North, South East and West of Scotland Cancer Networks

Brain and Central Nervous System Cancers
Scottish Adult Neuro Oncology Network

Audit Report

Brain and Central Nervous System Cancers Quality Performance Indicators

Report of the 2019 Clinical Audit Data

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Brain/CNS cancer QPI final data analysis

Patients diagnosed between 1st January - 31st December 2019

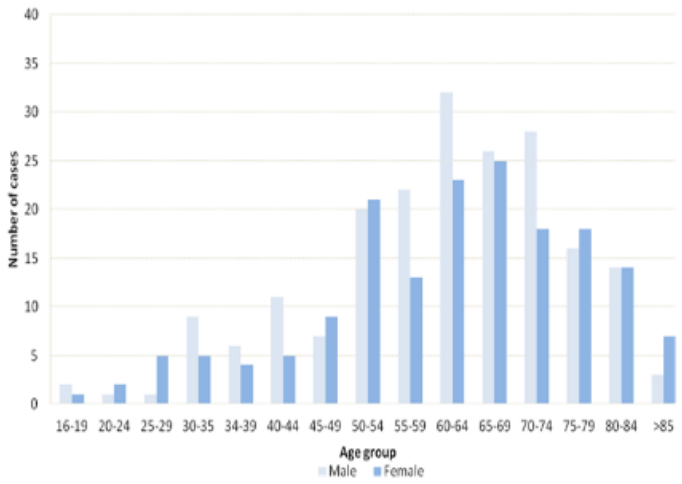
Number of cases diagnosed
368

Gender split
Males: 53.8%
Females: 46.2%

Annual change since 2018
-11.3%

Case ascertainment
87.5%

Number of patients by region of diagnosis, age



Quality Performance Indicators

QPI 1: Documentation of performance status 91.1% 95%	QPI 2: Documentation of MDT meeting 74.4% 95%	QPI 3 i): Molecular analysis 47.6% 90%	QPI 3 ii): Molecular analysis 83.9% 90%	QPI 4: Neuropathologic -al diagnosis 96.8% 95%	QPI 5: Pre-treatment MRI 98.5% 90%
QPI 6: Maximal surgeon resection 74.7% 40%	QPI 7: Early post-operative imaging 94.8% 90%	QPI 8: Specialist neuro-oncology access 100.0% 100%	QPI 9: Access to adjuvant treatment 74.7% 95%	QPI 10: Radical radiotherapy planning process 97.8% 95%	QPI 11: Seizure management 37.0% 95%
	QPI 12: Key worker 28.3% 95%	QPI 13: Mortality (chemoradioth -erapy) 2.5% <5%	QPI 13: Mortality (Surgery) 2.2% <5%	QPI 13: Mortality (Radiotherapy) 8.9% <5%	

Clinical trials

Proportion of patients diagnosed with brain/CNS cancer who consented* to a clinical trial / research study

		2017	2018	2019
NCA	N	-	-	-
	D	-	-	-
	%	1.9%	3.5%	1.6%
SCAN	N	14	8	19
	D	143	138	145
	%	9.8%	5.8%	13.1%
WoSCAN	N	18	23	31
	D	162	166	199
	%	11.1%	13.9%	15.6%
Scotland	N	34	35	52
	D	411	417	466.8
	%	8.3%	8.4%	11.1%

*QPI target - 15%

Main areas for improvement

- All centres to ensure WHO Performance Status recorded on the day of MDT discussion (QPI 1)
- Dundee to address pathology delays to minimise delays in starting oncology & patients are referred to oncology clinic immediatley after surgery. (QPI 9)
- Dundee/Aberdeen centres to work with pathology in Edinburgh to review pathology delays in processing samples. (QPI 3)
- 2nd QPI review currently underway.

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 from 1st January 2019 to 31st December 2019, with twelve months of data measured against the Brain and CNS Cancer QPIs[1] for the sixth consecutive year.

Methodology

Further detail on the audit and analysis methodology and data quality is available in the meta data within Appendix 1.

Results

A summary of the Brain/CNS Cancer QPIs (QPI 1 to 14) 2019 clinical audit data is presented below, with a more detailed analysis of the results set out in the main report. 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.

Any commentary provided by NHS Region or MDT/neuro-oncology centre relating to the impacted indicators will, however, be included as a record of continuous improvement. Specific NHS Region or MDT/neuro-oncology centre actions have been identified to address issues highlighted through data analysis.

Please note actions have been categorised into the following groupings for internal management purposes to allow regional trends to be identified, and co-ordinated regional action across multiple tumour groups where appropriate; MDT, Pathology, Radiology, Other diagnostic, Treatment Decision, Time to Treatment, Surgery, Oncology, Resource, Workforce, Practice and Capacity.

Summary of QPI Results

Colour Key	
	Above QPI target
	Below QPI target

Quality Performance Indicator (QPI)	Performance by NHS Board of diagnosis					
	QPI target	Year	NCA	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%	2019	94.3%	89.3%	90.2%	91.1%
		2018	90.0%	94.1%	91.7%	92.0%
		2017	88.1%	93.1%	95.3%	92.5%
QPI 2: Documentation of MDT meeting - Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery.	95%	2019	82.4%	82.9%	63.4%	74.4%
		2018	71.6%	83.3%	76.5%	77.1%
		2017	No data available			
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. **In 2018, this target changed from 90% to 95%*	*95%	2019	92.3%	98.7%	98.2%	96.8%
		2018	93.3%	100.0%	91.7%	94.8%
		2017	95.5%	100.0%	87.5%	94.4%
QPI 5: Pre-treatment MRI - Proportion of patients with Brain/CNS cancer undergoing surgery who have contrast enhance MRI prior to treatment.	90%	2019	98.6%	97.3%	99.1%	98.5%
		2018	97.7%	98.8%	98.3%	98.3%
		2017	No data available			
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%	2019	100.0%	100.0%	100.0%	100.0%
		2018	100.0%	100.0%	100.0%	100.0%
		2017	100.0%	100.0%	100.0%	100.0%
QPI 9: Access to Adjuvant Treatment – Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgery who commence their oncological	95%	2019	34.9%	86.0%	89.6%	74.7%
		2018	31.0%	89.5%	95.8%	77.8%

Quality Performance Indicator (QPI)	Performance by NHS Board of diagnosis					
	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgery.		2017	35.6%	82.2%	95.0%	73.1%
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.	95%	2019	100.0%	100.0%	94.8%	97.8%
		2018	95.7%	98.4%	96.1%	96.8%
		2017	80.4%	98.3%	100.0%	93.3%
QPI 11: Seizure Management – Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a named ESN within four weeks of diagnosis.	95%	2019	39.3%	43.3%	29.4%	37.0%
		2018	57.1%	50.0%	18.2%	38.9%
		2017	85.2%	78.6%	60.0%	76.4%
QPI 12: Key Worker - Proportion of patients with Brain/CNS cancer who have an identified key worker by the first MDT meeting.	95%	2019	90.9%	0.0%	5.6%	28.3%
		2018	95.3%	0.0%	18.0%	35.3%
		2017	No data available			
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of chemoradiotherapy.	<5%	2019	0.0%	2.6%	3.5%	2.5%
		2018	3.2%	0.0%	3.2%	2.3%
		2017	No data available			
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of radiotherapy.	<5%	2019	9.5%	9.4%	7.7%	8.9%
		2018	15.0%	11.8%	0.0%	10.0%
		2017	No data available			
QPI 14(i): Clinical Trials Access – Proportion of patients with brain/CNS cancer who CONSENT TO PARTICIPATE in a clinical trial.	15%	2019	13.1%	1.6%	15.6%	11.1%
		2018	3.5%	5.8%	13.9%	8.4%
		2017	1.9%	9.8%	11.1%	8.3%

Quality Performance Indicator (QPI)	Performance by NHS Board (Reported by Hospital of Surgery)						
	QPI target	Year	Aberdeen	Dundee	Edinburgh	Glasgow	Scotland
QPI 3(i): Molecular Analysis - Proportion of patients with biopsied or resected gliomas who undergo 1p/19q molecular analysis of tumour tissue within 21 days of surgery.	90%	2019	33.3%	50.0%	75.0%	43.5%	47.6%
		2018	40.0%	33.3%	68.4%	50.0%	55.3%
		2017	No data available				
QPI 3(ii): Molecular Analysis - Proportion of patients with biopsied or resected gliomas who undergo MGMT promoter hypermethylation status testing within 21 days of surgery.	90%	2019	57.1%	64.3%	92.3%	92.3%	83.9%
		2018	28.3%	84.6%	100.0%	98.9%	80.4%
		2017	No data available				
QPI 6: Maximal surgical resection - Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who undergo surgical resection where 90% or greater reduction in tumour volume is achieved provided it is considered consistent with safe outcome.	40%	2019	50.0%	100.0%	81.8%	70.5%	74.7%
		2018	62.5%	0.0%	70.4%	45.0%	58.9%
		2017	No data available				
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%	2019	78.6%	84.6%	97.3%	100.0%	94.8%
		2018	84.6%	80.0%	97.6%	95.4%	92.3%
		2017	65.4%	100.0%	95.7%	94.7%	89.7%
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of surgery.	<5%	2019	4.3%	0.0%	1.4%	2.4%	2.2%
		2018	9.8%	4.8%	2.4%	3.2%	4.5%
		2017	No data available				

Conclusions and Action Required

The Scottish Adult Neuro-Oncology Network (SANON) is encouraged by the continued support and commitment of Network members to deliver a high quality service to brain/CNS cancer patients across the country. The results presented in this report demonstrate that patients with brain/CNS cancer receive a consistent and improving standard of care across all geographical locations. Case ascertainment and data capture is of a high standard enabling robust assessment of performance against QPIs.

The results presented within this report illustrate that some of the QPI targets set have been challenging for NHS Boards to achieve and there remains room for further service improvement, however it is encouraging that the target was consistently met by the majority of Regions for QPIs relating to neuropathological diagnosis, pre-treatment MRI, specialist neuro-oncology access, radical radiotherapy planning and 30 day mortality after chemoradiotherapy and surgery.

Targets have been particularly challenging for QPIs relating to access to adjuvant treatment, molecular analysis, seizure management and documentation at MDT. Where targets have not been met NHS Boards have provided detailed comment indicating valid clinical reasons.

In order to ensure the success of the QPIs in driving quality improvement the indicators will be reviewed during 2020 to ensure they remain clinically effective and relevant.

SANON, MDTs and 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 SANON, MDTs and neuro-oncology centres has been included within the Action Plan templates in the Appendix.

Actions required

QPI 1: Documentation of Performance Status

- Aberdeen/Inverness MDT to ensure that all surgeons will be reminded to ideally add cases to MDT prior to treatment unless very urgent.
- Edinburgh centre will ensure that performance status is recorded by MDT coordinator for all patients at time of MDT discussion and that late add-on patients have KPS documented.
- Glasgow centre actioned that MDT Chair should confirm and record WHO Performance Status on the day of discussion and remind the referring doctors of their responsibility to submit the WHO status.

QPI 2: Multi-disciplinary Team Meeting

- Aberdeen/Inverness MDT to remind all surgeons to add cases to MDT prior to treatment unless very urgent.
- Dundee centre will continue to encourage early discussion where appropriate.
- Glasgow centre to review cases to look for differences in practice across the department and take action to ensure adequate theatre capacity is made available for brain cancer referrals.
- Edinburgh centre to monitor the impact of the change in MDT day and report back to the MCN.

QPI 3: Molecular Analysis

- Dundee to implement a spreadsheet of when ordering molecular tests and when they get the results back to ensure accurate recording.
- Glasgow to discuss further with neuropathology cases where 1p/19q was not requested and determine if any improvement action is required.
- Glasgow centre to discuss with neuropathology scope for improvement in time from biopsy to receipt in genetics for 1p/19q FISH referrals.

- Dundee/Aberdeen centres to work with pathology in Edinburgh to establish reasons for processing delays in samples received from out with Edinburgh and develop a plan for improvement.

QPI 4: Neuropathological Diagnosis

- The Dundee centre will liaise with the biomedical scientists in Dundee pathology department to ensure tissue samples are measured in 3 dimensions going forward.

