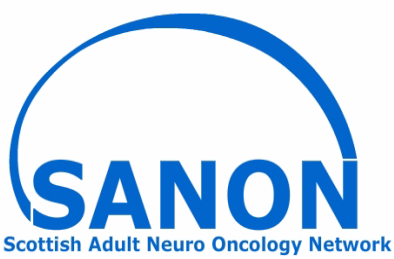
North, South East and West of Scotland Cancer Networks

Neuro-Oncology Cancers
Scottish Adult Neuro Oncology Network



Audit Report

Brain and CNS Cancer
Quality Performance Indicators

Report of the 2015 Clinical Audit Data

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Executive Summary

Introduction

The purpose of this report is to present an assessment of the performance of Adult Neuro-Oncology services using clinical audit data relating to patients diagnosed with brain and central nervous system (CNS) cancers across Scotland during 2015. Results are measured against the Brain and CNS Cancer Quality Performance Indicators[1] (QPIs) which were introduced for patients diagnosed on or after 1st January 2014.

The National Cancer Quality Steering Group (NCQSG) completed a programme of work to develop national QPIs for all cancer types to enable national comparative reporting and drive continuous improvement for patients in 2014. In collaboration with the NMCN for Brain and CNS Cancers and Information Services Division (ISD), the Brain and CNS Cancer QPIs[1] were published by Healthcare Improvement Scotland (HIS) in December 2013 and implemented for patients diagnosed on or after 1st January 2014. Data definitions[2] and measurability criteria[3] to accompany the Brain and CNS Cancer QPIs are available from the ISD website.

Twelve months of data were measured against the Brain and CNS Cancer QPIs for the second consecutive year. Unlike most other tumour types which have undergone pre-QPI data collection and analysis, this is only the second year of such an undertaking for brain and CNS cancers. Following reporting of Year 1 data, a process of baseline review was undertaken to ensure QPIs were fit for purpose and truly driving quality improvement in patient care. This review process resulted in measurability changes to some QPIs and therefore Year 1 data is only presented within this audit report alongside Year 2 data for QPIs where results have remained comparable. Future reports will continue to compare clinical audit data in successive years to further illustrate trends.

Background

The Scottish Adult Neuro-Oncology Network (SANON) was established in 2006 and is one of three national cancer networks in Scotland. Brain and CNS cancers are relatively rare cancers with approximately 400 adult cases diagnosed in Scotland each year[4]. The 2015 audit identified 330 patients diagnosed with a new primary cancer of the brain or CNS in Scotland.

The percentage frequency of brain and CNS cancers in Scotland is comparatively low at 1.4% of all cancers diagnosed[5]. It was ranked as the fourteenth most commonly diagnosed cancer in males and the eighteenth most commonly diagnosed cancer in females in Scotland in 2014[5]. The incidence of brain and CNS cancers has increased by 0.9% in males over the past ten years from 2004 to 2014. However an increase in incidence of 10.7% has been observed in the female population over the same period and overall incidence for both males and females has increased by 4.7% in the past ten years[5].

Although one-year relative survival is seen to be increasing for both males and females (+9.9% and +7.8% respectively between 1987 – 1991 and 2007 – 2011)[6], there is little change in five-year survival rates for brain and CNS cancers.

The table below details the four MDTs which manage all cases of brain and CNS cancer in Scotland. There are five specialist centres carrying out neuro-oncology treatment in Scotland and these are considered the centres for specialist treatment, which includes surgery, chemotherapy and radiotherapy. Patients may receive diagnostic or palliative care in their local hospital where appropriate; however the majority of patients are referred to one of the four MDTs for specialist management.

Neuro-oncology Centre / MDT	Constituent Hospital(s)
Aberdeen	Aberdeen Royal Infirmary (surgery and oncology) Raigmore Hospital – Inverness (oncology)
Dundee	Ninewells Hospital (surgery and oncology)
Edinburgh	Western General Hospital (surgery and oncology)
Glasgow	Queen Elizabeth University Hospital (surgery) and Beatson West of Scotland Cancer Centre (oncology)

Methodology

The clinical audit data presented in this report was collected by clinical audit staff in each NHS Board in accordance with an agreed dataset and definitions. NOSCAN and WoSCAN data was recorded manually and entered locally into the electronic Cancer Audit Support Environment (eCASE): a secure centralised web-based database. Data relating to patients diagnosed between 1st January 2015 and 31st December 2015 was downloaded from eCASE at 2200 hrs on 6th June 2016. SCAN data was collected and analysed regionally and the final results were submitted to WoSCAN.

Analysis was performed centrally by the WoSCAN Information Team for NOSCAN and WoSCAN Boards and the timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for each case. Initial results of the analysis were provided to local NHS Boards to check for inaccuracies, inconsistencies or obvious gaps and a subsequent download taken upon which final analysis was carried out. The final data analysis was disseminated for NHS Board verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area.

Results

This is the second year of data collection for brain and CNS cancers by clinical effectiveness teams across Scotland. A previous internal audit review was carried out by SANON in 2011 in preparation for the introduction of Brain and CNS Cancer QPIs.

Case ascertainment is an estimate of the proportion of expected patients identified through audit and can aid in the assessment of data quality. Overall case ascertainment for Scotland is reasonable at 81.9% which indicates that the capture of new cases of brain and CNS cancers through audit is good. It should be noted however that this is lower than last year, where case ascertainment was 89.3%. A higher case ascertainment produces more meaningful data and NHS Regions/MDTs are therefore requested to investigate case ascertainment in more detail once cancer registry data becomes available for 2015.

Overall data capture is good; however there are areas where improvement is required to enable robust measurement against all QPIs. QPIs 6 and 11 had a high proportion of cases which were not recorded for the numerator. Data fields to define the denominator and exclusion criteria generally had good completion rates with only a low number of incomplete fields for QPIs 7, 10 and 11. Data entry issues were also identified in NOSCAN with regards to 'most valid basis of diagnosis' field, affecting the denominator value for QPI 4.

Despite good data capture rates, a number of dataset interpretation and measurability issues were highlighted through the first year of analysis. These were addressed through the formal QPI baseline review process and Year 1 data is presented alongside Year 2 data where QPIs have remained comparable following baseline review.

Results for each QPI are shown in detail in the main report and illustrate regional/treatment centre performance against each target and overall national results for each performance indicator. Results are presented graphically and the accompanying tabular format also highlights any missing data and its possible effect on any of the measured outcomes.

Where the number of cases meeting the denominator criteria for any indicator is between one and four, the percentage calculation has not been shown on any associated charts or tables. This is to avoid any unwarranted variation associated with small numbers and to minimise the risk of disclosure. Any charts or tables impacted by this restricted data are denoted with a dash (-). An asterisk (*) is applied to indicate a denominator of zero and to distinguish between this and a 0% performance.

The summary of results overpage shows the overall percentage performance for Scotland and individual performance by NHS Region or MDT/neuro-oncology centre.

Brain/CNS Cancer **Quality Performance Indicator (QPI)**		**QPI target**	**Performance by Region of diagnosis (QPIs 1, 2, 4, 5, 8-11)**							
			NOSCAN		**SCAN**		**WoSCAN**		**SCOTLAND**	
QPI 1: Documentation of Performance Status – Proportion of newly diagnosed patients with brain/CNS cancer who have a documented WHO performance status at the time of multidisciplinary team (MDT) discussion.		95%	68.2% >		74.8% >		95.2% >		80.9% >	
			60	88	83	111	119	125	262	324
QPI 2: Multidisciplinary Team Meeting – Proportion of patients with brain/CNS cancer who are discussed at MDT meeting before definitive treatment.		95%	76.4% >		93.6% >		99.2% >		91.0% >	
			68	89	103	110	121	122	292	321
QPI 4: Neuropathological Diagnosis – Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists) including WHO Grade.		90%	94.0% <		96.0% <		98.1% >		96.6% <	
			47	50	72	75	105	107	224	232
QPI 5: Pre-treatment MRI – Proportion of patients with brain/CNS cancer undergoing surgical resection and/or radical radiotherapy or chemotherapy, who have an MRI prior to treatment.		90%	98.2% >		98.5% <		85.9% >		92.9% <	
			54	55	64	65	79	92	197	212
QPI 8: Specialist Neuro-oncology Access – Proportion of patients with brain/CNS cancer undergoing oncological treatment (chemotherapy or radiotherapy) who are managed by a specialist neuro-oncologist.		100%	100% =		100% =		100% =		100% =	
			45	45	66	66	78	78	189	189
QPI 9: Access to Adjuvant Treatment – Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgery who commence their oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgery.	2015	95%	61.3% >		79.6% >		88.6% >		78.2% >	
			19	31	39	49	39	44	97	124
	2014	95%	56.7%		79.2%		85.9%		77.5%	
			17	30	38	48	55	64	110	142
QPI 10: Radical Radiotherapy Planning Process – Proportion of patients with brain/CNS cancer undergoing radical radiotherapy for whom the radiotherapy planning process includes MRI fusion.	2015	95%	91.4% >		100% =		98.2% >		97.2% >	
			32	35	53	53	56	57	141	145
	2014	95%	90.0%		100%		86.8%		92.7%	
			27	30	54	54	46	53	127	137
QPI 11: Seizure Management – Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a nurse with expertise in epilepsy management.		95%	81.5% >		97.1% >		59.5% <		77.9% >	
			22	27	34	35	25	42	81	104

Brain/CNS Cancer **Quality Performance Indicator (QPI)**		**QPI target**	**Performance by Hospital of surgery (QPIs 3, 6 and 7)**									
			Aberdeen		**Dundee**		**Edinburgh**		**Glasgow**		**SCOTLAND**	
QPI 3 (i): Molecular Analysis – Patients with gliomas with an oligodendroglial component who have the tumour tested for combined loss of 1p/19q within 21 days of surgery.		90%	-		-		60.0% <		83.3% <		58.8% <	
			-	-	-	-	3	5	5	6	10	17
QPI 3 (ii): Molecular Analysis – Patients with glioblastomas who have the tumour tested for MGMT promoter methylation status within 21 days of surgery.		90%	34.5% <		38.9% >		98.4% >		65.2% <		69.0% <	
			10	29	7	18	60	61	43	66	120	174
QPI 6: Maximal Surgical Resection – Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who undergo maximal surgical resection (>90% resection of the measurable enhancing component), provided it is considered consistent with safe outcome.	(i) resection	30%	25.0% <		40.0% >		41.5% <		16.7% >		34.5% >	
			4	16	6	15	17	41	2	12	29	84
	(ii) biopsy and resection	30%	23.5%		40.0%		40.5%		16.7%		33.7%	
			4	17	6	15	17	42	2	12	29	86
QPI 7: Early Post-Operative Imaging – Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection.		90%	58.8% >		40.0% >		88.1% >		18.2% >		51.7% >	
			10	17	6	15	37	42	8	44	61	118

A dash (-) denotes restricted data where the denominator is less than 5.

Colour Key		Symbol Key	
	Above QPI target	**>**	Indicates increase on previous year's figure
	Below QPI target	**<**	Indicates decrease from previous year's figure
		=	Indicates no change from previous year
			Indicates no comparable measure from previous year

Region/Centre	
%	
N	**D**

N: Numerator **D**: Denominator

Conclusions and Action Required

The development of national QPIs for brain and CNS cancers will help drive continuous quality improvement in patient care whilst ensuring that activity is focussed on those areas that are most important in terms of improving survival and patient experience. In addition, the introduction of QPIs and the associated governance structure will facilitate regular monitoring and reporting of data to ensure equitable care across the country.

