South West Neonatal Term Admissions Report

March 2017
Foreword

At a National level, there is very considerable focus on the organisation of services and clinical outcomes of babies born prematurely, particularly for extremely preterm infants born before 27/40 gestation. This patient group is extremely important, as they carry the highest mortality rates and have the longest duration of admission, so account for a significant proportion of neonatal unit activity. The adverse effect on individual families is enormous, and always challenging. However, in terms of numbers of families affected by neonatal unit admission, term admissions (>37/40) are equally if not more important – accounting for 60% of all neonatal unit admissions. They arguably offer more opportunity for intervention to reduce admissions and maternal-infant separation as these infants are less unwell than their preterm counterparts and National data suggests that admission rates have been climbing despite falling birth rates.

This report describes changes in the neonatal unit admission rates, reasons for admission and levels of treatment required for babies born in the South West Neonatal ODN over the last 6 years to the end of December 2016. The data has been collected from the Badger database and relates to first admissions only. It reflects a range of practices in terms of different ways of recording admissions and diagnostic coding, but nonetheless represents data and coding as recorded in individual units and given the duration of the study period, and the number of admissions clearly demonstrates some interesting trends:

- Climbing admission numbers and rates/1000 live births in the region over the 6 year period
- There is a wide range of admission rates between units of the same and different levels, with 8 out of 12 units admitting at above the National average of 5%, and 4 out of 12 units admitting at considerably below this level. The lowest admission rates for babies <37/40 was around 3% and it seems reasonable to assume that all units should aspire to this level.
- With the exception of one unit, St Michael’s, which hosts the regional cardiac and surgical services and provides surgical care to infants with complex medical conditions that have been diagnosed antenatal, one would expect the population of infants born over 37/40 to be demographically/medically similar across all units of all levels in the region.
- Although units with TC wards seem to have more unwell babies admitted to their neonatal units, they also have quite high admission rates as a percentage of live births.
- The commonest reasons for admission in the SW region vary slightly from the national picture with fewer admissions for jaundice, but a greater proportion of admissions for suspected sepsis.
- The absolute number of babies recorded as being admitted for suspected sepsis has risen dramatically since the implementation of the NICE neonatal sepsis guideline in 2012.
- Other factors that may contribute to the increasing admission rate include lower thresholds for screening mothers for sepsis, increasing rates of early induction of labour for possible intra-uterine growth failure and earlier elective delivery for multiple pregnancies. Other maternal factors such as increasing maternal age and weight and increasing rates of diagnosis of gestational diabetes may also be playing a part.
A significant minority of babies received no treatment / observation only or only minimal treatment that could be delivered in a transitional care setting. This is truer of Local Neonatal units (LNUs) and Special Care units (SCUs) than NICUs.

There is evidence of a trend for lower admission rates for specific conditions in SCUs and LNUs vs Neonatal Intensive Care units (NICUs) – specifically, they demonstrate lower admission rates for HIE / cooling, hypoglycaemia and respiratory symptoms. Admission rates /1000 deliveries are higher for babies with possible sepsis.

This report is generated in 2 parts: the first describes the changing pattern of neonatal unit admission across the whole South West region, followed by unit specific reports which have been generated to offer individual units the chance to identify areas where local practise might have deviated from a regional norm, and where reductions in neonatal unit admission rates are achievable.

As a final note, many teams have commented that babies >37/40 who require minimal additional levels of care or observation are admitted to neonatal units because the post-natal ward environment in many units are simply not well enough staffed to deliver the extra care and support these babies and their mothers need. This report suggests strongly that the opportunity to improve the patient experience exists, by reducing neonatal unit admission and the associated maternal infant separation - but that at least a portion of savings liberated may need to be invested in improved post-natal support outside neonatal services and within maternity services to enable that change to happen in a safe way. It additionally seems possible that some changes in practise e.g. NICE sepsis guidance has driven up admission rates with relatively limited evidence of improvements in outcome and these areas merit more detailed review.

Dr Rebecca Mann
Clinical Director of the South West Neonatal Operational Delivery Network

April 2017
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1. Introduction

In 2013 there were 80,251 admissions to neonatal units across England of which almost 60% (48,000) were infants delivered >37 weeks gestation. By 2015 the number of term admissions had risen to 54,821 nationally despite a 3.6% fall in term live births. This trend is mirrored in the South West where live birth rates have decreased by an average of 2% per year between 2012 and 2016 against an increase in term admissions of 4% per year over the same time period.

Work undertaken across the South West in 2015/16 as part of a national CQUIN demonstrated a need within the region to more fully understand potentially preventable factors leading to full term babies being admitted to a neonatal unit.

The main section of this report is presented at a regional level comparing SW network data against national trends and breaking down SW network data analysis by unit level. The report looks in detail at the top five most frequently recorded reasons for admission to a neonatal hospital in the South West according to admissions data recorded in 2016. These reasons differ slightly to the top four factors identified at national level (hypoglycaemia, jaundice, respiratory conditions and asphyxia) and include:

- Respiratory
- Suspected Infection
- Hypoglycaemia
- Monitoring
- Suspected HIE

The report also looks into babies whose care could potentially have been managed without separation from their mother either in a transitional care or postnatal ward setting, at home or in the community without admission. This is particularly important given the overwhelming evidence summarised in a recent NHS improvement document which highlighted:

- That separation of mother and baby at or soon after birth can affect the positive development of the mother–child attachment process (Crenshaw 2014).
- Mothers may find it harder to establish and maintain breastfeeding and it may affect their mental health (Bigelow et al 2012; Dumas et al 2013).
- Preventing separation, except with compelling medical indications, is an essential part of providing safe maternity services and an ethical responsibility for healthcare professionals (Crenshaw 2007; 2014).
Alongside the main report each trust will find an individualised unit report setting out term admission data specific to their neonatal and maternity services. This individualised report explores the individual trusts term admission activity in relation to current national ATAIN targets and compares data across the SW Network as a whole and against the relevant unit level. In addition each Trust is provided with suggested key areas for exploration in relation to potential reductions in term admissions to NNU.

The intention is that these unit reports will form the basis of evidence for Trusts participation the Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP NHS England (South) 17/18 Improving Value Project within which, through varying initiatives, Trusts will seek to identify areas for improvement and reduce the percentage of term admissions within their Trusts.

To further support Trusts participation in the ATAIN QIPP Improving Value Project, and to provide a fuller overview to wider audiences this document also includes:

- **Term admission activity with varying measurement criteria** – This appendix highlights that term admissions can be defined in varying ways and shows how the use of differing criteria changes term admission activity figures at each unit (Appendix one)
- **The Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP NHS England (South) 17/18 Project Initiation Document** – This sets out the QIPP in more detail and the quality improvement initiatives NHS England (South) and the SW Neonatal Network ask Trusts to participate in. (Appendix two)
- **A unit based ‘Action Plan’ for the ATAIN QIPP** – This sets out your identified areas for improvement in 2017/18 and actions and timescales for achieving this. This should be completed and submitted to the South West Neonatal Network for review and monitoring. (Appendix three)
- **The SW ATAIN QIPP useful resources directory** – To signpost Trusts to useful resources and areas of best practice to further support implementation and improvement. (Appendix four)
- **A SW ATAIN Lead nomination form** – For Trusts to identify ATAIN leads within Maternity and Neonatal Services. (Appendix five)
- **A SW ATAIN case study template** – For Trusts to submit examples of best practice and service improvements to share across the region. (Appendix six)
- **Neonatal Critical Care Mandatory Data Set (NNMDS)** – National Neonatal Data Set as agreed by the CRG in 2016. This should be used by units to determine the categories of care for their infants and reduce and inconsistencies around what determines, SC, TC and normal care babies (Appendix seven).

We strongly acknowledge that some term admissions are necessary even when the appropriate postnatal care has been provided (e.g. a baby born with a congenital abnormality requiring surgical management). Other admissions may reflect successful implementation of improvement programmes in related areas, such as stillbirth reduction programmes.
Some babies will require admission for antibiotic treatment or intensive phototherapy for jaundice, however, babies who remain well with these conditions can often be managed in a transitional care or postnatal ward setting alongside their mothers. Indeed, one unexpected finding of the work led by the ATAIN Programme and the South West programme of work has been the number of babies who would not have needed to be admitted if there were greater services were available to keep mother and baby together.

