tertiary centre were commissioned by NHS England as part of its specialised services responsibilities, resulting in less interest in neurological services from local CCGs.

Last year, the Prescribed Specialised Services Advisory Group (PSSAG) recommended that CCGs take on responsibility for all outpatient referrals to specialist neuroscience centres, apart from referrals from a consultant to a consultant (ensuring that tertiary hospitals get paid a standard tariff for routine appointments). CCGs took on this responsibility from April 2015 and we understand that PSSAG will also be considering commissioning responsibilities for non-specialist inpatient neurology services.12

Although CCGs look set to take on an increasing role, research from the Neurological Alliance in January 2015 found that less than 15% of CCGs had made an assessment of local costs relating to the provision of neurology services and less than 40% have taken action to promote integration across primary, secondary, tertiary and social care.13 The report found that there are significant delays in people receiving a diagnosis and that over 70% of people with a neurological condition have not been offered a care plan to help them to manage their condition.14

In a survey conducted by Epilepsy Action, 91% of CCGs stated that they were not intending to further address neurology services at all. Just 11 had produced a needs assessment for neurological conditions, with very few planning to redesign services.15

The NAO analysis published in July found that only half of Joint Strategic Needs Assessments referenced neurology with at least one or more specific sentences, with only one in five joint health and wellbeing strategies referring to neurology.16 Our report contributors echoed these findings. Neurology is not a commissioner priority and this is having a direct impact on neurological services, including the roll-out of models of care structured around the needs of patients.

A key challenge is in relation to data and understanding the services available to people with neurological conditions to inform prioritisation decisions. The launch of the NIN was welcome but, aside from epilepsy, the available data has been relatively limited.

It is encouraging that in August and September 2015, data for 12 neurological conditions was added to NIN’s neurological profiles. This sets out admissions data based on a mention or primary diagnosis for a range of conditions, including MS, Parkinson’s, headaches and migraine and traumatic brain injury. There are also general neurological indicators on outpatient appointments in the home.17 This data should allow for more benchmarking between areas and planning of services. Extending this data to look at emergency admissions, finished consultant episodes and patient experience would also help to inform a more detailed picture of neurology services.

The Neurological Alliance has already used this data to underline variations in services across the country, as noted above. The NIN director has also outlined the aspiration that the data will be able to inform commissioning decisions but this will not be possible for some time.
“Local prioritisation is dependent on the interests and experience of CCGs so it can be challenging for SCNs to encourage a greater focus on neurology”
Dr Sue Woodward, Chair, Royal College of Nursing Neurosciences Forum and Lecturer, King’s College London

“I don’t see SCNs in their current form delivering too much. Their remits also include dementia and psychiatry which is too large an agenda to get any sort of vision”
Dr Richard Grunewald, Consultant neurologist, Sheffield Teaching Hospital NHS Foundation Trust and Member, Neurosciences Clinical Reference Group, NHS England

“The combination of neurology with mental health and dementia means that there is a significant and vast agenda. Mental health and dementia both have performance standards attached to them, which gives then a focus in the system. Very rarely does anyone ever ask what we’re doing on neurological conditions. However, moving forward, neurology is in a better position than it was before - having clinical leads is a definite positive”
Bernie County, Interim Network Manager, West Midlands Strategic Clinical Network

“Thanks to the continued hard work of the SCNs we are beginning to see some success in raising the profile of neurology”
Dr Neil Bindemann, Executive Director, Primary Care Neurology Society

“The Yorkshire and Humber SCN is working collaboratively with clinicians and commissioners to take forward the neurology agenda”
Sheriden McKiniry, Quality Improvement Manager, Neurology, Yorkshire and Humber Strategic Clinical Network

“Specialist clinics are useful and good in terms of patients’ annual appointments with expert neurologists, but when people who have travelled long distances for appointments return to their home environment, they don’t always get easy access to the follow up services they require locally, such as physio and speech therapy”
Sue Millman, Chief Executive, Ataxia UK

“There are real problems at the moment, partially driven by the fact that although some neurological services fall under specialised commissioning, some do not. Some people have exactly what they need where they are and others don’t…it depends what condition you’ve got, who is funding the service where you live”
Professor Mike Barnes, Chair, UK Acquired Brain Injury Forum

“Where services are CCG funded, access is contingent on the interest of the CCG, as with the case of PCTs, but there are more CCGs than PCTs and thus more differing priorities”
Professor Mike Barnes, Chair, UK Acquired Brain Injury Forum

“Due to the split in commissioning responsibilities between CCGs and specialised commissioning, it has been difficult to secure CCG engagement on a single specialty basis. There are no clear indicators or levers such as the CCG Outcomes Indicator Set so a CCG focus on neurology tends to be driven by personal interest”
Sunita Berry, Associate Director, South West Strategic Clinical Network and Senate

“Neurologists have found it difficult to make the argument for investment in neurology and to use the language of commissioners. Neurology is low down the priority list because it is difficult to measure its impact when compared with specialties driven by procedures such as surgery or endoscopy”
Professor Kevin Talbot, Head of the Division of Clinical Neurology, Nuffield Department of Clinical Neurosciences, University of Oxford and Honorary Secretary, Association of British Neurologists