Results presented in this report demonstrate that there has been considerable progress towards achieving an equitable and consistent standard of care across NHS Scotland for patients diagnosed with brain and CNS cancers. Almost half of all QPI targets were met or exceeded at a Scotland level and a further five QPIs showed improved performance. Molecular analysis is the only area where performance has not improved and, although testing is being performed, an overall increase in the number of days for the reports to become available has affected performance. It is evident that some of the QPI targets set have been challenging for centres to achieve and some variance and areas for improvement have been highlighted.

This audit report has identified areas where data capture must improve to enable more meaningful analysis of performance against QPIs in the coming years, specifically with regards to date of definitive treatment, tumour reduction volume and whether patients have been seen by an epilepsy specialist. However overall case ascertainment and data capture for the first two years of data collection and analysis is encouraging, and provides a good foundation to further build upon and from which to measure service improvement in future years.

Areas for service improvement have been identified relating to variation in molecular analysis completion rates, the proportion of patients undergoing maximal surgical resection and early post-operative imaging. The process of baseline review following Year 1 of reporting was successful in addressing the measurement issues identified for QPIs 9 and 10 which were not reported in Year 1. Two years of data were therefore analysed and presented within the current audit report using the revised definitions and overall improvement was noted for both these QPIs.

MDTs/neuro-oncology centres are asked to develop local Action/Improvement Plans in response to the findings presented in the report.

Actions required:

Data quality and capture

- All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.

QPI 1 – Documentation of performance status

- Aberdeen, Dundee and Edinburgh MDTs should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.

QPI 2 – Multidisciplinary team meeting

- The Aberdeen, Dundee and Edinburgh MDTs should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.

QPI 3 (i) – Molecular analysis for combined loss of 1p/19q

- All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.

QPI 3 (ii) – Molecular analysis MGMT promoter methylation status

- The Glasgow MDT, and the Aberdeen and Dundee MDTs in conjunction with Edinburgh pathology department, should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.

QPI 4 – Neuropathological Diagnosis

- The Aberdeen and Dundee MDTs/audit teams should review processes to ensure 'most valid basis of diagnosis' is correctly recorded in order to allow inclusion in the denominator.

QPI 5 – Pre-treatment MRI

- The Glasgow MDT should review cases where no pre-operative MRI scan was undertaken and feedback results to MCN with appropriate action.

QPI 6 – Maximal surgical resection

- The Dundee and Glasgow MDTs should review processes for the recording of 'tumour reduction volume' to reduce the proportion of cases that have not-recorded values.
- The Glasgow MDT should review cases that were not recorded as having undergone maximal surgical resection and take appropriate action on findings.

QPI 7 – Early post-operative imaging

- The Dundee and Glasgow MDTs should review all cases where post-surgery MRI was not performed, or not completed within the 72-hour interval, to identify areas for service improvement.

QPI 9 – Access to adjuvant treatment

- The Glasgow MDT should review cases that did not have adjuvant therapy within 6 weeks of surgery and identify whether the process can be modified to minimise any delay to treatment.
- The Edinburgh and Aberdeen MDTs should review results locally to ensure changes to the pathway noted have been effective in reducing the time to adjuvant treatment.

QPI 11 – Seizure management

- The Glasgow MDT should review processes and take action to improve data collection with regards to whether patients have been reviewed by an epilepsy specialist.
- The Edinburgh centre should review results/data-recording processes to ensure all patients presenting with seizures at diagnosis have been included in the denominator.

A template has been provided in the Appendix to enable each MDT/neuro-oncology centre to produce an Action Plan to address the areas highlighted above.

Completed Action Plans should be returned to WoSCAN within two months of publication of this report.

Progress against these plans will be monitored by the MCN Advisory Board and any service or clinical issue which the Advisory Board considers not to have been adequately addressed will be escalated to the NHS Board Territorial Lead Cancer Clinician and Regional Lead Cancer Clinician.

Additionally, progress will be reported annually to the Regional Cancer Advisory Group (RCAG) by NHS Board Territorial Lead Cancer Clinicians and MCN Clinical Leads, and nationally on a three-yearly basis to Healthcare Improvement Scotland as part of the governance processes set out in CEL 06 (2012).

1. Introduction

The purpose of this report is to present an assessment of the performance of Adult Neuro-Oncology services using clinical audit data relating to patients diagnosed with brain and central nervous system (CNS) cancers across Scotland during 2015. Results are measured against the Brain and CNS Cancer Quality Performance Indicators[1] (QPIs) which were introduced for patients diagnosed on or after 1st January 2014.

The National Cancer Quality Steering Group (NCQSG) completed a programme of work to develop national QPIs for all cancer types to enable national comparative reporting and drive continuous improvement for patients in 2014. In collaboration with the NMCN for Brain and CNS Cancers and Information Services Division (ISD), the Brain and CNS Cancer QPIs[1] were published by Healthcare Improvement Scotland (HIS) in December 2013 and implemented for patients diagnosed on or after 1st January 2014. Data definitions[2] and measurability criteria[3] to accompany the Brain and CNS Cancer QPIs are available from the ISD website.

Twelve months of data were measured against the Brain and CNS Cancer QPIs for the second consecutive year. Unlike most other tumour types which have undergone pre-QPI data collection and analysis, this is the second year of such an undertaking for brain and CNS cancers. Following reporting of Year 1 data, a process of baseline review was undertaken to ensure QPIs were fit for purpose and truly driving quality improvement in patient care. This review process resulted in measurability changes to some QPIs and therefore Year 1 data is only presented within this audit report alongside Year 2 data for QPIs where results have remained comparable. Future reports will continue to compare clinical audit data in successive years to further illustrate trends.

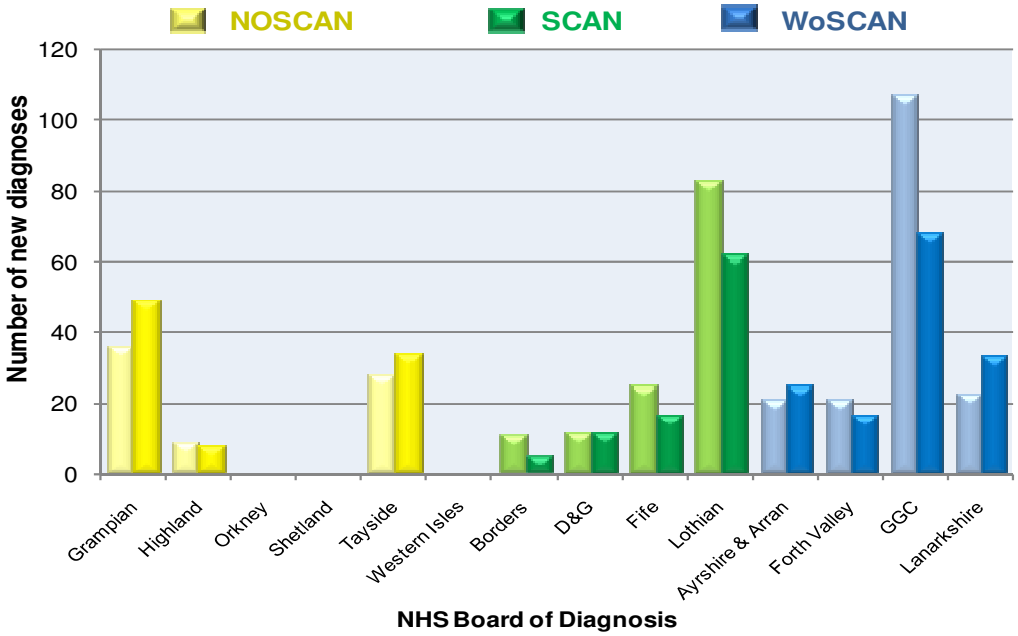
2. Background

The Scottish Adult Neuro-Oncology Network (SANON) was established in 2006 and is one of three national cancer networks in Scotland. The aim of the network is to link together health professionals, patients, their families and carers, social care, voluntary sector representatives and external companies to ensure the delivery of equitable, high quality and clinically effective care for patients in Scotland[7].

Brain and CNS cancers are relatively rare cancers with approximately 400 adult cases diagnosed in Scotland each year between 2010 and 2014[4]. The 2015 audit identified 330 patients diagnosed with a new primary cancer of the brain or CNS in Scotland. This is lower than in Year 1 when 376 cases were captured by audit, and NHS Boards/MDTs have been asked to investigate this decrease in the audit numbers to identify whether cases are being missed.

The distribution of the 330 newly diagnosed cases in 2015 is presented in Figure 1 by location of diagnosis across the fourteen NHS Boards. The West of Scotland Cancer Network (WoSCAN) recorded 43.3% of new diagnoses in 2015 with 143 new cases of brain and CNS cancers captured by audit. This is in line with the adult population distribution in this region as 2013 mid-year population estimates[8] show that 46.1% of the Scottish adult population reside within West of Scotland (WoS) region. It should be noted that 17 of the cases diagnosed in the WoS, specifically NHS Forth Valley, are included in SCAN results throughout the report as these patients are managed through the Edinburgh MDT.

Figure 1: Number of patients diagnosed with brain or CNS cancer across Scotland by NHS Board, 2014 and 2015.



NOSCAN	Grampian	Highland	Orkney	Shetland	Tayside	W. Isles	NOSCAN
Number of cases	49	8	0	0	34	0	91

SCAN	Borders	D&G	Fife	Lothian	SCAN
Number of cases	5	12	17	62	96

WoSCAN	AA	FV‡	GGC	Lanarkshire	WoSCAN
Number of cases	25	17	68	33	143

‡ Patients diagnosed in Forth Valley are managed through the Edinburgh MDT and are included in SCAN performance for QPI results.

The table below details the four MDTs which manage all cases of brain and CNS cancer in Scotland. There are five specialist centres carrying out neuro-oncology treatment in Scotland and these are considered the centres for specialist treatment, which includes surgery, chemotherapy and radiotherapy. Patients may receive diagnostic or palliative care in their local hospital where appropriate; however the majority of patients are referred to one of the four MDTs for specialist management.

Neuro-oncology Centre / MDT	Constituent Hospital(s)
Aberdeen	Aberdeen Royal Infirmary (surgery and oncology) Raigmore Hospital – Inverness (oncology)
Dundee	Ninewells Hospital (surgery and oncology)
Edinburgh	Western General Hospital (surgery and oncology)
Glasgow	Queen Elizabeth University Hospital (surgery) and Beatson West of Scotland Cancer Centre (oncology)

2.1 Incidence and survival

Brain and CNS cancers are relatively rare cancers with approximately 400 cases diagnosed in Scotland each year between 2010 and 2014[4]. The percentage frequency of brain and CNS cancers in Scotland is comparatively low at 1.4% of all cancers diagnosed. It was ranked as the fourteenth most

commonly diagnosed cancer in males and the eighteenth most commonly diagnosed cancer in females in Scotland in 2014[5].

The incidence of brain and CNS cancers has increased by 0.9% in males over the past ten years from 2004 to 2014. An increase in incidence of 10.7% has been observed in the female population over the same period and overall incidence for both males and females has increased by 4.7%[5]. Although the mortality rate from brain and CNS cancers has seen a moderate decrease in males of 1.9%, an 11.7% rise in female mortality has resulted in an overall increase in mortality of 3.1%. Brain and CNS cancers are ranked as the twelfth most common cause of death from cancer and accounted for 2.6% of all deaths from cancer in 2015[5].