QPI 9: Access to Adjuvant Treatment

- Dundee MDT to address pathology delays to minimise delays in starting oncology.
- Dundee MDT to implement processes to ensure patients are referred to Oncology clinic immediately after surgery and promptly follow up outstanding pathology results.
- Aberdeen MDT to monitor the impact of the change in radiotherapy planning process and report back to the MCN.
- SANON to review the timeframe for this QPI as part of the formal review process, as centres note that it is not achievable in practice.

QPI 11: Seizure Management

- Dundee to review data collection and establish reasons for the reduction in performance.
- Glasgow to develop processes to ensure the oncology team refer all appropriate cases to neurology.
- SANON to review the timeframe for this QPI as part of the QPI formal review, as centres note that the four week timeframe is not achievable in practice and is perhaps not clinically relevant.

QPI 12: Key Worker

- Edinburgh to add a new tick box to MDT forms to record the Key worker at the time of the MDT.
- SANON to initiate discussion around the most appropriate time frame within the pathway to assign a key worker during the current national formal review.

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

Progress against these plans will be monitored by SANON and any service or clinical issue which SANON 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 NMCN 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 from 1st January to 31st December 2019, for the sixth consecutive year. 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.

In order to ensure the success of the National Cancer QPIs in driving quality improvement in cancer care across NHS Scotland it is critical that the QPIs continue to be clinically relevant and focus on areas which will result in improvements to the quality of patient care. A programme of formal review of all QPIs was implemented whereby all tumour specific QPIs were reviewed following three years of comparative reporting. Formal review of the Brain/CNS QPIs was initiated in October 2020, with the revised QPIs expected to be published early in 2021.

Twelve months of data were measured against the Brain and CNS Cancer QPIs for the sixth consecutive year. A process of baseline review was undertaken after the reporting of Year 1 data with a formal review process undertaken after Year 3. The second review of the QPIs commenced in November 2020 after the publication of year 6 data

QPI data has been presented alongside data for previous years where results have remained comparable after processes of review. 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, researchers, 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].

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 (not in Inverness), 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.

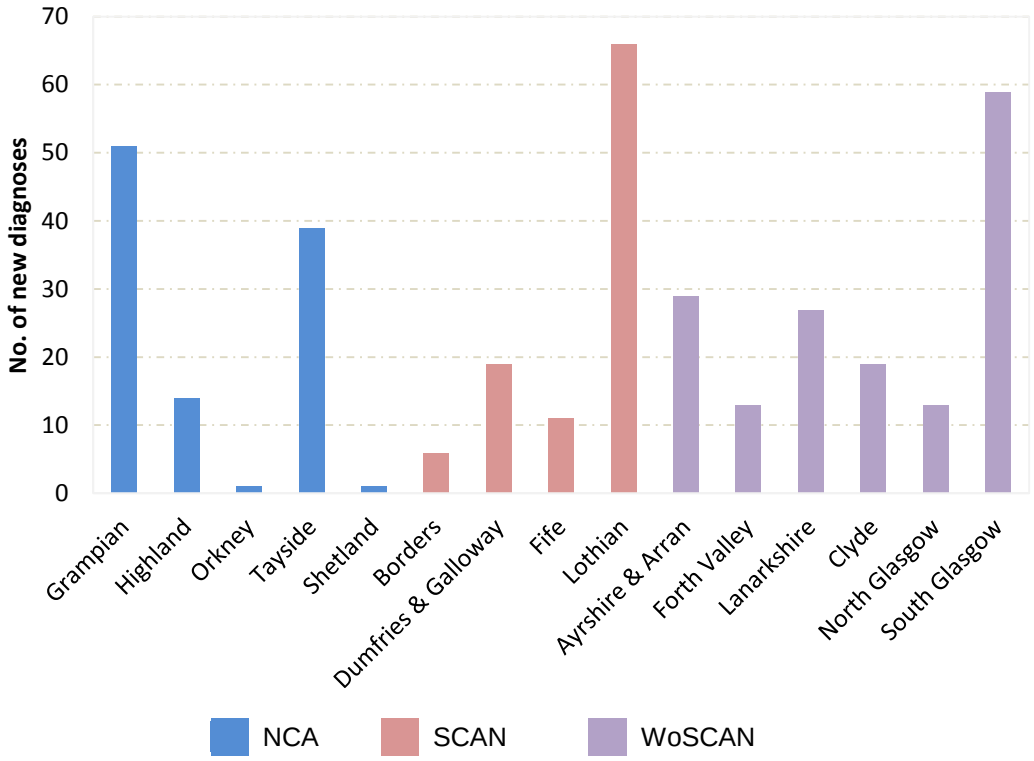
Neuro-oncology MDT	Constituent Hospital(s)
Aberdeen/Inverness	Aberdeen Royal Infirmary (surgery and oncology) Raigmore Hospital – Inverness (oncology)
Dundee	Ninewells Hospital (surgery and oncology)
Edinburgh	Western General Hospital (surgery and oncology)
Glasgow	Queen Elizabeth University Hospital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

2.1 National Context

Brain and CNS cancers are relatively rare cancers with approximately 456 adult cases diagnosed in Scotland each year between 2014 and 2018[4]. The 2019 audit identified 368 patients diagnosed with a new primary cancer of the brain or CNS in Scotland.

The distribution of the 368 newly diagnosed cases in 2019 is presented in Figure 1 by location of diagnosis across the fourteen NHS Boards. The West of Scotland Cancer Network (WoSCAN) recorded 43.5% of new diagnoses in 2019 with 160 new cases of brain and CNS cancers captured by audit. This is in line with the adult population distribution in this region as 2018 mid-year population estimates[8] show that 46.2% of the Scottish adult population reside within West of Scotland (WoS) region. It should be noted that 13 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, 2019.



NCA	Grampian	Highland	Orkney	Tayside	Shetland	Total
	51	14	1	39	1	106
SCAN	**Borders**	**Dumfries & Galloway**	**Fife**	**Lothian**	**Total**	
	6	19	11	66	102	
WoSCAN	**Ayrshire & Arran**	**Forth Valley***	**Lanarkshire**	**Clyde**	**North Glasgow**	**South Glasgow**	**Total**
	29	13	27	19	13	59	160

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

The tumour morphology of cases diagnosed in the audit of 2019 data is detailed below in Table 1, and is classified according to the International Classification for Diseases for Oncology (ICD-O 3). The majority of cases have an astrocytic tumour morphology. Where cases are noted as “Not Applicable”, no sample was sent to pathology for testing.

Table 1: Tumour morphology for patients diagnosed with Brain/CNS cancer across Scotland by Region of Diagnosis, 2019.

	Hospital of Diagnosis							
	NCA		SCAN		WoSCAN		Scotland	
Tumour Type	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Astrocytic and Oligodendroglial	67	63.2%	60	58.8%	116	72.5%	243	66.0%
Embryonal	*	*	4	3.9%	2	1.3%	6	1.6%
Ependymal	2	1.9%	1	1.0%	1	0.6%	4	1.1%
Meningioma	2	1.9%	1	1.0%	1	0.6%	4	1.1%
Negative Pathology	*	*	*	-	2	1.3%	2	0.5%
Other Astrocytic Tumours	1	0.9%	36	35.3%	38	23.8%	75	20.4%
Other Gliomas	2	1.9%	*	*	*	*	2	0.5%
Not Applicable	32	30.2%	*	*	*	*	32	8.7%
Total No of Pts	**106**		**102**		**160**		**368**	

(-) Data is not shown; less than 5. (*) denotes a zero.

Table 2 shows a description of the WHO classification of tumour grade. This is a scale to determine the aggressiveness of tumours and to estimate prognosis.

Table 2: Description of the WHO tumour grade classification.

Grade	Description
1	Tumours with low proliferative potential, a frequently discreet nature and a possibility of cure following surgical resection alone.
2	Generally infiltrating tumours low in mitotic activity but with a potential to recur.
3	Histological evidence of malignancy, generally in the form of mitotic activity, clearly expressed infiltrative capabilities and anaplasia.
4	Mitotically active, necrosis prone neoplasms, generally associated with a rapid pre- and post-operative evolution of the disease.

Table 3 illustrates the proportion of cases from the 2019 audit assigned to each tumour grade. The majority of cases are Grade 4 which is associated with poorer outcomes. Cases have been assigned as “Not Applicable” where no sample has been sent to pathology for analysis.

Table 3: Tumour grade for patients diagnosed with Brain/CNS cancer across Scotland by Region of Diagnosis, 2019.

	Hospital of Diagnosis							
	NCA		SCAN		WoSCAN		WoS Total	
Grade	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
1	1	0.9%	*	*	1	0.6%	2	0.5%
2	8	7.5%	6	5.9%	3	1.9%	17	4.6%
3	7	6.6%	4	3.9%	19	11.9%	30	8.2%
4	57	53.8%	54	52.9%	98	61.3%	209	56.8%
Not Applicable	32	30.2%	38	37.3%	39	24.4%	109	29.6%
Not Recorded	1	0.9%	*	*	*	*	1	0.3%
Total No of Pts	**106**		**102**		**160**		**368**	

(-) Data is not shown; less than 5. (*) denotes a zero.

2.2 Incidence and survival

Brain and CNS cancers are relatively rare cancers with approximately 456 cases diagnosed in Scotland each year between 2014 and 2018[4]. The percentage frequency of brain and CNS cancers (malignant and non-malignant) in Scotland is comparatively low at 1.4% of all cancers diagnosed in 2018. It was ranked as the 17th most commonly diagnosed cancer in females and the 15th most commonly diagnosed cancer in males in Scotland in 2018[5].

The incidence of brain and CNS cancers has decreased in females by 1.4% in the ten years from 2008-2018, with a decrease in the incidence for males of 3.7%. Overall there has been a decrease in incidence of 2.7%[5]. The mortality of Brain/CNS cancer has increased for males with female mortality essentially static in the ten years from 2008-2018 (females 5.4%, males 4.7%) with an overall increase of 4.9%[5]. Brain and CNS cancers are ranked as the 12th most common cause of death from cancer and accounted for 2.6% of all deaths from cancer in 2018[5].

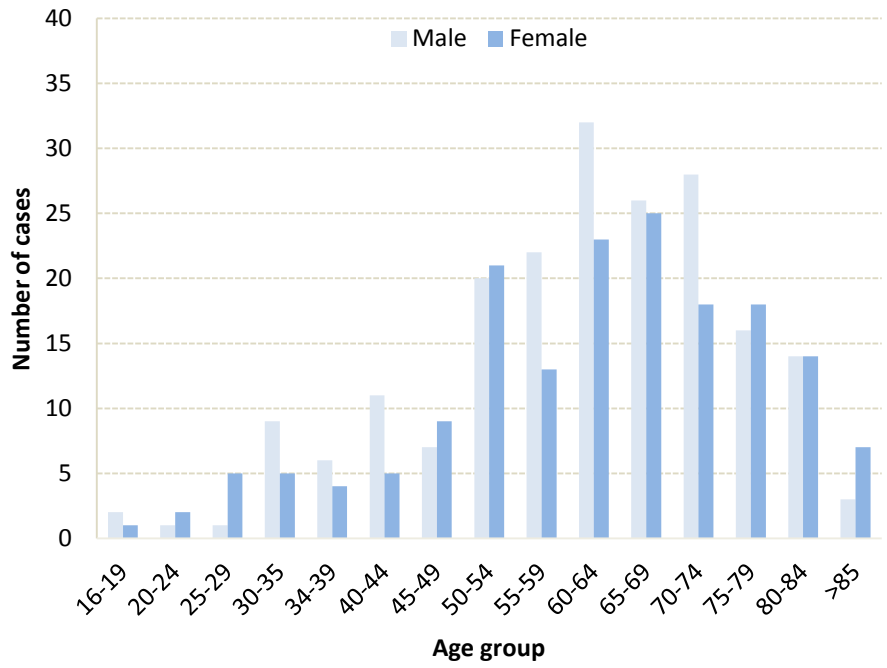
Relative survival at one year is increasing for brain and CNS cancers[6]. Table 4 shows the percentage change in survival rates for patients diagnosed between 1987 and 1991 compared to those diagnosed between 2007 and 2011.

