Wessex Strategic Clinical Network
Neurology Intelligence Report 2015

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2014/15 data are provisional and may be incomplete or contain errors for which no adjustments have yet been made. Counts produced from provisional data are likely to be lower than those generated for the same period in the final dataset. This shortfall will be most pronounced in the final month of the latest period, e.g. September from the April to September extract. It is also probable that clinical data are not complete, which may in particular affect the last two months of any given period. There may also be errors due to coding inconsistencies that have not yet been investigated and corrected.

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There was a look of incredulity from a patient representative: "How can you possibly develop a neurology strategy without data?" This would seem self-evident to most people, but the simple fact is, there has been relatively little use of data to help support service redesign strategy in neurology.

Things are changing, but until recently service data has been hard to access, and difficult to analyse in clinically meaningful ways. With the help of NCS, NHiS Commissioning Excellence, and the Wessex CLAHRC, we have used routinely collected Hospital Episode Statistics (HES) data, to try and develop a clearer picture of neurology service provision in Wessex.

In this report, we have tried to link neurology data analysis with practical examples of how service delivery has been improved in other areas across the country, so as to encourage and facilitate efforts here in Wessex. It has been challenging to refine the data and present it in a way that is both useful, and easy to interpret. I hope we have succeeded.

Dr Christopher Kipps
Clinical Director for the Strategic Clinical Network at NHS England (Wessex) for Mental Health, Dementia and Neurological Conditions
NIHR CLAHRC Wessex lead for Dementia

Supported by the Wessex CLAHRC
(Collaborations for Leadership in Health Research Care)
It is a great pleasure to write a foreword to this in-depth analysis on the management of neurological conditions in Wessex. It highlights important information, not only for the Wessex region, but is relevant to all Neurology Clinical Networks in England.

The lack of robust data to inform service delivery in neurology has prevented significant improvement in neurology services for many years. Service delivery cannot be improved without details of how services are performing, and we cannot hope to make a difference if we do not know what will make most impact and provide the best outcomes for patients.

The development of the Neurology Intelligence Network has been a huge step forward for neurology over the last two years. It is beginning to allow us to understand much more about how the public access neurology services, and how provision of these services varies across the country.

This report takes that intelligence a step further, analysing more closely how people with different neurological conditions utilise hospital services and why. It demonstrates a substantial local increase in demand for neurological services over the past five years, but also that access to emergency hospital care often takes place not through neurology but through different specialties: general medicine, accident and emergency and elderly care departments. It further highlights how, for example, a stronger focus on integrated care pathways and the earlier treatment of infections in the community could significantly impact the number of emergency hospital admissions for people with long-term neurological conditions. The report emphasises practical measures, already implemented in various parts of the country, that could be used locally to improve community and emergency care in neurology. I hope that the report will help spark numerous conversations with commissioners and providers, and deliver change in how services are organised. Although every Clinical Network is different, the findings will provide a framework for assessment of local neurological service delivery in other networks in England.

This is a major step forward, and I commend the determination and leadership of Dr Kipps and his team in developing this.

David Bateman
National Clinical Director for Adult Neurology Conditions for NHS England
Summary

Hospital Episode Statistics (HES) data was analysed from across Wessex for the period 2009-2014 across a range of neurological conditions. Of these, five conditions (headache, epilepsy, neuromuscular conditions, Parkinson’s disease and multiple sclerosis) were considered in greater detail. Admission rates, spend, length of stay and re-admission rates showed considerable variation across the region. Further analysis of admitting specialty, co-morbidities and outpatient access identified areas with implications for service improvement activity.

This data report is a collaboration between the Wessex Strategic Clinical Network, the Wessex Collaboration for Leadership in Applied Health Research and Care (CLAHRC) and Neurological Commissioning Support.

Highlight findings from the data analysis:

• Total admission costs for neurological conditions are relatively high across Wessex (£51 million over five years), but rank second lowest by cost per head population.
• Substantial increase in neurological admissions over five year period to 2014 (49%), but reduction in cost per admission (down by £44 compared with 2009), and 1% cost reduction since 2012-13.
• Decrease of £175 per admission for five major neurological conditions in five years to April 2014.
• Considerable variability in spend across Wessex, with five-year reduction in normalised costs ranging from -18% to +12%.
• Reduction in unscheduled admissions across Wessex by one third in five years to 2014, but high variability (range -127% to +47%).
• Demographic factors (age) are significantly different across neurological spectrum, and can be expected to play a role in admission variation.
• Non-elective admissions dominated by headache and epilepsy by overall number of admissions and spend.
• Length of stay decreased across all major neurological conditions, and now averages 4.9 days.
• High zero bed day and readmission rates for epilepsy and headache; high excess bed days and longer length of stay for Parkinson’s disease, multiple sclerosis and neuromuscular conditions.
• Admission specialty varies considerably depending on neurological condition: epilepsy and headache are seldom managed directly by neurologists; multiple sclerosis and neuromuscular conditions have highest admissions under neurologists, but may reflect scheduled, rather than unscheduled care.
• Modifiable comorbidities identified from analysis of comorbidity data:
  o high rate of fractures, falls and injuries in Parkinson’s disease, and high levels of urinary and respiratory tract infections.
  o high levels of urinary tract pathology (including infection) in multiple sclerosis, with other modifiable factors including falls and decubitus ulcers.
  o epilepsy data identified a high level of injury associated with the condition, and may represent a safety signal with respect to adequacy of community care.
  o neuromuscular conditions significantly associated with respiratory dysfunction, highlighting a potential focus for pathway re-design.
  o headache comorbidity shows a range of associations as secondary contributors to headache symptoms, and are probably not directly modifiable.
• Outpatient capacity in Wessex has risen by over 75% in the past five years, but Wessex continues to have the lowest number of outpatient episodes per 100,000 population in southern England; new to follow-up ratios are better than in any other region.
• Significant opportunity for pathway intervention based on analysis of data: emergency care for headache and epilepsy, long-term support and community care and admission avoidance for Parkinson’s disease, multiple sclerosis and neuromuscular conditions.
• Comorbidity data potential indicator for effectiveness of pathway re-design and quality improvement efforts.
Introduction

This document is developed as part of work commissioned by the Wessex Strategic Clinical Network to provide intelligence around neurology services. It provides key messages from neurology data intelligence, service costs and activity around prioritised conditions and examples of practice that could be replicated from other areas. This could translate into actions Wessex Strategic Clinical Network might want to consider. This work was undertaken between June and October 2014 and involved:

- Interviews with key neurology services stakeholders across the South East Coast SCN area who have provided qualitative data
- Document reviews
- A stakeholder meeting with neurologists (September 2014)
- A final first phase report incorporating comments and requests for reporting following the stakeholder meeting

Data analysis

A full analysis of local data was undertaken in July 2014 which provided the Wessex SCN Clinical Director for Neurology a wide range of databases.

Data provided includes:

- CCG to Provider referrals – for all ages only
- Inpatient data (actuals)
- Comorbidities – for all ages only, for CCGs and Area Teams only
- Inpatient data (normalised)
- Inpatient data (treatment specialty)
- Outpatient data (actuals)
- Outpatient data (normalised)

The data has been collected across the constituent CCGs:

- Dorset CCG
- Fareham and Gosport CCG
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- Isle of Wight CCG
- North and East Hampshire and Farnham CCG
- North Hampshire CCG
- Portsmouth CCG
- South Eastern Hampshire CCG
- Southampton CCG
- West Hampshire CCG

Data was also collected across the following trusts:

- The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
- Dorset County Hospital NHS Trust
- University Hospital of Southampton NHS Trust
- Hampshire Hospitals NHS Trust
- St Mary's Hospital Isle of Wight
- Poole Hospital NHS Foundation Trust
- Salisbury NHS Foundation Trust
- Portsmouth Hospitals NHS Foundation Trust

For the different age groups, data has been normalised by the specific age group (so the data for 18 to 64 year olds has been normalised per 100,000 in each CCG). However, age group populations were only available for 2012.

Please note that St Mary's Hospital was listed under Isle of Wight NHS PCT in HES 2009-10, 2010-11 and 2011-12 and then was listed under Isle of Wight NHS Trust in HES 2012-13. Therefore, we’ve had to include both organisations in the provider tables.

**Conditions reviewed**

Data were collected across a number of conditions and following detailed discussions with the Clinical Director.
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<thead>
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<th>Area</th>
<th>Descriptor (for context only)</th>
<th>ICD10 Code</th>
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<td></td>
<td>Myasthenia gravis</td>
<td>G70</td>
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<td></td>
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<td>Cluster headache and other TAC</td>
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</tr>
<tr>
<td>Cognitive</td>
<td>AD, other dementias and MCI</td>
<td>G30, G31</td>
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### Conditions in more depth

Following consultation and exploration of the data with Wessex Strategic Clinical Network it was agreed that six conditions would be looked at in more depth. Key messages and recommendations would be developed regarding these conditions which could be shared with commissioners and providers of services and then more widely with partners in the voluntary sector. The conditions focused on are:

- Movement disorders, epilepsy, multiple sclerosis, motor neurone disease, headache and Huntington’s disease.