Therefore our conclusions and findings in this report focus not just on the improvements required to clinical care and admission practice on Maternity Units to reduce admissions but also on consideration of the role that transitional care and family integrated care models could play locally in reducing unnecessary admissions to neonatal units whilst keeping mother and baby together.

2. Background
Improving the safety of maternity services is a key priority for the NHS and reducing admission of full-term babies to neonatal care is an indicator in the NHS Outcomes Framework for 2016 to 2017. The number of unexpected admissions of term babies is seen as a proxy indicator that harm may have been caused at some point along the maternity or neonatal pathway. A recent report by NHS Improvement in early 2017\(^1\) emphasised the coalition of commitment across the NHS in addressing this as a priority.

As well as setting out key national findings in relation to Term Admissions it also summarised the work of the ATAIN programme\(^2\) and highlighted opportunities and resources for care delivery and service improvement across Maternity and Neonatal Services. The drive to reduce Term Admissions into Neonatal Units also aligns with further national priorities including:

- the Secretary of State for Health’s ambition to reduce stillbirth, neonatal brain injury and neonatal death by 50% by 2030\(^1\)
- recommendations in Better Births, taken forward in the NHS England-led Maternity Transformation Programme
- reducing harm through learning from serious incidents and litigation claims
- Improving culture, team work and improvement capability within maternity units.

To better understand term admission activity in the South West of England and to identify where safe reduction in term admissions may be possible this report explores five year trends in term admission activity, key reasons for term admissions to NNU across the SW and provides a retrospective investigation of patients for whom care may have been possible within a transitional or family integrated care setting.

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\(^1\) NHS Improvement, ‘Reducing harm leading to avoidable admission of full-term babies into neonatal units, Findings and Resources for improvement’, February 2017

\(^2\) Atain (an acronym for ‘avoiding term admissions into neonatal units’) is a programme of work led by clinical experts to reduce harm leading to avoidable admission to a neonatal unit for infants born at term, ie ≥ 37+0 weeks gestation.
3. Method

Data was collected from all 12 of the South West network neonatal units, including three level 3 units (Neonatal Intensive Care Units (NICUs)), six level 2 units (Local Neonatal Units (LNUs)) and three level 1 units (Special Care Units (SCUs)):

Level 3 - NICUs:
- Southmead, North Bristol NHS Trust
- St Michaels, University Hospitals Bristol NHS Foundation Trust
- Plymouth Hospitals NHS Trust

Level 2 - LNUs:
- Great Western Hospitals NHS Foundation Trust
- Gloucestershire Hospitals NHS Foundation Trust
- Taunton and Somerset NHS Foundation Trust
- Bath, Royal United Hospital S Bath NHS Foundation Trust
- Exeter, Royal Devon and Exeter NHS Foundation Trust
- Truro, Royal Cornwall Hospitals NHS Trust

Level 1 - SCUs:
- Northern Devon Healthcare NHS Trust
- South Devon Healthcare NHS Foundation Trust
- Yeovil District Hospital NHS Foundation Trust

Data was collected from the national BadgerNet dataset that UK neonatal units routinely use to record information relating to all neonatal episodes of care. Anonymised patient data was downloaded for all babies admitted to a neonatal unit between 1st January 2012 and 31st December 2016 based on the following criteria:

- Born ≥37 weeks gestation (full term)
- First episode of care only
- Admitted to the neonatal unit (NNU) for any portion of their neonatal care episode based on location of care in the BadgerNet Day Summary
- Admitted within 28 days of birth from any setting

Babies for whom the full neonatal care episode was based within a transitional care (TC) or postnatal (PN) ward setting were excluded.

This definition of term admissions is in line with that used for the national data collection to enable comparison with national outcomes. However it is recognised that use of alternative criteria such as ‘carer status’ (whether or not mother is resident and caring for baby) rather than the physical ‘location of care’ would also be an appropriate measure in particular for South West units where a TC service is provided within a NNU location. For further details please see Appendix 1.

The final dataset contained information on a total of 13,573 1st episode, term admissions to NNU. Data from admissions during 2012 to 2016 (calendar years) were used to explore activity trends over
the past 5 years, whilst data on admissions from 2016 (calendar year) were used for a more detailed analysis of current care practices across the SW network.

Since some babies (e.g. those with jaundice) may be admitted from home into a paediatric rather than a neonatal setting the data presented in this report does not include these babies, this report may therefore underestimate the issues affecting these groups.

4. Term Admission Trends Data: 2012-2016

4.1 National Trends in Term Admission Rates
Between 2011 and 2014, the number of term live births in England declined by 3.6%, but the number of admissions of term babies to neonatal units increased by 24% with a further increase of 6% in 2015. This increase is seen across all categories of care but particularly in special care where an extra 10,000 babies were admitted in 2015 compared to 2011.


Between 2011 and 2015 the number of care days for term admissions across care at levels 1, 2 and 3 rose by over 30%.

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3 NHS Improvement, ‘Reducing harm leading to avoidable admission of full-term babies into neonatal units, Findings and Resources for improvement’, February 2017
The increase in activity generated by term admissions was seen in all types of units: neonatal intensive care units (NICUs), local neonatal units (LNUs) and special care units (SCUs) as well as in all categories of care.

4.2 South West Trends in Term Admission Rates

In 2013 there were 80,251 admissions to neonatal units across England of which almost 60% (48,000) were babies born at term. By 2015 the number of term admissions had risen to 54,821 nationally despite a 3.6% fall in term live births.

Findings are highly comparable across the South West of England where live birth rates have decreased by an average of 2% per year between 2012 and 2016 from 61131 births in 2012 to 56764 in 2016, whilst term admissions to SW neonatal units (NNUs) have increased by an average of 4% per year over the same time period from 2602 in 2012 to 2976 in 2016 (graph 1).

This has resulted in an increase from 42.6 term admissions per 1000 live births in 2012 to 52.4 in 2016. Thus by 2016 term admissions accounted for 57% of all admissions to NNU across the South West of England.

Graph 1: Cumulative percentage change in South West births and term admissions from 2012 and 2016

Across the SW the total number of NNU care days provided has increased in line with the rising total numbers of term admissions. The total number of NNU care days provided for term admissions to NNU increased by 374 days per year between 2012 and 2016, this equates to an average yearly increase of 2.9%. During this time period the average length of stay in NNU remained relatively consistent at ~5 days per baby (table 1 below).

Table 1: Five Year Admissions Activity Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Live Births</th>
<th>1st Episode Term Admissions to NNU</th>
<th>1st Episode Pre-term Admissions to NNU</th>
<th>Total NNU Care Days</th>
<th>Total NNU Care Days per Baby</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>61131</td>
<td>2602</td>
<td>2226</td>
<td>12751</td>
<td>4.9</td>
</tr>
</tbody>
</table>
4.3 Current Term Admission Activity & ATAIN targets
The NHS England Souths 17/18 Improving Value Project – ‘Reducing Term Admissions into Neonatal Care’ recommends that no more than 5%\(^4\) of term live births should be admitted to a neonatal unit.

In 2016, term admissions accounted for 6.1% of all live births across the SW. In total 8 of the 12 SW network units admitted more than the recommended 5%, ranging from 5.8% up to 11.0% of live births becoming term admissions to NNU. If these units were to have reached the 5% target in 2016 this would have reduced total term admissions by a total of 740 babies across the SW network.

4.4 Financial Impact of Changing Trends in Term Admissions
The average cost of a single term admission in 2016 was approximately £3,000. This figure based on the average length of stay at each level of care for all term babies admitted to an NNU in the South West in 2016 using 2013/14 National Neonatal Reference Costs.

In 2012, there were 2602 term admissions to an NNU, suggesting that the total cost of Term Admissions in the South West equated to approximately £7.8 million. In 2016, term admissions to an NNU rose to 2976, with a total cost of term admissions in the South West equating to approximately £8.9 million, a £1.1 million increase in 4 years.