Table 4: Percentage change in relative survival for brain and CNS cancer in Scotland at 1 year and 5 years from 1987-1991 to 2007-2011. Source data: ISD[6]

Age 15 – 99 years	Relative survival at 1 year (%)		Relative survival at 5 years (%)	
	2007 – 2011	% change	2007 – 2011	% change
Male	41.2 %	+ 9.9 %	15.1 %	+ 1.0 %
Female	39.5 %	+ 7.8 %	15.8 %	- 0.9 %

This report includes all cases aged 16 and over and the age distribution for males and females diagnosed in 2019 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 2019 by age group and sex.



	M	F
16-19	2	1
20-24	1	2
25-29	1	5
30-35	9	5
34-39	6	4
40-44	11	5
45-49	7	9
50-54	20	21
55-59	22	13
60-64	32	23
65-69	26	25
70-74	28	18
75-79	16	18
80-84	14	14
>85	3	7
Total	**198**	**170**

(-) Data is not shown; less than 5. (*) denotes a zero

3. Methodology

Further detail on the audit and analysis methodology and data quality is available in the meta data within Appendix 1.

4. Results and Action Required

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. Where possible, 3 years' worth of data (Years 4-6) data is presented. However, a number of QPIs were not reported for 2017 data due to a large number of measurability changes and the addition of new data items at formal review.

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

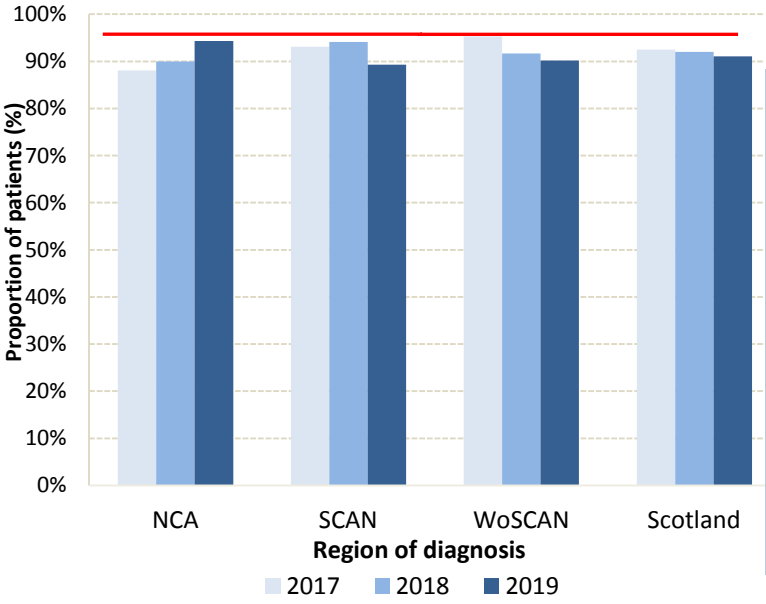
QPI 1: Documentation of Performance Status

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 World Health Organisation (WHO) performance status.

QPI 1:	Patients with newly-diagnosed brain/central nervous system (CNS) cancer should have a world health organisation (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, 2017 - 2019.



		2017	2018	2019
NCA	N	89	108	99
	D	101	120	105
	%	88.1%	90.0%	94.3%
SCAN	N	120	128	100
	D	129	136	112
	%	93.1%	94.1%	89.3%
WoSCAN	N	122	143	129
	D	128	156	143
	%	95.3%	91.7%	90.2%
Scotland	N	331	379	328
	D	358	412	360
	%	92.5%	92.0%	91.1%

(-) Data is not shown; less than 5. (*) denotes a zero.

No region met the 95% target. Performance ranged from 90.2% in WoSCAN to 94.3% in NCA. The overall national performance was 91.1%.

The Aberdeen/Inverness MDT reviewed all 5 cases and noted that performance status was recorded for these patients at MDT however the MDT date was after first treatment. The MDT will take action to ensure that surgeons add cases to MDT lists prior to treatment unless very urgent treatment is required.

The SCAN/Edinburgh MDT noted that all cases have been reviewed and that 12 cases did not have performance status recorded at the time of 1st MDT discussion. They will ensure that performance status is recorded by MDM coordinator for all patients at time of MDT discussion and that late add-on patients have performance status documented. The centre has commented that this is often found challenging during busy MDMs.

The Glasgow centre noted that there are cases where the performance status information is not available when poor referral details have been submitted. They noted that in future the MDT Chair will confirm and record performance status on the day of discussion, flagging with relevant referring clinicians where this information has been omitted.

Actions:

- Aberdeen/Inverness MDT to ensure that all surgeons will be reminded to ideally add cases to MDT prior to treatment unless very urgent.
- Edinburgh centre will ensure that performance status is recorded by MDT coordinator for all patients at time of MDT discussion and that late add-on patients have KPS documented.
- Glasgow centre actioned that MDT Chair should confirm and record WHO Performance Status on the day of discussion and remind the referring doctors of their responsibility to submit the WHO status.

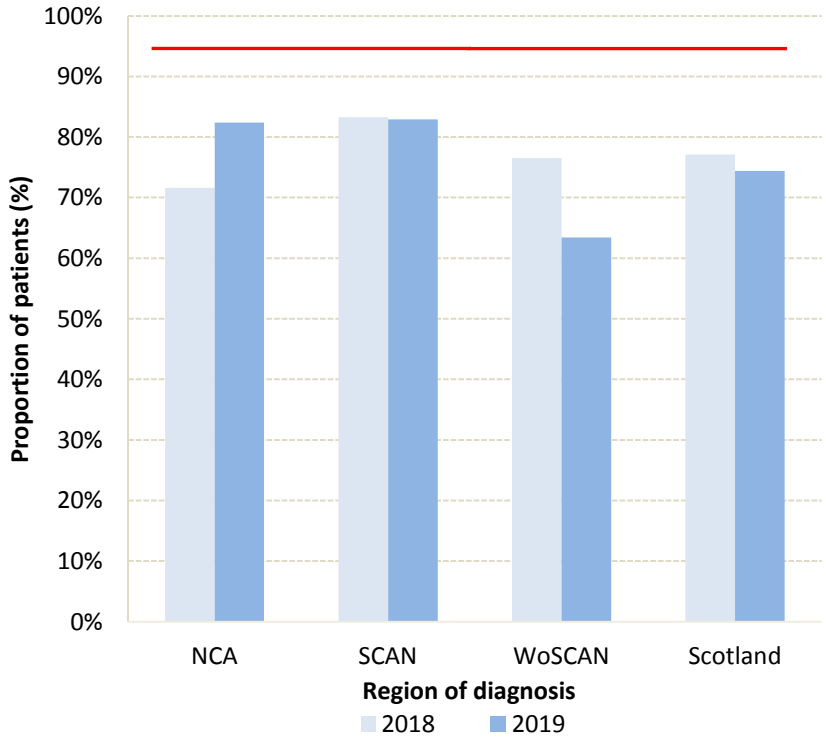
QPI 2: Multi-disciplinary Team Meeting (MDT)

Evidence suggests that patients with cancer managed by a MDT have a better outcome. There is also evidence that the multidisciplinary management of patients increases their overall satisfaction with care.[1]

Discussion prior to definitive management decisions being made provides reassurance that patients are being managed appropriately. In the majority of cases, patients with brain/CNS cancer will undergo surgery (biopsy or resection) as their initial intervention prior to any treatment. The measurement of this QPI will therefore focus on discussion of patients at this initial point within the clinical pathway.[1]

QPI 2:	Patients with Brain/CNS cancer should be discussed by a multidisciplinary (MDT) team prior to any surgical procedure.
Description:	Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery.
Numerator:	Number of patients with Brain/CNS cancer discussed at MDT before surgery.
Denominator:	All patients with Brain/CNS cancer undergoing surgery.
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 surgery, 2018 – 2019.



		2018	2019
NCA	N	58	61
	D	81	74
	%	71.6%	82.4%
SCAN	N	70	63
	D	84	76
	%	83.3%	82.9%
WoSCAN	N	88	71
	D	115	112
	%	76.5%	63.4%
Scotland	N	216	195
	D	280	262
	%	77.1%	74.4%

(-) Data is not shown; less than 5. (*) denotes a zero.

No regions met the 95% target, with performance ranging from 63.4% in WoSCAN to 82.9% in SCAN. The overall national performance was 74.4%.

MDTs have provided feedback on cases not meeting the target. The majority of cases required emergency surgery or early/urgent biopsy and so could not have treatment delayed in order to be discussed at MDT.

The Aberdeen/Inverness MDT noted that those patients not meeting the QPI criteria required urgent surgery due to either a low Glasgow Coma Score or deteriorating symptoms. The MDT will continue to encourage early discussion where appropriate.

The Glasgow centre flagged that prolonged issues with theatre capacity impacted upon performance against this measure, as a number of brain cancer referrals are treated on Emergency Lists/Urgency of Treatment-Theatre Capacity to ensure the next available oncological theatre session is used. The centre will review cases to look for differences in practice across the department.

Edinburgh MDT noted that 4 cases were diagnosed in Dumfries and Galloway and Forth Valley, but referred to Glasgow for further management and were therefore not managed through the Edinburgh MDT. As such the centre believes the tolerance of 5% to be too low, especially considering 5.2% of cases this year were managed out with the SCAN area. Following the move of the Department of Clinical Neurosciences to Royal infirmary Edinburgh the MDT discussions are moved to Wednesdays rather than Fridays. This may allow some patients to be discussed before surgery and operated on by the end of the week/weekend.

Actions:

- Aberdeen/Inverness MDT to remind all surgeons to add cases to MDT prior to treatment unless very urgent.
- Dundee centre will continue to encourage early discussion where appropriate.
- Glasgow centre to review cases to look for differences in practice across the department and take action to ensure adequate theatre capacity is made available for brain cancer referrals.
- Edinburgh centre to monitor the impact of the change in MDT day and report back to the MCN.

QPI 3: Molecular Analysis

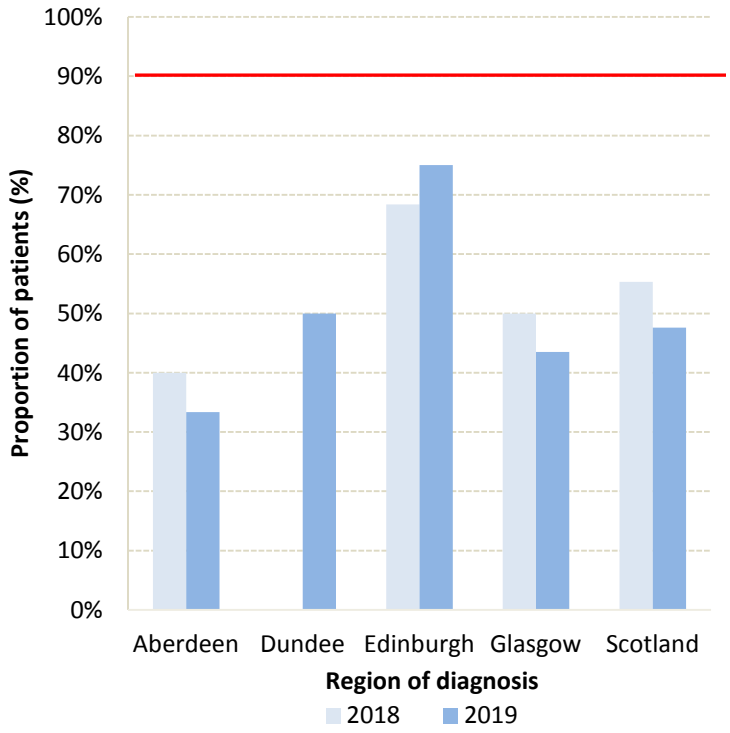
Combined loss of 1p/19q in gliomas is associated with a more favourable response to therapy (chemotherapy or radiotherapy) and is associated with considerably better prognosis when compared to tumours with intact 1p/19q. As such, where indicated, 1p/19q analysis should be carried out to help determine treatment and provide information on predicted tumour response to therapy and prognosis.