A new service model would support more appropriate management in primary care throughout the course of the identified condition from diagnosis through to end of life. Currently considerable expense is incurred for four of these conditions, (MS, Movement disorders, headache and epilepsy) with emergency admission costs as an example:

- Urinary Tract Infection emergency admission costs = £8.9m
- Pneumonia emergency admission costs = £9m
- Fracture neck of femur emergency admission costs = £6.6m
- Constipation emergency admission costs = £750k

The consensus agreement from the neurology stakeholder meeting was that the primary causes of admission should be prioritised in movement disorders, and models of existing good practice that could be adapted explored.
Wessex demographics

The Wessex Strategic Clinical Network covers urban and rural areas across Southampton, Hampshire, Isle of Wight, Portsmouth and Dorset, with an overall population of approximately 2.8 million people. There are nine Clinical Commissioning Groups (CCGs), seven Local Authorities (LAs) and seven acute hospital trusts within Network areas.

The majority of the population lives within Hampshire and Dorset, with a much smaller proportion living in the Isle of Wight (Figure 1). The Isle of Wight and Dorset have the highest proportion of people over 65 years old, whilst Southampton and Portsmouth have the lowest (Figure 2), more in line with the average for England (17%).
Chronic headache and epilepsy are the most common neurological conditions seen across Wessex. True prevalence data is lacking, and only estimates are available for a wide range of conditions (Figure 3). The burden of care in neurological conditions varies considerably, and is significantly influenced by disease-specific factors, including their potential for long-term disability. Some conditions with lower prevalence estimates are highly complex (e.g. motor neurone disease, Huntington’s disease), and may require significant resources for effective management.

Figure 3
Predicted prevalence of neurological conditions in Wessex based on Neurological Alliance estimates (Neuro Numbers, 2014)
Neurological conditions admissions

Admission spend for neurology is relatively high, ranking second, in comparison to other Strategic Network Areas in the south of England, at £51,201,943 over the five-year period ending March 2014 (Figure 4). However, Wessex has the second lowest spend for neurology admissions per head of population across the same networks (Figure 5).

Across the nine Clinical Commissioning Groups that comprise the Wessex area, neurological admissions have increased by 49% over the last five years in 10 condition groupings. Although spending rose by approximately 26% in the years 2009 to 2012, this increase slowed substantially to only 4.9% in the year to 2013, and actually decreased by 1% in the year ending 2013/14. This represents an overall decrease in real spend of £44 per admission, from £1,581 in 2009/10 to £1,537 in 2013/14 (see Figure 6).
The ‘Big Five’, namely epilepsy, headache, multiple sclerosis, Parkinson’s disease and neuromuscular conditions, are analysed in greater detail, and show overall spend per admission decreased by £175 in five major neurological conditions, from an average cost per admission of £1,522 to the current figure of £1,347 (see Figure 7).

Neurological spend varies considerably within Clinical Commissioning Groups (CCGs) in the period 2009-2014, ranging from 18.9% below the regional average (Isle of Wight) to 9.4% above the average (North East Hampshire and Farnham). Over the same five-year period, the greatest reduction in (normalised) admission spend was seen in Portsmouth CCG (18% reduction relative to 2009); the greatest increase was in Southampton CCG (11.9%). This is illustrated in Figure 8, and detailed actual costs for each CCG including trend markers are provided in Table 1.
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Clinical Commissioning Group 2009-10 (£) 2010-11 (£) 2011-12 (£) 2012-13 (£) 2013-14 (£) Trend