“In the East of England, we set up a community neurology multidisciplinary team. 5,000 people with neurological conditions and acquired brain injury were on the books starting with 300 and increasing to 700 new referrals a year. Unfortunately that specialist neuro service no longer exists because the CCGs thought that, at the time, with the muddles in interpretation in commissioning, it would be specialised and thought it would be commissioned through NHS England which as a level three provision it wasn’t”
Amanda Swain, Executive Committee, Health Policy Adviser, UK Acquired Brain Injury Forum

“Health intelligence is starting to be used to support clinical networks in their work and the NIN is working towards making more data and intelligence available. By getting better data, we will have a better understanding of the state of services. For example, in areas where there are higher rates of emergency admissions, this may be symptomatic of variations in the provision of care and/or challenges in other parts of the pathway”
Michael Jackson, Head of Health Intelligence (Dementia & Neurology), Knowledge & Intelligence - CKO Directorate, Public Health England
KEY FINDINGS

- Integration and new models of care are accepted terminology in the NHS, seen as necessary to address the needs of people with a single or multiple long term condition(s)
- The Five Year Forward View set out proposals for new models of care which are being taken forward by vanguard sites across the country
- Managed care networks for neurology are important to provide a more seamless service for patients and to ensure that people have access to specialist support
- The shortage of neurological specialists and complex clinical requirements of many people with neurological conditions underlines the need for networked models of working
- National policy is increasingly supportive of networks for neurology, with reference in the neurosciences CRG service specification and selection of the Walton Centre’s Neuro Network as an acute care collaboration vanguard

INTEGRATION

The move towards networks has progressed since the publication of the ABN and RCP guidance in 2011, with integration becoming an increasingly important term within health and social care services.

The NHS sees fewer people for “one off” episodes of care than it used to, as many more people are living with a long term condition or multiple long term conditions which require input from several different healthcare professionals and services. Integrating these services is essential to ensure that people can access streamlined care and are seen by the right person at the right time to secure good patient outcomes and effective use of NHS resources.

The ‘house of care’ model is based on the concept that the management of people with long term conditions should be based on “an holistic approach to their lives”, helping them “achieve the best outcomes possible”. Single condition services, lack of coordination and fragmented care are all identified by NHS England as barriers that have prevented people with long term conditions from accessing great care – a further argument in support of integration.

Integration is a key feature in the Five Year Forward View models of care:

- Multispecialty community providers (MCP): “groups of GPs will combine with nurses and other community health services, hospital specialists and perhaps mental health and social care to create integrated out-of-hospital care”
- Primary and acute care systems (PACS): an integrated hospital and primary care provider “combining for the first time general practice and hospital services”
- Urgent and emergency care services will be redesigned to “integrate between A&E departments, GP out-of-hours services, urgent care centres, NHS 111, and ambulance services”
- Specialised care: “we will also look to these specialised providers to develop networks of services over a geography, integrating different organisations and services around patients”

Vanguard sites have been selected across the country to take forward these models of care. The Walton Centre’s Neuro Network vanguard site will be an important model for other neurosciences centres to consider. Many other vanguards are considering initiatives to support people with long term conditions, one specifically references Parkinson’s disease in its early plans (Airedale NHS Foundation).

The proposals to devolve health and social care budgets to Greater Manchester are also designed to support greater integration of health and social care.

National oversight of these initiatives should provide greater impetus behind networked models of care than in the past. The challenge will be to ensure neurology is at the fore of developments.
NETWORKS IN NEUROLOGY

There are many different types of networks:

- Professional information sharing networks such as the Royal College of Nursing (RCN) Neurosciences Forum, which provides information and event resources for nurses.\(^{22}\)
- SCNs, which "bring together groups of health professionals to support commissioners to improve services for a particular condition in order to improve the quality of care and outcomes for patients".\(^{23}\)
- Operational or managed care networks, which directly support patient care.

It is the third of these types of network which forms the focus of this report. SCNs and professional networks may play a role in supporting the implementation of managed care networks but the latter will require practical collaboration between providers of neurological services to streamline services, maximise patient experience and outcomes and ensure effective use of NHS resources.

WHY ARE MANAGED CARE NETWORKS FOR NEUROLOGY IMPORTANT?

Increasing demand, minimal real-terms increases in the NHS budget and cuts to the social services budget have left healthcare finances in an increasingly challenged state. Provider deficits are expected to reach £2 billion by the end of the 2015/16.\(^{24}\) Within this context, maximising the use of resources is even more important and over time, new care models, such as networks, are expected to deliver efficiency savings.\(^{25}\)

The need in neurology is especially acute. In particular, there is an acknowledged shortage of neurologists in England, with one neurologist per 115,000 of the population; – less than a third of the European average.\(^{26}\) The distribution of neurologists is also highly variable. This manifests itself in widely differing rates of access around the country. Neurologist appointments for people admitted to hospital who have a neurological condition are available on 89% of days in the best performing hospitals (highest quartile) but on just 17% of days in hospitals in the lowest quartile.\(^{27}\) Networks provide a smarter way of using scarce clinical expertise to the benefit of patients.