Determination of MGMT promoter methylation status predicts response to therapy (chemotherapy or concomitant chemoradiotherapy) in glioblastomas and assists in determination of prognosis. 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.

A 21 day timeframe is associated with this QPI to ensure that the molecular analysis is undertaken and reported before treatment takes place.

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:	Proportion of patients with biopsied or resected Grade II or III gliomas who have the tumour tested for combined loss of 1p/19q.
Numerator:	Number of patients with a Grade II or III glioma undergoing surgery where tissue sample is tested for 1p/19q within 21 days of surgery.
Denominator:	All patients with a Grade II or III glioma undergoing surgery.
Exclusions:	No exclusions.
Target:	90%

Figure 6: Proportion of patients with biopsied or resected Grade II or III gliomas who have the tumour tested for combined loss of 1p/19q, 2018 - 2019



		2018	2019
Aberdeen	N	-	-
	D	5	9
	%	40.0%	33.3%
Dundee	N	-	-
	D	-	-
	%	-	50.0%
Edinburgh	N	13	6
	D	19	8
	%	68.4%	75.0%
Glasgow	N	10	10
	D	20	23
	%	50.0%	43.5%
Scotland	N	26	20
	D	47	42
	%	55.3%	47.6%

(-) Data is not shown; less than 5. (*) denotes a zero.

No centres met the 90% target with performance ranging from 33.3% in Aberdeen to 75.0% in Edinburgh. The overall national performance was 47.6%.

Boards have reviewed cases not meeting the target and provided feedback. As this is an Edinburgh or Glasgow based service, other centres indicated that there is limited scope for improvement at a local level.

The Aberdeen/Inverness and Dundee MDTs noted that although local labs process and transport samples in a timely manner delays within Edinburgh pathology relating to technical difficulty, processing delays or delays in reporting between board IT systems.

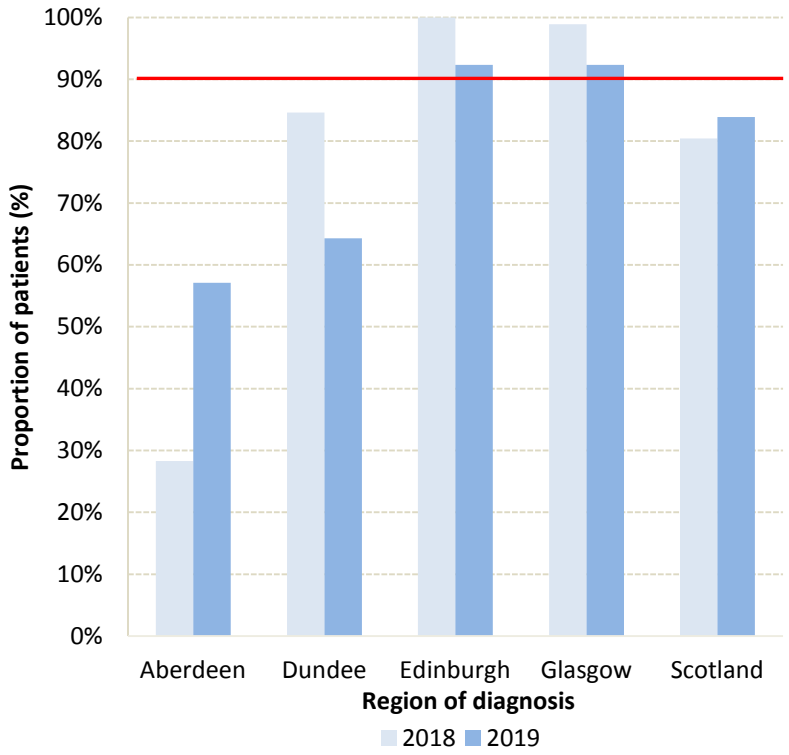
The Dundee MDT will implement a spreadsheet detailing when molecular tests are ordered and when results are received to ensure accurate recording, and overcome reporting delays between the Edinburgh and Tayside IT systems.

The Glasgow centre reviewed cases not meeting the target and concluded that delays in issuing report on to portal, requirement for repeat testing and requirement for further discussion with neuropathology had all impacted upon performance. Additionally, in six cases 1p/19q analysis was not requested and the reasons for this will be explored further with neuropathology. The centre also noted that the time from biopsy to receipt in Genetics ranges from 4-15 days for the 1p/19q FISH referrals; this will be discussed in detail with the neuropathology lead for improvement.

Edinburgh commented that pathology are now documenting when cytogenetics results are available (frequently earlier than the authorised report) and these are now routinely emailed to clinicians to inform treatment decision making. This led to an anticipated improvement for this year. They also commented that the move to Royal Infirmary Edinburgh may allow quicker turnaround with reducing times of transporting samples between sites.

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:	Proportion of patients with biopsied or resected 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:	No exclusions.
Target:	90%

Figure 7: Proportion of patients with biopsied or resected glioblastomas who have the tumour tested for MGMT promoter methylation status, 2018 - 2019.



		2018	2019
Aberdeen	N	15	20
	D	53	35
	%	28.3%	57.1%
Dundee	N	11	9
	D	13	14
	%	84.6%	64.3%
Edinburgh	N	55	48
	D	55	52
	%	100.0%	92.3%
Glasgow	N	87	84
	D	88	91
	%	98.9%	92.3%
Scotland	N	168	161
	D	209	192
	%	80.4%	83.9%

(-) Data is not shown; less than 5. (*) denotes a zero.

The Edinburgh and Glasgow centres met the 90% target with 92.3% each. Dundee and Aberdeen were short of the target with 64.3% and 57.1% respectively. The overall national performance was 83.9%.

The Aberdeen centre reviewed the 15 cases not meeting target. In 9 cases the target was narrowly missed by under 72 hours. The remaining 6 cases were significantly delayed by up to 32 days. The centre will work with the Edinburgh pathology department to understand the root cause of these delays and work to improve turnaround time.

The Dundee centre noted that for some cases it took 31 days to process samples which may have been related to the reagent that molecular pathology were using at that time which took longer to obtain results. They anticipate that the implementation of the aforementioned spreadsheet will improve results for this QPI.

Actions:

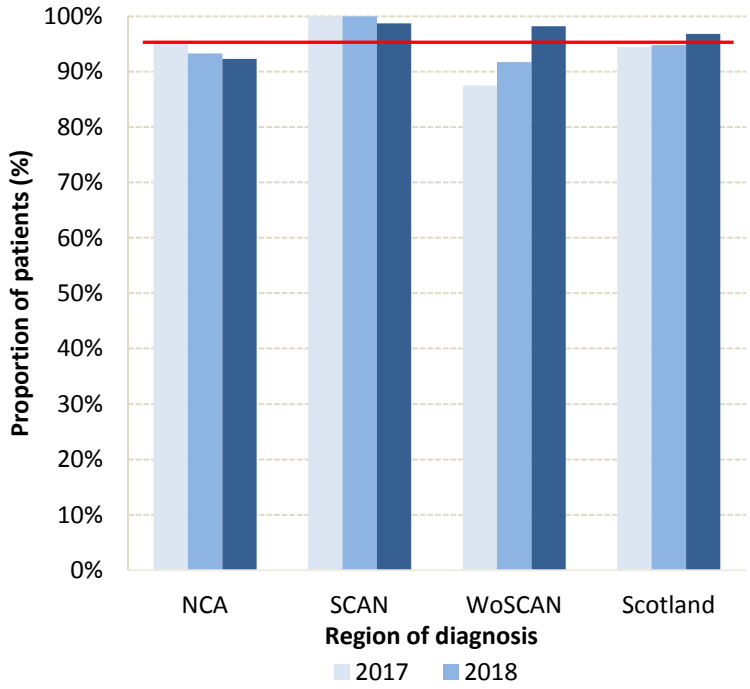
- Dundee to implement a spreadsheet of when ordering molecular tests and when they get the results back to ensure accurate recording.
- Glasgow to discuss further with neuropathology cases where 1p/19q was not requested and determine if any improvement action is required.
- Glasgow centre to discuss with neuropathology scope for improvement in time from biopsy to receipt in genetics for 1p/19q FISH referrals.
- Dundee/Aberdeen centres to work with pathology in Edinburgh to establish reasons for processing delays in samples received from out with Edinburgh and develop a plan for improvement.

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/central nervous system (CNS) cancer should contain full pathology information (including tumour type as described in World Health Organisation (WHO) Classification of CNS tumours (2016) and WHO grade where appropriate) 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:	95%

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), 2017 - 2019



		2017*	2018	2019
NCA	N	64	70	60
	D	67	75	65
	%	95.5%	93.3%	92.3%
SCAN	N	103	86	75
	D	103	86	76
	%	100.0%	100.0%	98.7%
WoSCAN	N	84	99	109
	D	96	108	111
	%	87.5%	91.7%	98.2%
Scotland	N	251	255	244
	D	266	269	252
	%	94.4%	94.8%	96.8%

(-) Data is not shown; less than 5. (*) denotes a zero.
*2017 data was compared against a 90% target

All regions, apart from NCA, met the 95% target. Performance ranged from 92.3 % in NCA to 98.7% in SCAN. The overall national performance was 96.8%, an increase from last year.

Aberdeen centre noted a single case where WHO grade could not be determined.

The Dundee centre noted that upon review it was apparent that tissue samples processed in Dundee were measured in 2 dimensions rather than 3 and therefore did not meet the QPI criteria. The Dundee centre will liaise with the biomedical scientists in Dundee pathology department to ensure tissue samples are measured in 3 dimensions going forward.

It should be noted that the new International Collaboration on Cancer Reporting (ICCR) dataset is being implemented and therefore it will be proposed to change from the Royal College of Pathology dataset to the ICCR dataset at the next formal review of QPIs planned for December 2020.

Actions:

- The Dundee centre will liaise with the biomedical scientists in Dundee pathology department to ensure tissue samples are measured in 3 dimensions going forward.

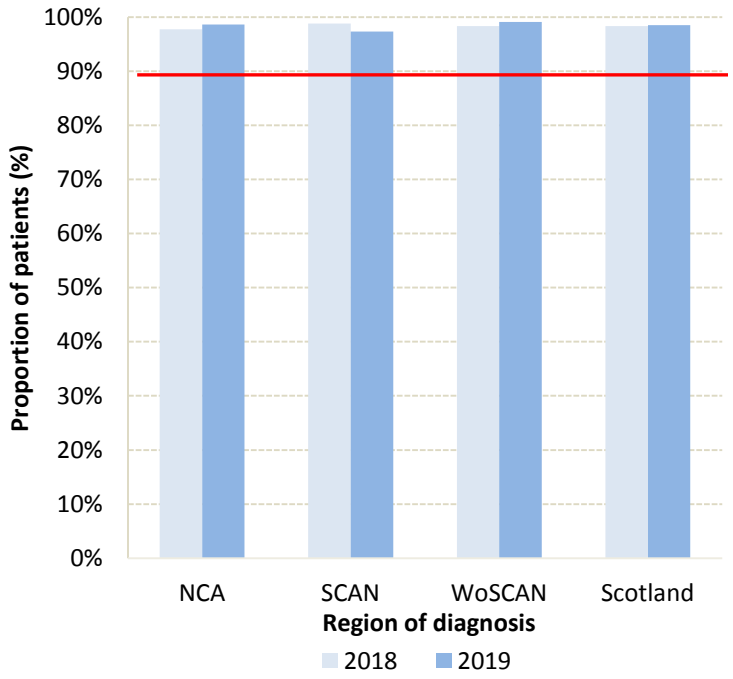
QPI 5: Pre-Treatment Magnetic Resonance Imaging (MRI)

MRI is the established investigation for patients with presumed low grade tumours.

Although contrast enhance 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.

