NHS SCOTLAND

msn MANAGED SERVICE NETWORK NEUROSURGERY

Audit of Neurosurgery SMR01 Submissions to ISD

Full Report with Executive Summary

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Audit of Neurosurgery SMR01 Submissions to ISD

Contents

Executive Summary 1
- Summary of Results 2
- Conclusion 4

Review of Neurosurgical SMR01 Data September – November 2012 5
- Background to Audit of Neurosurgical SMR01 Data 5
- Standard for Audit 5
- Standard for Analysis 5
- Coding Processes 6
- Methodology for Review of SMR01 Data 8

Audit of Neurosurgical SMR01 Data – Results 11
- Responsible Consultant 12
- Main Condition 13
- Neurosurgical Procedure(s) 17

Conclusion 28
- Neurosurgical Condition 28
- Neurosurgical Operation / Procedure 28

Appendix – Data Collection Form 29

Acknowledgements 31

Executive Summary

Details of approximately 10,000 episodes of care in the four Scottish neurosurgery units are submitted annually to ISD as SMR01 returns. Before starting to make routine use of this data the Managed Service Network for Neurosurgery (MSN) must first of all ensure that it is sufficiently accurate for use in national analysis. An initial review of episodes of care between September and November 2011 was undertaken by MSN Audit Facilitators during 2013 as a test exercise. This report summarises the results of a second review, undertaken by the same staff, examining episodes of care between September and November 2012. Slight changes to the data collection process and analysis were made in this second review, however these changes are not considered likely to impact upon the ability to make comparison with the first review.

Analysis of SMR01 data by the MSN is likely to focus on high level codes with certain rules and intricacies of coding making no significant difference to the conclusions reached. As such, whilst high levels of accuracy are desirable, it is acknowledged that for the purposes of MSN analysis, data may be used with confidence at a lower level of accuracy as long as certain conditions are met. For the purposes of MSN analysis coding should accurately define the body system or location and procedure type, but may lack the highest level of detail. Therefore an attempt has been made to identify codes which, although not completely accurate, would not hamper national analysis of conditions or procedures and are essentially good enough for the purposes of the network.

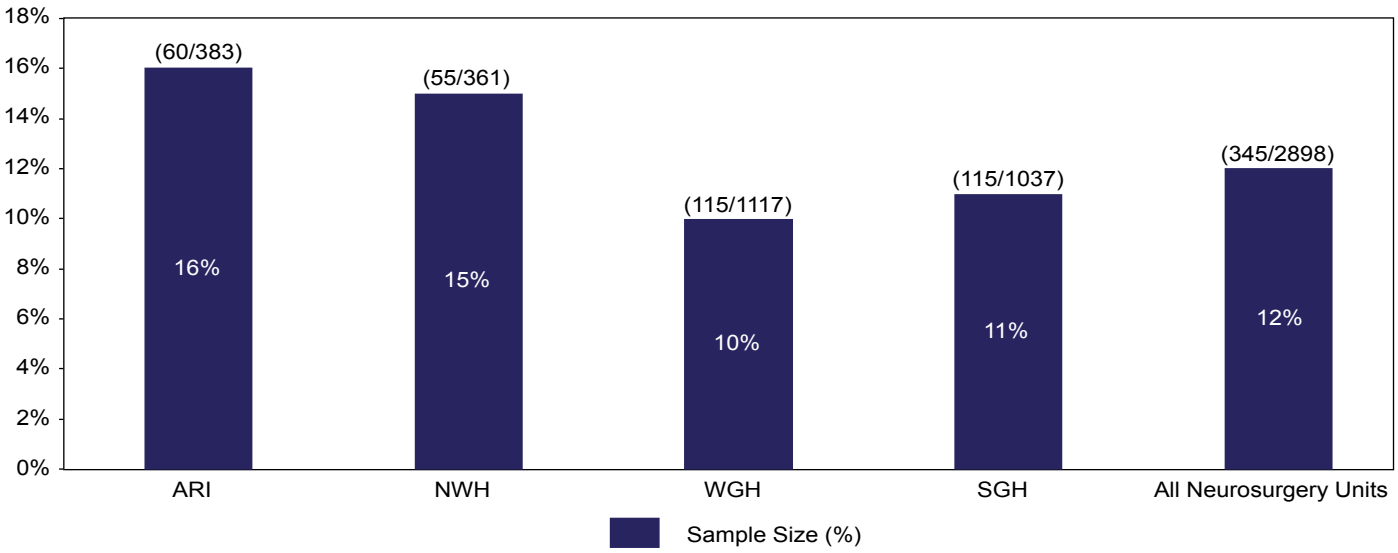
As the data used for this review was historic the MSN Audit Facilitators may have access to clinical information that was not available to coding staff at the time of data submission to ISD.

Data for all four adult neurosurgery sites; Aberdeen Royal Infirmary (ARI), Ninewells Hospital (NWH), Western General Hospital, Edinburgh (WGH) and the Southern General Hospital, Glasgow (SGH) have been included in the results which follow.

Summary of Results

Sample size

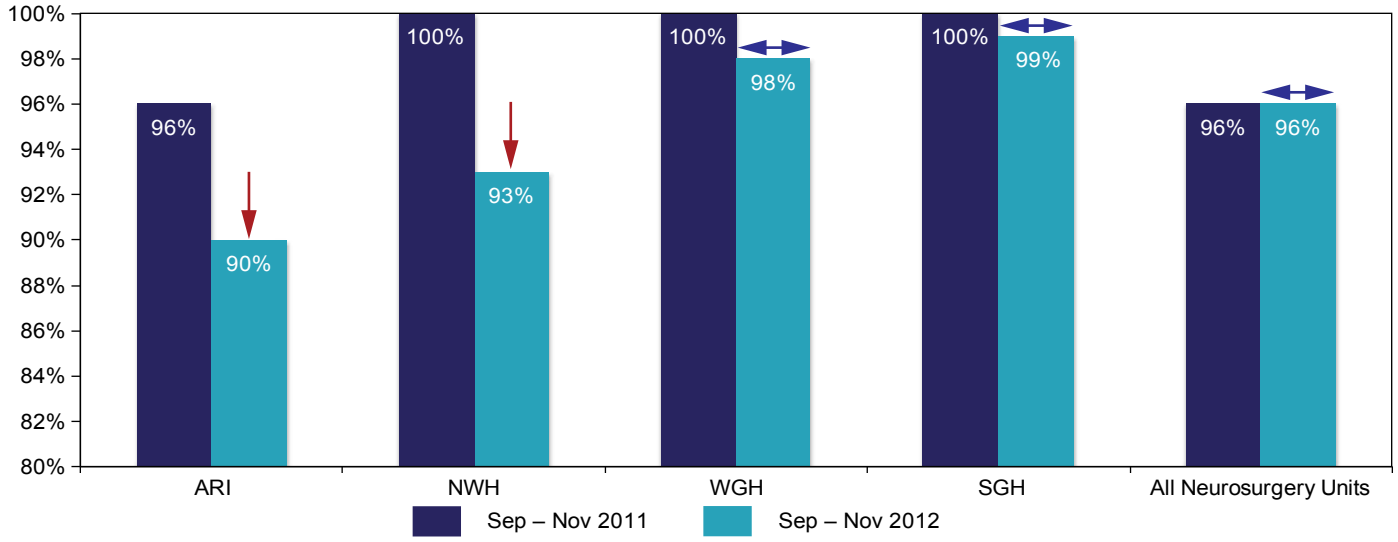
Figures in brackets denote the number of episodes sampled and the total number of episodes.



Overall, 12% of episodes were sampled, with this varying between 10% and 16% across the four neurosurgery sites

Accuracy of Responsible Consultant

Directional arrows show a change of +/- 5% from review of 2011 data



Admission by an on-call Consultant and subsequent transfer to another Consultant during the period of admission may have impacted on the accuracy of Consultant data. Overall, national accuracy remains comparable with the first review at 96%.

Accuracy of Main Condition (ICD 10) and Accuracy of Procedural Coding (OPCS)

Directional arrows show a change of +/- 5% from review of 2011 data

Unit	Accuracy of Main Condition (ICD 10)			Accuracy of Procedural Coding (OPCS)		
	3 Digit Level 2012	3 Digit Level 2011	Suitable for MSN Analysis	3 Digit Level 2012	3 Digit Level 2011	Suitable for MSN Analysis
ARI	96% ↔	94%	98%	91% ↓	96%	92%
NWH	84% ↔	80%	89%	71% ↓	96%	88%
WGH	99% ↔	100%	99%	92% ↓	100%	94%
SGH	96% ↔	97%	97%	92% ↓	99%	95%
All Neurosurgery Units	**95%**	**94%**	**97%**	**88%**	**98%**	**93%**

There has been a decrease in the accuracy of procedural coding in all sites. Pressure from submission deadlines and staffing issues at the Western General Hospital are known to have impacted upon the accuracy of coding data. Training of the Audit Facilitator in Tayside on spinal procedures is likely to have impacted on the results in this location.