If all units who are currently above the national average for term admissions are able to reduce their term admissions to 5% of all live births, in line with the regional ATAIN target, this could reduce admissions to Neonatal Units by 740 babies, but realise a potential cost saving to neonatal services of approximately £2.2 million per annum. Whilst recognising that such neonatal cost savings may require greater investment in alternative models of care and maternity staff, we recognise that reduction in avoidable clinical admissions, and greater efficiency in our systems, processes and ways of working will create overall health system efficiencies. More importantly, aside from financial savings this reduction will result in fewer mothers being separated from their babies and mothers and families who will not face the anxiety or worry of a neonatal unit admission.

\(^4\) This figure was suggested by the ATAIN South of England Regional Programme as an average that all units should aim to achieve.
5. South West Term Admissions Data: 2016

5.1 Principal admission reason for term admissions to NNU

In 2016 the five most common reasons for term admissions in the South West of England were:

1. Respiratory symptoms (36% of term admissions)
2. Suspected Infection (23% of term admissions)
3. Hypoglycaemia (9% of term admissions)
4. Monitoring (6% of term admissions)
5. Suspected HIE (5% of term admissions)

This differs slightly to findings from national data collected in 2015 where jaundice ranked in the top 5 admissions reasons across England (ranked 7th in the SW in 2016) but term admissions for monitoring did not.

Respiratory symptoms have been the most common reason for term admission to NNU in the SW consistently for the past five years with 1062 admissions in 2016 accounting for 36% of all term admissions across the South West and equating to 18.7 admissions per 1000 live births (table 2). It is possible and probable that there is an overlap in coding between patients admitted with “respiratory symptoms” and those with possible infection, as one of the important differential diagnoses in a patient with respiratory symptoms is infection. There may therefore be coding differences between individuals as well as between units in regards to recording respiratory symptoms or suspected infection as the principal admission reason.

The greatest increases in term admissions over the last 5 years are seen for suspected infection rising from 1 (0% of total term admissions) in 2012 to 671 (23% of total term admissions) in 2016 equating to 11.8 admissions per 1000 live births. Notably new NICE guidance on the management of neonatal sepsis was published in 2012.

Similarly term babies admitted for monitoring have risen from 2 (0%) in 2012 to 172 (6%) in 2016 and admitted for suspected HIE from 1 (0%) in 2012 to 138 (5%) in 2016 (graph 2 and table 2).
Graph 2: Five year trends in principal admission reason

Table 2: Five year trends in principal admission reason for term admissions to NNU in SW England

<table>
<thead>
<tr>
<th>Year</th>
<th>Respiratory Symptoms</th>
<th>Suspected Infection</th>
<th>Hypoglycaemia</th>
<th>Monitoring</th>
<th>Suspected HIE</th>
<th>Other</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%) of ads</td>
<td>Per 1000 births</td>
<td>N (%) of ads</td>
<td>Per 1000 births</td>
<td>N (%) of ads</td>
<td>Per 1000 births</td>
<td>N (%) of ads</td>
</tr>
<tr>
<td>2012</td>
<td>822 (32%)</td>
<td>13.4</td>
<td>1 (0%)</td>
<td>0.0</td>
<td>291 (11%)</td>
<td>4.8</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>2013</td>
<td>937 (37%)</td>
<td>16.0</td>
<td>0 (0%)</td>
<td>0.0</td>
<td>334 (13%)</td>
<td>5.7</td>
<td>9 (0%)</td>
</tr>
<tr>
<td>2014</td>
<td>1045 (41%)</td>
<td>17.9</td>
<td>92 (4%)</td>
<td>1.6</td>
<td>351 (14%)</td>
<td>6.0</td>
<td>38 (1%)</td>
</tr>
<tr>
<td>2015</td>
<td>1016 (35%)</td>
<td>17.5</td>
<td>572 (20%)</td>
<td>9.9</td>
<td>284 (10%)</td>
<td>4.9</td>
<td>172 (6%)</td>
</tr>
<tr>
<td>2016</td>
<td>1062 (36%)</td>
<td>18.7</td>
<td>671 (23%)</td>
<td>11.8</td>
<td>275 (9%)</td>
<td>4.8</td>
<td>172 (6%)</td>
</tr>
</tbody>
</table>
**Unit level differences in principal admission reason**

Reasons for term admissions to NNU in the SW vary by unit level. In NICUs respiratory symptoms account for 44% of all term admissions to NNU, compared to 35% in LNUs and just 19% in SCUs. In contrast suspected infections account for 47% of all term admissions in SCUs compared to 25% in LNUs and just 7% in NICUs. Similarly hypoglycaemia admissions are substantially lower in SCUs, accounting for just 4% of term admissions, compared with 9% and 11% in NICUs and LNUs respectively (graph 3 and table 3). A confounding issue which needs to be considered here is the existence of a transitional care unit or ward. In the SW ODN, all three NICUs have established TC units, defined and delivered separately from their neonatal units. This possibly explains the lower admission rates to neonatal units for babies with conditions requiring lower levels of support such as possible sepsis.

**Graph 3: 2016 Principal Admission Reason by Unit Level**

![Graph showing admission reasons by unit level]

**Table 3: 2016 Principal Admission Reason by Unit Level**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total</th>
<th>NICU</th>
<th>LNU</th>
<th>SCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>1062</td>
<td>413</td>
<td>568</td>
<td>81</td>
</tr>
<tr>
<td>Infection</td>
<td>671</td>
<td>61</td>
<td>411</td>
<td>199</td>
</tr>
<tr>
<td>Hypoglycaemia</td>
<td>275</td>
<td>86</td>
<td>171</td>
<td>18</td>
</tr>
<tr>
<td>Monitoring</td>
<td>172</td>
<td>68</td>
<td>85</td>
<td>19</td>
</tr>
<tr>
<td>HIE</td>
<td>138</td>
<td>68</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>657</td>
<td>239</td>
<td>313</td>
<td>105</td>
</tr>
</tbody>
</table>
5.2 Treatment Levels for SW Term Admissions to NNU

In 2016 term admissions to NNUs received varying levels of treatment during their neonatal care period that have been categorised as follows:

None
- Observations only

Limited - only treatments that could potentially be provided on transitional care or post-natal wards including:
- IV antibiotics
- NG or OG feeding
- IV fluids

Some – required at least one treatment that is typically only available on NNU including:
- Any respiratory support
- Any cooling
- Parenteral Nutrition

Across the SW 12% of term admissions to NNU (n=358) received no treatment other than observations during their neonatal care period. A further 48% (n=1425) of term admissions received only treatments that could potentially have been provided on a TC or PW ward (chart 1).

![Chart 1: 2016 NNU Term Admissions by level of treatment received](image-url)
The proportion of admissions receiving ‘none’, ‘limited’ and ‘some’ treatment varied across the SW by unit level. Across NICUs and LNUs 11% of term admissions received observations only compared with 17% at SCUs. NICUs provided ‘limited’ treatment to a further 39% of term admissions with the remaining 50% of admissions receiving at least one treatment available only in the NNU. In contrast 51% and 53% of admissions received ‘limited’ treatment in LNUs and SCUs respectively whilst 37% and 30% of admissions received at least one treatment available only in the NNU in LNUs and SCUs respectively (graph 4).

Graph 4: Level of treatment by unit level

Across the SW in 2016 a total of 1149 NNU care days were provided for term admissions that received no treatment other than observation during their neonatal care period.

On average term admissions in the no treatment category received 2.72 days care with the NNU. Length of NNU stay for these admissions was longest in SCUs where average NNU care was 3.68 days and shortest in NICUs where average NNU care was 2.31 days (graph 5).

Graph 5: Average number of NNU days by level of care and unit level
6. South West Top Five Reasons for Term Admissions to NNU – Further Analysis

6.1 Respiratory Symptoms
In 2016 respiratory symptoms were the most common reason for term admissions to NNU across the SW and ranked as the top reason for admission in 7 of the 12 SW units. Respiratory symptoms accounted for 36% (n=1062) term admissions to NNU across the SW equating to 18.7 admissions per 1000 live births.