With an increasing number of people living with long term conditions and the need for people to access a range of healthcare professionals, managed care networks are becoming increasingly important. The ABN and RCP stated that, "Good [neurological] management requires better integrated primary, secondary and tertiary resources to achieve a neurology network that is easily accessible, provides local care where appropriate and, when necessary, and involves the regional neurosciences centre."\(^{28}\)

The NHS England specialised services specification for neurology services suggests that the 25 identified neurosciences centres should play a key role in coordinating neurological care:

"specialist centres act as coordinator to ensure appropriate care plans are in place to ensure lines of communication and whole system management of patients...Specialised services will be available within each NHS region to support local provision where appropriate".\(^{29}\)
PRACTICAL IMPLEMENTATION OF MANAGED CARE NETWORKS FOR NEUROLOGY

KEY FINDINGS

- Managed care networks for neurology should ensure that patients can access the right level of support at the right time, helping them to manage their condition and avoid preventable escalation of problems.
- There are several approaches that could be incorporated into networks such as centres for particular neurological conditions, and greater use of technology and triage services.
- Hub and spokes models of care, such as those overseen by The Walton Centre, allow input from specialist neurologists and coordination of care by other professionals to support a seamless service for patients.
- Despite the benefits, some networks have struggled to demonstrate the case for investment and services have been cut.
- Barriers preventing greater roll-out of networks have included: challenges in securing commissioner buy-in, changing commissioning responsibilities, poor data and inflexible payment mechanisms.

CONSIDERATIONS FOR MANAGED CARE NETWORKS FOR NEUROLOGY

Effective networks are dependent on joint-working between different healthcare professionals. Services that operate more efficiently tend to be those that coordinate the different elements of care that people might need to access and pre-empt problems that are likely to trigger an escalation of requirements, whether that be an emergency admission to hospital and/or an unnecessary deterioration of someone’s condition.

For neurology, these arrangements are based around the expertise of consultant neurologists, specialist nurses, allied health professionals (AHPs) and social care services. Primary care practitioners can also support ongoing management of people with long term neurological conditions. The coordination of these professionals is made far easier when a network is in place. Accessing integrated care and support via a care network, based on a mutually agreed pathway, can help to meet patients’ needs in a much more holistic way.

Patients need to access the right level of support in a timely manner: this might be a fast-tracked visit to a neurologist at a tertiary centre for a definitive diagnosis following a flare in symptoms, but it might also be advice from a nurse specialist about a cough to assess whether antibiotics are required or support from general practice to manage ongoing health concerns. Making sure that people can access appropriate advice and support in a timely manner improves patient experience and is also a more effective use of resources, especially if it avoids an unnecessary admission to hospital and can be delivered closer to people’s homes.

“Diagnosis is a key issue for patients, it needs to be accurate and timely with neurologist specialist input. Referral, support and coordination are the top issues”
Arlene Wilkie, Chief Executive, Neurological Alliance

“Networks are particularly important where you have highly specialised treatments which can only be delivered with special skills”
Dr Richard Grunewald, Consultant neurologist, Sheffield Teaching Hospital NHS Foundation Trust and Member, Neurosciences Clinical Reference Group, NHS England

The effectiveness of any joint working arrangements is dependent on a mutual understanding of when each element of support is needed and why those particular skills are most needed for an individual patient at any given time.

“All care should be part of a linked network of delivery and those in each part of the pathway should have an understanding and a respect for the benefits that come from the different elements of care”
Dr Beverly Castleton, Consultant Physician in the Care of the Elderly
This mutual respect has been seen in cancer where multidisciplinary team (MDT) led care has become the norm. Testament to the importance placed upon the role of the MDT within cancer, data assessing the quality of cancer services can be disaggregated by MDT.30

“In cancer, the multidisciplinary team (MDT) concept has helped to transform the way that professionals work together. The MDT, including oncologists, surgeons, specialist nurses, comes together to discuss the case and how to move forward with care planning arrangements”

Sunita Berry, Associate Director, South West Strategic Clinical Network and Senate

ENHANCING NEUROLOGICAL SERVICES

There are a range of approaches to neurology services which could be incorporated into formal networks. A central element to this is ensuring that patients are at the heart of any service. By establishing a service around the needs of patients, it is possible to support them more effectively in the community, improving outcomes and saving money.

There are three ataxia centres in England which are accessed by about 2,500 of the 10,000 people with ataxia. The centres are run by a consultant neurologist with a specialist interest in ataxia and Ataxia Specialist Nurses. The centres try to offer a joined up service where people can get access to other therapists that they might need to see, for example: speech and language therapists, physiotherapists, neuropsychiatry and occupational health. In some instances, all these services are in one place. Patients are referred from long distances to receive specialist input from the neurologists and the other services offered by the centres but they should then receive ongoing support from local services. The feedback on the services provided has been excellent.31

Thames Valley SCN is supporting a project to help prevent prolonged admissions for people with long term neurological conditions that are costly and reduce quality of life. A patient with a long term neurological condition will, on average, have a ten day stay in hospital with a chest infection but these admissions are often preventable. By auditing hospital admissions, it was found that more than £200,000 could be saved each year by having a respiratory nurse or chest physiotherapist in place to visit patients in their homes. Monitoring patients and early intervention with definite treatments can help to prevent admission to hospital and saves money.32

A telephone triage service for people with Parkinsonism in NW Surrey was able to intervene early if patients reported problems. Prompt access to knowledgeable advice also came through a dedicated website supported by Parkinson’s Disease Specialist Nurses and doctors specialising in Parkinsonism. This telephone and email access often avoided escalation of symptoms and hospital admission. Unfortunately this service has since been discontinued.

Commenting on the service, Dr Beverly Castleton stated: “This timely open access to expert advice should be available to all but we need methods of measuring outcomes and recording data to prove prevention or minimisation of problems is achieved.”33
Making better use of advances in technology has the potential to streamline services and improve patient outcomes. By incorporating technology into services for neurological conditions, it is possible to support better self-management and appropriate referral to relevant healthcare professionals.