Accuracy of Responsible Operating Consultant and Accuracy of Date of Neurosurgical Procedure

Unit	Responsible Operating Consultant correct	Date of Neurosurgical Procedure correct
ARI	92%	72%
NWH	91%	87%
WGH	95%	90%
SGH	98%	72%
All Neurosurgery Units	**95%**	**80%**

Missing data (i.e. no surgical procedure coded but evidence of surgery found on review) has been categorised as not correct. The date of operation should be collected in future for comparison to provide an assurance that the date recorded in the SMR01 submission is within 1 or 2 days of the actual date of the procedure as considered to be most likely.

Conclusion

Review of SMR01 data for the period September – November 2012 suggests that routinely collected neurosurgical data continues to be of a high quality, particularly at a 3 digit level. Diagnostic and procedural coding relating to spinal conditions is the most likely to be affected by possible inaccuracies, however in many instances errors are considered unlikely to impact on national analysis at a network level.

Neurosurgical Condition:

- Nationally the accuracy of coding of neurosurgical conditions to 3 digit level remains high at 95% and does meet the minimum standard recommended by ISD.
- 97% of ICD diagnostic codes were considered to be sufficiently accurate for use in national analysis.
- Errors in coding appear most likely to occur in relation to back pain and spinal conditions.
- A systematic error was found in the coding of post-procedural complications in one hospital. This has been discussed with the Coding Manager and highlighted to staff.
- The accuracy of submissions to the SMR01 dataset is dependent upon the detail provided in discharge communication. Where there are delays to final discharge communication Coding staff must work with information provided on the immediate discharge letter.

Neurosurgical Operation / Procedure:

- Overall accuracy of coding of neurosurgical procedures to 3 digit level is close to the minimum standard required by ISD at 88%, however a slight decrease in accuracy has been demonstrated in comparison with results of the 2011 review.
- 93% of OPCS procedural codes were considered to provide sufficient detail for use in national analysis. Coding detailing a completely incorrect or unrelated procedure is uncommon.
- Under and over coding was more prominent in this second exercise. Time pressure, submission deadlines, reduced staffing and a lack of clinical details at discharge considered to be key factors in this.

Both Coding staff and clinicians have a responsibility to ensure that data submitted to SMR01 is of the very highest quality. Ensuring dialogue between the two and ensuring both understand their role in this process will be critical to continuing improvement in this specialty.

Review of Neurosurgical SMR01 Data September – November 2012

Background to Audit of Neurosurgical SMR01 Data

Details of every episode of acute hospital care is captured by Clinical Coding Departments in all Scottish hospitals and submitted to Information and Statistics Division of NHS Scotland (ISD) as an SMR01 return. Approximately 10,000 neurosurgical episodes are submitted to ISD annually, providing an untapped resource for the Managed Service Network for Neurosurgery (MSN). This report provides results of a second review of SMR01 Neurosurgery data (Sep-Nov 2012) carried out by MSN Audit Facilitators. It is planned to undertake this exercise routinely for data submitted by the four adult neurosurgery units.

Before the MSN starts to make more routine use of this data it is first of all necessary to determine that it is fit for purpose and if necessary identify ways in which it can be improved upon. The first review of national data found this to be of good quality with no systematic errors found in individual units or at a national level. Completeness of data has not been audited in the second review as electronic systems require fields to be completed prior to submission, as such, the accuracy of the data submitted is the central focus for this exercise.

Clinical coding is a highly specialised field drawing on both the experience of Coding staff and the quality of information provided by Clinicians and it is likely that any attempts to improve on quality will require the support of both. Details of the first review of national data were shared with Clinical Coding Managers and Lead Clinicians in the four provider Boards.

Standard for Audit

SMR01 coding is a highly standardised, rule based process, governed by ISD data definitions, ICD-10 classifications of conditions and diagnoses and OPCS-4 classifications of procedures.

The ISD Data and Quality Issues Group have defined the minimum standard for SMR01 Coding accuracy as “90% accuracy at 3 digit level for main condition, other conditions, main operation/procedure and other operations/procedures”.

Standard for Analysis

Analysis of SMR01 data by the MSN for national planning is likely to focus on high level neurosurgical codes with certain rules and intricacies of coding making no significant difference to the conclusions reached. As such, whilst high levels of accuracy are desirable it is acknowledged that for the purposes of MSN analysis data may be used with confidence at a lower level of accuracy as long as certain conditions are met. Codes should accurately define the body system or location and procedure type, but may lack the highest level of detail. For example, a patient with an intracranial haemorrhage may have sustained this in

a number of ways with the bleed occurring spontaneously or after a traumatic event. Basic coding of such an event would suggest a code of I62, but with additional clinical detail on the nature of the haemorrhage could be coded as I61. For the purposes of MSN analysis it is sufficient to know that the patient has been diagnosed with a brain haemorrhage and as such the less detailed code would be regarded as fit for purpose.

Likewise, procedural coding may provide detail to a level that is not required for national planning, for example; a patient having a primary decompression of the lumbar spine would be allocated a V29 OPCS code. However, if clinical information indicated that the patient had a disc fully or partially excised to decompress the spinal cord this should be coded as V33. At the level of MSN analysis the key detail to be extracted is that a lumbar spinal procedure has been carried out and as such this may also be regarded as fit for purpose.

Clinicians and budget holders may require to analyse and make use of data at a more detailed level and it is sensible that clinicians and coding staff work together to ensure the highest level of accuracy possible. But, as it has been acknowledged that MSN demands for the very highest level of accuracy are less critical, an attempt has been made in this review to identify codes which although not completely accurate would not hamper national analysis of conditions or procedures and are essentially good enough for the purposes of the network.

Coding Processes

Coding processes in the four neurosurgery unit were outlined in the report of the first SMR01 review (October 2013). There had been no changes in process at the time of the 2012 data submission reviewed in this second exercise. Neurosurgical specialist coders continued to code episodes in NHS Lothian and NHS Greater Glasgow and Clyde with all coding staff in the two smaller units being responsible for coding neurosurgical care. Tight deadlines for the submission of data to ISD continued to put pressure on coding departments.

As the data used for this review was historic the Audit Facilitators may have access to clinical information that was not available to coding staff at the time of data submission to ISD. Audit Facilitators also had additional time to search patient records for all available information, a luxury which may not be available to coding staff.

Example of Three, Four and Five Digit ICD-10 Codes for Main Condition

Example of 3, 4 and 5 Digit ICD-10 Codes for Main Condition		
3 Digit Level	**4 Digit Level**	**5 and 6 Digit Level**
Diagnosis and major anatomical site e.g. S02 – Fracture of skull and facial bones	Diagnosis and more detailed description of anatomical site e.g. S02.1 – Fracture of base of skull	Diagnosis, detailed description of anatomical site and supplementary information e.g. S02.10 – Fracture of base of skull and closed wound

The process of assigning OPCS-4 (NHS Connecting for Health) codes uses a similar format of 3 and 4 digits, with 3 digit codes identifying the high level procedure and anatomical site of operation:

Example of Three and Four Digit OPCS-4 Codes for Main Procedure

Example of 3 and 4 Digit OPCS-4 Codes for Main Procedure	
3 Digit Level	**4 Digit Level**
Nature of procedure and high level detail of anatomical site e.g. A02 – Excision of lesion of brain	Nature of procedure and more detailed description of anatomical site e.g. A02.1 – Excision of lesion of tissue of frontal lobe of brain, A02.2 – Excision of lesion of tissue of temporal lobe of brain

There are no fifth or sixth codes to be added to procedural data, however codes within the Y classification may be added to provide additional detail where appropriate:

Y47 – Burrhole approach to contents of cranium

Y47.1 – Trans-sphenoidal burrhole approach to contents of cranium

Methodology for Review of SMR01 Data

SMR01 Data for Review: All SMR01 returns to ISD for the Specialty C6 (Neurosurgery) from 1 September 2012 – 30 November 2012 were provided as a data extract in Excel by ISD Bespoke Services. The following fields were included in the data extract:

- Patient name; Date of birth; Gender; Postcode
- Hospital; Significant facility; Admission type, Date of admission; Date of discharge
- Main condition ICD10 Code; Other condition 1 – 5 ICD10 Code; Responsible Consultant
- Date of main operation, Main operation A OPCS 4 Code; Main operation B OPCS 4 Code; Operating Consultant
- Date of other operation 1 – 3, Other operation 1A – 3A OPCS 4 code; Other operation 1B – 3B OPCS 4 code; Other operation 1 – 3 operating Consultant

The following documents were used for guidance on the application of coding processes and data definitions:

- WHO ICD-10 International Statistical Classification of Diseases and Health Related Problems Tenth Revision
- OPCS-4 Classification of Interventions and Procedures Version 4.5
- ISD Scotland data dictionary – SMR01 Data Definitions

Sample: A random sample of neurosurgery episodes from September – November 2012 were reviewed by MSN Neurosurgery Audit Facilitators in each of the four adult units. The sample was stratified to ensure that data for all Consultants was included.