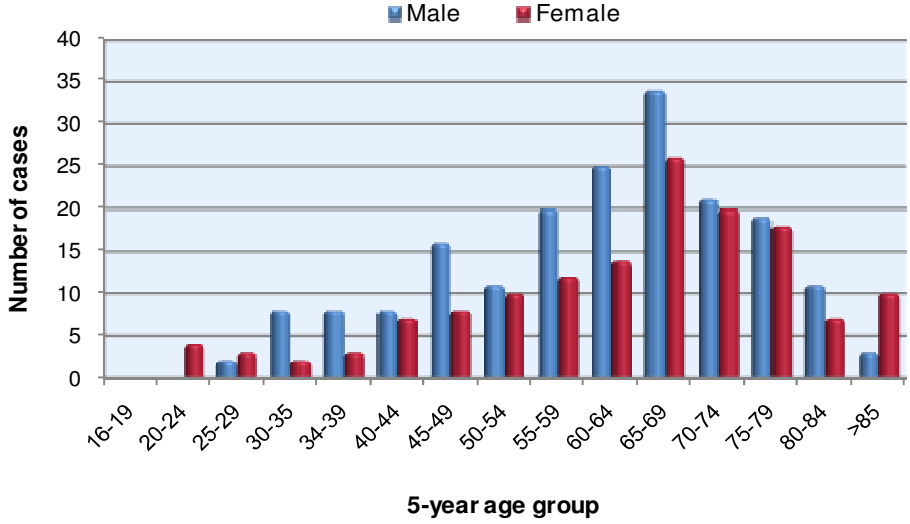
Relative survival at one year is increasing for brain and CNS cancers[6]. Table 1 shows the percentage change in survival rates for patients diagnosed between 1987 and 1991 compared to those diagnosed between 2007 and 2011.

Table 1: Percentage change in relative age-standardised survival for brain and CNS cancer in Scotland at 1 year and 5 years from 1987-1991 to 2007-2011. Source data: ISD[6]

	Relative survival at 1 year (%)		Relative survival at 5 years (%)	
	2007 – 2011	% change	2007 – 2011	% change
Male	41.2 %	+ 9.8 %	15.1 %	+ 1.0 %
Female	39.5 %	+ 7.7 %	15.8 %	- 0.8 %

The incidence of brain and CNS cancers has an unusual age distribution compared to other cancer types. The incidence is relatively high in children, decreasing in the teens and then rising again after age 40[9]. This report includes all cases aged 16 and over and the age distribution for males and females diagnosed in 2015 in Scotland is illustrated in Figure 2. The incidence of brain and CNS cancer is higher for males in almost all age groups and approximately 5 males are diagnosed for every 4 female cases.

Figure 2: Number of patients diagnosed with brain and CNS cancers in Scotland in 2015 by age group and sex.



	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	**Total**
Male	0	0	2	8	8	8	16	11	20	25	34	21	19	11	3	**186**
Female	0	4	3	2	3	7	8	10	12	14	26	20	18	7	10	**144**

3. Methodology

The clinical audit data presented in this report was collected by clinical audit staff in each NHS Board in accordance with an agreed dataset and definitions. NOSCAN and WoSCAN data was recorded manually and entered locally into the electronic Cancer Audit Support Environment (eCASE): a secure centralised web-based database. Data relating to patients diagnosed between 1st January 2015 and 31st December 2015 was downloaded from eCASE at 2200 hrs on 6th June 2016. SCAN data was collected and analysed regionally and the final results were submitted to WoSCAN. Cancer audit is a dynamic process with patient data continually being revised and updated as more information becomes available. This means that apparently comparable reports for the same time period and cancer site may produce slightly different figures if extracted at different times.

Analysis was performed centrally by the WoSCAN Information Team for NOSCAN and WoSCAN Boards and the timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for each case. Initial results of the analysis were provided to local NHS Boards to check for inaccuracies, inconsistencies or obvious gaps and a subsequent download taken upon which final analysis was carried out. The final data analysis was disseminated for NHS Board verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area.

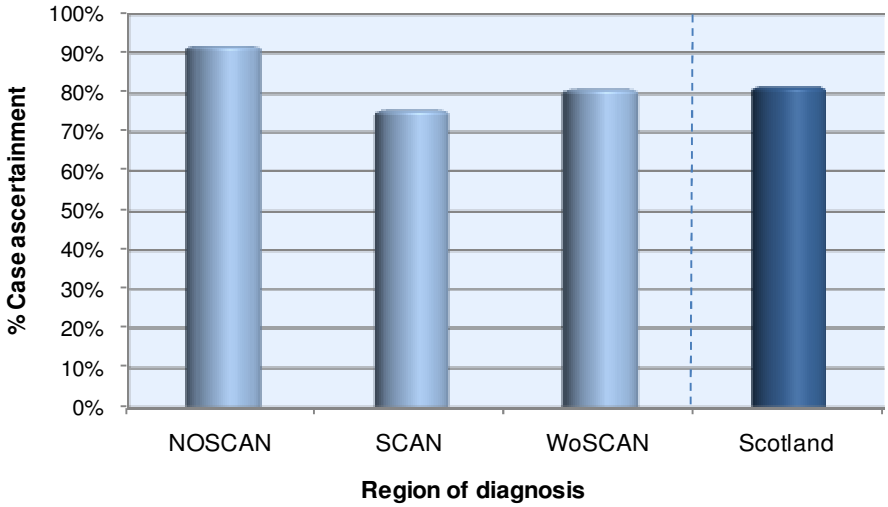
4. Results and Action Required

4.1 Data Quality

Audit data quality can be assessed in the first instance by estimating the proportion of expected patients that have been identified through audit. Case ascertainment is calculated as the number of new cases identified by the audit as a proportion of the number of cases reported by the National Cancer Registry (provided by Information Services Division, National Services Scotland). Cancer Registry figures were extracted from ACaDMe (Acute Cancer Deaths and Mental Health), a system provided by Information Services Division (ISD). Cancer Registry figures are an average of the previous five years' figures to take account of annual fluctuations in incidence within NHS Regions.

Overall case ascertainment for Scotland is reasonably high at 81.9% which indicates that the capture of new cases of brain and CNS cancers through audit is good and overall results should be an accurate reflection of performance. Case ascertainment figures however are provided for guidance and are not an exact measurement as it is not possible to compare directly with the same cohort. Case ascertainment for each NHS Region is illustrated in Figure 3 and varies from 75.8% in SCAN to 91.9% in NOSCAN.

Figure 3: Case ascertainment by region for patients diagnosed with brain and CNS cancers in Scotland in 2015.



	NOSCAN	SCAN	WoSCAN	Scotland
Cases from audit	91	113	126	330
ISD Cases (2010-2014 average)	99	149	155	403
% Case ascertainment	91.9%	75.8%	81.3%	81.9%

Overall data capture is reasonably good, especially when it is taken into consideration that collection of clinical audit data for Brain/CNS cancer was introduced in 2014 and this is only the second year of collection and analysis. However there are areas where improvement is required to enable robust measurement against all QPIs.

Overall case ascertainment was lower than in 2014, specifically in SCAN and WoSCAN and these regions should investigate whether there are any reasons for the decrease in cases captured by audit. Audit data can be compared directly with Cancer Registry data once this becomes available for 2015.

QPIs 6 and 11 had a high proportion of cases which were not recorded for the numerator. Data fields to define the denominator and exclusion criteria generally had good completion rates with only a low number of incomplete fields for QPIs 7, 10 and 11.

In NOSCAN, there were 19 cases diagnosed in Grampian and Tayside NHS Boards which had 'radiological diagnosis' recorded as the most valid basis of diagnosis; however these patients were found to have a valid histological diagnosis. Resultantly, these cases were not included in the denominator for QPI 4 as the denominator includes only patients with a valid histological diagnosis. This is likely to be a recording error and records should be checked and updated accordingly.

In WoSCAN there were a proportion of records which had null values and were not included in the denominator for measurement against QPI 5. This reduced the denominator by 13.5% in these regions; however the missing data had minimal effect on the results in this instance.

Actions required:

- All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.

4.2 Performance against Quality Performance Indicators (QPIs)

Results of the analysis of Brain and CNS Cancer Quality Performance Indicators are set out in the following sections. Graphs and charts have been provided where this aids interpretation and, where appropriate, numbers have also been included to provide context.

Data are presented for each QPI by region of diagnosis or by location of treatment (neuro-oncology centre) both graphically and in tabular format, with performance also shown as an overall national representation. Year 2 data is presented alongside Year 1 data where measurement has remained comparable following the baseline review process.

Where the number of cases meeting the denominator criteria for any indicator is between one and four, the percentage calculation has not been shown on any associated charts or tables. This is to avoid any unwarranted variation associated with small numbers and to minimise the risk of disclosure. Any charts or tables impacted by this restricted data are denoted with a dash (-). An asterisk (*) is applied to indicate a denominator of zero and to distinguish between this and a 0% performance.

Specific regional actions have been identified to address issues highlighted through the data analysis.

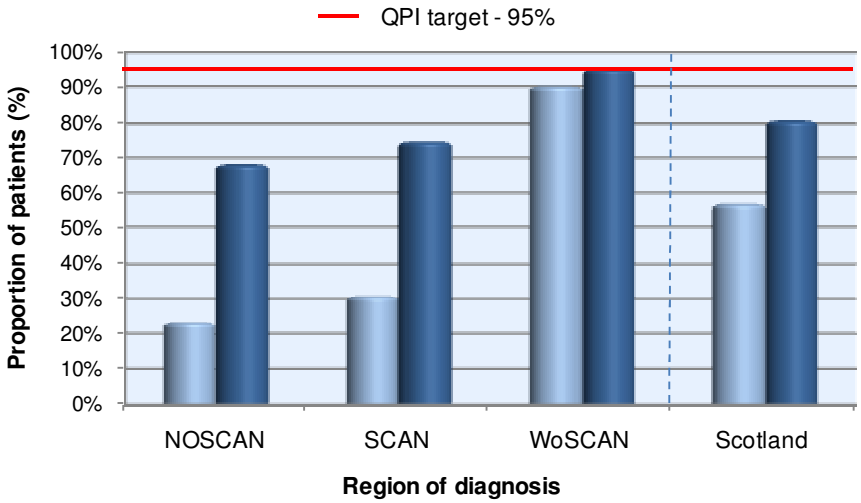
QPI 1: Documentation of Performance Status

Performance status is an important prognostic indicator in patients with brain/CNS cancer. Accurate communication of performance status is vital in guiding complex management decisions, including recruitment into clinical trials[1]. In patients referred from other sites, who have not yet met a member of the neuro-oncology MDT, an estimated performance status should be given based on the available information from the referring site[1].

The tolerance within the 95% target against QPI 1 accounts for situations where there is insufficient information from the referring site to estimate the WHO performance status.