The NeuroResponse service was established by MS nurse consultant, Bernadette Porter at the University College London Hospital (UCLH) National Hospital for Neurology and Neurosurgery at Queens Square, to improve services and provide a more timely response to MS patients.

Under the old system, clinical nurse specialists (CNSs) were busy all day in face-to-face clinics. CNSs would return from clinic to find several voice messages that would need to be dealt with. An audit found that this was not satisfactory for patients or staff.

With funding from Nesta and the Young Foundation, NeuroResponse was set up to address this problem. The service includes:

- A videoconference facility to allow people to be assessed in the community with input from specialists at Queens Square
- NeuroMail, where a GP can get advice from a neurologist about patients with MS via email
- Neurodirect, a telephone assessment service for patients where nurses undertake an assessment and provide evidence-based triage support. Patients sign up for the service and give UCLH permission to access the different triage points to support a seamless service.

Neurodirect supports self-management by encouraging people to understand their symptoms and self-monitor before seeing a healthcare professional. It also supports GPs to manage people’s MS symptoms, for example, somebody with neuropathic pain could visit their GP and an assessment from the specialist nurse would be emailed with details of the telephone assessment and links to the relevant NICE guidelines.

The service considers the holistic needs of each patient. For example, the nurse may encourage someone to get a social services assessment if these needs are identified.

The telephone service also provides a relapse assessment, taking into account previous responses to intravenous steroids and ensuring that someone is referred to the right part of the hospital. UCLH has a bespoke relapse clinic which sees about eight people a week.

Evaluation is embedded into the programme. Quality of life (EQ-5D) questionnaires are included on day one of admission with relapse and six weeks after as part of a routine follow up phone call. The service is commissioned through CCGs via a tariff that captures the expert telephone assessment and triage elements of the service.

An indication of the success of the programme, NeuroResponse has been selected as part of NHS England’s NHS Innovation Accelerator (NIA) programme which should help to support expansion of the service to other parts of the country and roll-out of these concepts to other neurological conditions.34
ParkinsonNet was established in the Netherlands in 2004. Initially a regional network covering two cities, the network now covers the whole country and involves almost 3,000 professionals, including neurologists, rehabilitation specialists, pharmacists and occupational therapists. The model includes an online platform with information resources for patients and communities where patients and healthcare providers can chat. The network allows neurologists to link with therapy services in a streamlined manner and has delivered impressive results. It is estimated that the model has saved up to 20 million euros since its inception, mainly by transferring care away from hospital clinics into the community. It has also improved clinical results – patients living in the two oldest ParkinsonNet areas sustained fewer fractures, including a 55% decrease in hip fractures than those in other regions.

Specialist nurses should have a key role to play in coordinating care for patients. The extension or adoption of similar NeuroResponse services around the country should provide an opportunity for more holistic management of individual people with neurological conditions.

“Specialist nurses could be a key player in these networks, making sure that care is properly co-ordinated and that people see a neurologist if needed but if possible, are managed in the community with appropriate expert input”

Dr Sue Woodward, Chair, Royal College of Nursing Neurosciences Forum and Lecturer, King’s College London

There have already been some efforts to introduce formal networked models of care for neurological conditions and these work well in some areas.

“The network for the delivery of care for patients with MS in South Yorkshire works reasonably well because all the neurologists work in the same centre and provide an outreach service to the region”

Dr Richard Grunewald, Consultant neurologist, Sheffield Teaching Hospital NHS Foundation Trust and Member, Neurosciences Clinical Reference Group, NHS England

Several consultant neurologists travel to district general hospitals for clinic appointments with patients. Often this is focused on consultant neurologist support, rather than the whole range of services that people with a neurological condition might need to access.

“Part of the West Midlands is covered by secondary and some tertiary care. People closer to a tertiary centre tend to have better access but most district general hospitals now have a neurologist on site. There is already a hub and spokes model in the West Midlands to introduce a more uniform pattern of working, and this needs to be expanded across the region, so that there is no disparity between one hospital to another”

Dr Saiju Jacob, Consultant Neurologist and Clinical Service Lead, University Hospitals Birmingham

One of the most developed tertiary-led network models has been established at The Walton Centre in Liverpool. This approach will be further developed through NHS England’s vanguards programme.

Technology can also be used as the basis for more ambitious networked models of working.
The Walton Centre operates a ‘hub and spokes’ model that makes tertiary centre neurology services available to more than three million patients across Merseyside, Cheshire, north Wales and the Isle of Man. Currently 13 NHS trusts are included in that model, covering all 15 district general hospitals in the region. Patients are able to access outpatient consultations and a range of tests close to where they live; services are also provided from health centres and other community settings.

Consultant neurologists provide general and some specialist neurology clinics and ward referral services at the general hospitals. The model enables the consultants at the same time to provide specialist services at the Centre, so facilitating access to specialist care for the full range of neurological conditions. The focus is on multidisciplinary working, with the full team of specialists.

Patients with long-term conditions and complex needs are also supported by Advanced Neurology nurses. These nurses liaise with other specialists including physiotherapists, occupational therapists, speech and language services, dieticians, social services, mental health teams and carers. The coordination of multiple professionals ensures that patients have all the support they need, close to home. They act in the role of key worker.

All neurological activity is co-ordinated from the Walton Centre thus ensuring standardisation of booking processes and outcomes.