If data on a case was not available for review (paper or electronic records) it was removed from the sample and a substitute selected at random from the same Consultant cohort.

Data Input: Data was input to an Excel spreadsheet showing the source data as submitted to ISD in the SMR01 form with columns added to record that:

- the variable has been checked for accuracy
- the result of this check for accuracy
- the source of any information in the patient electronic or paper record that suggests there may be a discrepancy with the data submitted on the SMR01 form

Audit Facilitators in the four neurosurgery units made use of a standard template.

Variables for Review: The following variables in the SMR01 dataset were checked against electronic and paper records to compare the coding submission with the information available on various systems. The final discharge summary was used as the first source of information for checking.

- Neurosurgical conditions coded (ICD10 code)
- Responsible Consultant
- Date of main operation

- Neurosurgical operations (OPCS 4 code, procedure A and B)
- Operating Consultant

Coding Data Checks:

Variable	Options
ICD10 Code(s)	C – Correctly coded N – Incorrectly coded to 3 digit level (major error) P – Correctly coded to 3 digit level but incorrectly coded at 4 digit level (minor error) U – Uncertain of accuracy – request check
Responsible Consultant	C – Correctly coded N – Incorrectly coded
Date of main operation	C – Correctly coded N – Incorrectly coded
OPCS 4 Code(s) Operation A and B	C – Correctly coded N – Incorrectly coded to 3 digit level (major error) P – Correctly coded to 3 digit level but incorrectly coded at 4 digit level (minor error) U – Uncertain of accuracy – request check
Operating Consultant (all procedures)	C – Correctly coded N – Incorrectly coded

The data collection process was amended for this second exercise to select all neurosurgical codes and procedures from the episode of care rather than focus only on the main condition and main operation. As such a greater, overall, number of codes were reviewed and included in the results. This should have no impact on the comparability of data unless coding of conditions and procedures 1-5 is considered to be less accurate than the coding of main conditions and procedures. There is no reason to expect this to be the case as the same rules and procedures are applied to all conditions and procedures irrespective of where they occur in the hierarchy of coding. The order that neurosurgical codes appeared in the data submission was not considered for review.

Review of Errors: Local processes were developed for review of codes considered to be inaccurate by coding staff or clinicians.

Quality Assurance of Audit Data: A plan for peer review of Audit Facilitator data collection will be developed for future exercises to quality assure this process.

Analysis:

Data was analysed to answer three key questions:

- Is the code correct? (Neurosurgical condition(s) and procedure(s))
- Is the correct Consultant listed?
- Is the accuracy of data sufficient for national analysis and planning?

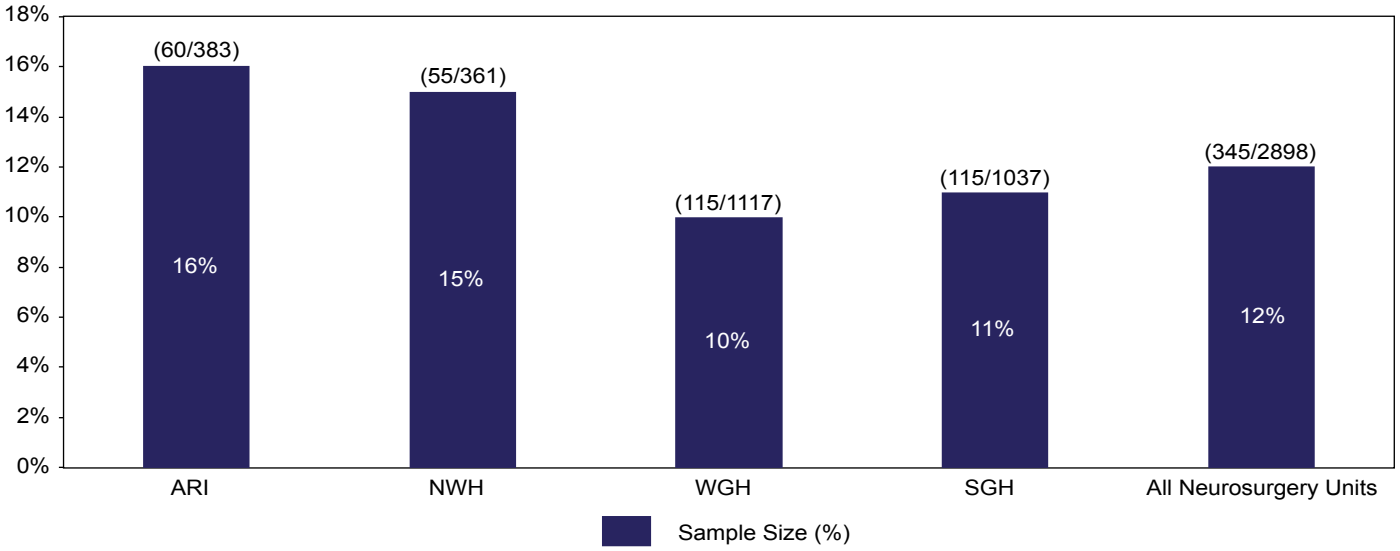
Data for all four adult neurosurgery sites; Aberdeen Royal Infirmary, Ninewells Hospital, Western General Hospital Edinburgh and the Southern General Hospital, Glasgow have been included in the analysis which follows.

Audit of Neurosurgical SMR01 Data – Results

2898 discharges from adult neurosurgery units in Aberdeen (ARI), Dundee (NWH), Edinburgh (WGH) and Glasgow (SGH), between 1 September and 30 November 2012, were extracted from the SMR01 database for use in second review of the quality of routinely collected data.

A total of 345 (12%) SMR submissions from across the four neurosurgery units were reviewed for accuracy by the Audit Facilitators.

Sample Size (%)

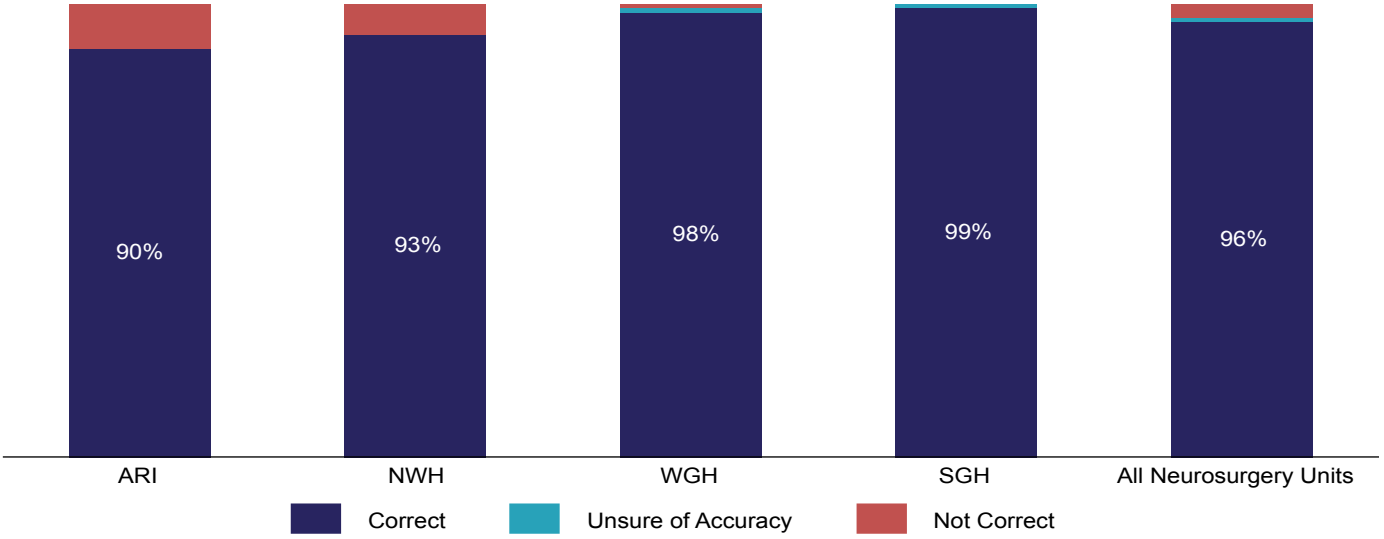


Figures in brackets denote the number of episodes sampled and the total number of episodes.