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>% NNU term admissions</th>
<th>Per 1000 Births</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>822</td>
<td>32%</td>
<td>13.4</td>
<td>1</td>
</tr>
<tr>
<td>2013</td>
<td>937</td>
<td>37%</td>
<td>16</td>
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<td>35%</td>
<td>17.5</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>1062</td>
<td>36%</td>
<td>18.7</td>
<td>1</td>
</tr>
</tbody>
</table>

The proportion of term babies admitted for respiratory symptoms varied between unit levels both in terms of the percentage of total term admissions to NNU as well as the number of admissions per 1000 births locally.

In NICUs 44% of total term admissions to NNU were admitted due to respiratory symptoms equating to 25 admissions per 1000 live births. In contrast in SCUs just 19% of total term admissions were admitted due to respiratory symptoms equating to 15 admissions per 1000 births (graph 6).
Across the SW the majority of term babies (74%) admitted with respiratory symptoms were categorised as receiving ‘some’ treatment (e.g. treatment that is typically only available with an NNU including any form of respiratory support), whilst just 4% of these admissions received observation only.

However, this varied between unit level, in NICUs (where the percentage of admissions for respiratory symptoms is highest) the percentage of term respiratory admissions receiving ‘some’ treatment was lowest at 70%, compared to 83% of term respiratory symptom admissions to SCUs (graph 7).

Graph 7: 2016 Respiratory Symptom admissions by treatment and unit level
6.2 Suspected Infection

In 2016 suspected infection was the second most common reason for term admission to NNU across the South West accounting for 23% of all term admissions to NNU (n=671) and equating to 11.8 admissions per 1000 births.

This is a dramatic rise since 2012 where just 1 baby was admitted with suspected infection across the region. Suspected infection was the most common reason for admission in all 5 units where respiratory symptoms were ranked the second highest reason for admission. Jointly respiratory symptoms and suspected infections accounted for nearly 60% of all term admissions to NNU in the SW, and as discussed previously, it is possible that there is considerable overlap between these two diagnostic criteria. A change on this scale in terms of recorded incidence cannot be explained by changes in disease incidence alone, indeed there is not biologically plausible mechanism that would explain an increase in the rate of underlying bacterial infection in the same population for infants over such a short time frame. It seems the increasing rate of babies with suspected sepsis is likely to be explained by a number of extraneous factors such as changes in clinical practise (NICE guidance) changes in service delivery (more babies being admitted to NICUs rather than cared for on the PN wards) and changes in coding (coding babies as being admitted to record activity as PN ward extra workload is not as reliably recorded or remunerated).

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>% NNU term admissions</th>
<th>Per 1000 Births</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1</td>
<td>0%</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>2014</td>
<td>92</td>
<td>4%</td>
<td>1.6</td>
<td>4</td>
</tr>
<tr>
<td>2015</td>
<td>572</td>
<td>20%</td>
<td>9.9</td>
<td>2</td>
</tr>
<tr>
<td>2016</td>
<td>671</td>
<td>23%</td>
<td>11.8</td>
<td>2</td>
</tr>
</tbody>
</table>

Suspected infection admissions to NNU differ between unit levels accounting for 6.5% of all NICU term admissions, 25.4% of all LNU term admissions and 46.7% of SCU term admissions. Similarly there was a substantial difference in terms of proportion of live births with 3.8, 15.4 and 37.5 admissions per 1000 live births local to NICUs, LNUs and SCUs respectively (graph 8).
The majority of term admissions for suspected infection (80%, n=537) across the SW were categorised as receiving 'limited' treatment (e.g. treatments that could potentially be provided on TC or PN wards) (graph 9) largely explained by the use of IV antibiotic (chart 2).

In total 9% (n=59) of SW babies admitted to NNU for suspected infection were not started on IV antibiotics. Of the remaining 91% the majority (79% n=435) received just 1-3 days of IV antibiotics indicating that no infection was found. Finally 26% were treated for more than 3 days. This is 5 times greater than the proportion predicted to have early onset sepsis as the national average is 0.5 per 1000 babies. Furthermore this figure does not take into account the additional 9 times more
babies cared for on the PN wards. These findings suggest an excess of treatment of babies at risk of possible sepsis, both in terms of the total numbers treated and the duration of therapy.

Chart 2: 2016 Suspected Infection admissions by IV drug treatment

6.3 Hypoglycaemia
In 2016 Hypoglycaemia was the third most common reason for admission to NNU with 275 admissions accounting for 9% of all term admissions across the SW equating to 4.8 admissions per 1000 live births. These numbers have remained consistent over the last 5 years (table 6).

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>% NNU term admissions</th>
<th>Per 1000 births</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>291</td>
<td>2%</td>
<td>4.8</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>334</td>
<td>13%</td>
<td>5.7</td>
<td>2</td>
</tr>
<tr>
<td>2014</td>
<td>351</td>
<td>14%</td>
<td>6.0</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>284</td>
<td>10%</td>
<td>4.9</td>
<td>3</td>
</tr>
<tr>
<td>2016</td>
<td>275</td>
<td>9%</td>
<td>4.8</td>
<td>3</td>
</tr>
</tbody>
</table>

There is some variation in the proportion of term admissions accounted for by hypoglycaemia between unit levels. The highest admission rates were found at LNUs (10.6% of all term admissions) compared with the lowest rates found at SCUs (4.2% of all term admissions) (graph 10).
In total 13% (n=36) of babies admitted for Hypoglycaemia across the SW received observation only with 79% (n=216) receiving ‘limited’ treatment (e.g. only treatment that could potentially be provided in a TC or PN ward) and just 8% (n=23) receiving at least one treatment typically only provided in NNU. This varied slightly between unit levels in particular in SCUs where 33% of hypoglycaemia term admissions received observation only. However it should be noted that total numbers of hypoglycaemia term admissions to SCUs were very low (n=18) (graph 11).

Graph 11: 2016 Hypoglycaemia admissions by treatment and unit level
6.4 Monitoring

In 2016 monitoring was the fourth most common reason for term admission to NNU across the South West accounting for 6% of all term admissions to NNU (n=172) and equating to 3 admissions per 1000 live births. This is a substantial increase since 2012 where just 2 babies were admitted for monitoring across the region (table 7).

Table 7: Monitoring: Five year activity trends

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>% NNU term admissions</th>
<th>Per 1000 births</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2</td>
<td>(0%)</td>
<td>0.03</td>
<td>16</td>
</tr>
<tr>
<td>2013</td>
<td>9</td>
<td>(0%)</td>
<td>0.15</td>
<td>15</td>
</tr>
<tr>
<td>2014</td>
<td>38</td>
<td>(1%)</td>
<td>0.65</td>
<td>10</td>
</tr>
<tr>
<td>2015</td>
<td>172</td>
<td>(6%)</td>
<td>2.96</td>
<td>4</td>
</tr>
<tr>
<td>2016</td>
<td>172</td>
<td>(6%)</td>
<td>3.03</td>
<td>4</td>
</tr>
</tbody>
</table>

The proportion of term babies admitted for monitoring in 2016 was relatively consistent across all units in the SW, but was highest in NICUs accounting for 7.3% of all term admissions and lowest in SCUs accounting for 4.5% of all term admissions (graph 12).

Graph 12: 2016 Monitoring: 2016 admissions by unit level

Across the SW 38% (n=66) of term babies admitted for monitoring were categorised as receiving no treatment other than observation and a further 47% (n=80) received ‘limited’ treatment that could potentially be provided on a TC or PN ward.

Just 15% (n=26) of term babies admitted for monitoring across the SW received treatment typically only available in NNU. This was similar across all unit levels although the highest percentage of ‘no
treatment’ (47%) was recorded for SCUs compared with lowest percentage of ‘no treatment’ (34%) at NICUs (graph 13).

Graph 13: 2016 Monitoring admissions by treatment and unit level

6.5 Suspected HIE
In 2016 suspected HIE was the fifth most common reason for term admission to NNU across the South West accounting for 5% of all term admissions to NNU (n=138) and equating to 2.4 admissions per 1000 births. This is a substantial increase since 2012 where just 1 baby was admitted for suspected HIE across the region (table 8).