Dorset 10,262,658 11,051,668 11,803,248 13,293,059 13,636,919

Fareham and Gosport 2,227,024 2,220,783 2,495,381 2,889,924 2,793,255

Isle of Wight 1,420,852 1,374,513 1,865,402 1,908,945 1,888,339


North Hampshire 2,425,053 2,936,576 8,256,648 3,015,449 3,413,126

Portsmouth 2,664,206 2,439,896 2,710,736 2,973,060 3,026,967

South Eastern Hampshire 2,542,535 2,873,896 2,979,166 3,292,352 3,154,042

Southampton 3,064,380 3,315,856 3,738,720 4,894,942 4,669,127

West Hampshire 6,338,618 7,153,511 8,253,706 9,624,573 9,157,689

Admission costs are dominated by several neurological conditions, particularly epilepsy and headache. Figure 9 shows the annual admission costs by condition across a range of neurological conditions. The ‘Big Five’ conditions: epilepsy, headache, multiple sclerosis, Parkinson’s disease and neuromuscular conditions were subsequently assessed in more detail.
The pattern of elective versus non-elective admissions also shows considerable variation between Wessex CCGs. A relative reduction in non-elective or emergency admissions (compared with elective or scheduled admissions) of 33% is seen; however this varies from a marked decrease in North Hampshire (127%) to increases in Southampton (41%) and Portsmouth (47%) CCGs (see Figure 10). The precise reason for this regional variation is unclear, and there may be important local reasons for this variation, but increase in non-elective admissions may create pressure on emergency services and secondary care. It might also represent a marker for evaluating the provision and effectiveness of community services for individuals with long-term neurological conditions.

Figure 9
Annual admission costs for a range of neurological conditions. Note: Headache plus groups secondary causes of headache due to intracranial haemorrhage and other cerebrovascular events

Figure 10
Percentage change in non-elective versus elective admissions ratio (2009-10 to 2013-14) across Wessex CCGs. Wessex average displayed in red, and shows over 33% reduction in admission ratio. In this graph, negative values represent a relative reduction in non-elective admissions compared to elective admissions over the time period, whereas positive values indicate increase in proportion of non-elective admissions.
Epilepsy and headache are the most prominent contributors to non-elective admissions across the age spectrum, whereas for multiple sclerosis and neuromuscular conditions, elective admissions make up the bulk of cases (Figure 11). Primary diagnosis admissions for Parkinson's disease are relatively low, presumably reflecting the fact that Parkinson's as a direct cause of admission is relatively uncommon (elective and non-elective), and tends to occur as a comorbidity contributing to the severity of other conditions. This is discussed in more detail later in this report.

The proportion of people over the age of 65 years differs considerably between the five major neurological conditions analysed in this report. The majority of people admitted with epilepsy and movement disorders as a primary diagnosis are over the age of 65 years, and the numbers are increasing year on year. Those with headache and multiple sclerosis show no major age demographic split, and neuromuscular conditions are marginally more common in older age groups. Admission costs, split by age at admission are shown in Figure 12. There are particular implications for the Wessex region with its ageing population.
Length of Stay (LOS)

Reductions in length of stay (LOS) from 4.9 days in 2009 to 3.4 days in 2014 have undoubtedly contributed to the decrease in admission spend despite the increase in admission numbers over this period. The reduction is evident in all conditions except headache; however, headache LOS is already low at approximately 1.5 days (see Figure 13).

Figure 12
Age distribution of admissions cost for five major neurological conditions (£M)

Figure 13
Average length of stay (LOS) by condition. LOS has decreased for all conditions except primary headache disorders and dystonia.
Zero bed day admissions (ZBD)

Brief admissions lasting less than a day, known as zero bed day (ZBD) admissions, are particularly common for epilepsy and headache, but negligible for Parkinson’s disease, multiple sclerosis and neuromuscular conditions (see Figure 14).

Excess bed days

In contrast, excess bed days (EBD), which occur once an admission lasts longer than the expected length (i.e. beyond the trim point), are most prevalent for Parkinson’s disease, multiple sclerosis and neuromuscular conditions, and much lower for epilepsy and headache (see Figure 15).
Readmission rates are highest for epilepsy and headache, with the other conditions forming a group of lower volume readmissions (Figure 16).

There are substantially more people aged 65 years and over in the group with prolonged admissions in all conditions except MS and inflammatory conditions (see Figure 17).
Admissions summary

The data shows that headache and epilepsy are characterised by high presentation rates, high levels of zero bed day admissions, and overall low lengths of stay. Readmissions are particularly common in epilepsy, and not infrequent in headache. In contrast, Parkinson’s disease, multiple sclerosis and inflammatory conditions, and neuromuscular conditions have lower admission rates, but admissions are typically longer and contribute significantly to excess bed days. Readmissions in this groups are less common.

This suggests we should consider a dual strategy for managing these admissions more effectively. Epilepsy and headache management may be improved through education of referrers and emergency staff, and rapid review by neurology where admission avoidance is possible. For Parkinson's disease, multiple sclerosis and neuromuscular conditions, enhanced admission prevention in primary and community care, early supported discharge and enhanced management of comorbidities which may be contributing to both presentation and delayed discharge, would be appropriate.