Responsible Consultant

Data on the Consultant responsible for care was considered to be highly accurate across the four units (332/345, 96%). In a small number of cases in each unit an alternative Consultant was noted to have been responsible for the patient's care.

Responsible Consultant Coding Accuracy



	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct	54	90%	51	93%	113	98%	114	99%	332	96%
Unsure of Accuracy	0	0%	0	0%	1	1%	1	1%	2	1%
Not Correct	6	10%	4	7%	1	1%	0	0%	11	3%
Total	**60**		**55**		**115**		**115**		**345**	

Admission by an on-call Consultant and subsequent transfer to another during the period of admission may not be recorded on the patient administration system. Therefore, this information may not be available to coding staff at the time of the data submission, particularly if a final discharge summary has not been completed within the deadline for SMR returns.

Accuracy of the responsible Consultant is comparable with review of 2011 data, remaining at 96% nationally.

Main Condition

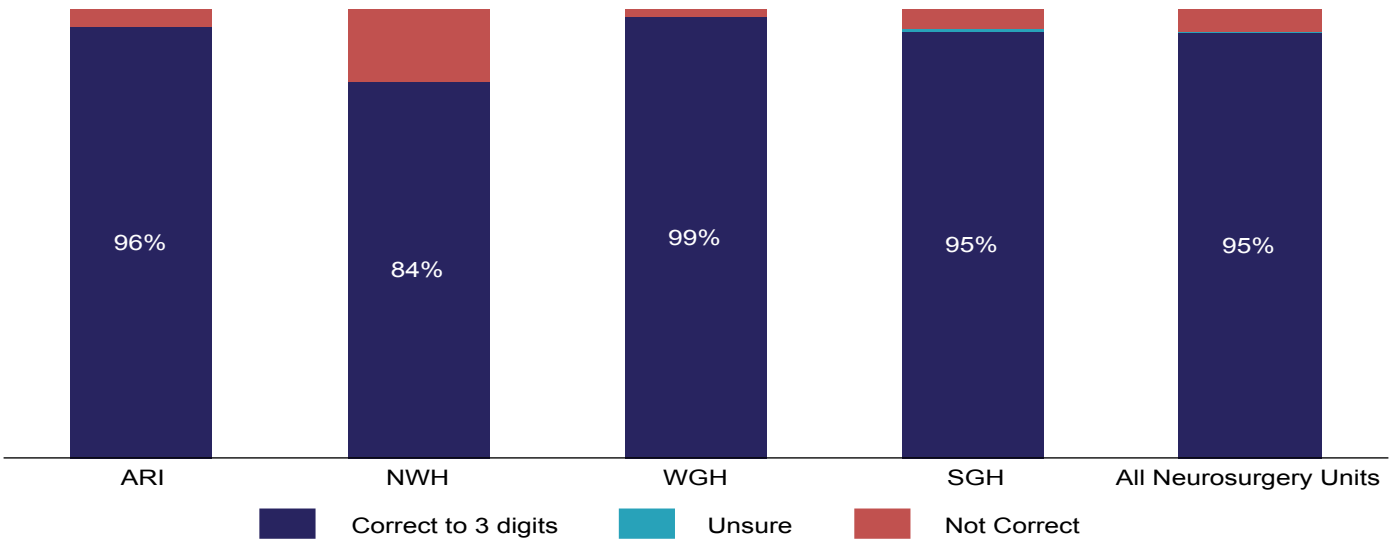
(a) Neurosurgical Conditions Accurate to 3 Digit Level

In a change to the analysis of ICD coding in this second exercise, all neurosurgical codes were reviewed rather than the main condition alone. A revised data collection tool allowed for the identification and review of up to three neurosurgical codes. All patients had at least one neurosurgical code recorded in their episode of care and nearly half (158/345, 46%) had two conditions recorded, only 52 (52/345, 15%) had a third neurosurgical condition. These codes may have come at any position and in any order of the data extract.

A total of 556 ICD 10 codes from the four units were reviewed. At three digit level accuracy was considered to be very good with 95% (528/556) of codes categorised as correct. Despite an increase in the number of codes reviewed, accuracy levels remain consistent with 2011 data (95% of main condition categorised as correct).

Main Condition Accurate to Three Digit Level

	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct to 3 digits	78	96%	68	84%	200	99%	182	95%	528	95%
Unsure	0	0%	0	0%	0	0%	1	1%	1	0%
Not Correct	3	4%	13	16%	3	1%	8	4%	27	5%
Total	**81**		**81**		**203**		**191**		**556**	



The following 27 (5%, 27/556) ICD 10 codes were considered to be inaccurate at 3 digit level:

SMR01 Code	Changed to	AF Review Code
D48 (Neoplasm of unknown behaviour of endocrine glands)		D16 (Tumour of bones of skull and face)
G96 (x3) (Disorder of CNS – CSF leak)		G97 (Post procedural disorder of CNS - psuedomeningocele)
G96 (Disorder of CNS)		I77 (Arteriovenous fistula (acquired))
I62 (Intracranial haemorrhage)		I61 (Intracerebral haemorrhage)
I72 (Aneurysm)		G96 (Disorder of CNS – CSF leak)
J34 (Other disorder or nose and nasal sinus)		Z86 (Personal history of diseases of the circulatory system)
M47 (Spondylosis)		M48 (Spinal stenosis)
M47 (Spondylosis)		I62 (Intracranial haemorrhage)
M48 (Spinal stenosis)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
M50 (Cervical intervertebral disc disorder)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
M51 (Lumbar / thoracic / sacral intervertebral disc disorder)		M48 (Spinal stenosis)
M51 (x2) (Lumbar / thoracic / sacral intervertebral disc disorder)		M50 (Cervical intervertebral disc disorder)
M54 (x2) (Dorsalgia without intervertebral disc disorder)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
Q06 (Malformation of spinal cord (congenital))		I77 (Arteriovenous fistula, acquired)
T85 (Complication of neurostimulator of peripheral nerve)		G96 (Disorder of CNS – CSF leak)
Z09 (Follow up examination after surgery)		G44 (Other headache syndromes)
I61 (Intracerebral haemorrhage)		No Code (No condition)
M51 (Lumbar / thoracic / sacral intervertebral disc disorder)		No Code (No condition)
D32 (Benign neoplasm of meninges)		No Code (No condition)
I61 (Intracerebral haemorrhage)		No Code (No condition)
No Code (No condition)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
No Code (No condition)		Z98 (Presence of CSF fluid drainage device)
No Code (No condition)		G91 (Obstructive hydrocephalus)

The first review of SMR01 data undertaken by the MSN Audit Facilitators data found no evidence of systemic inaccuracies in individual units or at a national level but did highlight that codes in relation to back pain (M51 and M54) were the most likely to be considered as incorrect. A similar pattern has been identified by review of the 2012 data extract. Inaccuracies in the coding of back pain are most likely to relate to the location (cervical – M50 or other M51) and whether or not the cause of pain is a damaged intervertebral disc (M50 / M51 disc disorder or M54 no disc disorder). In some of these cases the detail of the condition may be inaccurate but the location and general condition may be adequate for use in national planning. In a number of instances it was noted that a more specific code, particularly with regard to spinal conditions, could have been allocated to a diagnosis had additional information to verify this been provided in the final discharge summary.

In one unit coding of psuedomeningocele was incorrectly coded as CSF leak on three occasions suggesting that this error may be repeated throughout data submitted from this location. This has been discussed with the Coding Manager and highlighted to staff.

Other errors appear to be sporadic and do not follow a particular pattern.