QPI 5:	Patients with Brain/CNS cancer should have contrast enhanced Magnetic Resonance Imaging (MRI) prior to treatment.
Description:	Proportion of patients with Brain/CNS cancer undergoing surgery who have contrast enhanced MRI prior to treatment.
Numerator:	Number of patients with Brain/CNS cancer who receive a contrast enhanced MRI prior to treatment.
Denominator:	All patients with Brain/CNS cancer undergoing surgery.
Exclusions:	Patients unable to undergo a contrast enhanced MRI e.g. • pacemaker or other MRI incompatible implanted device • cerebral aneurysm clip • contraindication to intravenous contrast medium Patients who refuse MRI
Target:	90%

Figure 9: Proportion of patients with brain/CNS cancer undergoing surgery who have contrast enhanced MRI prior to treatment, 2018 - 2019



		2018	2019
NCA	N	84	73
	D	86	74
	%	97.7%	98.6%
SCAN	N	85	73
	D	86	75
	%	98.8%	97.3%
WoSCAN	N	115	111
	D	117	112
	%	98.3%	99.1%
Scotland	N	284	257
	D	289	261
	%	98.3%	98.5%

(-) Data is not shown; less than 5. (*) denotes a zero.

All regions met the 90% target. Performance ranged from 98.6% in NCA to 99.1% in WoSCAN. The overall national performance was 98.5%.

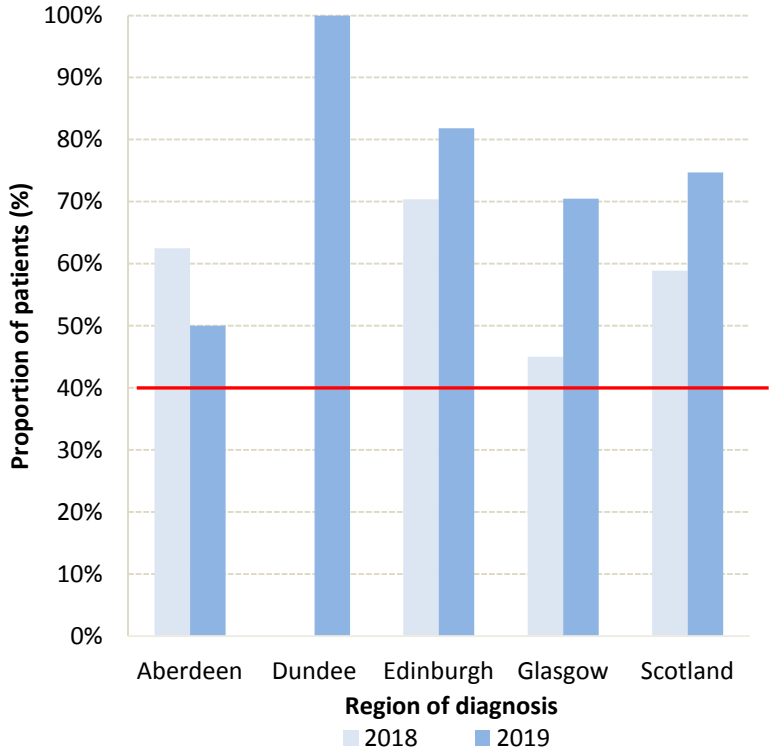
QPI 6: Maximal Surgical Resection

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. Maximum safe surgical resection is recommended by several published guidelines.

Measurement of this QPI will focus on those patients with the intention for maximal safe surgical resection. This will be identified pre-operatively and documented at the MDT.

QPI 6 :	Wherever possible patients should undergo maximal surgical resection of malignant gliomas.
Description:	Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who undergo surgical resection where ≥90% reduction in tumour volume is achieved 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. Patients in who surgeons intent is partial resection/debulking surgery.
Target:	40%

Figure 10: Proportion of patients with malignant glioma undergoing surgical resection where ≥90% reduction in tumour volume is achieved, 2018 – 2019.



		2018	2019
Aberdeen	N	5	-
	D	8	-
	%	62.5%	50.0%
Dundee	N	*	5
	D	-	5
	%	*	100.0%
Edinburgh	N	19	18
	D	27	22
	%	70.4%	81.8%
Glasgow	N	9	31
	D	20	44
	%	45.0%	70.5%
Scotland	N	33	56
	D	56	75
	%	58.9%	74.7%

(-) Data is not shown; less than 5. (*) denotes a zero.

All centres met the 40% target. Performance ranged from 50.0% in Aberdeen to 100.0% in Dundee. The overall national performance was 74.7%.

The Glasgow centre has previously highlighted the limitations of this QPI and commented that intent of surgery cannot always be stated prior to the operation and not all debulking procedures have the intent preoperatively of >90% resection.

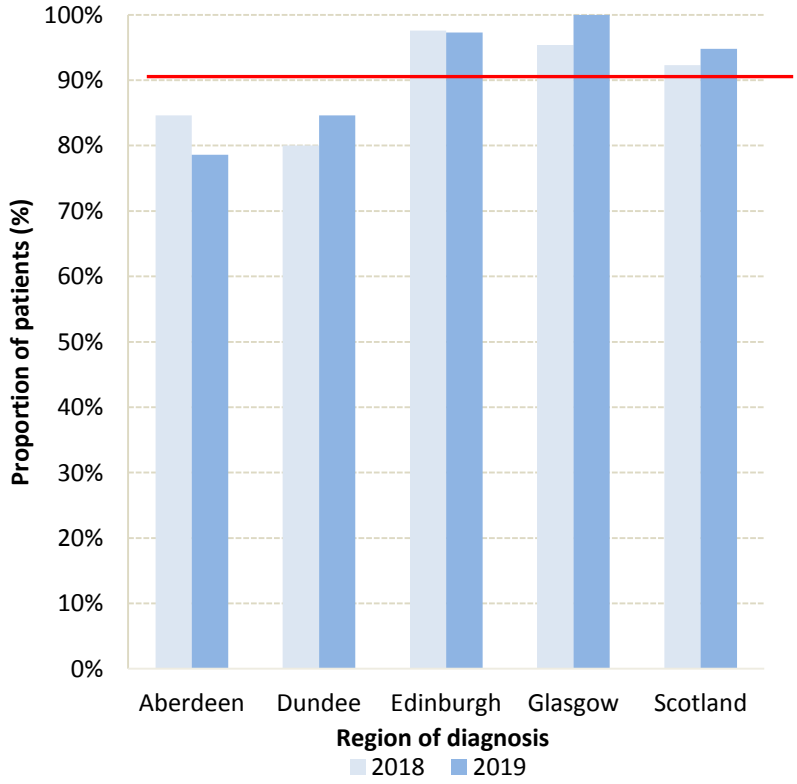
SANON has reviewed this QPI as part of the formal review of QPIs and have agreed to remove the surgical intention clause in the QPI. There was an overwhelming opinion that the introduction of the surgical intent clause led to a variation in data collection practices rather than a reduction. The denominator will now include all patients who undergo surgery with the intention to partial debulking or completely resect the tumour.

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, 2018- 19.



		2018	2019
Aberdeen	N	33	22
	D	39	28
	%	84.6%	78.6%
Dundee	N	8	11
	D	10	13
	%	80.0%	84.6%
Edinburgh	N	40	36
	D	41	37
	%	97.6%	97.3%
Glasgow	N	62	94
	D	65	94
	%	95.4%	100.0%
Scotland	N	143	163
	D	155	172
	%	92.3%	94.8%

(-) Data is not shown; less than 5. (*) denotes a zero.

The Edinburgh and Glasgow centres met the 90% target with performances of 97.3% and 100.0 % respectively. Aberdeen and Dundee were short of the target with 78.6% and 84.6%. The overall national performance was above the target at 94.8%. Continual improvement has been shown over the years measured.

All 6 cases reviewed by the Aberdeen centres. 3 patients were too unwell to have MRI and had post-operative CT instead. The remaining 3 cases had MRI imaging on day 4, this was due to pressure on urgent inpatient imaging capacity as there is only one on site scanner for all specialties.

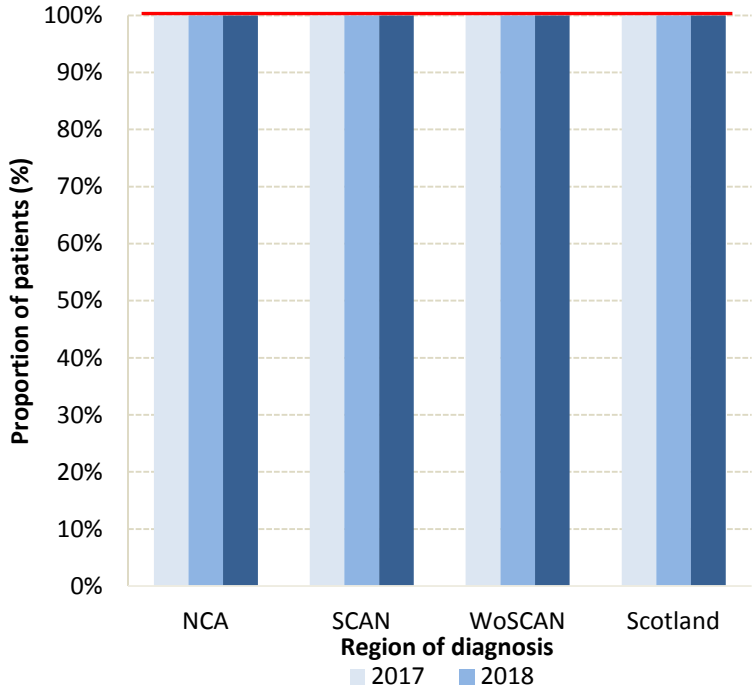
Dundee commented that small denominator numbers impacted upon performance for this measure with one case having a biopsy only and the other case requiring emergency debulking and was unfit for a post-operative MRI.

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, 2017 – 2019.



		2017	2018	2019
NCA	N	60	60	58
	D	60	60	58
	%	100.0%	100.0%	100.0%
SCAN	N	89	73	71
	D	89	73	71
	%	100.0%	100.0%	100.0%
WoSCAN	N	72	95	98
	D	72	95	98
	%	100.0%	100.0%	100.0%
Scotland	N	221	228	227
	D	21	228	227
	%	100.0%	100.0%	100.0%

(-) Data is not shown; less than 5. (*) denotes a zero.

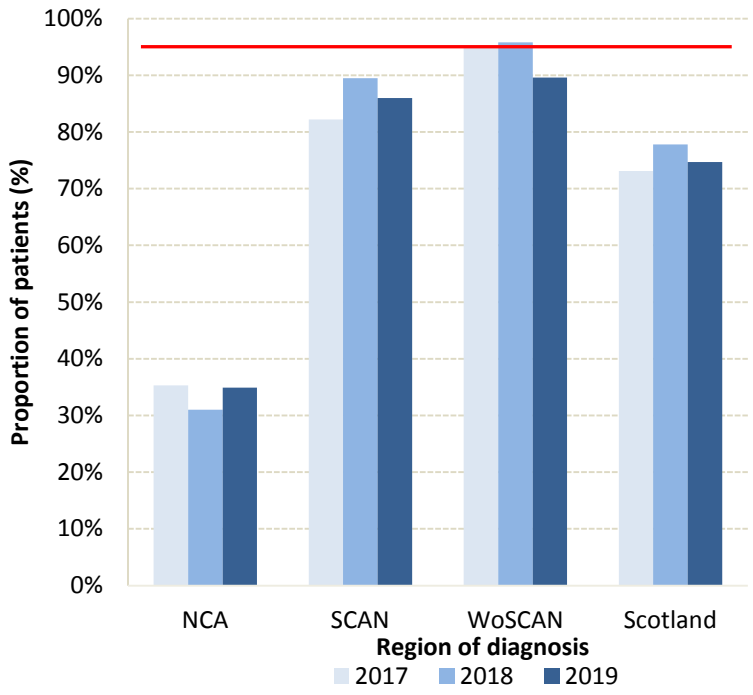
All regions met the 100.0% target. All regional and national performances have been 100% in each year of audit. NMCN has proposed that this QPI should be retired as part of the national formal review, as this is now standard practice in all centres.

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, 2017 – 2019.



		2017	2018	2019
NCA	N	12	13	15
	D	34	42	43
	%	35.3%	31.0%	34.9%
SCAN	N	37	51	43
	D	45	57	50
	%	82.2%	89.5%	86.0%
WoSCAN	N	38	69	69
	D	40	72	77
	%	95.0%	95.8%	89.6%
Scotland	N	87	133	127
	D	119	171	170
	%	73.1%	77.8%	74.7%

(-) Data is not shown; less than 5. (*) denotes a zero.