QPI 1:	Patients with newly diagnosed brain/CNS cancer should have a WHO performance status documented at time of diagnosis.
Description:	Proportion of newly diagnosed patients with brain/CNS cancer who have a documented WHO performance status at the time of MDT discussion.
Numerator:	Number of newly diagnosed patients with brain/CNS cancer discussed at MDT meeting with a documented WHO performance status at the time of MDT discussion.
Denominator:	All newly diagnosed patients with brain/CNS cancer discussed at MDT meeting.
Exclusions:	None
Target:	95%

Figure 4: Proportion of newly diagnosed patients with brain/CNS cancer who have a documented WHO performance status at the time of MDT discussion, 2014 and 2015.



QPI 1	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	68.2%	74.8%	95.2%	80.9%
Numerator	60	83	119	262
Denominator	88	111	125	324
Not recorded numerator	0	0	1	1
Not recorded numerator (%)	0.0%	0.0%	0.8%	0.3%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0

Overall performance across Scotland for QPI 1 was 80.9% in Year 2. Although this does not meet the 95% QPI target, it does show a considerable improvement on Year 1 results when performance was 56.8% and improvement was demonstrated across all three regions. Performance against QPI 1 varied between the three regions with performance of 68.2% in NOSCAN, 74.8% in SCAN and 95.2% in WoSCAN. WoSCAN met the 95% target with 119 of 125 newly diagnosed cases having WHO performance status recorded at time of diagnosis.

The Aberdeen neuro-oncology centre commented that cases have been reviewed and although the performance status of the patient was known by the referring clinician in almost all cases, this was not formally documented at MDT. Performance status is now a mandatory field on the MDT discussion form and, following implementation in October 2015, improvement will be more discernible in 2016 results. Further analysis has shown that performance had increased to 83.3% in the final quarter of 2015 for the Aberdeen centre.

The Dundee centre has commented that they will continue to highlight the need to complete this information at MDT meeting.

The Edinburgh centre stated that the 28 cases that did not meet the QPI were discussed at MDT meeting but no performance status was recorded at this time. Nine cases had performance status recorded after MDT meeting and 19 did not have a performance status recorded.

It was agreed at baseline review that MDT meeting is the appropriate time to record each patients' performance status and the MDT chair should be responsible for checking the validity of the performance status recorded and updating as required.

Action required:

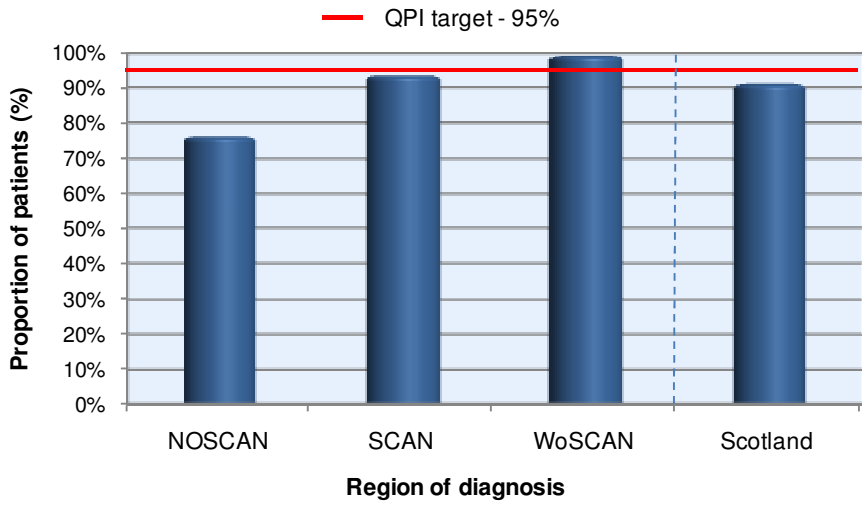
- Aberdeen, Dundee and Edinburgh MDTs should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.

QPI 2: Multidisciplinary Team Meeting

Evidence suggests that patients with cancer managed by a multidisciplinary team have a better outcome. There is also evidence that the multidisciplinary management of patients increases patients' overall satisfaction with their care[1]. Discussion prior to definitive management decisions being made provides reassurance that patients are being managed appropriately.

QPI 2:	Patients with brain/CNS cancer should be discussed by a multidisciplinary team prior to definitive management.
Description:	Proportion of patients with brain/CNS cancer who are discussed at MDT meeting before definitive treatment.
Numerator:	Number of patients with brain/CNS cancer discussed at the MDT before definitive management.
Denominator:	All patients with brain/CNS cancer.
Exclusions:	Patients who died before first treatment
Target:	95%

Figure 5: Proportion of patients with brain/CNS cancer who are discussed at MDT meeting before definitive treatment, 2015.



QPI 2	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	76.4%	93.6%	99.2%	91.0%
Numerator	68	103	121	292
Denominator	89	110	122	321
Not recorded numerator	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0

Performance across Scotland was 91.0% against the 95% QPI target with 292 of 321 patients diagnosed with brain or CNS cancer in 2015 being discussed at MDT meeting before definitive treatment. WoSCAN exceeded the target with 99.2% of patients being discussed prior to definitive treatment and SCAN was slightly below target with 93.6% of patients meeting the QPI criteria.

NOSCAN achieved 76.4% against the 95% target. The Aberdeen centre had 6 cases not meeting the QPI criteria and these cases have been reviewed retrospectively. One case was found to be an administration error as no MDT date was entered and 4 cases had emergency surgery before discussion. There was one case where it was not apparent why the patient had not been discussed prior to surgery. Dundee and Edinburgh centres also stated there were cases where patients required emergency surgery before they could be discussed at MDT.

It was agreed at baseline review however that surgery should not be considered 'definitive' treatment for brain and CNS cancers as this is seldom considered the 'definitive' treatment. This change also accounts for patients requiring emergency surgery prior to discussion and the data definitions were updated to reflect this. Where no further oncological treatment is given following surgery, the date it was decided to give best supportive care should be recorded as the definitive treatment date. Only Year 2 results are presented in Figure 5 due to the above changes in the measurability of this QPI.

Action required:

- The Aberdeen, Dundee and Edinburgh MDTs should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.

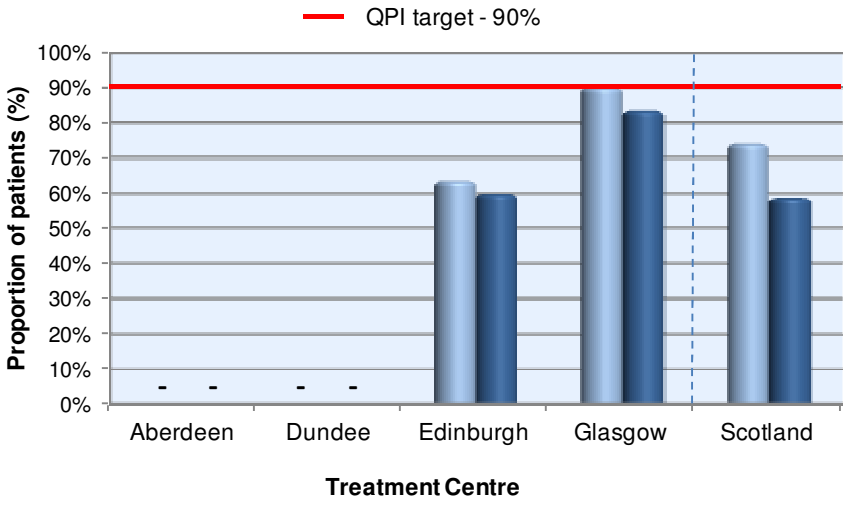
QPI 3: Molecular Analysis

(i) Combined loss of 1p/19q in gliomas with an oligodendroglial component

Combined loss of 1p/19q in gliomas with an oligodendroglial component is associated with a more favourable response to therapy and is associated with considerably better prognosis when compared to tumours with intact 1p/19q. As such, where indicated, 1p/19q analysis should be carried out to help determine treatment and provide information on predicated tumour response to therapy and prognosis[1].

QPI 3(i):	Patients with biopsied or resected gliomas should have molecular analysis performed on the tumour tissue within 21 days of surgery to inform treatment decision making.
Description:	Patients with gliomas with an oligodendroglial component who have the tumour tested for combined loss of 1p/19q
Numerator:	Number of patients with glioma with an oligodendroglial component undergoing surgery where tissue sample is tested for 1p/19q within 21 days of surgery.
Denominator:	All patients with glioma with an oligodendroglial component undergoing surgery.
Exclusions:	None
Target:	90%

Figure 6: Proportion of patients with gliomas with an oligodendroglial component who have the tumour tested for combined loss of 1p/19q within 21 days of surgery, 2014 and 2015.



QPI 3 (i)	Aberdeen	Dundee	Edinburgh	Glasgow	Scotland
Performance (%)	-	-	60.0%	83.3%	58.8%
Numerator	-	-	3	5	10
Denominator	-	-	5	6	17
Not recorded numerator	0	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0	0

A dash (-) denotes restricted data where the denominator is less than 5.

Performance across Scotland was 58.8% against the 90% target for QPI 3 (i) with 10 of 17 cases meeting the QPI criteria. None of the four neuro-oncology MDTs met the 90% target however it should

be noted that numbers are low across all centres and analysis on combined results after Year 3 may provide more meaningful results for comparison. Data has been restricted for the Aberdeen and Dundee centres due to small numbers.

In Aberdeen, although 1p/19q molecular analysis was carried out for all relevant cases, this was outwith the 21-day time frame and does not meet the QPI criteria. The Aberdeen centre has commented that histopathological services are provided by NHS Lothian and additional resources may enable faster processing in NHS Lothian. An internal audit of pathology results has been performed in order to minimise any transport delays from the Aberdeen centre to Edinburgh.

In Glasgow 1 of 6 cases did not meet the QPI, resulting in a performance of 83.3%, as molecular analysis for this case was reported outwith the 21-day time frame.

The Edinburgh centre commented that the 2 cases not meeting the QPI criteria did undergo 1p/19q molecular analysis where initial testing failed and repeat testing was outwith the 21-day time frame.

It was noted that the proportion of brain and CNS cancers with an oligodendroglial component is slightly lower than would be expected with 17 cases in 2015 compared to 23 in 2014. This could be due in part to the lower overall case ascertainment in 2015; however liaison with pathology departments may help to clarify whether numbers are accurate.

Action required:

- All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.

QPI 3: Molecular Analysis

(ii) MGMT promoter methylation status in glioblastomas

Determination of O6-methylguanine-DNA methyltransferase (MGMT) promoter methylation status predicts response to therapy (chemotherapy or concomitant chemoradiotherapy) in glioblastomas and assists in determination of prognosis[1]. As such, where indicated, MGMT promoter methylation analysis should be carried out to help determine treatment and provide information on predicted tumour response to therapy and prognosis.