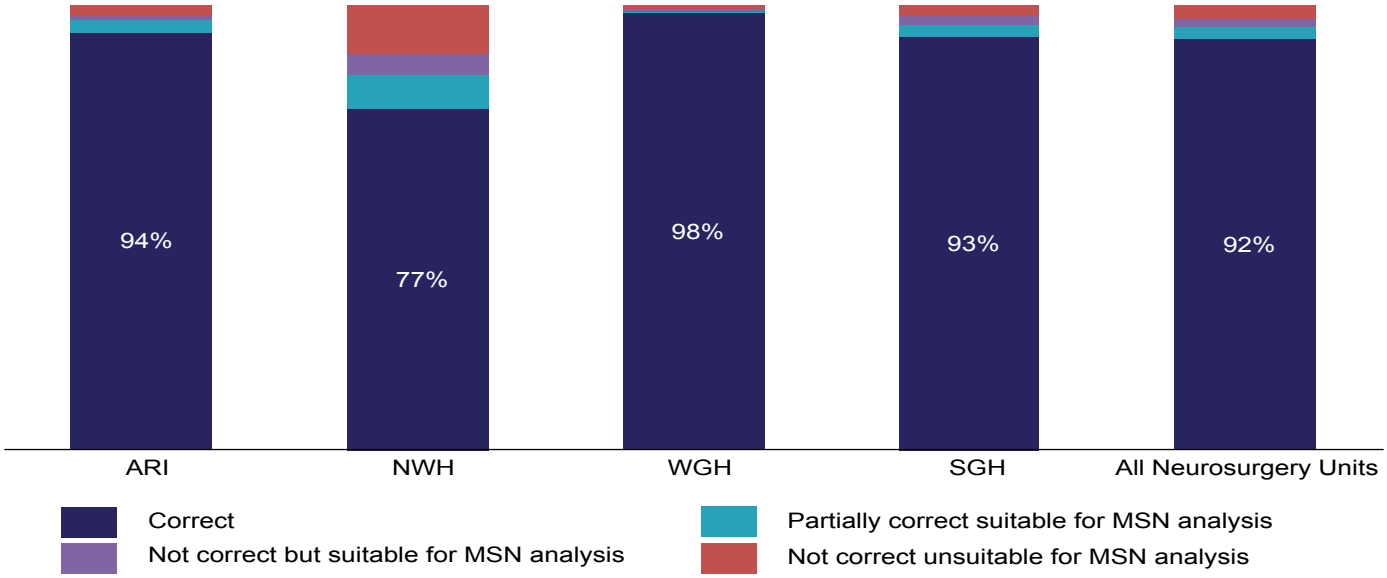
(b) Neurosurgical Condition(s) Accurate to Four Digit Level

Data has not been analysed for accuracy at four digit level (eg S02.1). At four digit level coding is considered to be partially correct with the final digit adding specific detail to a diagnosis. As such, partially correct codes are more than adequate for national analysis, providing information on the general condition and location or body system.

(c) ICD Data Accuracy for Use in National Analysis

As noted previously, an attempt was made in this second review to assess coding as sufficiently accurate for use at a national level to demonstrate that SMR01 data can confidently be used for this purpose. Assessing data in this way gives an indication that nationally, 97% (538/556) of the ICD 10 codes reviewed provide the necessary detail for MSN analysis even though a more accurate code might have been used. This includes codes which are correct, codes which are partially correct (ie correct to 3 digit level) and codes which although considered to be incorrect provide enough relevant information for national analysis.

ICD Neurosurgical Conditions Data Suitable for Use in MSN Analysis



	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct	76	94%	62	77%	199	98%	177	93%	514	92%
Partially correct – suitable for MSN analysis	2	2%	6	7%	1	0%	5	3%	14	3%
Not correct - but suitable for MSN analysis	1	1%	4	5%	1	0%	4	2%	10	2%
Not correct – unsuitable for MSN analysis	2	2%	9	11%	2	1%	5	3%	18	3%
Total	**81**		**81**		**203**		**191**		**556**	

10 codes were categorised as not correct but considered to provide sufficient, general, detail for use in national analysis:

SMR01 Code	Changed to	AF Review Code
I62 (Intracranial haemorrhage, unspecified)		I61 (Intracerebral haemorrhage with hemisphere unspecified)
M47 (Spondylosis)		M48 (Spinal stenosis)
M48 (Spinal Stenosis)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
M50 (Cervical disc disorder)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
M51 (Lumbar / thoracic / sacral intervertebral disc disorder)		M48 (Spinal stenosis)
M51 (x2) (Lumbar / thoracic / sacral intervertebral disc disorder)		M50 (Cervical disc disorder)
M54 (x2) (Radiculopathy without intervertebral disc disorder)		M51 (Lumbar / thoracic / sacral intervertebral disc disorder)
Q06 (Malformation of spinal cord (congenital))		I77 (Arteriovenous fistula, acquired)

Codes related to back pain were again most likely to fall into this category. Coding may lack accuracy of detail but be sufficient for the identification of patients with a spinal condition.

Neurosurgical Procedure(s)

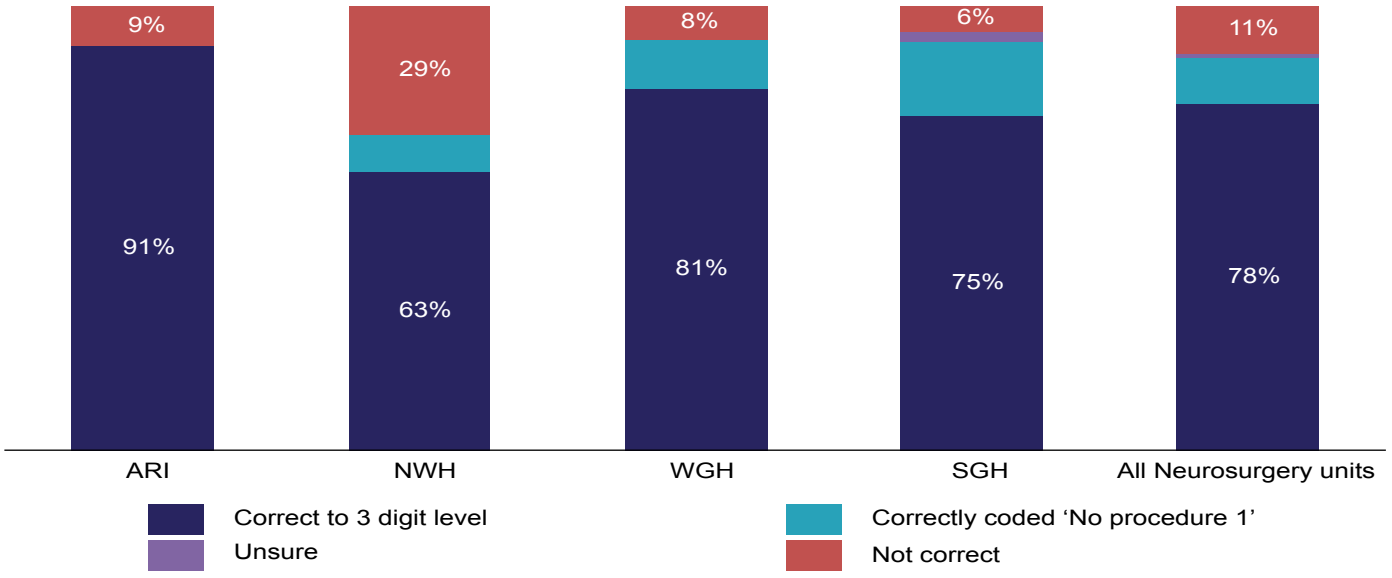
As with diagnostic coding, this second review has considered all neurosurgical procedures included in the SMR01 submission, not only the main procedure. All episodes of care have been included in the baseline for review of the main operation or procedure, including those where SMR01 data indicates that no procedure was undertaken. The absence of a procedural code was considered to be correct if no neurosurgical procedure was undertaken during the patient's hospital admission (Procedure 1 only). A total of 364 procedural codes were reviewed (including 38 'Not Applicable' for Procedure 1).

(a) Main Operation / Procedure Accurate to 3 Digit Level

Overall, Audit Facilitators agreed with the coding of the neurosurgical procedures to three digit level in 322/364 (88%) episodes reviewed. This includes a small number of cases correctly coded as 'no procedure 1'.

Procedural Coding Accuracy (3 Digit Level)

	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct to 3 digit level	60	91%	37	63%	96	81%	91	75%	284	78%
Correctly coded 'No procedure 1'	0	0%	5	8%	13	11%	20	17%	38	10%
Unsure	0	0%	0	0%	0	0%	3	2%	3	1%
Not Correct	6	9%	17	29%	9	8%	7	6%	39	11%
Total	**66**		**59**		**118**		**121**		**364**	



There has been a slight decrease in the accuracy of procedural coding in all sites and as such a corresponding drop in the national figure from 98% (Sep-Nov 2011) to 88% (Sep-Nov 2012). Training of the Audit Facilitator in Ninewells Hospital on spinal surgery is likely to have had an impact on the drop in accuracy levels at this site with 2012 coding data being reviewed with a greater knowledge of the neurosurgical procedures. As such this may be an artefact of the data collection process rather than a change in coding quality. Pressure from submission deadlines and staffing issues at the Western General Hospital are known to have impacted upon the accuracy of coding data. A reduction in the number of neurosurgical coders in this location resulted in a loss of specialist expertise and also increased the pressure on the coding staff to meet national deadlines for all specialties.