All district general hospitals and community centres have access to specialist advice from the Walton Centre at all times via the emergency line managed by the consultants for one hour per day or via the nurse advice line manned Monday to Friday from 8am until 5pm.36

The Walton Centre also oversees the Cheshire and Merseyside rehabilitation network.

The Cheshire and Merseyside rehabilitation network is an example of a genuine partnership between NHS organisations in that area. The Walton Centre acts as the host with the hub being at the Walton centre and the spokes in two other district general hospitals, extended and community services are also available to provide stepped down care as the patient progresses.

Admissions are taken across a range of units, depending on the needs of patients, with opportunities with outpatient consultant and therapist appointments to manage ongoing support needs.37 Hyper acute and level 1 rehabilitation is provided at the Centre, networking with three level 2 spokes in district general hospitals, plus community rehabilitation services.

The service has impressive results:38

- 96 per cent of patients and families are very satisfied with the models of care
- All national waiting times targets for assessment and admission for specialist rehabilitation care are being exceeded
- 81 per cent of patients admitted with critical illness are discharged within 70 days

Admissions, transfers and discharges across the network are coordinated from a central office, based at the Walton Centre. This ensures that the tertiary centre has a good sense of length of stay within the network and where any blocks in the pathway are.39
Despite these positive examples, our report contributors suggested that good models were often linked to individuals with “vision”, and that the ways of working were at risk if that individual moved on. Furthermore, even successful models have been at risk of being cut if the service was unable to demonstrate clear improvements in outcomes or if a commissioner could not see the value of networked approaches to care.

“There used to be [a network] in Northumberland, which again worked out of the Newcastle specialist level one service providing a pathway through the levels of provision of care however I believe their funding has also been changed”

Amanda Swain, Executive Committee, Health Policy Adviser, UK Acquired Brain Injury Forum

BARRIERS TO THE ESTABLISHMENT OF NEUROLOGICAL NETWORKS

In order to make recommendations about a wider roll out of networked models of care, it is important to understand why their implementation has not been widespread across England. During the telephone interviews, a number of barriers were identified as to why neurological networks have not become the norm. Many of these are aligned with the overarching challenges facing the neurological community as outlined above.

Commissioner buy-in
The low profile of neurology at a commissioner level was limiting proactive approaches to neurology services and the establishment of networks. In areas where active work had been undertaken, it tended to be driven by individuals with a personal interest in neurology

“GPs and other commissioners think that neurological conditions are too rare. It doesn’t seem to sink in when we say how many millions of people there are living with a brain injury and neurological condition – around 8 million – plus the knock on effect to families”

Amanda Swain, Executive Committee, Health Policy Adviser, UK Acquired Brain Injury Forum

Changing commissioner responsibilities
Uncertainty in relation to commissioner responsibilities and the interchange between NHS England and CCGs had limited direct interventions in services. In line with this, services as set out in the NHS England specialised neurology service specification have failed to materialise in many areas, perhaps due to the challenge in coordinating care across specialised and standard provision. Furthermore, there were examples where CCGs have decommissioned community neurology services because they thought that they were the responsibility of NHS England.

“In parts of the region, there are examples where specialist nurses have retired or gone off sick and they simply haven’t been replaced. It may be that the person who championed their employment is no longer involved or it has been suggested that this is now ‘NHS England’s responsibility’, which makes funding tricky”

Dr Saiju Jacob, Consultant Neurologist and Clinical Service Lead, University Hospitals Birmingham
**Poor data**

Limited data to demonstrate the status of neurological services, including that on outcomes, expenditure and staffing levels was making it hard to make the case for neurological networks.

“At the moment, we do not have a good enough understanding about the numbers of people being diagnosed to fully appreciate the current and future demand for services. A better understanding would surely lead to improvements in service planning”

*Michael Jackson, Head of Health Intelligence (Dementia & Neurology), Knowledge & Intelligence - CIO Directorate, Public Health England*

“We need “big data” to make commissioners sit up and take notice of the high cost of resources currently utilised by people with Parkinsonism. The challenge is to tease out the amounts of money spent on the care needs of an individual as they journey through life with Parkinsonism, amalgamate that into the total spend on all people affected by Parkinsonism in an area and then collect data to show how new ways of integrated working leads to improvement of outcomes in a more cost effective delivery system”

*Dr Beverly Castleton, Consultant Physician in the Care of the Elderly*

**Clinical buy-in**

Although some clinicians within neurology had identified the benefits of following a networked-model of care, and supported their introduction actively, it was suggested that many neurologists are focused on the day-to-day tasks of delivering their clinic and seeing individual patients, with limited impetus for change. Significant changes in clinical practice or treatment often acted as a catalyst for change in other areas.

“In cardiology, services are shared because 24/7 angioplasty services are required and trusts have to work together to ensure that this is in place and to determine a shared pathway. This development in treatment has been instrumental in driving changes”

*Sunita Berry, Associate Director, South West Strategic Clinical Network and Senate*

**Payment mechanisms**

Where a clinician had identified and set out the workings for a potential network, tariff arrangements would not necessarily support appropriate reimbursement. A new tariff might be required to recognise support outside clinic appointments or, for the services that fall outside hospital walls, ‘year of care’ tariffs might also allow a more holistic approach to paying for neurological services.