Table 8: HIE: Five year activity trends

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>% NNU term Admissions</th>
<th>Per 1000 births</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1</td>
<td>0%</td>
<td>0.02</td>
<td>17</td>
</tr>
<tr>
<td>2013</td>
<td>3</td>
<td>0%</td>
<td>0.05</td>
<td>17</td>
</tr>
<tr>
<td>2014</td>
<td>5</td>
<td>0%</td>
<td>0.09</td>
<td>17</td>
</tr>
<tr>
<td>2015</td>
<td>128</td>
<td>4%</td>
<td>2.21</td>
<td>5</td>
</tr>
<tr>
<td>2016</td>
<td>138</td>
<td>5%</td>
<td>2.43</td>
<td>5</td>
</tr>
</tbody>
</table>

Term admissions for suspected HIE were highest in NICUs in 2016 accounting for 7.3% of all term admissions and equating to 4.2 admissions per 1000 births. In contrast suspected HIE accounted for <1% of term admissions to SCUs equating to 0.8 admissions per 1000 births.
Across the SW 9% (n=12) of term babies admitted for suspected HIE received no treatment other than monitoring compared with 53% (n=73) receiving at least one treatment typically only provided in NNU.
7. Summary and Conclusions

- Term admissions to NNU across the SW of England have risen over the last 5 years despite a decrease in the total number live births.

- In 2016, 8 of the 12 neonatal units in the SW admitted more than 5% of live births as term admissions to NNU.

- Had these 8 units all reached the ATAIN 5% target in 2016 there would have been at least 740 fewer term admissions to NNU.

- Impact on separation of mother and baby.

- The five most common principal admission reasons for term admissions to NNU across the SW in 2016 were:
  - Respiratory symptoms
  - Suspected infection
  - Hypoglycaemia
  - Monitoring
  - Suspected HIE

- Over the past 5 years the greatest increase in term admissions has been seen for suspected infection increasing from just 1 admission in 2012 to 671 admission in 2016 and accounting for 23% of all term admissions across the SW.

- Principal admission reasons varied between unit levels, in particular respiratory symptom admissions were highest in NICUs accounting for 44.2% of term admissions compared to just 19% of term admissions in SCUs. In contrast suspected infection admissions were highest in SCUs accounting for 46.7% of all term admissions compared to just 6.5% of term admissions in NICUs. This may be explained by greater TC/PN ward care options within SW NICUs.

- Across the SW 12% (n=358) of term admissions to NNU received no treatment other than observation during their neonatal care period and a further 48% (n=1425) received only ‘limited’ treatment (those that could potentially be provided on a TC or PN ward). Indicating that there is substantial opportunity to decrease NNU term admissions if greater options for care on a TC or PN ward were available.

- The highest proportion of babies receiving no treatment were seen in babies admitted for monitoring where 38% (n=66) received no treatment other than observation.

- The highest proportion of babies receiving either no treatment or ‘limited’ treatment were seen in babies admitted for hypoglycaemia where 92% (n=252) received either no or ‘limited’ treatment.
CONTACT DETAILS

South West Neonatal Operational Delivery Network

Level C, St Michaels Hospital

Southwell Street

Bristol BS2 8EG

Telephone: 0117 3421738

Email: swneonatalnetwork@uhbristol.nhs.uk

Website: www.swneonatalnetwork.co.uk

Twitter: @swneonatal
Appendix One: Term admission activity with varying measurement criteria

Throughout this report term admissions were measured using the national criteria:

- Born ≥37 weeks gestation
- First episode of care only
- Admitted to the neonatal unit (NNU) for any portion of their neonatal care episode based on location of care in the BadgerNet Day Summary
- Admitted within 28 days of birth from any setting

However given different care pathways and BadgerNet recording practices between units this measure may over estimate term admission activity in some units and under estimate activity in others.

For example: increased term admission figures will be recorded in units where TC is provided within the boundaries of the NNU (e.g. location of care recorded as NNU, but TC is being delivered). In contrast term admission figures may be reduced in a unit that does not record short stays in NNU (<1 day).

Graph (i) below highlights how such 4 different criteria to define term admissions (see table (i) below) impacts the term admission figures as a percentage of live births.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria A</td>
<td>Admitted to the NNU for any portion of their neonatal care episode based on location of care in the BadgerNet Day Summary (excludes babies whose entire stay was TC or PNW)</td>
</tr>
<tr>
<td>Criteria B</td>
<td>Separated from carer for any portion of the neonatal care episode based on carer status in the BadgerNet Day Summary (includes babies whose entire stay was TC if parent carer was not resident / caring for some portion of the stay)</td>
</tr>
<tr>
<td>Criteria C</td>
<td>Admitted to the NNU for 1 day or more based on location of care in the BadgerNet Day Summary (excludes babies whose entire stay was TC or PNW)</td>
</tr>
<tr>
<td>Criteria D</td>
<td>All term entries onto BadgerNet (as defined in the first box) regardless of location of care or carer status</td>
</tr>
</tbody>
</table>

A reduction from criteria A to criteria B would indicate that a number of babies recorded as location of care - NNU will have had a carer resident and caring for baby. Whilst an increase from criteria A to criteria B would indicate that babies recorded as location of care - TC do not always have a carer resident and caring for baby.

A large reduction from criteria A to criteria C would indicate that this unit enters a large number of babies receiving short-term care in NNU (e.g. less than 24 hours). Differences between units here may be explained by different policies for recording admissions to BadgerNet.

A large increase from criteria A to criteria D would indicate substantial numbers of term babies cared for in TC or PN ward settings.
Graph i: Percentage of live births recorded as term admissions based on differing BadgerNet criteria
Appendix 2: South West Region Scheme PID and Action Plan

**NHSE South 17/18 Improving Value Project PID and Action Plan**

**Title:** Avoidable Term admissions into Neonatal Care

**Ref:** SW Neonatal Network ATAIN scheme

**RO:** Dr Rebecca Mann & Rebecca Lemin

**Scheme Overview:**
To support the National ATAIN work programme and reduce the number of avoidable term admissions into NNU.

**Anticipated Financial Benefit:**

<table>
<thead>
<tr>
<th>2017/18 Value:</th>
<th>Type of Saving:</th>
<th>Phasing:</th>
<th>2017/18 Value:</th>
<th>Monitoring</th>
<th>RA/G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>Activity Reduction</td>
<td>3 monthly</td>
<td>There should be a reduction in YA03 &amp; YA04 days for avoidable term admissions</td>
<td>Minimal: To be agreed</td>
<td>Neonatal Operational Delivery Network &amp; unit level</td>
</tr>
</tbody>
</table>

**Additional Information:**
The number of term babies admitted to neonatal care is increasing. The prevention of avoidable term admissions needs to take place within the maternity pathway and the admission criteria of neonatal units. This work will need to form part of a maternity pathway to provide care to prevent the need for some of these admissions.

**Key Risks to Delivery:**
Lack of engagement with Trust maternity teams: need to raise awareness of this cohort of babies within the maternity pathway.