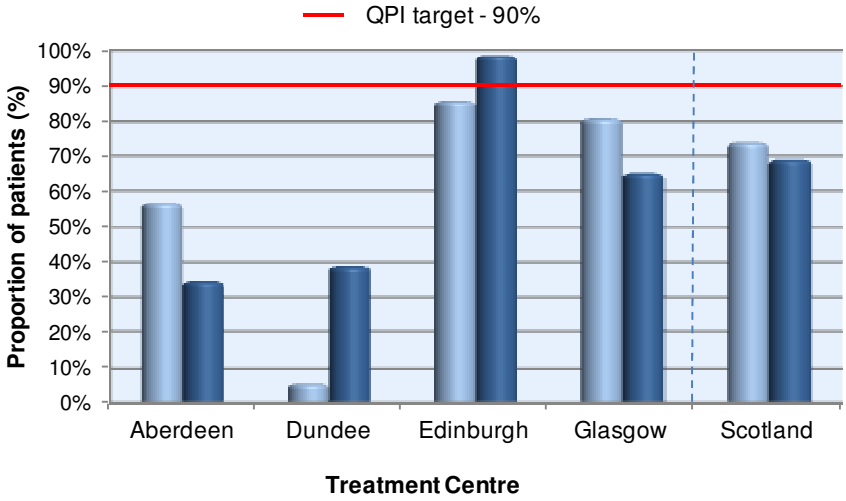
QPI 3(ii):	Patients with biopsied or resected gliomas should have molecular analysis performed on the tumour tissue within 21 days of surgery to inform treatment decision making.
Description:	Patients with glioblastomas who have the tumour tested for MGMT promoter methylation status.
Numerator:	Number of patients with glioblastomas undergoing surgery where tissue sample is assessed for MGMT promoter hypermethylation status within 21 days of surgery.
Denominator:	All patients with glioblastomas undergoing surgery.
Exclusions:	None
Target:	90%

Performance across Scotland was 69.0% against the 90% target with 120 of 174 patients diagnosed with glioblastoma having the tumour tested for MGMT promoter methylation status within 21 days of surgery. This is a decrease of 5.0 percentage points on 2014 performance.

The Edinburgh and Dundee neuro-oncology centres demonstrated improvement on 2014 results and Edinburgh also exceeded the QPI target achieving 98.4%.

The Glasgow and Aberdeen centres showed decreased performance on 2014 results; performance in 2015 was lower by 15.7 and 22.0 percentage points respectively. It should be noted that for cases not meeting the QPI, all but one case in Glasgow had testing for MGMT promoter methylation status however these were reported outwith the 21-day time frame. The median number of days to reporting for cases not meeting the QPI in Aberdeen and Glasgow was 26 days and 35 days respectively.

Figure 7: Proportion of patients with glioblastomas who have the tumour tested for MGMT promoter methylation status within 21 days of surgery, 2014 and 2015.



QPI 3 (ii)	Aberdeen	Dundee	Edinburgh	Glasgow	Scotland
Performance (%)	34.5%	38.9%	98.4%	65.2%	69.0%
Numerator	10	7	60	43	120
Denominator	29	18	61	66	174
Not recorded numerator	0	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0	0

Across Scotland, 99.4% of patients with glioblastomas had their tumour tested for MGMT promoter methylation status however 30.5% of cases did not meet the QPI criteria due to analysis being reported outwith the 21-day time frame, thus performance is lower at 69.0%.

Additional analysis of NOSCAN and WoSCAN data showed that the median number of days for molecular analysis in 2015 was 21 days compared to 17 days in 2014.

Action required:

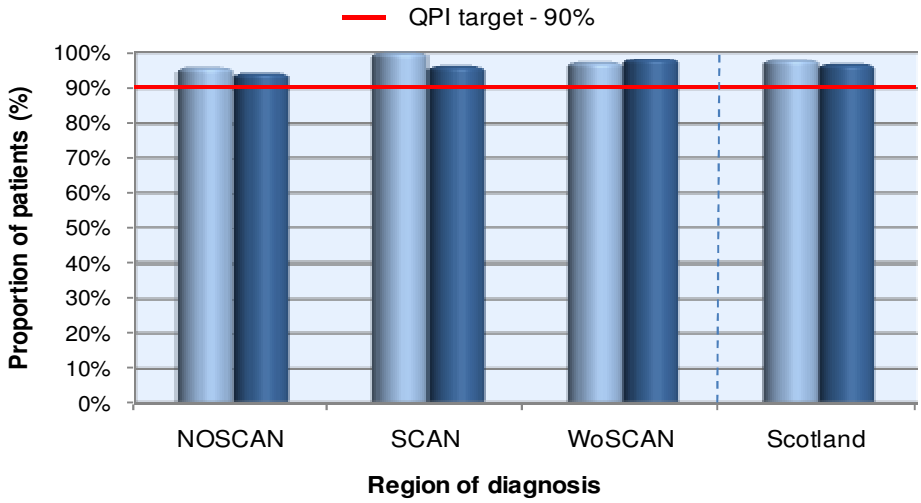
- The Glasgow MDT, and the Aberdeen and Dundee MDTs in conjunction with Edinburgh pathology department, should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.

QPI 4: Neuropathological Diagnosis

Accurate and robust standardisation of tumour diagnosis is required for appropriate patient management. Neuropathologists should report to the standards defined by the Royal College of Pathologists in 'Standards and Datasets for Reporting Cancers: Dataset for Tumours of the Central Nervous System, including Pituitary Gland.' [1]

QPI 4:	All pathology reports for brain/CNS cancer should contain full pathology information (including WHO grade) to inform patient management.
Description:	Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists).
Numerator:	Number of patients with a histological diagnosis of brain/CNS cancer where histological pathology report contains all data items.
Denominator:	All patients with a histological diagnosis of brain/CNS cancer.
Exclusions:	None.
Target:	90%

Figure 8: Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists), 2014 and 2015.



QPI 4	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	94.0%	96.0%	98.1%	96.6%
Numerator	47	72	105	224
Denominator	50	75	107	232
Not recorded numerator	0	0	1	1
Not recorded numerator (%)	0.0%	0.0%	0.9%	0.4%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0

Overall performance across Scotland is 96.6% for QPI 4 which exceeds the 90% QPI target by 6.6 percentage points. All three regions met the target for the second consecutive year with performance of 94.0%, 96.0% and 98.1% in NOSCAN, SCAN and WoSCAN respectively.

On review of results, it was noted that NOSCAN had 55 patients in the denominator for QPI 5 which includes all patients diagnosed with brain/CNS cancer undergoing surgical resection or 'radical' oncological treatment and only 50 patients in the denominator for QPI 4 which includes all patients recorded as having a histological diagnosis. It was highlighted that patients would not progress to treatment without a histological diagnosis and therefore the discrepancy in the figures should be investigated and corrected as necessary.

Action required:

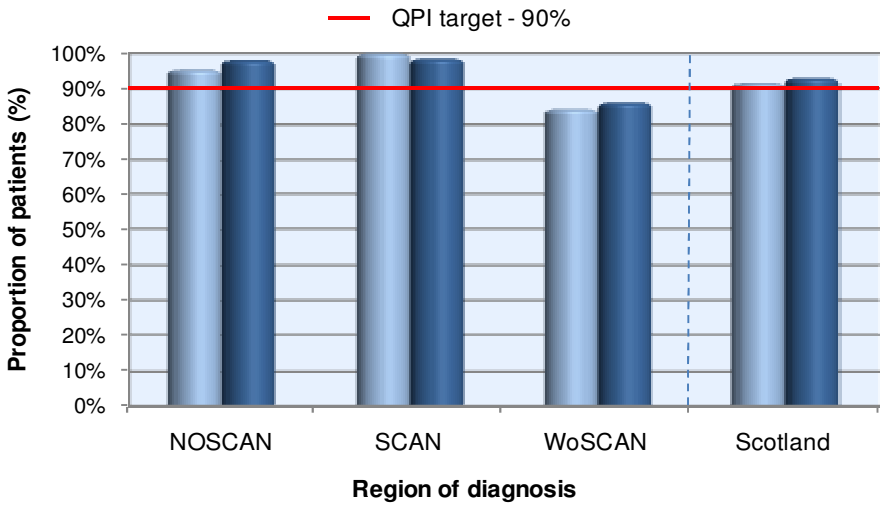
- The Aberdeen and Dundee MDTs/audit teams should review processes to ensure 'most valid basis of diagnosis' is correctly recorded in order to allow inclusion in the denominator.

QPI 5: Pre-treatment Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) is the established investigation for patients with presumed low grade tumours. Although contrast-enhanced computed tomography (CT) will often be the initial investigation suggesting the diagnosis of CNS tumour, MRI provides additional information in many cases. Revised response assessment criteria for high grade gliomas suggest that MRI is the preferred modality used to assess response and progression, therefore pre-treatment MRI is essential for this[1].

QPI 5:	Patients with brain/CNS cancer should have MRI imaging prior to treatment.
Description:	Proportion of patients with brain/CNS cancer undergoing surgical resection and/or radical radiotherapy or chemotherapy, who have an MRI prior to treatment.
Numerator:	Number of patients with brain/CNS cancer undergoing resection of tumour, radical radiotherapy or chemotherapy, who receive an MRI prior to treatment.
Denominator:	All patients with brain/CNS cancer undergoing resection of tumour, radical radiotherapy or chemotherapy.
Exclusions:	• Patients who are unable to undergo an MRI scan. • Patients who refuse MRI scan.
Target:	90%

Figure 9: Proportion of patients with brain/CNS cancer undergoing surgical resection and/or radical radiotherapy or chemotherapy, who have an MRI prior to treatment, 2014 and 2015.



QPI 5	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	98.2%	98.5%	85.9%	92.9%
Numerator	54	64	79	197
Denominator	55	65	92	212
Not recorded numerator	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0

Two of the three regions exceeded the 90% QPI target with performance of 98.2% and 98.5% in NOSCAN and SCAN respectively. The overall performance for Scotland was 92.9%, with 197 of 212 patients undergoing radical treatment having a pre-treatment MRI. This is an improvement of 1.4 percentage points and also exceeds the QPI target.

In WoSCAN, 13 cases did not have a pre-treatment MRI scan, resulting in a performance of 85.9% in 2015. This is a 1.9 percentage-point improvement on 2014 performance however remains under the 90% target.

Action required:

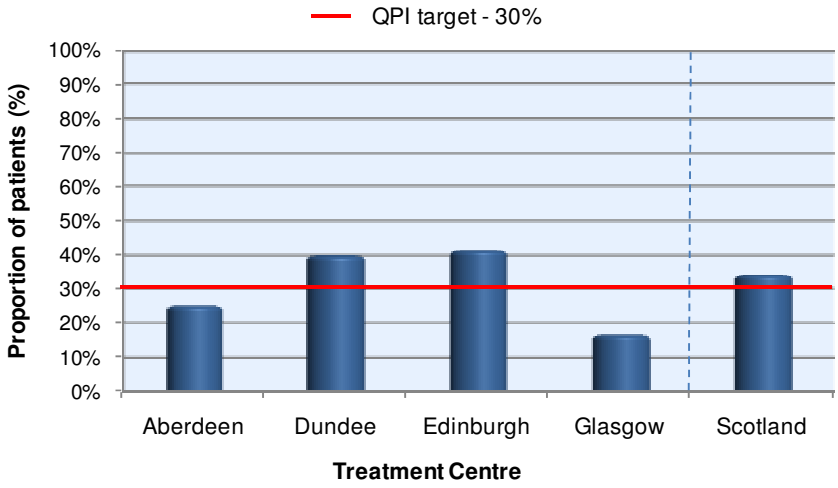
- The Glasgow MDT should review cases where no pre-operative MRI scan was undertaken and feedback results to MCN with appropriate action.

QPI 6: Maximal Surgical Resection

The extent of surgical resection is an independent prognostic factor in Grade III and Grade IV malignant gliomas. Maximal safe surgical resection (>90%) prolongs time to tumour recurrence and is associated with prolonged survival[1]. Maximum safe surgical resection is recommended by several published guidelines. Published evidence shows that 70 – 90 % of patients judged eligible for maximal safe surgical resection (>90%) actually receive this (depending on surgical technique used). It is less clear what proportion of patients has the potential for maximal safe surgical resection. This is possibly only 30 – 50 %[1].