“Community providers may be helpful but there are subtle things that would need to be considered to make these work effectively, particularly in relation to funding flows, but this needs to be reinforced with equal input from both the health and social service”

*Dr Saiju Jacob, Consultant Neurologist and Clinical Service Lead, University Hospitals Birmingham*

“In NW Surrey, Commissioners were persuaded to change the service contract to support better continuity of care by maintaining specialist follow up for patients with Parkinsonism. It was a challenging negotiation”

*Dr Beverly Castleton, Consultant Physician in the Care of the Elderly*
In stroke services, the introduction of thrombolysis was a significant driver for the introduction of networked approaches to care.

There is a four hour window whereby patients with a stroke need to be assessed using a magnetic resonance imaging (MRI) scan and delivered thrombolysis in order for the clot buster to work effectively. The centralisation of London’s acute stroke care at eight hyperacute stroke units (HASUs), each open 24 hours a day for seven days a week meant that patients with suspected ischaemic stroke could receive thrombolysis in a timely manner. The British Medical Journal found that the centralisation of these stroke services reduces mortality and length of hospital stay.

London had the benefit of a number of potential HASUs but it was necessary for other parts of the country to implement a networked approach in different ways. In the South West, the Avon, Gloucestershire, Wiltshire (AGWS) Stroke Network was created, serving a population of approximately 2.25 million people. The service consisted of nine acute hospitals and two ambulance services. A clinical reference group was established which undertook the following activities:

- Developed a network-wide thrombolysis protocol
- Undertook clinician training
- Established an out-of-hours telemedicine thrombolysis support rota

The latter meant that clinicians could always get advice from a stroke consultant if they had queries about a thrombolysis procedure. Regular engagement was undertaken within the network to share expertise and report data across the Network. The approach successfully reduced delays to patients receiving thrombolysis.
EMBEDDING MANAGED CARE NETWORKS FOR NEUROLOGY IN THE NHS

KEY FINDINGS

- There will be different approaches to networked models of care, depending on the local geography, proximity to a tertiary centre and population needs.
- Networked models should be able to develop from throughout the system – led by a tertiary centre, district general hospital, general practice or community centre.
- Tertiary neurosciences centres should have to demonstrate that they are implementing networked approaches to care as set out in NHS England’s neurosciences specialised service specification.
- Mechanisms to support data collection, new approaches to tariffs and provider-led models should be explored and piloted to address the challenges that have prevented widespread implementation of networked approaches to care.

PROPOSED APPROACH

Given the financial constraints that face the NHS, this report does not advocate wholesale changes to ways of working but rather seeks to identify ways that service provision can be adapted, using networks as a means to improve patient care and maximise the use of existing resources.

The King’s Fund’s work on integration highlighted the importance of having a shared narrative to explain why integrated care matters and to develop a persuasive vision of what integrated care will achieve. They also recognise that there is no set model for integrated care and that change can happen “from the bottom up”.

It was clear from the interviews undertaken to inform this report that there will not be a one-size fits all approach to neurological networks across England. Approaches will be driven by the nature of the geography, proximity to a tertiary neurosciences centre and existing local neurological service provision in the community via district general hospitals or other centres.

The key components of a networked model of care for neurology have been explored in Figure 9 overleaf. Its content was informed by the desk and telephone research undertaken for this report. The focus is on ensuring that neurological input features across the system – raising awareness among other health professionals to support earlier diagnosis and appropriate interventions and ensuring that healthcare professionals and patients can access neurological expertise in a timely manner. Once diagnosed, a care plan could inform the networked services that a patient might have to access as well as improving their experience of care.
Operational networks of care should be able to evolve from the top down led by tertiary centres and from the bottom up led by other providers, tapping into support and information from SCNs as appropriate. Innovation should be encouraged at all levels of the neurology service. Information sharing via the SCNs and National Clinical Director-led activity should facilitate input from individuals across the sector and support wider roll-out of successful networks.

The advantages of this approach are:

- **Expert-led**: Sharing neurology expertise across professionals and organisational boundaries should allow the services to meet the needs of people with a neurological condition more effectively.

- **Efficiency-focused**: Coordinating services should help people to access the right support, in the right way, at the right time. This will help to maximise use of NHS resources and improve patient experience and outcomes.

- **Supporting outcomes**: The stroke model strongly suggests that better use of neurological expertise for patients will improve outcomes.

Although it would be the ideal, in the short term, a networked model of care does not necessarily need to encompass the whole range of services above. It might be that a hospital decides to operate a networked approach to address the ongoing support needs of people with a long-term neurological condition, linking into primary care for ongoing monitoring requirements and identifying what wider services are required with a view to extending the networked approach to other parts of the neurology service. Teleconference consultations may be particularly relevant to reach people living in rural areas but may not be necessary to ensure neurologist input in urban areas.

Tertiary centre-led model

As demonstrated by The Walton Centre, a tertiary centre can be the focus point for a comprehensive, regional neurology service, using a hub and spokes model. The hospital’s expertise reaches a much wider geography than if all its services were delivered within the hospital grounds. Taking an active interest in the allied health professional services that people with a neurological condition need to access also helps to ensure a smooth service for patients.