Figure 18
Where should we put the effort?

**Headache, Epilepsy**
- High admission rates
- Shorter length of stay
- High zero bed day rates
- Low excess bed days
- High readmission rates

**Movement disorders, MS, Neuromuscular**
- Lower admission rates
- Longer length of stay
- Low zero bed days
- High excess bed days
- Low readmission rates

**Focus on**
- Front door emergency presentations
- Education referrers & emergency staff
- Rapid review (neurology)

- Early supported discharge
- Admission prevention
- Enhanced primary care management of prominent neuro LTC & co-morbidities
Across Wessex, there is considerable variation in the admitting specialty for different neurological conditions. This data is analysed by condition, and not by region, and there may be variation depending on local service provision. The data has been ranked for each condition by the proportion of admissions admitted under each specialty. Each diagram illustrated in the following figures shows the relative percentage of admissions attributable to neurology and other specialties, the relative spend, and the average spend per admission by each specialty.

For admissions with a primary diagnosis of epilepsy, neurology is the ninth ranked specialty with general medicine and accident and emergency responsible for most admissions.
Figure 20
Proportion of (a) movement disorders, (b) MS & inflammatory, and (c) neuromuscular admissions managed by different specialties. Category marked ‘various’ includes all specialties outside of top 10 ranked named specialties.
Similarly, for headache, neurology is the eighth ranked specialty behind general medicine and accident and emergency, which account for two thirds of total admissions. In the secondary headache syndromes (primary cerebrovascular events and head trauma), neurology admissions also contribute relatively little (data not shown). Cost efficiency is similar whether the admission is under a neurological specialty or not.

This contrasts with MS and inflammatory conditions, and the neuromuscular conditions, where neurology is the highest ranked admission specialty, and demonstrates good cost efficiency. Importantly, this data is not divided by admission type, and includes both scheduled and unscheduled care. The higher ranking in these latter conditions may be due to elective admissions for therapeutic infusions. Where these individuals are admitted to other specialties, for example medical assessment units, urology etc, there may be a higher proportion of acute presentations and a need to manage comorbidity.

The data highlights a potential problem with efforts to increase the involvement of neurologists in managing acute neurological presentations, and increasing the proportion of patients with a neurological condition being admitted under a neurologist. There may be a significant resource gap in the Wessex region in terms of achieving this aspiration with the current number of neurologists; significant resource would need to be directed away from general medicine (and possibly accident and emergency) in order to do this. Although cost efficiencies are evident when neurologists manage particular conditions (eg. multiple sclerosis and neuromuscular conditions), it is not certain that this will translate to care in other areas, particularly acute epilepsy and headache presentations where at present, neurologists manage only a very small proportion of total presentations.
Comorbidity

Hospital Episodes Statistics (HES) data is primarily transactional, but it contains useful information on comorbidities across different neurological conditions. Better recognition of comorbidities may help reduce length of stay, and help with efforts for early supported discharge, rehabilitation and reduction in readmission rates.

In order to better understand the range of comorbidities that may influence admission in long-term neurological conditions, causes of admission were grouped and aggregated over four years (2009-2013) in five major neurological conditions.

In Parkinson’s disease, fractures, falls and injuries, together with urinary tract infections account for over half of the comorbidities associated with admissions in this condition. There is a significant level of respiratory infection (15%), delirium, disorientation and dementia (10%).

The situation is quite different in multiple sclerosis, where urinary tract pathology accounts for the majority of comorbidity associated with admission. This includes complications relating to dysfunction of the urinary tract and bladder as well as...
infection. There is a significant association with respiratory infections, which may well relate to decompensation or relapse associated with intercurrent viral infection. Other comorbidities such as fractures, falls and injuries, and decubitus ulcers, are all potentially preventable causes of admission.

Surprising figures emerged from review of comorbidity in epilepsy. Respiratory comorbidity is prominent, perhaps reflecting episodes of aspiration, and/or a higher need for ventilator support for those people presenting in status epilepticus. A strong pattern of fractures, falls and injuries is evident from this data, something that has perhaps gone unnoticed in outcome measures for epilepsy. Injuries such as these represent a significant cost, totaling over £1 million per year, and may represent a good signal for evaluating the performance of neurological services in addressing seizure freedom and optimum epilepsy management. Urinary tract infections, another potentially modifiable comorbidity, contribute to 13% of admissions for epilepsy.
Unsurprisingly, respiratory complications are a prominent feature of neuromuscular conditions, accounting for half of the associated comorbidity. Both Guillain-Barré syndrome, and motor neurone disease, may require ventilatory support during admission. The other disease groupings reflect a number of known associations and underlying potential causes for these conditions.
The comorbidity data for headache reflects the non-specific nature of headache across a number of conditions including cerebrovascular disease (particularly stroke), where headache is a secondary phenomenon. It is likely that a similar phenomenon is responsible for the high levels of headache in fractures, falls and injuries. Together, these comorbidities contribute to 44% of admission costs for headache, with nearly a further third (28%) related to urinary tract infection and acute respiratory conditions.