All regions failed to meet the 95% target. The overall national performance was 74.7%. MDTs have reviewed cases not meeting the target and provided feedback.

The Aberdeen centre reviewed all 17 cases missing the target; in 7 cases the target was narrowly missed by under 5 days. In 4 cases there were delays due to patient factors such as ongoing seizures

and wound infections, and in the remaining 6 cases all treatment was commenced within 8 weeks of surgery. The main reason for the delay in the start of treatment is the delay introduced by molecular pathology results. The centre is introducing a change in radiotherapy workflow to speed up planning process so they can partially compensate for this. They note that it will continue to be challenging to meet this QPI unless pathology results are available sooner and therefore the centre has questioned the 6 week target and suggest moving it to 8 weeks.

Dundee noted a delay in receiving pathology reports has a knock on effect of being seen in Oncology and commencing treatment and that they aim to appoint to Oncology clinic as soon as surgery performed and follow up results that may be outstanding. However, they highlighted that there will always be potential for some delays as a single handed practice.

The Glasgow centre noted 4 of the cases were appropriate delays due to post-operative complications, a further patient was delayed 2 weeks for trial inclusion and 3 cases were delayed pending loss of heterozygosity (LOH) status returning from pathology before commencing primary chemotherapy. The centre noted that for a number of reasons, including these delays, they have changed practice to offer LOH patients primary radiotherapy, so these patients will no longer be delayed because of difficulties with histology.

The Edinburgh centre reviewed cases and provided detailed feedback on cases not meeting the QPI criteria. Factors such as enrolment in clinical trial, public holidays, additional molecular analysis, post-operative complications and delays in MDT discussion impacted upon performance.

Edinburgh indicated that the move to Royal Infirmary Edinburgh may allow quicker turnaround with regard to pathology results and this is likely to expedite treatment decision making.

SANON reviewed the QPI and decided that the 6 week time-frame to commence radiotherapy, after surgery, will remain as there is clear evidence within the literature that overall survival and prognosis is impacted negatively in patients, who start their treatment after 6 weeks.

Actions:

- Dundee MDT to address pathology delays to minimise delays in starting oncology.
- Dundee MDT to implement processes to ensure patients are referred to Oncology clinic immediately after surgery and promptly follow up outstanding pathology results.
- Aberdeen MDT to monitor the impact of the change in radiotherapy planning process and report back to the MCN.

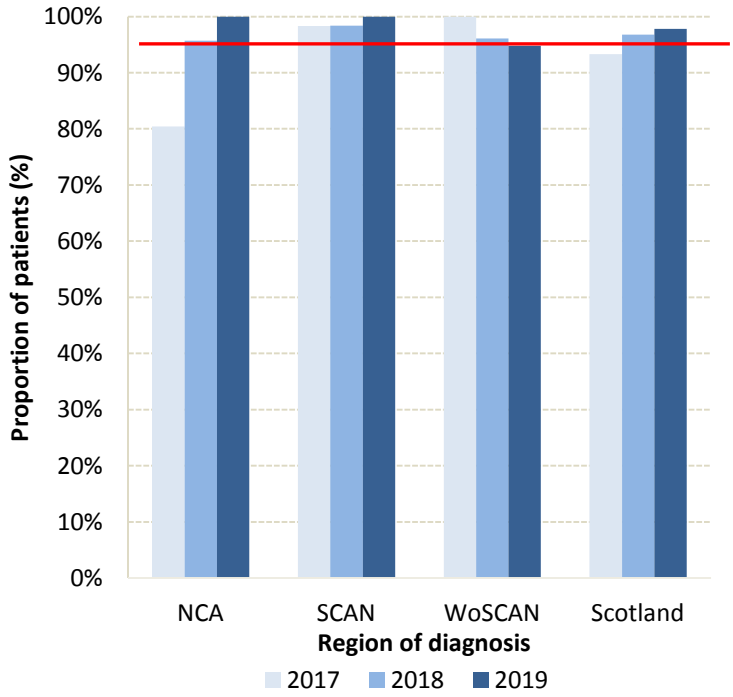
QPI 10: Radical Radiotherapy Planning Process

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%

Figure 14: Proportion of patients with brain/CNS cancer undergoing radical radiotherapy for whom the radiotherapy planning process includes MRI fusion, 2017 – 2019.



		2017	2018	2019
NCA	N	37	45	43
	D	46	47	43
	%	80.4%	95.7%	100.0%
SCAN	N	58	63	58
	D	59	64	58
	%	98.3%	98.4%	100.0%
WoSCAN	N	45	74	73
	D	45	77	77
	%	100.0%	96.1%	94.8%
Scotland	N	140	182	174
	D	150	188	178
	%	93.3%	96.8%	97.8%

(-) Data is not shown; less than 5. (*) denotes a zero.

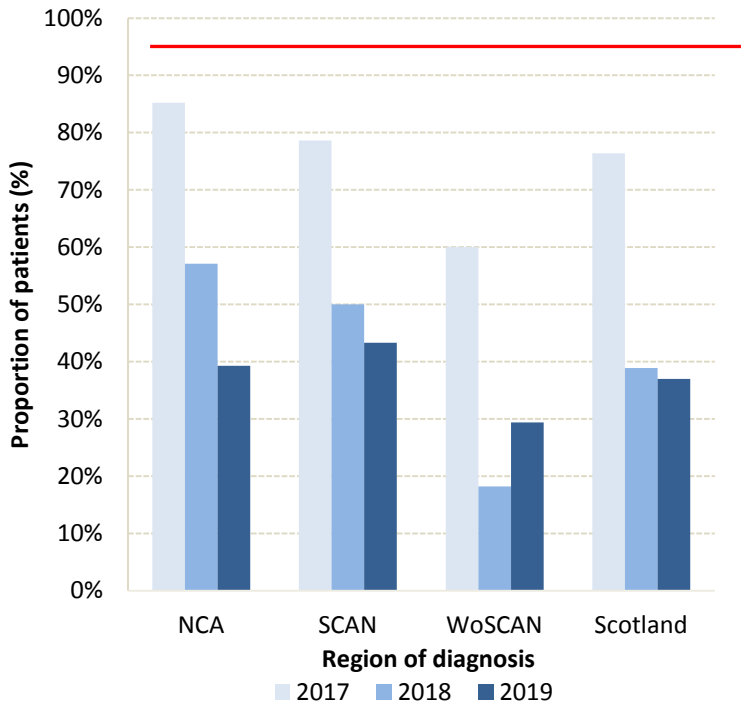
All Regions, except WoSCAN who narrowly missed it, achieved the 95% target with 100.0%. The overall national performance was 97.8%.

QPI 11: Seizure Management

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].

QPI 11:	Patients with brain/central nervous system (CNS) cancer presenting with seizures at diagnosis should be seen by a neurologist and/or a named epilepsy specialist nurse (ESN).
Description:	Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a named ESN within four weeks of diagnosis.
Numerator:	Number of patients presenting with seizures at diagnosis seen by a neurologist or a named ESN within four weeks of diagnosis.
Denominator:	All brain/CNS cancer patients presenting with seizures at diagnosis.
Exclusions:	None.
Target:	95%

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, 2017- 2019.



		2017	2018	2019
NCA	N	23	16	11
	D	27	28	28
	%	85.2%	57.1%	39.3%
SCAN	N	33	18	13
	D	42	36	30
	%	78.6%	50.0%	43.3%
WoSCAN	N	12	8	10
	D	20	44	34
	%	60.0%	18.2%	29.4%
Scotland	N	68	42	34
	D	89	108	92
	%	76.4%	38.9%	37.0%

(-) Data is not shown; less than 5. (*) denotes a zero.

No region met the 95% target. Performance ranged from 29.4% in WoSCAN to 43.3% in SCAN. The overall national performance was 37.0%. All MDTs have found the tightening to the 4 week timeframe challenging.

All centres noted that they believe this QPI needs to be reviewed as the QPI timeframe is logistically challenging and the target is unachievable with the current timeframe of 4 weeks from the date of diagnosis. Edinburgh commented that the best time to see these patients would be at the time of their treatment, rather than at the time of diagnosis to allow the patient time to come to terms with the diagnosis and therefore 4 weeks may not be clinically relevant. Additionally it has been highlighted that the format of the QPI does not capture patients who develop delayed seizures which are often more difficult to control.

Aberdeen provided detailed reasons for those cases not seen by a neurologist or ESN including patients having a poor performance status, three cases had a clinical suspicion of possible seizures but this was not witnessed or confirmed on EEG, In these cases the attending surgeon continued anti epileptic drugs in the operative period as prophylactic. In the remaining 2 cases the patients were seen by an epilepsy specialist but missed the 4 week target.

The Dundee centre will review the data to establish reasons for the reduction in performance from the previous year.

Glasgow highlighted that there is now a neurologist linked to the surgical neuro oncology department and therefore the MDT should refer patients presenting with seizures In four cases the lack of referral was unavoidable due to patient factors (did not attend, refused, died or was for supportive care). In 7 cases referral to neurology was timely, but the neuro appointment was greater than 4 weeks from diagnosis (or never made) and in 13 cases the fault lay with oncology not referring.

Glasgow stated that this service needs to be better resourced to satisfy QPI 11 and that Oncology needs to be more diligent re referring. The centre will take action to improve this.

Actions:

- Dundee to review data collection and establish reasons for the reduction in performance.
- Glasgow to develop processes to ensure the oncology team refer all appropriate cases to neurology.
- SANON to review the timeframe for this QPI as part of the QPI formal review, as centres note that the four week timeframe is not achievable in practice and is perhaps not clinically relevant.

QPI 12: Key Worker

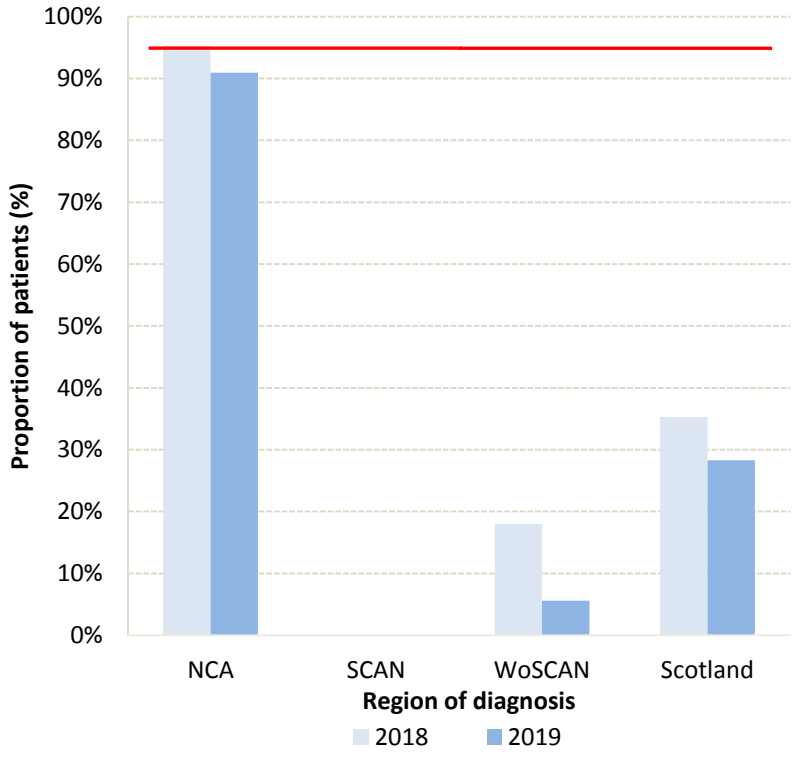
It is recommended that all patients with CNS tumours should have an identified key worker. Having a clearly identified key worker is important to ensure that care is adequately coordinated for patients with CNS tumours.

While the patient is being managed under the care of the neuroscience or oncology/radiotherapy centre the key worker is likely to be the Clinical Nurse Specialist (CNS).

Supportive care patients have been excluded from this QPI as they are managed separately through a palliative care route.