'Type' of Procedure Incorrect

Ten procedures were considered to be errors, reporting the wrong type of procedure (however, the level of detail provided in some cases may be suitable for analysis at a national level, see Section c below).

SMR01 Code	Changed to	AF Review Code
A02 (Excision of lesion of tissue of brain)		W09 (Excision of tumour of bone)
A33 (Neurostimulation of cranial nerve)		A09 (Neurostimulation of brain)
A51 (Other operation on meninges of spinal cord)		A54 (Implantation of intrathecal drug delivery device)
L27 (Endovascular insertion of stent graft for infrarenal abdominal aortic aneurysm)		L72 (Diagnostic transluminal operation on other artery)
L33 (Operation on aneurysm of cerebral artery)		A05 (Evacuation of intracerebral haematoma)
L35 (Transluminal operations on cerebral artery)		O01 (Transluminal coil embolisation of aneurysm of artery)
V03 (Re-opening of cranium and re-exploration of operation site)		Y22 (Aspiration of haematoma)
V05 (Other operation on cranium)		A02 (Excision of lesion of tissue of brain)
V26 (Revisional decompression of lumbar spine)		A39 (Repair of dura)
V46 (Fixation of fracture of spine)		V25 (Primary decompression operation on lumbar spine)

Clinical guidance issued to coding staff in Ninewells Hospital resulted in the coding of implantation of a Baclofen pump as A51 rather than A54. This has been discussed with the Coding Manager and a review of local guidance is planned. One error highlighted in the table above (L27 / L72) has been confirmed as a simple data input error.

Under Coding of Neurosurgical Procedures

Under coding of neurosurgical procedures was noted to have been more common than in the first review with 13 cases having no procedure included in the SMR submission but details of a neurosurgical operation during the admission found on review.

Neurosurgical Procedure Code at 3 Digit Level – Undercoding
AF Review Code :

- A02 (x2) (Excision of lesion of brain)
- A04 (Open biopsy of lesion of brain)
- A08 (Biopsy of lesion of brain)
- A12 (Creation of VP shunt)
- A17 (Endoscopic third Ventriculostomy)
- A41 (x2) (Evacuation of subdural haematoma)
- A55 (Diagnostic spinal puncture)
- O01 (Coil embolisation of aneurysm of artery)
- V25 (x2) (Primary posterior decompression of lumbar spine)
- V36 (Prosthetic replacement of cervical intravertebral disc)

Half (7/13) of the undercoded procedures were found on review of data from the Western General Hospital where it is known that staffing issues resulted in increased pressure within the coding department. Review of under coded procedures at SGH confirmed that the ISD submission date preceded the date of the final discharge letter. In these instances, coding staff would not have access to all information relating to the episode of care at the time of data submission. Cases of under coding at Ninewells Hospital (4/13) are known to relate to cases with limited or no discharge information from neurosurgery. A lack of clinical discharge communication following transfer from and back to other hospitals and specialties is likely to have impacted negatively on the quality of SMR data in these instances.

Over Coding of Neurosurgical Procedures

Over coding of procedures was also found more frequently in the 2012 data than in the previous review but was a rare occurrence with only two mistakes identified.

Neurosurgical Procedure Code at 3 Digit Level – Overcoding
SMR01 Code :

- A54 (Removal of intrathecal drug delivery device)
- V25 (Primary decompression of lumbar spine)

In these cases no evidence was found of the procedure detailed in the SMR data during the episode of care as defined by the admission and discharge dates.

Again, a lack of clarity in discharge communication was evident in some cases, requiring further investigation to establish the date of a procedure and confirm if it had been undertaken during the episode being coded. Re-admission to hospital before a first final discharge letter had been written was seen as a factor which may impact on this.

Detail of Type of Spinal Surgery

8 cases were noted to have included excision of all or part of an intervertebral disc but were coded as decompressive operations or vice versa, making this the second most common reason for categorising OPCS codes as not correct. This level of detail may not always be provided on the discharge summary used for coding submissions. All 8 cases were identified in data from Ninewells Hospital with training provided by a Consultant Neurosurgeon enabling more detailed review by the Audit Facilitator. However, it was also noted that discrepancies between the level of detail provided in immediate and final discharge communication may impact on the ability of coding staff to determine the nature of a spinal procedure using only the documentation produced at the time of discharge.

For the purposes of network analysis this is unlikely to impact on the conclusions reached for national planning.

Neurosurgical Procedure Code Incorrect at 3 Digit Level – Nature of Spinal Surgery (Decompression / Disc Excision)

SMR01 Code	Changed to	AF Review Code
V22 (Primary anterior decompression of cervical spinal cord)		V29 (Primary anterior excision of cervical intervertebral disc)
V25 (x3) (Primary decompression of lumbar spine)		V33 (Primary microdiscectomy of lumbar intervertebral disc)
V33 (Primary microdiscectomy of lumbar intervertebral disc)		V25 (Primary decompression of lumbar spine)
V26 (Revisional decompression of lumbar spine)		V34 (Revisional microdiscectomy of lumbar intervertebral disc)
V34 (x2) (Revisional microdiscectomy of lumbar intervertebral disc)		V26 (Revisional decompression of lumbar spine)

Review of procedural codes at ARI has identified that whilst a number of spinal operations have been correctly coded according to the information available in the discharge letter a more detailed code could have been allocated had additional detail been provided by the clinician.

Neurosurgical Procedure Code Incorrect at 3 Digit Level – Type of Spinal Surgery (Primary / Revisional)

Incorrect coding of a primary or revisional procedure occurred only once in the sample of cases reviewed. As such, this may not be of great concern in the overall accuracy of the procedural data.

SMR01 Code	Changed to	AF Review Code
V25 (x2) (Primary decompression of lumbar spine)		V26 (Revisional decompression of lumbar spine)

A lack of clinical information to confirm that a procedure is a second operation at the same level will result in a coding submission for a primary procedure. It is critical to coding staff that they have clinical information to verify the exact nature of a procedure. Should national analysis be focused on the types of surgery being undertaken in neurosurgery units the coding of primary and revisional procedures is unlikely to impact on the conclusions reached. However, should the focus be on outcome this may well result in discrepancies in the analysis over time. The allocation of a revisional procedure code by a clinician in discharge communication cannot be included in an SMR submission without the evidence to verify that the correct code has been selected.

Neurosurgical Procedure Code Incorrect at 3 Digit Level – Location of Spinal Surgery

One instance of lumbar surgery was found to have been coded as cervical surgery. As this has been found to be a rare error it may also be of little concern in the overall analysis of national data.

SMR01 Code	Changed to	AF Review Code
V29 (Primary microdiscectomy of cervical intervertebral disc)		V25 (Primary decompression of lumbar spine)

Detail of Type of Intracranial Surgery

Whilst the greatest number of errors identified appeared in relation to spinal surgery a small proportion were related to the nature of intracranial surgery.

Neurosurgical Procedure Code Incorrect at 3 Digit Level – Nature of Intracranial Surgery

SMR01 Code	Changed to	AF Review Code
A02 (Excision of lesion of tissue of brain)		A04 (Open biopsy of lesion of tissue of brain)
A08 (Biopsy of lesion of tissue of brain)		A02 (Excision of lesion of tissue of brain)
A10 (Other operation on tissue of brain)		A02 (Excision of lesion of tissue of brain)

Differentiating between biopsy and excision of an intracranial lesion is unlikely to impact on national analysis for MSN planning, however long term use of data for examining outcome of surgery may require a higher level of accuracy. Determining the nature of intracranial surgery may be complicated by a lack of information on the intent of surgery in discharge communication available at the time of a coding submission.