Comorbidities vary across neurological conditions, and pathway re-design for these areas should take this into account. The data also highlight a number of modifiable comorbidities that could be targeted in attempts to reduce admissions. Comorbidity data also represent potential outcome measures for quality improvement efforts. The other sections of this document outline projects that could be helpful in this respect.
Neurology outpatient episodes

An important part of the pathway in neurological long-term conditions involves outpatient activity. It is difficult to fully interpret this data as outpatient episodes are coded simply for occurrence and treatment specialty, but not for content or diagnosis. Whilst it is possible to link inpatient episodes with outpatient follow-up and infer a diagnosis, many patients are never admitted, and receive all of their neurological care in the community. The outpatient department remains a vital link in the neurological conditions pathway, but unfortunately long waiting lists are the norm, and capacity is regularly exceeded by demand.

In the period between 2009 and 2014, there was significant investment in outpatient activity across all regions within the Wessex area, with many regions doubling their outpatient capacity. The average Wessex CCG increase was 78% for the five-year period to 2014, and 14% over the last year. A few regions, notably North-East Hampshire (8%), and to a lesser extent Dorset (43%), had significantly lower increases in the number of total outpatient appointments (Figure 26). The current number of outpatient episodes per 100,000 population in 2013-14 has only just matched the lowest level of provision in the region from 2009/10 (see Figure 27). The regional averages however are the lowest in southern England for outpatient appointment provision (Figure 28).
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**Figure 27**
Outpatient episodes per 100,000 population for period 2009-10 to 2013-14 for Wessex versus regional Area Teams

**Figure 28**
Outpatient episodes per 100,000 population (2013-14): CCG and regional comparisons with Wessex average
New to follow-up ratios are a measure of the ability of a neurology service to deal with new cases. Low ratios imply a heavy burden of follow-up care which may limit availability of new patient appointments. Such ratios may also suggest difficulty in obtaining an appointment in individuals with long-term conditions who experience deterioration, or who require more urgent review. New to follow-up ratios are broadly similar across Wessex CCGs, and are better than the regional average (Figure 29). This implies that despite the low numbers of outpatient appointments relative to other regions, new cases are effectively prioritised within the Wessex region. This, however, may disadvantage access for those with long-term neurological conditions unless there are alternative options such as clinical nurse specialists or community teams with specific neurological expertise.
In comparison to other medical specialties (general medicine, geriatrics, pain), there is far less variability in new to follow-up ratios across the region (Figure 30). This is likely to be a consequence of largely centralised neurology provision with similar new to follow-up templates. Ratios are particularly variable for general medicine, and tend to be much lower than neurology in pain medicine. Interestingly, neurosurgeons see about half as many new patients as neurologists do. Despite high numbers of individuals with multi-morbidity and long-term conditions, geriatricians remain adept at maintaining a reasonable new to follow-up ratio, and may have some insights of value to neurologists.

![Figure 30](image_url)

**Figure 30**
CCG and regional new: follow-up ratios for selected specialties in Wessex 2013-14
Examples of good practice in neurology that can help improve services have emerged all over the country. These range from a simple stepped approach to dealing with bowel problems to a full integrated care pathway for Parkinson’s. Below is a summary of some of the many good practice strategies we have come across.

Managing acute deterioration in Parkinson’s

In Cornwall Lynne Osborne and colleagues have developed an acute deterioration pathway for professionals managing the care of Parkinson’s patients. This includes a flowchart which guides patients through self-management options when their condition is worsening. The advice is clearly presented and covers what to do for both patients and professionals in scenarios such as constipation and infection. For more details about the pathway contact: Lynne.Osborne@pch-cic.nhs.uk.