QPI 6 (i):	Wherever possible patients should undergo maximal surgical resection of malignant gliomas.
Description:	Proportion of patients with resectable malignant glioma (with enhancing component on pre-operative imaging) who undergo maximal surgical resection (>90% resection of the measurable enhancing component), provided it is considered consistent with safe outcome.
Numerator:	Number of patients with resectable malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection where >90% reduction in tumour volume is achieved.
Denominator:	All patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection.
Exclusions:	Patients undergoing biopsy only.
Target:	30%

Figure 10: Proportion of patients with resectable malignant glioma who undergo maximal surgical resection where >90% reduction in tumour volume is achieved in 2015.



QPI 6 (i)	Aberdeen	Dundee	Edinburgh	Glasgow	Scotland
Performance (%)	25.0%	40.0%	41.5%	16.7%	34.5%
Numerator	4	6	17	2	29
Denominator	16	15	41	12	84
Not recorded numerator	0	8	0	10	18
Not recorded numerator (%)	0.0%	53.3%	0.0%	83.3%	21.4%
Not recorded exclusions	0	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0	0

Overall performance across Scotland is 34.5% in 2015 which exceeds the 30% QPI target. Year 1 results are not shown in Figure 10 as there were changes to the measurability following baseline review and the denominator now only looks at those patients with resectable malignant glioma where there is an enhancing component on the pre-operative MRI scan. Year 1 data is therefore not directly comparable.

Two of the four surgical neuro-oncology centres, Dundee and Edinburgh, exceeded the QPI target achieving maximal surgical resection for 40.0% and 41.5% of patients with malignant glioma respectively. The Edinburgh centre has exceeded the target for two consecutive years.

The Aberdeen and Glasgow centres did not meet the QPI target with 25.0% and 16.7% of patients with malignant glioma with enhancing component on MRI being recorded as having had maximal surgical resection. The Aberdeen centre has commented that all cases have undergone retrospective review and there were 3 cases that were considered unresectable to 90% and underwent debulking (<50% volume) and another 3 cases were resected to approximately 80% volume. The Aberdeen centre is currently increasing the use of 5-ALA and new ultrasound equipment in order to maximise resection safely.

The Glasgow centre has commented that results for QPI 6 are not representative of the surgical service provided in the WoS as significantly more than 12 surgical resections were undertaken in 2015. The data does however highlight differences in practice with regard to pre- and post-surgery MRI scanning in Glasgow and this should be addressed to bring radiology practices into line with other regions.

QPI 6 (ii) includes the same measures as part (i) however it also includes patients undergoing biopsy only in the denominator. As results have varied by only 2 cases across Scotland in 2015, results are not presented here. Overall performance across Scotland in 2015 for QPI 6 (ii) is 33.7% (29/86) which exceeds the QPI target.

Action required:

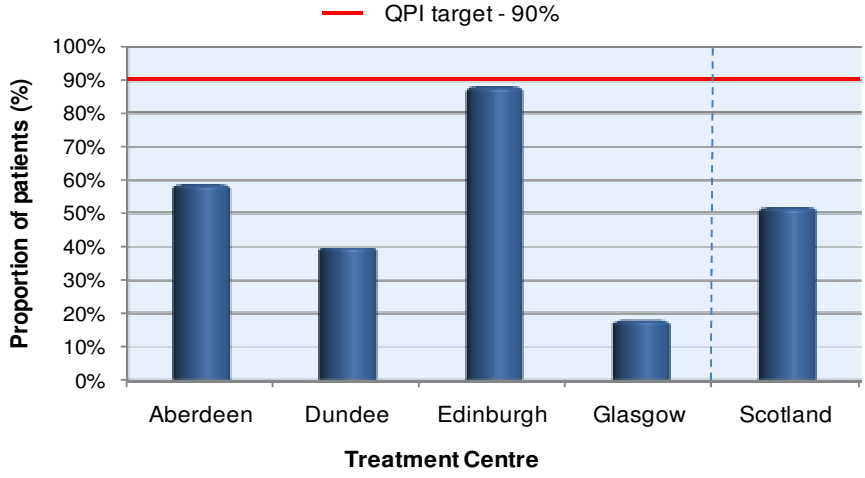
- The Dundee and Glasgow MDTs should review processes for the recording of 'tumour reduction volume' to reduce the proportion of cases that have not-recorded values.
- The Glasgow MDT should review cases that were not recorded as having undergone maximal surgical resection and take appropriate action on findings.

QPI 7: Early Post-operative Imaging

Post-operative imaging is important for a number of reasons; it provides a measurement of surgical performance and helps to determine whether and what type of further treatment is required. It also helps to assess prognosis[1]. Imaging should be carried out within 72 hours to enable reliable assessment of the extent of the resection. MRI is the preferred imaging modality for patients with glioma. After this time, changes in the tumour resection bed confound estimation[1].

QPI 7:	Patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection should be subject to early post-operative imaging.
Description:	Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection.
Numerator:	Number of patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection receiving MRI within 3 days (72 hours) of surgical resection.
Denominator:	All patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection.
Exclusions:	• Patients who are unable to undergo an MRI scan. • Patients who refuse an MRI scan. • Patients undergoing biopsy only.
Target:	90%

Figure 11: Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection, 2015.



QPI 7	Aberdeen	Dundee	Edinburgh	Glasgow	Scotland
Performance (%)	58.8%	40.0%	88.1%	18.2%	51.7%
Numerator	10	6	37	8	61
Denominator	17	15	42	44	118
Not recorded numerator	0	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	2	3	0	0	5

Overall results for Scotland show that 51.7% of patients with malignant glioma, with enhancing component on pre-operative MRI, underwent post-surgical MRI within the specified time (3 days). None of the four surgical centres met the 90% QPI target with the Edinburgh centre achieving the highest performance of 88.1%.

At baseline review the validity of including low grade gliomas was queried as the post-op MRI can be difficult to interpret for this group. It was agreed that the most valid factor in determining the requirement for post-op MRI was whether a tumour was contrast enhancing. The measurability was therefore updated to include only contrast-enhancing tumours, in line with QPI 6, and Year 1 results are not presented alongside Year 2 results on the basis of this change.

The Aberdeen centre has reviewed cases and stated that 3 cases not meeting the QPI had a post-operative MRI within 96 hours of surgery. Another 3 cases were delayed beyond this due to public holidays and 1 patient refused further imaging. The Aberdeen centre has sent reminders to all neurosurgeons and registrars to request immediate post-operative imaging for all newly diagnosed cases of glioblastoma. Neuroradiology will prioritise these scans where possible whilst allowing for other urgent requests.

The Dundee centre has also commented that taking the weekend into account, it is sometimes difficult to meet the 72-hour time frame. They will encourage that post-operative imaging is booked prior to surgery taking place to allow as much chance as possible to achieve timely scanning.

Action required:

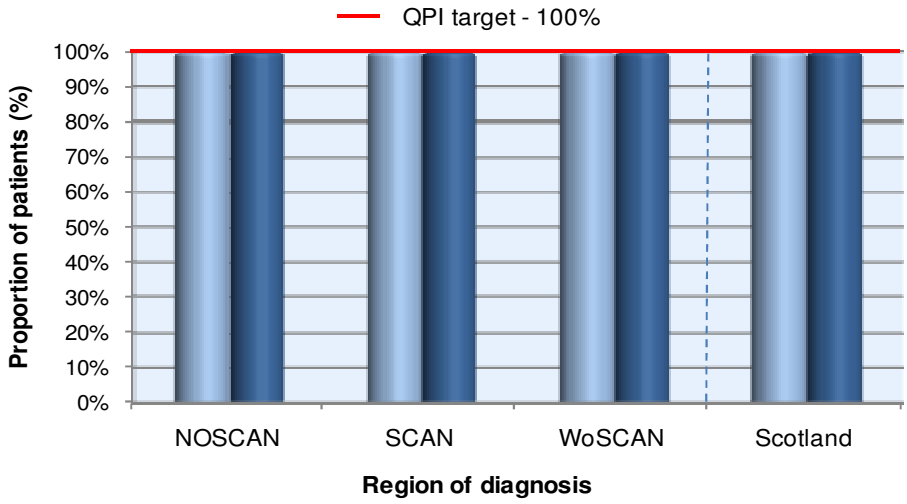
- The Dundee and Glasgow MDTs should review all cases where post-surgery MRI was not performed, or not completed within the 72-hour interval, to identify areas for service improvement.

QPI 8: Specialist Neuro-oncology Access

Non-surgical management of patients with brain and CNS tumours is increasingly complex. Radiotherapy and systemic therapy are evolving rapidly, particularly with regard to the emergence of new radiological technologies and novel prognostic and predictive molecular markers[1]. Psychosocial aspects of care are also complex. All patients should therefore be under the care of a clinical oncologist with a special interest in tumours of the brain and CNS[1].

QPI 8:	Patients with brain/CNS cancer undergoing oncological treatment should be managed by a site specialist neuro-oncologist.
Description:	Proportion of patients with brain/CNS cancer undergoing oncological treatment (chemotherapy or radiotherapy) who are managed by a specialist neuro-oncologist.
Numerator:	Number of patients with brain/CNS cancer undergoing oncological treatment (chemotherapy or radiotherapy) who are managed by a specialist neuro-oncologist.
Denominator:	All patients with brain/CNS cancer undergoing oncological treatment (chemotherapy or radiotherapy).
Exclusions:	None.
Target:	100%

Figure 12: Proportion of patients with brain/CNS cancer undergoing oncological treatment (chemotherapy or radiotherapy) who are managed by a specialist neuro-oncologist, 2014 and 2015.



QPI 8	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	100.0%	100.0%	100.0%	100.0%
Numerator	45	66	78	189
Denominator	45	66	78	189
Not recorded numerator	0	0	0	0
Not recorded numerator (%)	0.0%	0.0%	0.0%	0.0%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0

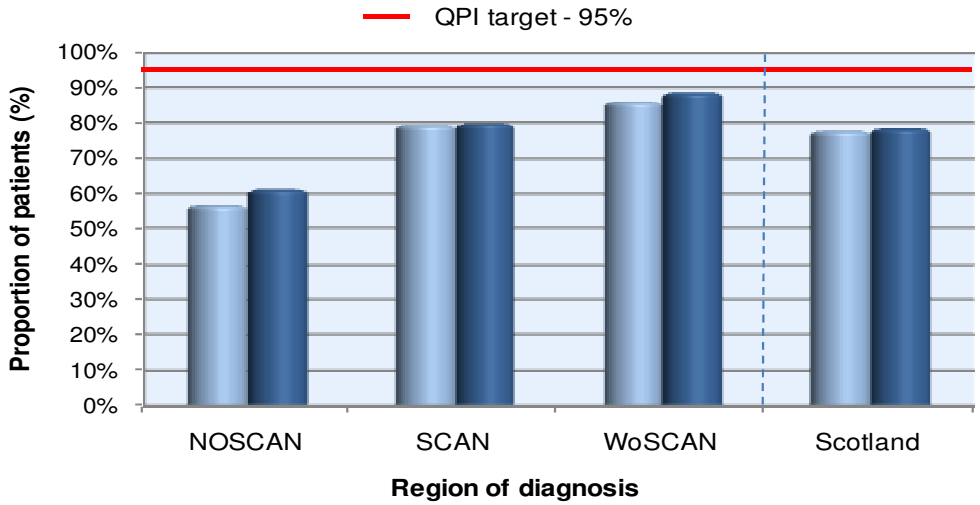
All three regions met the 100% target for QPI 8 for the second consecutive year, resulting in an overall Scotland performance of 100%.