(b) Neurosurgical Procedure(s) Accurate to Four Digit Level

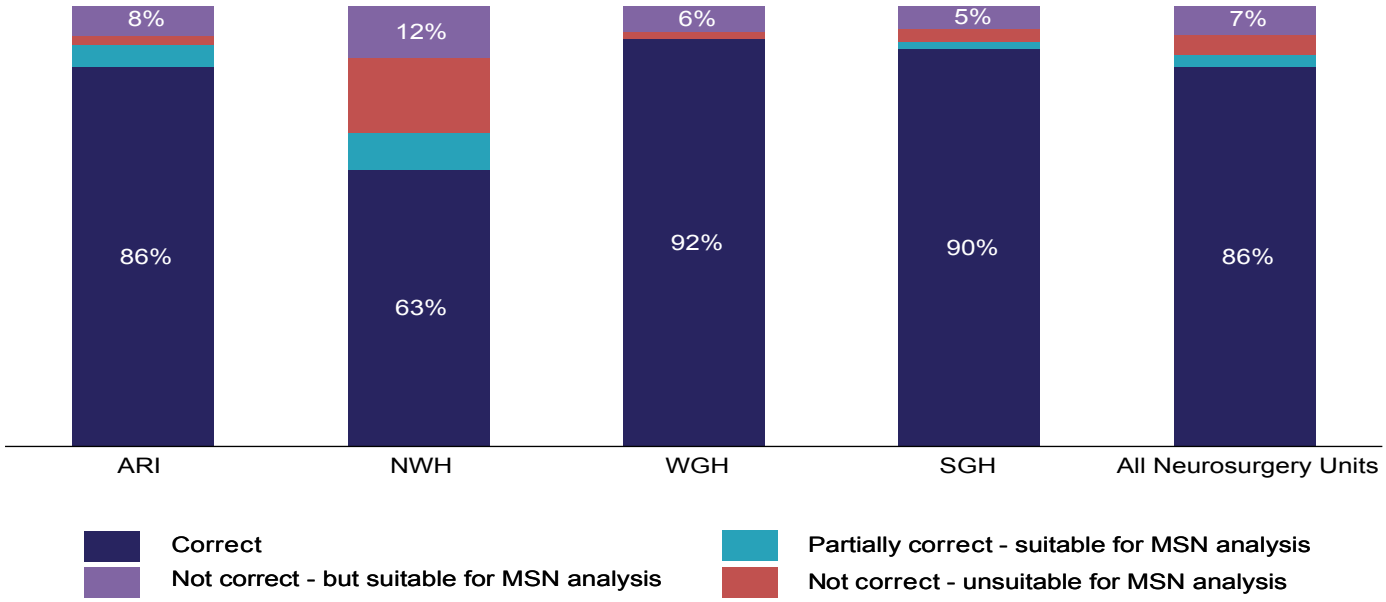
Data has not been analysed for accuracy at four digit level (eg A02.1). At four digit level coding is considered to be partially correct with the final digit adding specific detail to a procedure. As such, partially correct codes are more than adequate for national analysis, providing information on the general condition and location or body system.

(c) OPCS Data Accuracy for Use in National Analysis

Assessing data to identify if it is of the necessary quality for use in MSN analysis suggests that nationally, 93% (339/364) of the SMR01 procedural data is of a sufficient standard to provide the appropriate detail for analysis at this level. This includes codes which are correct, codes which are partially correct (ie correct to 3 digit level) and codes which although considered to be incorrect provide enough relevant information for national analysis.

OPCS Neurosurgical Procedural Data Suitable for MSN Analysis

	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct	57	86%	37	63%	109	92%	109	90%	312	86%
Partially correct – suitable for MSN analysis	3	5%	5	8%	0	0%	2	2%	10	3%
Not correct - but suitable for MSN analysis	1	2%	10	17%	2	2%	4	3%	17	4%
Not correct – unsuitable for MSN analysis	5	8%	7	12%	7	6%	6	5%	25	7%
Total	**66**		**59**		**118**		**121**		**364**	



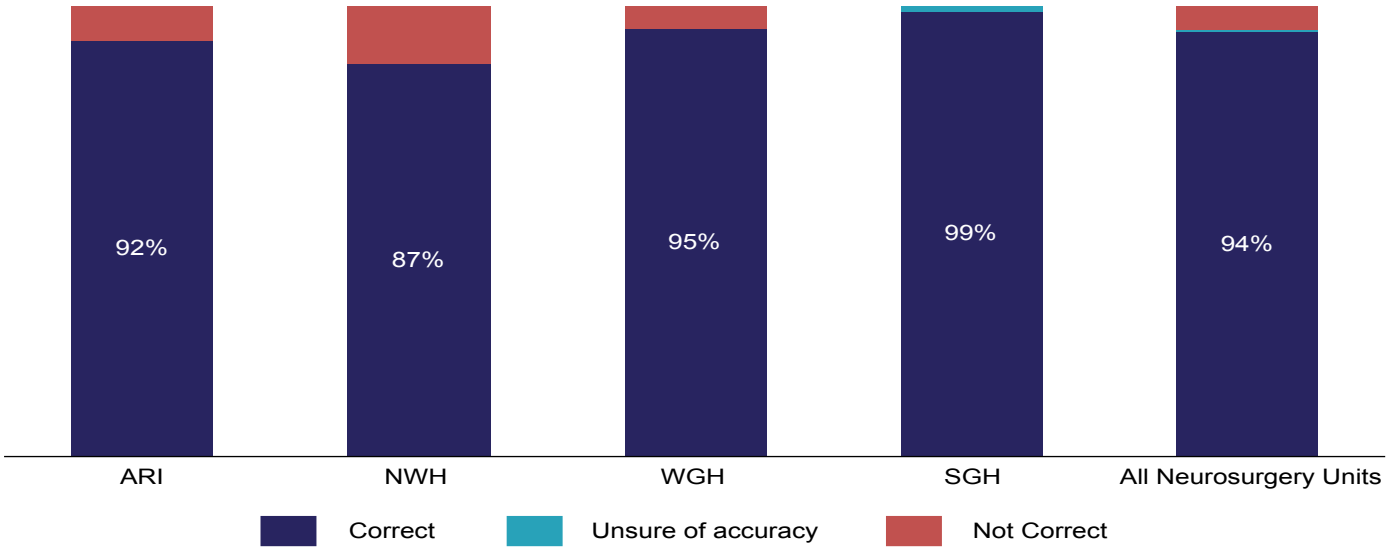
17 codes were categorised as not correct but were considered to provide sufficient detail for use in national analysis:

SMR01 Code	Changed to	AF Review Code
A02 (Excision of lesion of tissue of brain)		A04 (Open biopsy of lesion of tissue of brain)
A08 (Biopsy of lesion of tissue of brain)		A02 (Excision of lesion of tissue of brain)
A33 (Neurostimulation of cranial nerve)		A09 (Maintenance of neurostimulator in brain)
A51 (Other operation on meninges of spinal cord)		A54 (Therapeutic spinal puncture)
L35 (Transluminal operations on cerebral artery)		O01 (Transluminal coil embolisation of aneurysm of artery)
V22 (Primary anterior decompression of cervical spinal cord)		V23 (Revisional anterior decompression of cervical spinal cord)
V22 (Primary anterior decompression of cervical spinal cord)		V29 (Primary anterior excision of cervical intervertebral disc)
V25 (x2) (Primary posterior decompression of lumbar spine)		V26 (Revisional posterior decompression of lumbar spine)
V25 (x3) (Primary posterior decompression of lumbar spine)		V33 (Primary microdiscectomy of lumbar intervertebral disc)
V26 (Revisional decompression of lumbar spine)		V34 (Revisional microdiscectomy of lumbar intervertebral disc)
V29 (Primary anterior excision of cervical intervertebral disc)		V25 (Primary decompression of lumbar spine)
V33 (Primary microdiscectomy of lumbar intervertebral disc)		V25 (Primary posterior decompression of lumbar spine)
V34 (x2) (Revisional microdiscectomy of lumbar intervertebral disc)		V26 (Revisional decompression of lumbar spine)

(d) Responsible Operating Consultant Accurate

326 neurosurgical procedures were reviewed from the Sep-Nov 2012 SMR01 data extract. This baseline excludes patients correctly coded as having had no neurosurgical procedure but includes those missing SMR01 data who were found to have had an operation during the relevant episode of care. Nationally 94% (308/326) of data accurately identified the Consultant responsible for the neurosurgical procedure (the responsible Consultant may not be the primary operator).