Integrated care pathway for Parkinson’s

Going one step further, Dr Neil Archibald has developed a full integrated care pathway for Parkinson’s in his area of practice, South Tees. You can see it here: http://southtees.nhs.uk/services/neurology/parkinsons-disease-service/pathway/

The pathway covers the main aspects of Parkinson’s care, including for example the key points to consider when admitting Parkinson’s patients with hip fracture. The pathway provides a clear guide ensuring professionals ask the right questions and patients consistently get the best care possible from each professional in the service.

Commissioning toolkit for epilepsy

Epilepsy Society and Epilepsy Action have collaborated with several CCGs to put together a commissioning toolkit with resources that support effective commissioning of high quality services for people with epilepsy. You can find the full toolkit here: http://www.epilepsytoolkit.org.uk/
The toolkit goes through the whole commissioning process, from data analysis and mapping current service provision, to putting together a business case and implementing a new service model.

GP referral management system

NHS Kernow CCG have developed guidelines for GPs referring patients to neurology services, with information relevant to individual neurological conditions. This is aimed at supporting the delivery of high quality, correct first-time referrals that lead to a patient being seen in the right place, at the right time, first time for their first outpatient appointment. See here for further details:

https://www.kernowccg.nhs.uk/get-info/referral-management-system/

Bowel management in neurology patients

A stepped approach to managing bowel problems has been introduced by Dr Anton Emmanuel at University College London Hospitals (UCLH). The protocol ranges from conservative measures like diet, exercise and fluid intake, to more invasive treatment solutions such as sacral nerve stimulation or stoma. This helps to set out how professionals dealing with neurology patients suffering from constipation should use the least invasive methods first. See the treatment pyramid here (figure 1):

http://my-bowel.co.uk/pdf/Consensus%20TAI.pdf

A pathway for MS and urinary tract infection

Analysis of England hospital episode statistics found that hospital admissions for people with MS were largely bladder related issues with a high level of associated expenditure. This is a concern because urinary tract infection (UTI) can trigger worsening of MS and many patients admitted with suspected relapse in fact have a UTI. http://www.nhis.com/commissioning-excellence/ms-report
People with MS should be on a bladder management pathway and if they are at risk a UTI pathway ensures greater scope for preventive care by multidisciplinary community professionals before patients reach the acute setting.

Bladder management resources can be found here: https://www.mstrust.org.uk/health-professionals/practice-resources/bladder-practical-guide/what-evidencemanagement

MS nurses can ensure bladder issues are dealt with promptly by initiating investigation and treatment as soon as possible and avoiding costly unplanned admissions.

**Respiratory pathway**

Respiratory infections are a major cause of non-elective admissions in many conditions like MS and Parkinson’s. MND patients are particularly at risk of infection and respiratory crisis occurring. By identifying the most at-risk patients and prioritising monitoring this can help to prevent late or non-referral to the respiratory department, in turn preventing unnecessary hospital admissions. This also ensures that the community teams are fully aware of, and involved in, patients’ respiratory journeys.

The MND Association have developed a pathway to manage respiratory symptoms: http://www.mndassociation.org/forprofessionals/mndmanagement/respiratory-symptoms-in-mnd/mnd-respiratory-pathway/

**Advance care planning**

Advance Care Planning (ACP) can help people with a long-term neurological condition to prepare for the future. NHS Gloucestershire has produced an ACP booklet entitled ‘Planning for your Future Care’ which gives individuals an opportunity to think about, talk about and write down their preferences and priorities for their future care, including how they want to receive their care. See here: http://www.2gether.nhs.uk/files/Gloucestershire%20Advanced%20Care%20Planning.pdf
NeuroResponse: a telecare model for patients with MS

The National Hospital for Neurology and Neurosurgery at University College London Hospitals (UCLH) has introduced a model of telecare to provide a specialist opinion by phone to people with MS. This is aimed at reducing the demand on other services and maximising direct patient contact time. NeuroResponse aims to improve the efficiency and effectiveness of existing services and to provide expert advice and care that may not easily be available face-to-face. The scheme, which operates in London, is now extending its support to other locations in the UK. Contact: bernadette.porter@uclh.nhs.uk

NeuroResponse has three service strands:

1. NeuroDirect offers expert assessment, advice, triage and coordination by a clinical nurse specialist to people with MS via telephone or email. The service is unique in its nature as it provides a specialist assessment service to patients and a ‘clinical back office’ service to primary and secondary care colleagues.

2. NeuroView offers teleconference-linked clinics between a person with spasticity, a community rehabilitation team and a specialist neurology team. It links community rehabilitation teams to a specialist hospital team for opinion and care planning.