QPI 9: Access to Adjuvant Treatment

Evidence demonstrates a negative impact on patient outcome if adjuvant treatment is delayed. It has been reported that by delaying oncological treatment, the risk of death increased by 8.9% for each week from the date of first surgery[1]. In addition, evidence shows that patients commencing radiotherapy within 6 weeks of the date of surgery had improved overall survival. Hence a maximum interval of 6 weeks between surgery and first day of radiotherapy is recommended[1].

QPI 9:	The maximum time between surgical resection and oncological treatment for patients with high grade glioma (WHO Grades III and IV) should be 6 weeks.
Description:	Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgical resection who commence their oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgical resection.
Numerator:	Number of patients with high grade glioma (WHO Grades III and IV) who undergo oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) who commence oncological treatment within 6 weeks of surgery.
Denominator:	All patients with high grade glioma (WHO Grades III and IV) who undergo oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy).
Exclusions:	None
Target:	95%

Figure 13: Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgical resection who commence their oncological treatment within 6 weeks of surgery 2014 and 2015.



QPI 9	NOSCAN		SCAN		WoSCAN		Scotland	
	2014	2015	2014	2015	2014	2015	2014	2015
Performance (%)	56.7%	61.3%	79.2%	79.6%	85.9%	88.6%	77.5%	78.2%
Numerator	17	19	38	39	55	39	110	97
Denominator	30	31	48	49	64	44	142	124
Not recorded numerator	0	1	0	0	0	0	0	1
Not recorded numerator (%)	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Not recorded exclusions	0	0	0	0	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	0	0	0	0	0	1	0	1

The results for QPI 9 were not included in the 2014 audit report due to difficulties encountered with the measurement of the QPI. Measurability has been updated to include patients undergoing adjuvant chemoradiotherapy and two years of data were analysed against the revised measurability and are presented in Figure 13. It should be noted that the QPI does not include patients undergoing palliative chemotherapy or radiotherapy after surgery. The denominator for WoSCAN is notably smaller than in 2014 and this is likely to reflect the low case ascertainment in 2015 and not a change in practice.

None of the three regions met the 95% target for QPI 9 with 97 of 124 patients with high grade glioma undergoing adjuvant oncological treatment having their treatment within 6 weeks of surgery across Scotland (78.2%). All three regions demonstrated minor improvement on Year 1 figures.

The Aberdeen centre has stated that all cases where treatment was delayed have been reviewed. Reasons were found to be due to delay in post-operative MRI scanning to enable the radiotherapy planning or due to patient choice. All cases had treatment commenced within 49 days (as opposed to the 42-day target). The Aberdeen centre has commented that with improved post-operative imaging times and the reorganisation of the oncology clinic to enable earlier radiotherapy simulation, this target should be achievable in 2016.

The Dundee centre commented that some patients need time to recover post operatively prior to commencing oncology treatment and that the radiotherapy department is working at full capacity. Cases were reviewed and two of the five cases not meeting the QPI exceeded the time frame by only 3 working days

The Edinburgh centre reviewed all cases and stated that, of the 10 cases not meeting the QPI target in 2015, the time to oncological treatment was delayed in 2 cases due to health reasons, 3 were awaiting pathology results, and 5 were delayed to allow for VMAT (volumetric modulated arc therapy). Edinburgh also stated that the introduction of VMAT has made the process more time consuming, however work to increase capacity has allowed the pathway to be reduced by one week.

Action required:

- The Glasgow MDT should review cases that did not have adjuvant therapy within 6 weeks of surgery and identify whether the process can be modified to minimise any delay to treatment.
- The Edinburgh and Aberdeen MDTs should review results locally to ensure changes to the pathway noted above have been effective in reducing the time to adjuvant treatment.

QPI 10: Radical Radiotherapy Planning Process

Determining the Gross Target Volume is a critical process in the radiotherapy planning of patients with primary brain/CNS cancer. Radiotherapy planning CT scans provide very limited information on the extent of the primary tumour and attempts to utilise anatomical MRI information by 'side-by-side' visual assessment are usually inaccurate[1].

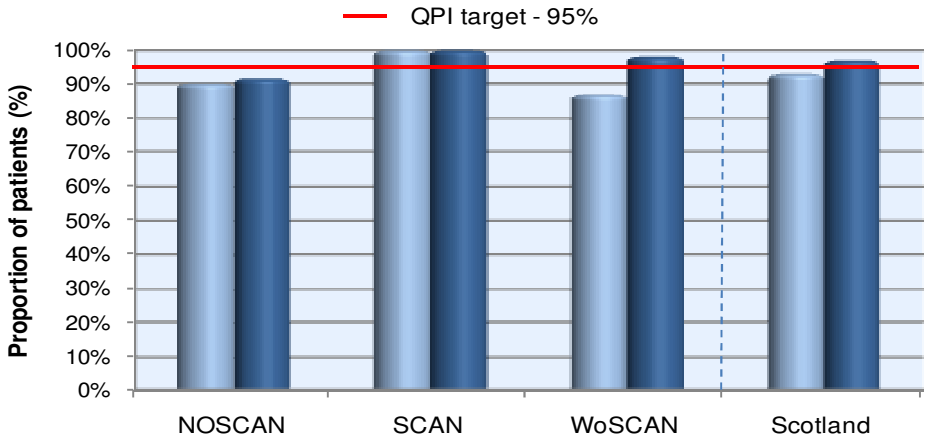
MRI fusion enables the superior anatomical and physiological information provided by MRI to be accurately combined with planning CT data sets in order to optimise gross tumour volume (GTV) delineation. MRI fusion has been shown to reduce inter-observer variation in target delineation of high grade gliomas and a number of studies have shown that target volumes determined by CT alone frequently underestimate tumour extent[1].

QPI 10:	The radical radiotherapy planning process for patients with brain/CNS cancer should include MRI fusion.
Description:	Proportion of patients with brain/CNS cancer undergoing radical radiotherapy for whom the radiotherapy planning process includes MRI fusion.
Numerator:	Number of patients with brain/CNS cancer undergoing radical radiotherapy for whom radiotherapy planning includes MRI fusion.
Denominator:	All patients with brain/CNS cancer undergoing radical radiotherapy.
Exclusions:	• Patients who are unable to undergo an MRI scan. • Patients who refuse an MRI scan.
Target:	95%

The results for QPI 10 were not included in the 2014 audit report as the dataset did not allow for the correct cohort of patients to be identified for the denominator (i.e. unclear definition of radical

radiotherapy). The measurability has been updated following baseline review to include patients undergoing radical radiotherapy, defined as patients receiving 20 fractions or more, and two years of data were analysed against the revised measurability and are presented in Figure 14.

Figure 14: Proportion of patients with brain/CNS cancer undergoing radical radiotherapy for whom the radiotherapy planning process includes MRI fusion, 2014 and 2015.



QPI 10	NOSCAN		SCAN		WoSCAN		Scotland	
	2014	2015	2014	2015	2014	2015	2014	2015
Performance (%)	90.0%	91.4%	100.0%	100.0%	86.8%	98.2%	92.7%	97.2%
Numerator	27	32	54	53	46	56	127	141
Denominator	30	35	54	53	53	57	137	145
Not recorded numerator	0	2	0	0	1	1	1	3
Not recorded numerator (%)	0.0%	5.7%	0.0%	0.0%	1.9%	1.8%	0.7%	2.1%
Not recorded exclusions	0	2	0	0	1	1	1	3
Not recorded exclusions (%)	0.0%	5.7%	0.0%	0.0%	1.9%	1.8%	0.7%	2.1%
Not recorded denominator	0	0	0	0	0	0	0	0

Performance across Scotland was 97.2% in 2015, exceeding the 95% target. Two of the three regions exceeded the target in 2015, with SCAN achieving 100% for two consecutive years.

The Aberdeen centre also achieved 100% against the target, however regionally NOSCAN achieved 91.4% overall with 32 of 35 patients undergoing radical radiotherapy recorded as having an MRI fusion as part of the radiotherapy planning process. The Dundee centre only had one case that did not meet the QPI criteria and performance is affected by small numbers. The Dundee centre commented that this patient underwent CT fusion as the tumour was clearly visible on CT.

QPI 11: Seizure Management

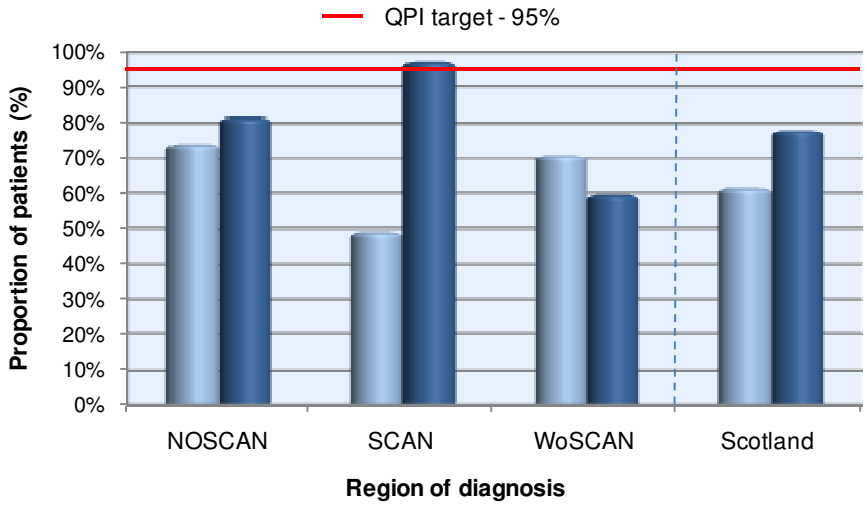
QPI 11:	Patients with brain/CNS cancer presenting with seizures at diagnosis should be seen by a neurologist and/or a nurse with expertise in epilepsy management.
Description:	Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a nurse with expertise in epilepsy management.
Numerator:	Number of patients presenting with seizures at diagnosis seen by a neurologist or a nurse with expertise in epilepsy management.
Denominator:	All brain/CNS cancer patients presenting with seizures at diagnosis.
Exclusions:	None.
Target:	95%

The diagnosis of epilepsy is more accurate when made by a medical practitioner who specialises in epilepsy, resulting in better patient outcomes. Access to a nurse with expertise in epilepsy management enhances quality of life for patients and gives a more patient-centred approach to care[1].

Overall performance across Scotland for QPI 11 was 77.9% against the 95% target which demonstrates a 16.6 percentage-point improvement on 2014 results. Only SCAN met the target with 97.1% of patients presenting with seizures being recorded as having been seen by a specialist in epilepsy management. It should be noted however that the denominator is considerably lower than previously, with 35 patients recorded as presenting with seizures at diagnosis in 2015 compared to 55 in 2014 and it would be prudent for the Edinburgh centre to investigate this decrease in overall numbers.