QPI 12 :	Patients with brain/CNS cancer should have an identified key worker to coordinate care across the patient pathway.
Description:	Proportion of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting.
Numerator:	Number of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting.
Denominator:	All patients with brain/CNS cancer.
Exclusions:	Patients undergoing supportive care.
Target:	95%

Figure 16: Proportion of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting, 2017 – 2019.



		2018	2019
NCA	N	82	70
	D	86	77
	%	95.3%	90.9%
SCAN	N	*	*
	D	92	84
	%	*	*
WoSCAN	N	20	6
	D	11	108
	%	18.0%	5.6%
Scotland	N	102	76
	D	289	269
	%	35.3%	28.3%

(-) Data is not shown; less than 5. (*) denotes a zero.

None of the centres met the 95% target. SCAN and WoSCAN were significantly short of the target with 0.0% and 5.6% respectively. The overall national performance was 28.3%.

Both the Edinburgh and Glasgow MDTs raised concern over the timing of assignment of a key worker. It is felt that MDT is not the most appropriate time to do this as the diagnosis and management plan are still being established. Having the key worker allocated at first MDT discussion when the diagnosis is not yet known is not appropriate for the pathway. It would be more effective to have a key worker further down the patient journey. This will be highlighted for discussion at the QPI Formal Review.

The Aberdeen MDT commented that resource issues had impacted upon performance and although this has now been resolved the service is dependent on a single individual and is therefore potentially unsustainable.

Edinburgh further highlighted that a new tick box will be added to MDM forms to record the Key worker at the time of the MDM. It was agreed that the Oncology CNSs will be named key workers.

Actions:

- Edinburgh to add a new tick box to MDT forms to record the Key worker at the time of the MDT.
- SANON to initiate discussion around the most appropriate time frame within the pathway to assign a key worker during the current national formal review.

QPI 13: 30 Day Mortality after Treatment for Brain/CNS Cancer

Treatment related mortality is a marker of the quality and safety of the whole service provided by the MDT. Outcomes of treatment, including treatment related morbidity and mortality should be regularly assessed.

Treatment should only be undertaken in individuals that may benefit from that treatment. This QPI is intended to ensure that treatment is given appropriately, and the outcome reported on and reviewed.

QPI 13:	30 day mortality following treatment for brain/CNS cancer.
Description:	Proportion of patients with brain/CNS cancer who die within 30 days of treatment (surgery, radiotherapy and chemotherapy) for brain/CNS cancer.
Numerator:	Number of patients with brain/CNS cancer who undergo treatment that die within 30 days of treatment.
Denominator:	All patients with brain/CNS cancer who undergo treatment. (i) Surgery (ii) Chemotherapy (iii) Chemoradiotherapy (iv) Radiotherapy
Exclusions:	No exclusions
Target:	<5%

Table 5: Proportion of patients with brain/CNS cancer who die within 30 days of surgery, 2018 – 2019.

	Aberdeen			Dundee			Edinburgh			Glasgow			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%	N	D	%
2018	6	61	9.8%	1	21	4.8%	2	85	2.4%	4	125	3.2%	13	292	4.5%
2019	2	46	4.3%	*	26	*	1	70	1.4%	3	127	2.4%	6	269	2.2%

(-) Data is not shown; less than 5. (*) denotes a zero.

All other centres were within the target with the overall national performance as 2.2%. Both Aberdeen and Edinburgh noted the patients not meeting the target had very aggressive and high grade tumour

Table 6: Proportion of patients with brain/CNS cancer who die within 30 days of chemoradiotherapy, 2018 – 2019.

	NCA			SCAN			WoSCAN			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%
2018	1	31	3.2%	*	37	*	2	62	3.2%	3	130	2.3%
2019	*	24	0.0%	1	38	2.6%	2	57	3.5%	3	119	2.5%

(-) Data is not shown; less than 5. (*) denotes a zero.

All Regions were within the <5% target, with performance ranging from 0.0% in NCA to 3.5% in WoSCAN.

Table 7: Proportion of patients with brain/CNS cancer who die within 30 days of radiotherapy, 2018 – 2019.

	NCA			SCAN			WoSCAN			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%
2018	3	20	15.0%	4	34	11.8%	*	16	*	7	70	10.0%
2019	2	21	9.5%	3	32	9.4%	2	26	7.7%	7	79	8.9%

(-) Data is not shown; less than 5. (*) denotes a zero.

All Regions exceeded the <5% target with the overall national performance being 8.9%.

MDTs have reviewed all cases of mortality for all treatment modalities. In most cases death was due to rapid disease progression, significant co-morbidities or death was not disease or treatment related. The centres concluded that all patients were appropriately treated and none were considered to be avoidable deaths, therefore no specific improvement actions were identified.

Edinburgh commented that it's important to note that the target is probably too low considering that the palliative radiotherapy is included in the calculation, and this is something that can be considered as part of the QPI formal review.

With regards to mortality following SACT, a decision has been taken nationally to move to a new generic QPI (30-day mortality for SACT) applicable across all tumour types. This new QPI will use CEPAS (Chemotherapy ePrescribing and Administration System) data to measure SACT mortality to ensure that the QPI focuses on the prevalent population rather than the incident population. The measurability for this QPI is still under development to ensure consistency across the country and it is anticipated that performance against this measure will be reported using CEPAS data in the next audit cycle. In the meantime all deaths within 30 days of SACT will continue to be reviewed at a NHS Board level.

QPI 14: Clinical Trials Access

Clinical trials are necessary to demonstrate the efficacy of new therapies and other interventions. Evidence suggests improved patient outcomes when hospitals are actively recruiting patients into clinical trials[1].

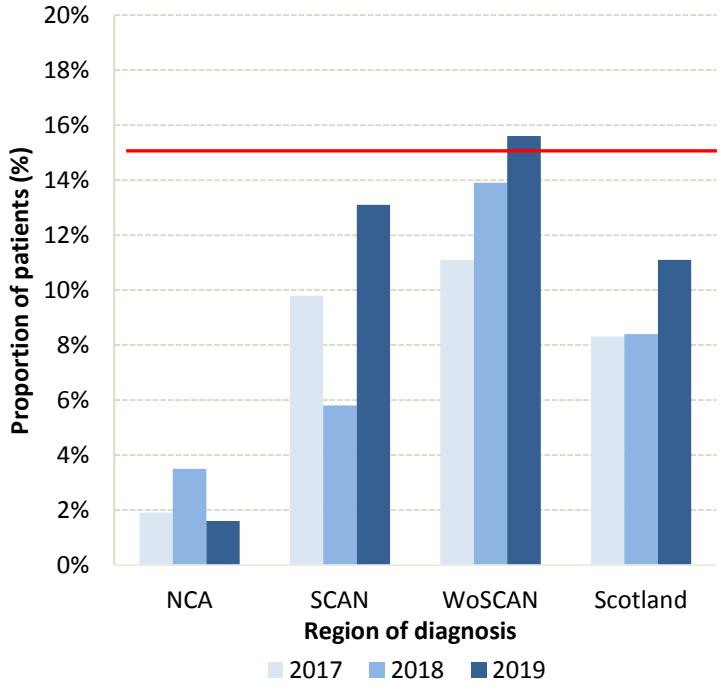
Clinicians are therefore encouraged to enter patients into well designed trials and to collect longer term follow up data. High accrual activity into clinical trials is used as a goal of an exemplary clinical research site.

The measurement of this QPI focuses on those patients who have consented in order to reflect the intent to join a clinical trial and demonstrate the commitment to recruit patients. Often patients can be prevented from enrolling within a trial due to stratification of studies and precise inclusion criteria identified during the screening process.

The clinical trials QPI is measured utilising Scottish Cancer Research Network (SCRN) data and ISD incidence data, as this is the methodology currently utilised by the Chief Scientist Office (CSO) and the National Cancer Research Institute (NCRI). The principal benefit of this approach is that this data is already collected utilising a robust mechanism[1].

QPI 14:	All patients should be considered for participation in available clinical trials/research studies, wherever eligible.
Description:	Proportion of patients diagnosed with brain/CNS cancer who are consented for a clinical trial/research study.
Numerator:	Number of patients diagnosed with brain/CNS cancer consented for a clinical/research study.
Denominator:	All patients with Brain/CNS cancer.
Exclusions:	No exclusions
Target:	15%

Figure 17: Proportion of patients consented for clinical trials for brain/CNS cancer by NHS Board of residence, 2017 - 2019.



		2017	2018	2019
NCA	N	2	4	2
	D	106	113	122.8
	%	1.9%	3.5%	1.6%
SCAN	N	14	8	19
	D	143	138	145
	%	9.8%	5.8%	13.1%
WoSCAN	N	18	23	31
	D	162	166	199
	%	11.1%	13.7%	15.6%
Scotland	N	34	35	52
	D	411	417	466.8
	%	8.3%	8.4%	11.1%

(-) Data is not shown; less than 5. (*) denotes a zero.
N: Number of patients consented/enrolled in trials.
D: Cancer registry data (5-year average)

All regions failed to meet the 15% target patients consented for clinical trials except for WoSCAN with 15.6% of Brain/CNS patients consenting to take part in a clinical trial. Performance ranged from 1.6% in NCA to 13.1% in SCAN. The overall national performance has increased over the year to 11.1%.

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.

The results presented within this report illustrate that some of the QPI targets set have been challenging for NHS Boards to achieve and there remains room for further service improvement, however it is encouraging that the target was consistently met by the majority of Regions for QPIs relating to neuropathological diagnosis, pre-treatment MRI, specialist neuro-oncology access, radical radiotherapy planning and 30 day mortality after chemoradiotherapy and surgery.

Targets have been particularly challenging for QPIs relating to access to adjuvant treatment, molecular analysis, seizure management and documentation at MDT. Where targets have not been met NHS Boards have provided detailed comment indicating valid clinical reasons.

In November 2020, SANON will initiate and lead national discussion into QPIs in order to ensure that NHS Boards are collecting meaningful data that will drive clinical service improvement. SANON should lead national discussion into QPIs 6, 9, 11 and 12, in order to ensure that they are collecting meaningful data that will drive clinical service improvement.

SANON, MDTs and 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 SANON, MDTs and neuro-oncology centres has been included within the Action Plan templates in the Appendix.

QPI 1: Documentation of Performance Status

- Aberdeen/Inverness MDT to ensure that all surgeons will be reminded to ideally add cases to MDT prior to treatment unless very urgent.
- Edinburgh centre will ensure that performance status is recorded by MDT coordinator for all patients at time of MDT discussion and that late add-on patients have KPS documented.
- Glasgow centre actioned that MDT Chair should confirm and record WHO Performance Status on the day of discussion and remind the referring doctors of their responsibility to submit the WHO status.

QPI 2: Multi-disciplinary Team Meeting

- Aberdeen/Inverness MDT to remind all surgeons to add cases to MDT prior to treatment unless very urgent.
- Dundee centre will continue to encourage early discussion where appropriate.
- Glasgow centre to review cases to look for differences in practice across the department and take action to ensure adequate theatre capacity is made available for brain cancer referrals.
- Edinburgh centre to monitor the impact of the change in MDT day and report back to the MCN.

QPI 3: Molecular Analysis

- Dundee to implement a spreadsheet of when ordering molecular tests and when they get the results back to ensure accurate recording.
- Glasgow to discuss further with neuropathology cases where 1p/19q was not requested and determine if any improvement action is required.
- Glasgow centre to discuss with neuropathology scope for improvement in time from biopsy to receipt in genetics for 1p/19q FISH referrals.

- Dundee/Aberdeen centres to work with pathology in Edinburgh to establish reasons for processing delays in samples received from out with Edinburgh and develop a plan for improvement.

QPI 4: Neuropathological Diagnosis

- The Dundee centre will liaise with the biomedical scientists in Dundee pathology department to ensure tissue samples are measured in 3 dimensions going forward.