**Figure 9** Key components of a managed care network for neurology

Note: The table below outlines the network services provided, including diagnosis, ongoing support, and interventions.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Ongoing support</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary care: Neurologist email support re. symptoms and referral</td>
<td>Key worker appointed to coordinate care (specialist nurse, GPwSI)</td>
<td>Access to acute rehabilitation services and community rehabilitation</td>
</tr>
<tr>
<td>A&amp;E: Neurologist on call to answer questions on phone and/or visit patients</td>
<td>Telephone/email triage service: self-management support, referral to therapists, GP, social services</td>
<td>Specialist input on relevant interventions such as surgery for epilepsy or DMT for MS</td>
</tr>
<tr>
<td>Referral to secondary care neurologist</td>
<td>Visit from specialist nurse or another general assessment</td>
<td>Ambulance: link into neurologist expertise to advise on hospital admission</td>
</tr>
<tr>
<td>Referral to tertiary care neurologist, if required</td>
<td>Timely referral to neurologist if required to hospital or community-based support (via triage service)</td>
<td>A&amp;E: Neurologist on call to answer questions on phone and/or visit patients</td>
</tr>
<tr>
<td>Monitoring and testing to reach diagnosis in timely manner</td>
<td>Managed admission to hospital to relevant department with neurologist oversight</td>
<td>Support provided to help patients and carers to understand the options available</td>
</tr>
<tr>
<td>Multidisciplinary team (MDT) meets to discuss patient needs</td>
<td>Appointments in tertiary centre, district general hospital or community available</td>
<td>End of life care plan developed and followed</td>
</tr>
<tr>
<td>Care plan developed and ongoing support programme identified</td>
<td>Teleconference assessment available for some patients in the community</td>
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**Information sharing between professionals: access to neurologist opinion and support and input from other relevant professionals such as geriatricians, respiratory consultants etc**
NHS England’s neurosciences CRG specialised service specification outlines three tiers of neurology services:

- Local community and primary care services such as physiotherapy and community nursing, with support from specialist staff from the ‘hub’ as required to support basic maintenance
- Multidisciplinary specialist outreach clinics provided by members of the multidisciplinary team visiting from the ‘hub’ centres, providing a ‘subspecialist spoke’ service
- Specialist care provided at the tertiary centre, the ‘hub’ for any given service

Despite the existence of this guidance, our research found that implementation of this approach has not been comprehensive. It may be that this has been held back due to uncertainty in relation to commissioning responsibilities but greater oversight from NHS England should ensure that all neuroscience centres are following the approach as set out in the service specification.

Not all tertiary centres will approach the delivery of their services in the networked approach that the Walton Centre has adopted but tertiary centres should be integrated in area provision as set out in NHS England’s service specification. In the same way, there may be district general hospitals, primary care or community centres which seek to introduce networked ways of working within their neurology services, tapping into tertiary expertise as required.

**Community-led model**

A community-led service can also help to foster effective networks. As a standalone model, these networks may be more limited in scope than the potential networks coordinated by tertiary centres but they could have a significant impact on patient experience. The GPwSI service for headache in York and the telephone triage service for people with Parkinson’s disease in North West Surrey are both examples whereby networks in the community can help to improve patient experience and outcomes.

A community model might be led by a GPwSI in neurology or a specialist nurse. These individuals could coordinate the ongoing needs of people with a diagnosed neurological condition, supporting optimal management, encouraging early intervention and assisting with referral to a neurologist or other professional as required. It may be that a service manager might be able to undertake the coordination role, tapping into healthcare professional and allied health professional services when necessary.

“Networks do not have to be led by the medical consultant in the community, an advanced practitioner nurse or Consultant AHP (specialist therapist) could manage a neurological care team with any referral for specialised medical input going back to the centre of excellence if necessary. This is a better use of time, making more use of expertise”

Amanda Swain, Executive Committee, Health Policy Adviser, UK Acquired Brain Injury Forum

Regardless of whether they are part of a formal network, all models should be able to refer up to tertiary centres for specialist input as required, which should help to make better use of that capacity. It is likely that a tertiary centre managed network would also want to tap into the support that can be offered in a community setting.

**RECOMMENDATION**

The remit of tertiary neurosciences centres should include a formal requirement to adopt networked models of working and adherence to this should be overseen by NHS England.

At a minimum, the 25 neuroscience centres identified in NHS England’s service specification for specialised neurology should be operating within networks, ensuring that specialist input is disseminated to local neurology services. NHS England should take a more proactive approach to neurological services, supporting coordination with CCGs as required.

Debate between CCGs and NHS England about commissioning responsibility should be put to bed, allowing neurological services to get the focused attention they deserve.
Based on the research undertaken to inform this report, the biggest challenge for the neurology community will be to foster support for neurological networks and mobilise relevant services to engage in networked approaches to working. Many of the ways of working explored in this report have demonstrated how patient experience and outcomes can be improved and have also shown that there are financial benefits to networked ways of working.

The NeuroResponse model measures the quality of life improvement for people with MS who access the service and independent evaluations of the service help to support the case for commissioner investment in it. Dr Zameel Cader, Clinical Director of Thames Valley SCN stated that evaluation and data collection have been embedded in its programmes, making it easier to present the benefits to CCGs and encourage future investment. ParkinsonNet demonstrates the significant savings that can be delivered through investing in networked models of care.

Although upfront investment might be required in the short term, the long term financial benefits are of potential significance.

Having data on models of care will also help to prevent unwarranted termination or reduction of services if there are changes in personnel and it becomes necessary to demonstrate again why particular service models are in place.

There are a number of ways to address this gap, one option would be partnership with Academic Health Science Networks (AHSNs). NHSE England could also play a role in this regard, with SCNs supporting monitoring and assessment of new ways of working.