Although NOSCAN as a whole did not achieve the 95% target, 100% of patients diagnosed in the Dundee centre were seen by a specialist in epilepsy management. The Aberdeen centre commented that they are altering the MDT proforma to enable patients who should be seen by an epilepsy specialist to be identified earlier. A direct referral pathway has also been set up via the epilepsy-specialist nurse team.

Figure 15: Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a nurse with expertise in epilepsy management.



QPI 11	NOSCAN	SCAN	WoSCAN	Scotland
Performance (%)	81.5%	97.1%	59.5%	77.9%
Numerator	22	34	25	81
Denominator	27	35	42	104
Not recorded numerator	1	0	14	15
Not recorded numerator (%)	3.7%	0.0%	33.3%	14.4%
Not recorded exclusions	0	0	0	0
Not recorded exclusions (%)	0.0%	0.0%	0.0%	0.0%
Not recorded denominator	2	0	0	2

Action required:

- The Glasgow MDT should review processes and take action to improve data collection with regards to whether patients have been reviewed by an epilepsy specialist.
- The Edinburgh centre should review results/data-recording processes to ensure all patients presenting with seizures at diagnosis have been included in the denominator.

5. Conclusions

The development of national QPIs for brain and CNS cancers will help drive continuous quality improvement in patient care whilst ensuring that activity is focussed on those areas that are most important in terms of improving survival and patient experience. In addition, the introduction of QPIs and the associated governance structure will facilitate regular monitoring and reporting of data to ensure equitable care across the country.

Results presented in this report demonstrate that there has been considerable progress towards achieving an equitable and consistent standard of care across NHS Scotland for patients diagnosed with brain and CNS cancers. Almost half of all QPI targets were met or exceeded at a Scotland level and a further five QPIs showed improved performance. Molecular analysis is the only area where performance has not improved and, although testing is being performed, an overall increase in the number of days for the reports to become available has affected performance. It is evident that some of the QPI targets set have been challenging for centres to achieve and some variance and areas for improvement have been highlighted.

This audit report has identified areas where data capture must improve to enable more meaningful analysis of performance against QPIs in the coming years, specifically with regards to date of definitive treatment, tumour reduction volume and whether patients have been seen by an epilepsy specialist. However overall case ascertainment and data capture for the first two years of data collection and analysis is encouraging, and provides a good foundation to further build upon and from which to measure service improvement in future years.

Areas for service improvement have been identified relating to variation in molecular analysis completion rates, the proportion of patients undergoing maximal surgical resection and early post-operative imaging. The process of baseline review following Year 1 of reporting was successful in addressing the measurement issues identified for QPIs 9 and 10 which were not reported in Year 1. Two years of data were therefore analysed and presented within the current audit report using the revised definitions and overall improvement was noted for both these QPIs.

MDTs/neuro-oncology centres are asked to develop local Action/Improvement Plans in response to the findings presented in the report. A summary of actions for each MDT/neuro-oncology centre has been included within the Action Plan templates in the Appendix.

Actions required:

Data quality and capture

- All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.

QPI 1 – Documentation of performance status

- Aberdeen, Dundee and Edinburgh MDTs should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.

QPI 2 – Multidisciplinary team meeting

- The Aberdeen, Dundee and Edinburgh MDTs should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.

QPI 3 (i) – Molecular analysis for combined loss of 1p/19q

- All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.

QPI 3 (ii) – Molecular analysis MGMT promoter methylation status

- The Glasgow MDT, and the Aberdeen and Dundee MDTs in conjunction with Edinburgh pathology department, should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.

QPI 4 – Neuropathological Diagnosis

- The Aberdeen and Dundee MDTs/audit teams should review processes to ensure 'most valid basis of diagnosis' is correctly recorded in order to allow inclusion in the denominator.

QPI 5 – Pre-treatment MRI

- The Glasgow MDT should review cases where no pre-operative MRI scan was undertaken and feedback results to MCN with appropriate action.

QPI 6 – Maximal surgical resection

- The Dundee and Glasgow MDTs should review processes for the recording of 'tumour reduction volume' to reduce the proportion of cases that have not-recorded values.
- The Glasgow MDT should review cases that were not recorded as having undergone maximal surgical resection and take appropriate action on findings.

QPI 7 – Early post-operative imaging

- The Dundee and Glasgow MDTs should review all cases where post-surgery MRI was not performed, or not completed within the 72-hour interval, to identify areas for service improvement.

QPI 9 – Access to adjuvant treatment

- The Glasgow MDT should review cases that did not have adjuvant therapy within 6 weeks of surgery and identify whether the process can be modified to minimise any delay to treatment.
- The Edinburgh and Aberdeen MDTs should review results locally to ensure changes to the pathway noted have been effective in reducing the time to adjuvant treatment.

QPI 11 – Seizure management

- The Glasgow MDT should review processes and take action to improve data collection with regards to whether patients have been reviewed by an epilepsy specialist.
- The Edinburgh centre should review results/data-recording processes to ensure all patients presenting with seizures at diagnosis have been included in the denominator.

Completed Action Plans should be returned to WoSCAN within two months of publication of this report.

Progress against these plans will be monitored by the MCN Advisory Board and any service or clinical issue which the Advisory Board considers not to have been adequately addressed will be escalated to the NHS Board Territorial Lead Cancer Clinician and Regional Lead Cancer Clinician.

Additionally, progress will be reported annually to the Regional Cancer Advisory Group (RCAG) by NHS Board Territorial Lead Cancer Clinicians and MCN Clinical Leads, and nationally on a three-yearly basis to Healthcare Improvement Scotland as part of the governance processes set out in CEL 06 (2012).

Acknowledgement

This report has been prepared using clinical audit data provided by each of the fourteen NHS Boards in Scotland. We would like to thank colleagues in the clinical effectiveness departments throughout Scotland for gathering, submitting and verifying these data.

We would also like to thank the clinicians, nurses and others involved in the management of brain and CNS cancers for their contribution to the clinical audit process.

Abbreviations

AA	NHS Ayrshire & Arran
ACaDMe	Acute Cancer Deaths and Mental Health
CNS	Central Nervous System
CT	Computed Tomography
D&G	NHS Dumfries & Galloway
eCASE	Electronic Cancer Audit Support Environment
ECNO	The Edinburgh Centre for Neuro-Oncology
FV	NHS Forth Valley
GGC	NHS Greater Glasgow and Clyde
GTV	Gross Tumour Volume
HIS	Healthcare Improvement Scotland
ISD	Information Services Division
Lan	NHS Lanarkshire
MCN	Managed Clinical Network
MDT	Multidisciplinary Team
MGMT	O6-methylguanine-DNA methyltransferase
MRI	Magnetic Resonance Imaging
NCQSG	National Cancer Quality Steering Group
NHSGGC	NHS Greater Glasgow and Clyde
NMCN	National Managed Clinical Network
NOSCAN	North of Scotland Cancer Network
PS	Performance Status
QPI(s)	Quality Performance Indicator(s)
RCAG	Regional Cancer Advisory Group
SANON	Scottish Adult Neuro-Oncology Network
SCAN	South and East of Scotland Cancer Network
VMAT	Volumetric Modulated Arc Therapy
WHO	World Health Organisation
WoS	West of Scotland
WoSCAN	West of Scotland Cancer Network

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Appendix: NHS Board Action Plans

A summary of actions has been provided within the Audit Report. Neuro-oncology centres should populate the template with relevant actions and completed Action Plans should be returned to WoSCAN within two months of publication of this report.

Action / Improvement Plan

Area:	Aberdeen MDT
Action Plan Lead:	
Date:	20/01/2017

KEY (Status)	
1	**Action fully implemented**
2	**Action agreed but not yet implemented**
3	**No action taken (please state reason)**

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above.*
Data	All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.						
1.	Aberdeen MDT should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
2.	Aberdeen MDT should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.						
3(i)	All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.						
3(ii)	The Aberdeen MDT, in conjunction with Edinburgh pathology department, should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.						
4.	The Aberdeen MDT/audit teams should review processes to ensure 'most valid basis of diagnosis' is correctly recorded in order to allow inclusion in the denominator.						
9.	The Aberdeen MDT should review results locally to ensure changes to the pathway noted have been effective in reducing the time to adjuvant treatment.						

Action / Improvement Plan

Area:	Dundee MDT
Action Plan Lead:	
Date:	20/07/2017

KEY (Status)	
1	**Action fully implemented**
2	**Action agreed but not yet implemented**
3	**No action taken (please state reason)**

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above.*
Data	All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.						
1.	Dundee MDT should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.						
2.	Dundee MDT should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
3(i)	All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.						
3(ii)	The Dundee MDT, in conjunction with Edinburgh path department, should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.						
4.	The Dundee MDT/audit teams should review processes to ensure 'most valid basis of diagnosis' is correctly recorded in order to allow inclusion in the denominator.						
6.	The Dundee MDT should review processes for the recording of 'tumour reduction volume' to reduce the proportion of cases that have not-recorded values						
7.	The Dundee MDT should review all cases where post-surgery MRI was not performed, or not completed within the 72-hour interval, to identify areas for service improvement.						

Action / Improvement Plan

Area:	Edinburgh MDT
Action Plan Lead:	
Date:	20/01/2017

KEY (Status)	
1	**Action fully implemented**
2	**Action agreed but not yet implemented**
3	**No action taken (please state reason)**

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above.*
Data	All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.						
1.	Edinburgh MDT should carry out local review to ensure processes implemented in 2015 to increase the proportion of cases with performance status recorded at MDT have been effective.						
2.	Edinburgh MDT should ensure that date of definitive treatment is being recorded in line with updated data definitions following baseline review.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
3(i)	All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.						
9.	The Edinburgh MDT should review results locally to ensure changes to the pathway noted have been effective in reducing the time to adjuvant treatment.						
11.	The Edinburgh centre should review results/data-recording processes to ensure all patients presenting with seizures at diagnosis have been included in the denominator.						

Action / Improvement Plan

Area:	Glasgow MDT
Action Plan Lead:	
Date:	20/01/2017

KEY (Status)	
1	**Action fully implemented**
2	**Action agreed but not yet implemented**
3	**No action taken (please state reason)**

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above.*
Data	All MDTs should investigate 2015 case ascertainment once Cancer Registry 2015 data (ISD) becomes available to identify if any cases eligible for inclusion in clinical audit have been omitted, and report findings to NMCN.						
3(i)	All MDTs should liaise with pathology departments to determine whether the proportion of gliomas recorded as having an oligodendroglial component is accurate.						
3(ii)	The Glasgow MDT should review pathways to identify where there are delays in molecular analysis reporting and take action to achieve the 21-day target.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
5.	The Glasgow MDT should review cases where no pre-operative MRI scan was undertaken and feedback results to MCN with appropriate action.						
6.	The Glasgow MDT should review processes for the recording of 'tumour reduction volume' to reduce the proportion of cases that have not-recorded values						
6.	The Glasgow MDT should review cases that were not recorded as having undergone maximal surgical resection and take appropriate action on findings.						
7.	The Glasgow MDT should review all cases where post-surgery MRI was not performed, or not completed within the 72-hour interval, to identify areas for service improvement.						
9.	The Glasgow MDT should review cases that did not have adjuvant therapy within 6 weeks of surgery and identify whether the process can be modified to minimise any delay to treatment.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
11.	The Glasgow MDT should review processes and take action to improve data collection with regards to whether patients have been reviewed by an epilepsy specialist.						