### HIGH LEVEL ACTION PLAN:

<table>
<thead>
<tr>
<th>Action No</th>
<th>Specific Action</th>
<th>Risk/Dependencies</th>
<th>Due Date</th>
<th>NHSE ACTION</th>
<th>ODN ACTION (in partnership with SCN)</th>
<th>TRUST ACTION</th>
<th>Lead</th>
<th>Reasons for RAG</th>
<th>RAG rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reducing avoidable Term Admissions into neonatal care includes Neonatal Units (NNU) and Transitional Care where these facilities exist</td>
<td>Benchmarking of reports and audit at network &amp; unit level to establish Trusts with higher than expected admissions and activity</td>
<td>01/04/2018</td>
<td>Include ATAIN action plans for South Region in all SW Contracts</td>
<td>Quarterly Reports and Exception Reports. Annual Term Admission Audit. Work in collaboration with newly appointed joint Regional Term Spray SCN/ODN Maternal Clinical Safety Improvement Lead to identify key and joint work programmes for Region and Trust in relation to TAs. Target specific summary reports. Consider and agree graduated levels of % improvement in each individual Trust.</td>
<td>Regular and accurate reporting on Benchmarking in line with ODN data requests. Receipt of Regional and Unit summary report produced by ODN: ATAIN leads and Trusts to submit an action plan to ODN and SCN to address any issues/areas within their Trust in 2017/18 and to agree % improvement target to be obtained</td>
<td>Network Manager, Trust ATAIN leads</td>
<td>Benchmarking complete and reports due by end of Feb 2017. Reducing Term Admissions dependent on a collaborative approach between SCN and ODN, SCN and Trusts.</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>Report &amp; monitor reason for admission at network &amp; unit level by NNU &amp; TC. ATAIN leads in all Trusts will be responsible for data to reduce avoidable Term Admissions. Includes gestational age &amp; type of delivery. Respiratory admissions &amp; elective LSCS rates below 26 weeks gestation, admission temperature, LOS. Day &amp; time of admission</td>
<td>Network Dashboards and Reports in place. Comprehensive Maternity Admission Report. Auditing will continue</td>
<td>01/12/2016</td>
<td>Regional Letter</td>
<td>Quarterly Report and Exception Reports. Annual SW Term Admission Report. Identify avoidable admissions to NNU &amp; TC. Exclude babies admitted for Cardiac, Surgery, or HTN/Coiling from denominator data. LOS data including those below 6 and 24 hours</td>
<td>Regular and accurate reporting on Benchmarking in line with ODN data requests. Completion and submission of exception reports to Neonatal ODN. ATAIN leads in Trusts to submit and be responsible for action plans</td>
<td>Network management &amp; ODN Leads</td>
<td>Will continue to monitor TA closely and produce Annual report and benchmark across the region</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Trusts to review SW Neonatal ODN Regional and Local report/summary on term admissions and develop and implement action plan for the areas where they are above the network average. Any unit above 5% of all live births will be asked to demonstrate in action plan how to reduce TA by 1% across the year.</td>
<td></td>
<td></td>
<td>Regional Letter</td>
<td>Work collaboratively with SCN and joint Clinical Safety Improvement Lead to encourage and enable Trusts to adopt Regional TC action plans. Produce quarterly TA report. Align with National Maternity and Neonatal Safety Collaborative.</td>
<td>Review 2015/16 data and ODN produced reports and summaries. Review TC action plans. ATAIN leads to submit action plans to ODN and report quarterly progress to ODN.</td>
<td>Trusts and ATAIN Leads</td>
<td>There is no national ratio of Term Admissions in the South they range from 2-12% with this being the mean.</td>
<td>A</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>Use of IV antibiotics based on NICE guidelines using NICE audit tool, specific projects with Trusts with high numbers of admissions for suspected infection. Areas for review: where the babies were sent. IDS, who delivers care, administration of IV AB's, availability of IV AB's. Units / Microbiology &amp; ICT practices. Support regional audit of all term babies in SW who received antibiotics against international tool.</td>
<td>01/06/2017 Regional Letter and to receive and assess any SW proposal to move away from NICE antibiotic guidelines.</td>
<td>South ODN Work Programme 2017/18. Use audit to inform regional discussion in relation to Network wide antibiotic policy / NICE implementation. Develop regional guidelines/approach if felt necessary. Work with Maternity SCN to understand antibiotic use and admission across the SW more widely and to promote baby being cared for alongside mother. To participate in the audit being undertaken in the Network. To engage in discussions around any future development and adoption of a region wider policy. To ensure that babies where possible receive care besides their mother.</td>
<td>ODN Clinical leads</td>
<td>Requires completion of audit and buy in to gain outcomes. Lack of TWG in some Trusts.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Identified ATAIN leads in all Trusts &amp; leading ATAIN programme, working with the Maternity &amp; Neonatal Networks.</td>
<td>01/04/2017 Regional Letter</td>
<td>ODN to request information from Trusts and link work collaboratively with ATAIN leads.</td>
<td>Trusts to identify and appoint Atain leads as specified by the National Safety Collaborative: 1 Consultant Obstetrician, 1 Senior Midwifery lead, 1 Neonatal Consultant, 1 Senior Neonatal Nurse. To engage with the ODN and SCN to implement improvement programmes and share best practice across the region.</td>
<td>Network Manager/Trusts</td>
<td>Required Implementation supported by NHS England and Roadshows delivered by ODNs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>Mandatory completion of the T&amp;VAS Avoidable Term Admission e-learning tool(RCPCH accredited). Trusts to introduce training &amp; report no of clinical staff who have completed e-learning package.</td>
<td>01/02/2018 Regional Letter</td>
<td>Work with Maternity SCN to support the introduction of the ATAIN e-learning tool. Audit compliance by Trusts.</td>
<td>Trusts to include the e-learning tool as part of their mandatory training and report to ODN and SCN on robust and compliance within Trusts.</td>
<td>NHS England/Trusts</td>
<td><a href="http://www.clincontent.nesc.nhs.uk/atain/062016_ATA/index.html">www.clincontent.nesc.nhs.uk/atain/062016_ATA/index.html</a></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>South West re-admissions from home: Realign the charging of babies in NICU that do not fall into the National Neonatal Service Specification. This namely means ensuring that all term babies that are readmitted post discharge from the community to Neonatal Units are not paid for under a Neonatal Specialist Tariff by NHSE Specialised Commissioning. In the South West in 2015/16 a total of 462 babies were readmitted from home to a NICU. This equated to approximately 1467 care days and using reference cost data calculates at approximately £600,000 additional spend for NHSE.</td>
<td>01/04/2017 Regional Letter</td>
<td>NHSE England to write clause into contract if agreed.</td>
<td>ODN to undertake regular analysis to identify re-admitted babies. NHSE to align Badgernet data with charging data.</td>
<td>ODN to inform clinical teams across the region of enforcement of Neonatal Pathway as contained within the National Neonatal Service Specification. ODN to undertake regular audit of re-admissions from the community, to monitor progress and to inform NHSE of those babies that fall outside contract.</td>
<td>Trusts to adhere to National Neonatal Service Specification in relation re-admissions to NICU. Trusts to not seek remuneration from NHSE for babies that sit outside the pathway for Neonatal Care (e.g. admitted back to NICU most discharges) Trusts to not include these patients on Badgernet.</td>
<td>NHS England/Network Manager</td>
<td>Ensuring change in recording and payment practice in relation to re-admissions dependent on NHSE and ODN working in partnership to align activity and reference data and to ensures its compliance across Trusts.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ensure that all units in the South West comply with and record in the South West Minimum Data Set (South West Neonatal Minimum Data Set) published in 2016. Adherence to nationally agreed definitions and data set to provide clarity as to what babies currently on TC or postnatal wards can be entered into the Badgernet database. Improve data entry in Badgernet across all units in relation to location of care, presence of carer and treatment being received. The ODN is aware that not all units in the South West adhere to the NNMDs so compliance with NNMDs should realise NHSE cost savings.</td>
<td>01/04/2017 Regional Letter</td>
<td>NHSE to ensure that NNMDS form part of contracts for T&amp;VAs. Monitor compliance to contract.</td>
<td>ODN to circulate NNMDs to all Units for use in regards to data set definitions. Ensure that Trusts in the SW are brought back into line with the national average.</td>
<td>ODN to circulate criteria to all clinical teams. ODN to monitor compliance to contract for NHSE through Badgernet.</td>
<td>Trusts to adopt and adhere to NNMDs as published in 2016.</td>
<td>NHS England/Network Manager and ODN working in partnership to align activity and reference data and to ensure its compliance across Trusts.</td>
<td>A</td>
<td>R</td>
</tr>
</tbody>
</table>

**Abbreviations:**
- NNMDS: Neonatal Minimum Data Set
- T&VAs: Term and Very Active Term
- NICU: Neonatal Intensive Care Unit
- ODN: Operational Delivery Network
- NHSE: NHS England
- ATAIN: Avoidable Term Admission Network
- T&C: Term Care
- TWG: Task and Finish Group
Appendix 3: South West Neonatal Network

Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP

2017/18 Action Plans

As part of the implementation of the Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP, Trusts are asked to complete and submit an action plan which sets out their plans for reducing avoidable term neonatal admissions throughout 2017/18. These action plans will identify areas for improvement as addressed within the unit specific term admission reports that have been produced and circulated by the South West Neonatal Network in April 2017. These action plans should be developed collaboratively by the following:

- Consultant Obstetricians
- Senior Midwifery Leads
- Neonatal Consultants
- Senior Neonatal Nurses
- ATAIN Leads (if different from above)

These action plans will form the basis upon which the South West Neonatal Network monitors and measures progress against the Avoiding Term Neonatal Admissions in Neonatal Units (ATAIN) QIPP on behalf of NHS England (South). Progress reports will be requested quarterly from Trusts and term admission specific dashboards will be developed and distributed by the Network. Please complete and return to:

South West Neonatal Network
Level C, Rm C061
St Michaels Hospital
Southwell Street, Bristol
BS2 8EG

Or email: swneonatalnetwork@uhbristol.nhs.co.uk
Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP
2017/2018 ACTION PLAN

<table>
<thead>
<tr>
<th>Aim/Objectives</th>
<th>Action</th>
<th>Nominated Lead</th>
<th>Outcome/Success Criteria</th>
<th>Evidence</th>
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<tbody>
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</tbody>
</table>

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Appendix 4: South West Neonatal Network
Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP

Resources Directory

South West Resources
- Links to National, Regional and Local Term Admissions documents and resources:
  www.swneonatalnetwork.co.uk

Resources to support clinical review of term admissions
- For more information and guidance on clinical reviews go to:
  https://improvement.nhs.uk/resources/reducing-admission-full-term-babies-neonatal-units/
- Reducing Term Admissions E – Learning Tool (Mandatory Training in South West from April 2017)

Resources to support prevention, identification and management of neonatal hypoglycaemia
- Anticipation and identification of ‘at risk’ babies:
- Implementation of the BAPM Newborn Early Warning Trigger and Track (NEWTT) tool:
- Prevention and management of neonatal hypoglycaemia outlined in UNICEF BFI
  www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/
- Ensuring adequate feeding support is in place for all babies:
  www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/
- Avoiding hypothermia after birth through appropriate thermal care including skin-to-skin contact:
  www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/
- Responsive attitudes to maternal concerns regarding feeding and/or infant wellbeing:
- Implement the BFI standards to achieve and maintain UNICEF Baby Friendly accreditation (Unicef 2011))
- Recommendations following the thematic review of litigation claims (Hawdon et al 2016):
  http://fn.bmj.com/content/early/2016/08/23/archdischild-2016-310936.full
• BAPM Framework for Practice: Identification and Management of Neonatal Hypoglycaemia in the Full Term Infant

Resources to support prevention, identification and management of neonatal jaundice

• Targeted assessment of jaundice in the first few days of life according to NICE guideline CG 98: Jaundice in newborn babies under 28 days:
  www.nice.org.uk/guidance/cg98

• Implementation of the BAPM NEWTT tool:

• Postnatal care:
  www.nice.org.uk/guidance/cg37/evidence

Resources to support prevention, identification and management of respiratory symptoms

• Highlighting the increased risk of admission to a neonatal unit for babies born before 39 weeks associated with elective caesarean:
  www.nice.org.uk/guidance/cg132/chapter/1-guidance

• Care of the baby born by CS:

• Implementation of the BAPM NEWTT tool:

• Postnatal care:
  www.nice.org.uk/guidance/cg37/evidence

• Avoiding hypothermia after birth through appropriate thermal care including skin-to-skin contact:
  www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/

• Responsive attitudes to maternal concerns about infant wellbeing:
  http://fn.bmj.com/content/early/2016/08/23/archdischild-2016-310936.full

• Royal College of Midwives Maternal Emotional Wellbeing and Infant Development: a good practice guide for midwives:

Resources to support mother–baby bonding, breastfeeding and neonatal thermoregulation

• Promoting skin to skin between mother and baby as soon as possible after delivery:
  www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/
  www.nice.org.uk/guidance/cg37/evidence
Discouraging early interruption (within two hours of birth) of skin-to-skin contact as this reduces the chances of early breastfeeding:
www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/

Evidence-based breastfeeding support and advice:
www.unicef.org.uk/BabyFriendly/Resources/Guidance-for-Health-Professionals/
www.nice.org.uk/guidance/cg37/evidence

Responsive attitudes to maternal concerns about infant wellbeing:
http://fn.bmj.com/content/early/2016/08/23/archdischild-2016-310936.full

Resources to support the reduction of maternal-infant separation

Family Integrated Care Models (FiCare) as a model or keeping mother and baby together even if an admission is necessary.
http://familyintegratedcare.com/
http://www.bbc.co.uk/news/uk-39444127#

Evaluation of the FiCare model

Promoting the role of the mother in the caring of the NICU infant
https://www.unicef.org.uk/babyfriendly/
Appendix 5: South West Neonatal Network

Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP

SW NHS Trusts ATAIN Leads

As part of the implementation of the Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP that NHS England (South) is delivering in partnership with the South West Neonatal Network in 2017/18, Trusts are asked to nominate the following ATAIN Leads. Please complete and return to:

South West Neonatal Network
Level C, Rm C061
St Michaels Hospital
Southwell Street, Bristol
BS2 8EG

Or email: swneonatalnetwork@uhbristol.nhs.co.uk

<table>
<thead>
<tr>
<th>Atain Leads</th>
<th>Nominated Name</th>
<th>Contact details (including address, email and phone number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant Obstetrician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Midwifery Lead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonatal Consultant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Neonatal Nurse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6: South West Neonatal Network

Avoiding Term Neonatal Admissions into Neonatal Units (ATAIN) QIPP

SW NHS Trusts Case Study Template

This Case Study template enables the submission of information to the South West Neonatal Operational Delivery Network to highlight local practice and initiatives that have improved the delivery and outcomes of Neonatal Care across the South West Region. Please do not include any patient identifiable information in this template. Please return all submissions to:

South West Neonatal Network
Level C, Rm C061
St Michaels Hospital
Southwell Street
Bristol
BS2 8EG

Or email to swneonatalnetwork@uhbristol.nhs.uk

<table>
<thead>
<tr>
<th>Lead Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case study title</td>
</tr>
<tr>
<td>Name of organisation</td>
</tr>
<tr>
<td>Contact details of the author of this case study</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Tel</td>
</tr>
<tr>
<td>E-mail</td>
</tr>
</tbody>
</table>

Background
Details about your Trust and the environment in which the initiative took place

What was the issue / problem being addressed?
Overview of the problem and its impact on patient care and outcomes
<table>
<thead>
<tr>
<th>Aim/ Intended Outcomes</th>
<th>Outline of your main aims and objectives for the initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action Taken</strong></td>
<td>Overview of what you did to address the problem</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Summary of the benefits realised by implementing your solution – on both the part of the NHS, patients and wider stakeholders</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>How sustainable is this improvement?</td>
</tr>
<tr>
<td><strong>Lessons Learnt</strong></td>
<td>Challenges/barriers that arose during implementation and critical factors to success. What would you do differently next time?</td>
</tr>
<tr>
<td><strong>Date completed / Last updated</strong></td>
<td>Are you happy for this to be shared on the South West Neonatal Networks Website?</td>
</tr>
</tbody>
</table>
Appendix 7: Neonatal Critical Care Mandatory Data Set (NNMDS)

CRG Pricing Group/ Neonatal HRG Development

National Neonatal Critical Care HRGs 2015

Representation
Eleri Adams (chair) CRG pricing group
Vanessa Attrell TCU working group/ CRG pricing group
Sarah Rattigan National Network Managers
Alan Fenton BAPM
Peter de Halpert TCU working group
Kujan Paramanathan Neonatal Data Analysts
Gary Hartnoll NCCEWG
Paula Monteith Head of Design, National Casemix Office
Sam Oddie CRG pricing group/ TCU working group
Yve Collingwood Midwifery
Paul Fenton NHS England Pricing Team
Peter Reynolds CRG/ BAPM Cat of Care working group
Zoe Chivers BLISS
Denise Evans NNA/ CRG
Lawrence Miall CRG
Andy Lyon Clevermed
Neil Marlow CRG pricing group
Caroline King Allied Health Care Professionals

Post-Report Consultation
BAPM Executive Committee

Background

- The payment structure for neonatal care is currently determined by NCC HRGs (HRGX01-HRGX05) which are derived from the data items collected as the NCCMDS (Neonatal Critical Care Mandatory Data Set). This is currently based largely around BAPM (British Association of Perinatal Medicine) Categories of Care 2001.
- BAPM Categories of Care were updated in 2011. However, NCCMDS has not been updated to reflect this because new data items were required and changes to the dataset are very infrequent and costly.
- The neonatal CRG has two workstreams relevant to the updating of NCCMDS: the TC (Transitional Care) Working Group and the National Pricing Group. The TC working group was formed to agree a better definition for transitional care following a national report demonstrating wide variation in clinical practise and payment for this type of care. The CRG pricing group is working with NHS England to review the whole pricing structure for neonatal care.
- There are some areas of discrepancy between BAPM 2011 categories of care, TC working group and NNC HRGs. In addition, some of the definitions used for BAPM 2011 require modification to make them suitable for use for NCC HRGs.