The South West AHSN has supported a project to allow patients with rheumatoid arthritis to have direct access to specialist support, instead of them having to wait six months for a regular appointment. A senior nurse specialist at Plymouth Hospital who has been leading the new approach commented: “Collaborating with the research team has been an essential part of the project’s success, providing the evidence we need to ensure it’s efficient and effective”. There are plans to roll out the approach to other long term conditions.

Making sure that the payment mechanisms are more flexible will support a better environment in which managed care networks for neurology can be established. If networks are seen in the context of NHSE England’s ‘house of care’ model, it should provide a framework for a tariff to be developed that meets the needs of individual patients.

There should be flexibility in what these payment mechanisms might look like but one approach is to adopt a ‘year of care’ tariff. The ‘year of care’ programme for long term conditions which is currently being tested by early implementers considers people’s needs across acute, primary care, community, mental health and adult social services. Although the focus has generally been on people with multiple co-morbidities, the techniques used to identify the relevant population, track expenditure and needs, could be readily undertaken for people with a neurological condition. Experience in Cystic Fibrosis could provide a useful template.

**RECOMMENDATION**

New networked approaches to care should be piloted in partnership with Academic Health Science Networks or other research bodies to develop the evidence base that will allow other areas to see the benefits and adopt a similar approach.

By collecting data it will be possible to demonstrate the clinical, patient experience and financial benefits of a networked approach to care. SCNs should play a role in sharing evidence among local commissioners to support them in taking a more proactive approach to neurological services commissioning.

Reimbursement of appropriate neurology services should be moved from payment by activity to ‘year of care’ or ‘house of care’ based tariffs to facilitate a networked approach and new models of care.

Introducing new mechanisms, based around the needs of individual patients, will provide greater incentives for providers to invest in care delivered outside routine outpatient appointments. This might include telephone triage systems, email and online support, as well as the provision of specialist advice outside hospitals. This kind of patient-centred approach should also help to ensure a more seamless service for patients – from diagnosis through to ongoing support and acute needs.

Support from SCNs and NHSE England in relation to the ‘house of care’ model for neurology should support roll out of this approach.
An ongoing challenge identified through our research was that many commissioners do not understand the complexities of neurological conditions and the services that they require. Although neurological conditions have not been identified specifically by most vanguard sites, work in relation to care planning for long term conditions could help to drive a patient-focused service, incorporating the network models within this report. Executed effectively, it could also support greater input from neurologists outside the expert centres in which they operate.

Northumberland CCG is exploring the option of handing its budget and most of its functions to a provider led accountable care organisation. Under this system, Northumbria NHS Foundation Trust would host a new special purpose vehicle (SPV) which would be in charge of the CCG’s delegated budget. The transfer of responsibility would be the culmination of the vanguard programme which is based on the PACS approach. A major element of the proposals is for “clinicians to work together in different ways in new integrated community/primary teams, making better use of technology including a unified patient record”[47].

Given the challenges that neurologists have experienced in relation to commissioning neurology services, this model may provide the opportunity for the implementation of managed care networks informed by neurologists themselves. Giving more responsibility to providers of services, led by neurologists, would help to ensure that services are developed around the needs of neurological patients. Neurologists would be best placed to devise networks and payment mechanisms to reflect the nature of different service models such as telephone or email triage systems and teleconference consultations.

**Recommendation**

Providers of neurology services should consider models of care being taken forward by vanguard sites where the provider takes on additional responsibility from CCGs to drive improvements in services.

Learning from the ongoing activity in Northumberland, this kind of model would allow neurology teams to consider the best approach for their service and roll-out would not necessarily be dependent on securing in-depth commissioner understanding.

**Recommendation**

The NHS should aim to have appropriate delivery neurology networks in place throughout England by 2020 with CCGs invited to report progress on an annual basis.

This report does not set out specific targets on the evolution of networks over the next few years. Instead, by encouraging reporting of progress and transparency in data about networked models of care, it is hoped that commissioners and providers of neurology services will be encouraged to benchmark their performance and take a more proactive approach to neurology services.
In developing this report, PINg was keen to recognise the significant work that has already been undertaken in this area. The report is based on a review of available evidence and a series of telephone discussions between July and August 2015. A full list of participants is included in the table below.

We would like to thank those individuals who took the time to speak to us to inform the development of the report.

Case studies were developed in partnership with those involved in operating particular networks and the explanations of the different approaches were agreed in partnership with these individuals.

<table>
<thead>
<tr>
<th>NAME</th>
<th>ROLE</th>
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<tr>
<td>1 Professor Mike Barnes</td>
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<td>2 Sunita Berry</td>
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<td>Secretariat Director</td>
<td>Primary Care Neurology Society</td>
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<td>4 Dr Zam Cader</td>
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<td>Sheffield Teaching Hospital</td>
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<td>NHS Foundation Trust, NHS England</td>
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<td>8 Michael Jackson</td>
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<td>18 Amanda Swain</td>
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<tr>
<td>19 Professor Kevin Talbot</td>
<td>Honorary Secretary, Head of</td>
<td>Association of British Neurologists</td>
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<td>20 Wendy Thomas</td>
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<td>Migraine Trust</td>
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<td>21 Arlene Wilkie</td>
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<td>22 Dr Sue Woodward</td>
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This report has been developed by the Pharmaceutical Industry Neurology Group (PING). Its members are AbbVie, Genzyme, Merck Serono and Novartis

PING
Pharmaceutical Industry Neurology Group