3. NeuroMail offers direct assessment advice on neurological problems from specialists in MS to another professional, whether a GP or consultant neurologist. Advice is given by email supporting local care, and empowering local professionals in assessing patients through an educational video.

The impact is a significant reduction in GP appointments and hospital admissions, plus the service is highly regarded as a model of quality, with excellent patient satisfaction rates.
Figure 1 Population in Wessex Strategic Clinical Network (2012-13 figures)  
Figure 2 Regional variation in proportion of population over age 65 years  
Figure 3 Predicted prevalence of neurological conditions in Wessex based on Neurological Alliance estimates (Neuro Numbers, 2014)  
Figure 4 Aggregate admission costs for five years ending 2013-14 in southern England Area Teams  
Figure 5 Normalised admission costs (per 100,000 population) for five years ending 2013-14 in southern England Area Teams  
Figure 6 Admission numbers and associated spend for 10 neurological conditions (2009/10 to 2013/14), showing increase in overall admission numbers, but lower cost per admission at end of period  
Figure 7 Admission numbers for five neurological conditions (epilepsy, headache, multiple sclerosis, Parkinson’s disease and neuromuscular conditions), from 2009-10 to 2013-14, with associated spend, showing similar pattern of overall increase in admission numbers, with spend reduction of £175 per admission at end of period  
Figure 8 Percentage change in normalised admission costs (relative to Wessex Area Team average) between 2009 and 2014. Bars below the axis show costs less than Wessex Area Team average  
Table 1 Actual admission costs and trends for Wessex area Clinical Commissioning Groups for period 2009-2014 (data not normalised for population)  
Figure 9 Annual admission costs for a range of neurological conditions. Note: Headache plus groups secondary causes of headache due to intracranial haemorrhage and other cerebrovascular events  
Figure 10 Percentage change in non-elective versus elective admissions ratio (2009-10 to 2013-14) across Wessex CCGs. Wessex average displayed in red, and shows over 33% reduction in admission ratio. In this graph, negative values represent a relative reduction in non-elective admissions compared to elective admissions over the time period, whereas positive values indicate increase in proportion of non-elective admissions  
Figure 11 Elective and non-elective admissions by neurological condition (primary diagnosis only, 2013-14). Marked variability is seen between conditions  
Figure 12 Age distribution of admissions cost for five major neurological conditions (£M)  
Figure 13 Average length of stay (LOS) by condition. LOS has decreased for all conditions except primary headache disorders and dystonia  
Figure 14 Zero Bed Day Admissions (ZBD) (2013-14) where admission lasts less than one day are particularly frequent in epilepsy and headache  
Figure 15 Excess bed days per admission calculated as admission duration beyond the expected ‘trim’ point  
Figure 16 Number of readmissions (2013-14). These are particularly frequent for epilepsy and headache  
Figure 17 Relative proportion of people over 65 years (versus under 65 years) contributing to excess bed days for major neurological conditions  
Figure 18 Where should we put the effort?  
Figure 19 Proportion of (a) epilepsy and (b) headache admissions managed by different specialties, ranked by frequency. ‘Various (category)’ is amalgamation of all specialty admissions outside of top 10 ranked specialties
Figure 20 Proportion of (a) movement disorders, (b) MS & inflammatory, and (c) neuromuscular admissions managed by different specialties. Category marked ‘various’ includes all specialties outside of top 10 ranked named specialties.

Figure 21 Movement disorders (Parkinson’s disease) comorbidities (total admissions spend 2009/10 - 2012/13). Comorbidity groups marked with (*) combine several ICD 10 codes to create one category in this and subsequent figures.

Figure 22 Multiple sclerosis & inflammatory conditions comorbidities (total admissions spend 2009/10 - 2012/13).

Figure 23 Epilepsy comorbidities (total admissions spend 2009/10 - 2012/13).

Figure 24 Neuromuscular conditions (total admissions spend 2009/10 - 2012/13).

Figure 25 Headache (total admissions spend 2009/10 - 2012/13).

Figure 26 Outpatient Episode Counts 2009-10 to 2013-14 for Wessex CCG.

Figure 27 Outpatient episodes per 100,000 population for period 2009-10 to 2013-14 for Wessex versus regional Area Teams.

Figure 28 Outpatient episodes per 100,000 population (2013-14): CCG and regional comparisons with Wessex average.

Figure 29 New: Follow-up ratios for Wessex CCGs and comparison with Wessex and regional southern England Area Team averages (2013-14).

Figure 30 CCG and regional new: follow-up ratios for selected specialties in Wessex 2013-14.