Final Document: 27th June 2017
Authors: Neonatal HRG Development Group
The following are the final HRGs agreed:

**HRG XA01Z**

<table>
<thead>
<tr>
<th>Data Item</th>
<th>NCCMDS Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any day where a baby receives any form of mechanical respiratory support via a tracheal tube</td>
<td>01/51</td>
</tr>
<tr>
<td>BOTH non-invasive respiratory support (e.g. nasal CPAP, SIPAP, BIPAP, duoPAP, HHHFT) and Parenteral Nutrition (amino acids +/- lipids)</td>
<td>02/53/07 and new for HHHFT</td>
</tr>
<tr>
<td>Day of surgery (including laser therapy for ROP, but excluding intraocular injections e.g. Bevacizumab)</td>
<td>03</td>
</tr>
<tr>
<td>Day of Death</td>
<td></td>
</tr>
<tr>
<td>Any day with Umbilical Venous Catheter Present</td>
<td>New</td>
</tr>
<tr>
<td>Any day with Umbilical Arterial Catheter or Peripherial Arterial Catheter Present</td>
<td>11</td>
</tr>
<tr>
<td>Any day with a chest drain in situ</td>
<td>11</td>
</tr>
<tr>
<td>Any day on which Insulin infusion is given</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which Prostaglandin infusion is given</td>
<td>06</td>
</tr>
<tr>
<td>Any day on which inotrope or vasodilator (including pulmonary vasodilator) is given</td>
<td>06</td>
</tr>
<tr>
<td>Day on which exchange transfusion occurs (includes dilutional exchange)</td>
<td>04/12</td>
</tr>
<tr>
<td>Any day on which Therapeutic Hypothermia is given (hypothermia treatment given during the initial assessment period should not be counted if ongoing cooling is not required)</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which a replege tube is present</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which an epidural catheter if present</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which an abdominal silo is present (for anterior abdominal wall defects)</td>
<td>New</td>
</tr>
<tr>
<td>Presence of External Ventricular drain or intraventricular catheter</td>
<td>69</td>
</tr>
<tr>
<td>Dialysis (any type)</td>
<td>5/66/16</td>
</tr>
</tbody>
</table>

**HRGX02Z**

Does not fulfill criteria for XA01Z where one of the following applies:

<table>
<thead>
<tr>
<th>Data Item</th>
<th>NCCMDS Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any day where a baby receives any form of non-invasive respiratory support (e.g. nasal CPAP, SIPAP, BIPAP, HHHFT)</td>
<td>02/53/07 and HHHFT – new</td>
</tr>
<tr>
<td>Any day a baby receives Parenteral Nutrition (amino acids +/- lipids)</td>
<td>07</td>
</tr>
<tr>
<td>Any day a baby receives an infusion of blood products (red cells, fresh frozen plasma, platelets, cryoprecipitate, intravenous immunoglobulin). It does not include infusion of albumin</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which a central venous or long line (PICC) is present</td>
<td>New</td>
</tr>
<tr>
<td>Any day on which a tracheostomy is present</td>
<td>13/14</td>
</tr>
<tr>
<td>Any day with a trans-anastomotic (TAT) tube present following oesophageal atresia repair</td>
<td>New</td>
</tr>
<tr>
<td>Any day with NP airway/nasal stent present</td>
<td>55</td>
</tr>
<tr>
<td>Confirmed Clinical Seizure(s) today and/or continuous CFM recording</td>
<td>New</td>
</tr>
<tr>
<td>Ventricular tap (including via reservoir)</td>
<td>New</td>
</tr>
</tbody>
</table>

Final Document: 27th June 2017
Authors: Neonatal HRG Development Group
HRGXA03Z/HRGXA04Z

The following data items code to either
- HRGXA03Z Special Care, Carer not resident alongside baby OR
- HRGXA04Z Special Care, Carer Resident at cotside and caring for baby

Any day where a baby does not fulfil the criteria for intensive or high dependency care and requires any of the following:

<table>
<thead>
<tr>
<th>Data Item</th>
<th>NCCMDS Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of an indwelling urethral or suprapubic catheter</td>
<td>New</td>
</tr>
<tr>
<td>Oxygen by low flow nasal cannula</td>
<td>09</td>
</tr>
<tr>
<td>Feeding by orogastric, nasogastric, jejunal tube or gastrostomy*</td>
<td>24</td>
</tr>
<tr>
<td>Care of a Stoma</td>
<td>New</td>
</tr>
<tr>
<td>Intravenous medication not otherwise specified elsewhere**</td>
<td>29</td>
</tr>
<tr>
<td>Receiving Intravenous Sugar +/- electrolyte solutions</td>
<td>23</td>
</tr>
<tr>
<td>Receiving drug treatment for neonatal abstinence AND on an observations scoring regimen 4 hourly or more frequently</td>
<td>10 + 28</td>
</tr>
<tr>
<td>Birth weight ≤2kg for first 2 days after birth</td>
<td>New code not required</td>
</tr>
<tr>
<td>Gestation at birth 35 weeks for first 2 days after birth</td>
<td>New code not required</td>
</tr>
<tr>
<td>Gestation at birth 34 weeks for first 7 days of age after birth</td>
<td>New code not required</td>
</tr>
<tr>
<td>Gestation at birth &lt;34 weeks until discharge from hospital</td>
<td>New code not required</td>
</tr>
</tbody>
</table>

*Requires comment added to existing NCCMDS data definitions to clarify that gastrostomy feeding is “tube-fed”

**Requires additional note to current definition but definition not changed

HRGXA05Z

<table>
<thead>
<tr>
<th>Data Item</th>
<th>NCCMDS Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any baby receiving care in a neonatal facility (neonatal unit or transitional care ward) who does not fulfill the criteria for HRG codes XA01Z-XA04Z</td>
<td></td>
</tr>
<tr>
<td>Babies receiving phototherapy</td>
<td>26</td>
</tr>
</tbody>
</table>
Normal Maternity Care

These babies should generally not receive neonatal payments unless they fulfil additional criteria as specified above:

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age at birth ≥ 36+0 weeks AND birth weight &gt; 2kg</td>
</tr>
<tr>
<td>Birth weight &lt; 2kg AND/OR gestational age 35 weeks, after first 2 days of life</td>
</tr>
<tr>
<td>Babies Gestational Age 34 weeks, after first 7 days of life</td>
</tr>
</tbody>
</table>

Any baby who has been discharged home who requires readmission in the first 14 days of life for any of the care activities considered to be part of normal care (see below)

The following care activities for babies described in the above 3 sections are considered to be part of normal care:

- PROM/GBS observations (12 hrs)
- Meconium observations (12 hrs)
- Thermoregulatory management
- Babies of diabetic mothers who are well and following a Management & Prevention of Hypoglycaemia policy
- Supporting establishment of infant feeding
- Investigation and support for infants with congenital abnormalities who do not otherwise fulfill criteria for higher category of care
- Support for babies with social care needs