QPI 9: Access to Adjuvant Treatment

- Dundee MDT to address pathology delays to minimise delays in starting oncology.
- Dundee MDT to implement processes to ensure patients are referred to Oncology clinic immediately after surgery and promptly follow up outstanding pathology results.
- Aberdeen MDT to monitor the impact of the change in radiotherapy planning process and report back to the MCN.
- SANON to review the timeframe for this QPI as part of the formal review process, as centres note that it is not achievable in practice.

QPI 11: Seizure Management

- Dundee to review data collection and establish reasons for the reduction in performance.
- Glasgow to develop processes to ensure the oncology team refer all appropriate cases to neurology.
- SANON to review the timeframe for this QPI as part of the QPI formal review, as centres note that the four week timeframe is not achievable in practice and is perhaps not clinically relevant.

QPI 12: Key Worker

- Edinburgh to add a new tick box to MDT forms to record the Key worker at the time of the MDT.
- SANON to initiate discussion around the most appropriate time frame within the pathway to assign a key worker during the current national formal review.

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 SANON and any service or clinical issue which the SANON 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 NMCN 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).

6. 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.

7. Abbreviations

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

8. References

1. Healthcare Improvement Scotland. Brain and CNS Cancer Quality Performance Indicators, v3.0; December 2013 (updated March 2018) Available at:http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/programme_resources/cancer_qpis.aspx

2. Public Health Scotland. National Data Definitions for the Minimum Core Data Set for Brain/CNS Quality Performance Indicators v3.3; May 2020, Available at: https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/

3. Information Services Division. Brain and CNS Cancer, Measurability of Quality Performance Indicators v3.1, December 2019. Available at: https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/

4. Public Health Scotland, Cancer Statistics, Malignant brain and CNS cancer – Annual incidence. Available at: https://beta.isdscotland.org/find-publications-and-data/conditions-and-diseases/cancer/cancer-incidence-in-scotland/28-april-2020/

5. Public Health Scotland, Cancer Statistics, Summary statistics for brain and CNS cancer - Scotland. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Brain-and-Central-Nervous-System/

6. Public Health Scotland, Cancer Statistics, Malignant brain and CNS cancer – Survival. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Brain-and-Central-Nervous-System/

7. The Scottish Adult Neuro-Oncology Network, 2006 Available at: https://www.sanon.scot.nhs.uk/

8. ScotPHO, Public Health Information for Scotland. Mid 2018 Population Estimates Scotland. Available at: https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2018

9. Copyright

Appendix 1: Meta Data

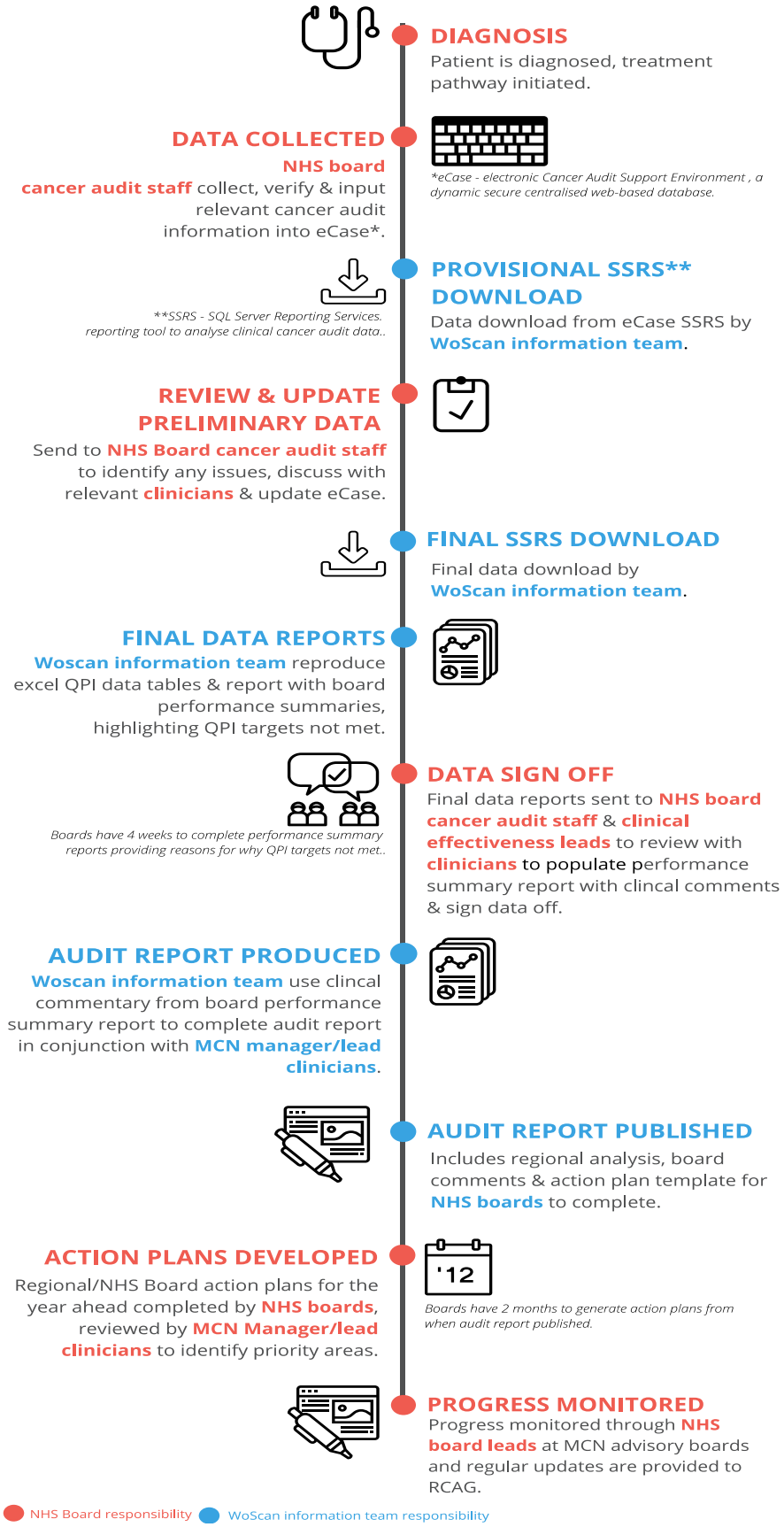
<table>
<tr><td>Report Title</td><td>Cancer Audit Report: Brain and Central Nervous System Cancers Quality Performance Indicators</td></tr>
<tr><td>Time Period</td><td>Patients diagnosed between 01 January 2019 to 31 December 2019</td></tr>
<tr><td>Data Source</td><td>Cancer Audit Support Environment (eCASE). A secure centralised web-based database which holds cancer audit information in Scotland.</td></tr>
<tr><td>Data extraction date</td><td>The NCA, SCAN data contained within this report was extracted from eCASE at 2200 hrs on 05/08/2020. Woscan data was extracted 13/08/2020.</td></tr>
<tr><td>Methodology</td><td>Analysis was performed centrally for the region by the WoSCAN Information Team. The timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for the majority of patients.

Initial results were provided to 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 & region verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area. Please see info graphic in appendix 2 for a more detailed look at the reporting process.</td></tr>
<tr><td>Data Quality</td><td>Audit data completeness can be assessed by estimating the proportion of expected patients that have been identified through audit compared to the number reported by the National Cancer registry (provided by ISD, National Services Division), this is known as case ascertainment. Figures should only be used as a guide as it is not possible to compare the same exact cohort from each data source. Note that a 5 year average is taken for cancer registry cases to take account of annual fluctuations in incidence within regions.

<table>
<tr><th></th><th>NCA</th><th>SCAN</th><th>WoSCAN</th><th>Scotland</th></tr>
<tr><td>Cases from audit</td><td>106</td><td>102</td><td>160</td><td>368</td></tr>
<tr><td>Cases from ISD (2014-2018)*</td><td>118</td><td>117</td><td>186</td><td>421</td></tr>
<tr><td>Case ascertainment</td><td>89.8%</td><td>87.5%</td><td>85.9%</td><td>87.5%</td></tr>
</table>
</td></tr>
</table>

Appendix 2: Cancer audit timeline



Appendix 3: 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 - Aberdeen/Inverness MDT

1st January - 31st December 2019

Area:	**Aberdeen/Inverness MDT**
Action Plan Lead:	
Date:	

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			
		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*.**
QPI 1: Documentation of Performance Status	Ensure that all surgeons will be reminded to ideally add cases to MDT prior to treatment unless very urgent **(MDT).**						
QPI 2: Multi-disciplinary Team Meeting	• Remind all surgeons to add cases to MDT prior to treatment unless very urgent **(MDT).** • Work with pathology in Edinburgh to establish reasons for processing delays in samples received from out with Edinburgh and develop a plan for improvement **(MDT).**						
QPI 9: Access to adjuvant	Monitor the impact of the change in radiotherapy						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
treatment	planning process and report back to the MCN. **(Practice)**						

Action / Improvement Plan - Glasgow

1st January - 31st December 2019

Area:	**Glasgow MDT**
Action Plan Lead:	
Date:	

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			
		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.***
QPI 1: Documentation of Performance Status	Glasgow centre actioned that MDT Chair should confirm and record WHO Performance Status on the day of discussion and remind the referring doctors of their responsibility to submit the WHO status. **(MDT)**						
QPI 2: Multi-disciplinary Team Meeting	Review cases to look for differences in practice across the department and take action to ensure adequate theatre capacity is made available for brain cancer referrals. **(MDT)**						
QPI 3: Molecular Analysis	Discuss further with neuropathology cases where 1p/19q was not requested and determine if any improvement action is required. **(Pathology)**						
QPI 11: Seizure Management	Develop processes to ensure the oncology team refer all appropriate cases to neurology. **(Oncology)**						

Action / Improvement Plan - Edinburgh

1st January - 31st December 2019

Area:	**Edinburgh MDT**
Action Plan Lead:	
Date:	

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			
		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.***
QPI 1: Documentation of Performance Status	Ensure that performance status is recorded by MDT coordinator for all patients at time of MDT discussion and that late add-on patients have KPS documented. **(MDT)**						
QPI 2: Multi-disciplinary Team Meeting	Monitor the impact of the change in MDT day and report back to the MCN. **(MDT)**						
QPI 3: Molecular Analysis	Discuss with neuropathology scope for improvement in time from biopsy to receipt in genetics for 1p/19q FISH referrals. **(Pathology)**						
QPI 12: Key Worker	Add a new tick box to MDT forms to record the Key worker at the time of the MDT. **(Practice)**						

Action / Improvement Plan - Dundee

1st January - 31st December 2019

Area:	**Dundee MDT**
Action Plan Lead:	
Date:	

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			
		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*.**
QPI 2: Multi-disciplinary Team Meeting	Continue to encourage early discussion where appropriate. **(Treatment decision)**						
QPI 3: Molecular Analysis	• Implement a spreadsheet of when ordering molecular tests and when they get the results back to ensure accurate recording **(Practice).** • Work with pathology in Edinburgh to establish reasons for processing delays in samples received from out with Edinburgh and develop a plan for improvement **(Capacity)**						
QPI 4: Neuropathological Diagnosis	Liaise with the biomedical scientists in Dundee pathology department to ensure tissue samples are						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	measured in 3 dimensions going forward. **(Pathology)**						
QPI 9: Access to Adjuvant Treatment	• Address pathology delays to minimise delays in starting oncology. **(Pathology)** • Implement processes to ensure patients are referred to Oncology clinic immediately after surgery and promptly follow up outstanding pathology results. **(Oncology).**						
QPI 11: Seizure Management	Review data collection and establish reasons for the reduction in performance. **(Practice)**						

Action / Improvement Plan - SANON

1st January - 31st December 2019

Area:	**SANON**
Action Plan Lead:	
Date:	

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			
		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*.**
QPI 9: Access to Adjuvant Treatment	Review the timeframe for this QPI as part of the formal review process, as centres note that it is not achievable in practice. **(Practice)**						
QPI 11: Seizure Management	Review the timeframe for this QPI as part of the QPI formal review, as centres note that the four week timeframe is not achievable in practice and is perhaps not clinically relevant. **(Practice)**						
QPI 12: Key worker	Initiate discussion around the most appropriate time frame within the pathway to assign a key worker during the current national formal review. **(Practice)**						