Accuracy of Responsible Operating Consultant



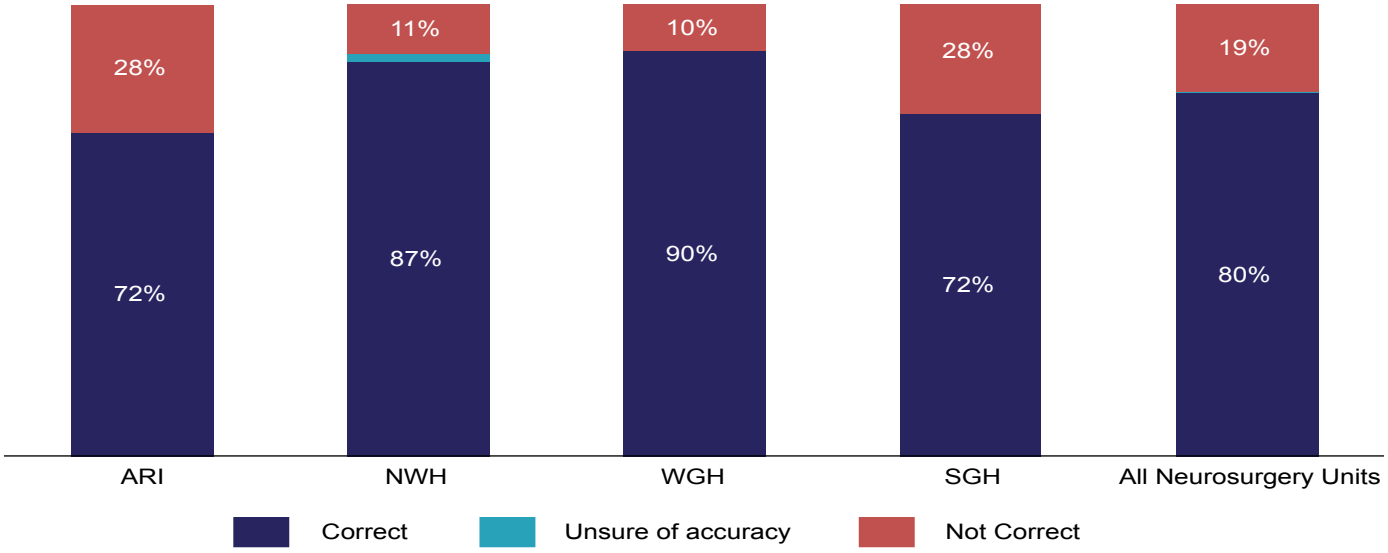
	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct	61	92%	48	87%	100	95%	99	99%	308	94%
Unsure of Accuracy	0	0%	0	0%	0	0%	1	1%	1	0%
Not Correct	5	8%	7	13%	5	5%	0	0%	17	5%
Total	**66**		**55**		**105**		**100**		**326**	

(e) Date of Neurosurgical Procedure is Accurate

Only the date of the main neurosurgical procedure was reviewed, the baseline includes all patients. As such cases correctly coded as 'no procedure' and those with no procedural details and found to be missing surgical data are included. Episodes missing all details of a neurosurgical procedure will have the date of operation categorised as not correct.

Although data on the date of the main operation was considered to be inaccurate in nearly one fifth of all cases nationally, it should be noted that this includes missing dates and also a large proportion likely to be within one day of operation. Extraction of data for coding from patient administration systems may not take account of patients admitted to hospital on the day prior to elective surgery. In a formal review of data by the ISD Data and Quality Team these dates would be considered sufficiently accurate for coding.

Date of Main Operation Accurate



	ARI		NWH		WGH		SGH		All Neurosurgery units	
Correct	43	72%	48	87%	103	90%	83	72%	277	80%
Unsure of Accuracy	0	0%	1	2%	0	0%	0	0%	1	0%
Not Correct	17	28%	6	11%	12	10%	32	28%	67	19%
Total	**60**		**55**		**115**		**115**		**345**	

The date of operation should be collected in future for comparison to provide an assurance that the date recorded in the SMR01 submission is within 1 or 2 days of the actual date of the procedure as considered to be most likely.

Conclusion

Review of SMR01 data for the period September – November 2012 suggests that routinely collected neurosurgical data continues to be of a high quality, particularly at a 3 digit level.

Neurosurgical Condition

- Nationally the accuracy of coding of neurosurgical conditions to 3 digit level does meet the minimum standard recommended by ISD.
- 95% of ICD diagnostic codes were considered to be sufficiently accurate for use in national analysis.
- Errors in coding appear most likely to occur in relation to back pain and spinal conditions.
- A systematic error was found in the coding of post-procedural complications in one hospital. This has been discussed with the Coding Manager and highlighted to staff.

Neurosurgical Operation / Procedure

- Overall accuracy of coding of neurosurgical procedures to 3 digit level is close to the minimum standard required by ISD both at a national and unit level.
- 92% of OPCS procedural codes were considered to provide sufficient detail for use in national analysis. Coding detailing a completely incorrect or unrelated procedure is rare.
- Under and over coding was more prominent in this second exercise, with time pressure, deadlines, reduced staffing and a lack of clinical details at discharge considered to be key factors in this.

Review of codes marked as ‘incorrect’ by the Coding staff has highlighted a number of challenges for coding staff:

- Diagnoses or procedures can only be coded if there is clinical evidence to verify the exact nature of these. A lack of clinical information may result in a less detailed code being assigned to an episode of care.
- Codes assigned by clinicians cannot be used without supporting evidence to verify that these are correct.
- Coding rules dictate that the initial diagnosis should be used if the patient has not been discharged from this episode of care. This may be a particular issue for patients undergoing ongoing rehabilitation in tertiary care, potentially indicating the existence of an acute condition which has subsequently resolved.
- Guidance issued by clinical teams may result in the application of ‘local’ codes for procedures with the potential to complicate national analysis.

Both Coding staff and clinicians have a responsibility to ensure that data submitted to SMR01 is of the very highest quality. Ensuring dialogue between the two and ensuring both understand their role in this process will be critical to continuing improvement in this specialty.

Appendix – Data Collection Form

Patient ID

Responsible Consultant:
Correct ❑
Not Correct ❑

Neurosurgery Condition 1

SMR01 Code: _____
Is the SMR01 Code Correct?
Correct (4 digits) ❑
Partially Correct (3 digits) ❑ **AF Alternative Code:** _____
Unsure ❑
Not Correct ❑

Could a more detailed code have been used if other information had been available?
Yes ❑
No ❑
Unsure ❑

What code could have been used to provide more detail of the neurosurgical condition?
More Detailed Code: _____
Comment on Coding for Neurosurgical Condition 1:

Neurosurgery Condition 2

SMR01 Code: _____
Is the SMR01 Code Correct?
Correct (4 digits) ❑
Partially Correct (3 digits) ❑ **AF Alternative Code:** _____
Unsure ❑
Not Correct ❑

Could a more detailed code have been used if other information had been available?
Yes ❑
No ❑
Unsure ❑

What code could have been used to provide more detail of the neurosurgical condition?
More Detailed Code: _____
Comment on Coding for Neurosurgical Condition 2:

Neurosurgery Condition 3

SMR01 Code: _____
Is the SMR01 Code Correct?
Correct (4 digits) ❑
Partially Correct (3 digits) ❑ **AF Alternative Code:** _____
Unsure ❑
Not Correct ❑

Could a more detailed code have been used if other information had been available?
Yes ❑
No ❑
Unsure ❑

What code could have been used to provide more detail of the neurosurgical condition?
More Detailed Code: _____
Comment on Coding for Neurosurgical Condition 3:

Patient ID

Neurosurgery Procedure:

SMR01 Code Procedure __A: _____ **Date of Procedure:** _____

Is the SMR01 Code __A Correct?
Correct (4 digits) ❑
Partially Correct (3 digits) ❑
Unsure ❑
Not Correct ❑

Is the date of the Procedure Correct?
Yes ❑
No ❑

AF Alternative Code (A): _____

SMR01 Code Procedure __B: _____

Is the SMR01 Code __B Correct?
Correct (4 digits) ❑
Partially Correct (3 digits) ❑
Unsure ❑
Not Correct ❑

AF Alternative Code (B): _____

Is the Operating Consultant Correct:
Yes ❑
No ❑
Unsure ❑

AF Alternative Operating Consultant: _____

What Grade was the Operating Surgeon?
Consultant Neurosurgeon ❑
Staff Grade Neurosurgeon ❑
Specialist Trainee ❑
Not Known ❑

What Grade was the Surgeon Assisting?
Consultant Neurosurgeon ❑
Staff Grade Neurosurgeon ❑
Specialist Trainee ❑
Not Known ❑

Year of Trainee (if known): _____

Year of Trainee (if known): _____

Was a Trainee Operating WITHOUT a Consultant Being Present in Theatre?
No (Consultant Present) ❑
Yes (No Consultant Present) ❑
Unsure ❑

If NO Consultant was Present in Theatre:
Day of procedure: _____
Time of procedure: _____
Consultant on Call at time of procedure: _____

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Lothian

Audit Facilitator - Anne Addison

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