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 2021 Clinical Audit Data

Mr Imran Liaquat
NMCN Clinical Lead

Lindsay Campbell
NMCN Manager

Kallely Soumine George
Information Officer

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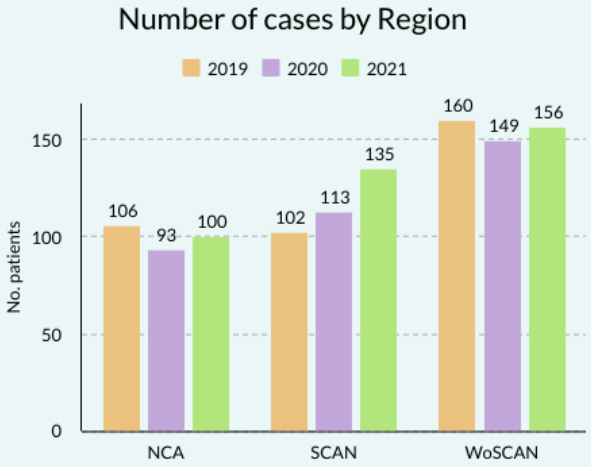
Brain/CNS Cancer Quality Performance Indicators Overview

Patients diagnosed between 1st January - 31st December 2021

Number of patients:	391	
Gender of patients:	Male	Female
	56.5%	43.5%
Mode Age group:	Male	Female
	60-64	70-74
	Male	Female
1 year Net survival*	42.9%	38.4%
5 year Net survival*	13.9%	15.1%

* Net non-age standardised survival for pateints diagnosed 2013-17 in Scotland



1 2 3 4 Not applicable Not Recorded

WHO tumour grade classification

Performance (%)

Target Performance 2021 — Difference from 2020

	Target	Performance 2021
QPI 1: Documentation of Performance Status	95%	95.1%
QPI 2: Documentation of MDT meeting	90%	79.9%
QPI 3: Molecular Analysis	90%	(i) 56.3%; (ii) 48.4%
QPI 4: Neuropathological Diagnosis	95%	98.5%
QPI 6: Maximal Surgical Resection	40%	58.3%
QPI 7: Early Post-Operative Imaging	90%	99.4%
QPI 9: Access to Adjuvant Treatment	90%	84.2%
QPI 11: Seizure Management	95%	54.4%
QPI 12: Key Worker	95%	37.4%
QPI 13: 30 Day Mortality after Treatment -(i)Surgery, (ii)Chemoradiotherapy and (iii)Radiotherapy	<5%	(i) 5.0%; (ii) 4.5%; (iii) 9.8%
QPI 14: Clinical Trials & Research Study Access	15%	20.9%

Conclusion

Performance across Regional centres is variable for a number of QPIs, however it is encouraging that targets were met by all centres for the following indicators:

- Neuropathological diagnosis in 98.5% of cases across Scotland.
- Maximal surgical resection in 58.3% cases.
- Early post-operative imaging in 99.4% of cases.

Targets were met nationally for Documentation of Performance status (95.1%), 30-Day mortality after Chemoradiotherapy (4.5%) and Clinical trials and Research study Access (20.9%).

Improvements in performance against QPI 9 (Access to adjuvant treatment), QPI 11 (Seizure management) and QPI 12 (Key worker).

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 2021 to 31st December 2021, with twelve months of data measured against the Brain and CNS Cancer quality performance indicators[1] (QPIs) for the eighth 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 2021 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 Board, region or MDT/neuro-oncology centre relating to the impacted indicators will, however, be included as a record of continuous improvement. Specific NHS Board, region or MDT/neuro-oncology centre actions have been identified to address issues highlighted through data analysis.

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%	2021	94.0%	94.6%	96.2%	95.1%
		2020	94.4%	88.2%	92.6%	91.7%
		2019	94.3%	89.3%	90.2%	91.1%
QPI 2: Documentation of MDT meeting - Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery.	90%	2021	91.5%	90.9%	66.7%	79.9%
		2020	82.8%	95.8%	67.6%	79.6%
	95%	2019	82.4%	82.9%	63.4%	74.4%
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.	95%	2021	98.3%	100.0%	97.6%	98.5%
		2020	98.3%	100%	100%	99.6%
		2019	92.3%	98.7%	98.2%	96.8%
QPI 9: Access to Adjuvant Treatment – Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgery who commence their oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgery.	90%	2021	61.5%	83.3%	95.2%	84.2%
		2020	47.4%	65.9%	89.1%	71.2%
	95%	2019	34.9%	86.0%	89.6%	74.7%
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%	2021	63.2%	73.2%	23.3%	54.4%
		2020	60.0%	56.4%	7.3%	37.0%
		2019	39.3%	43.3%	29.4%	37.0%

Quality Performance Indicator (QPI)	Performance by NHS Board of diagnosis					
	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
QPI 12: Key Worker - Proportion of patients with Brain/CNS cancer who have an identified key worker by the first MDT meeting.	95%	2021	40.6%	84.9%	0.0%	37.4%
		2020	72.1%	43.5%	0.0%	31.8%
		2019	90.9%	0.0%	5.6%	28.3%
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of **chemoradiotherapy**.	<5%	2021	3.8%	2.6%	5.8%	4.5%
		2020	0.0%	4.3%	0.0%	1.0%
		2019	0.0%	2.6%	3.5%	2.5%
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of **radiotherapy**.	<5%	2021	7.7%	14.3%	3.7%	9.8%
		2020	0.0%	4.2%	3.1%	3.2%
		2019	9.5%	9.4%	7.7%	8.9%
QPI 14: Clinical Trials Access – Proportion of patients with brain/CNS cancer who CONSENT TO PARTICIPATE in a clinical trial.	15%	2021	23.5%	26.6%	14.0%	20.9%
		2020	5.5%	10.9%	3.0%	6.2%
		2019	13.1%	1.6%	15.6%	11.1%

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%	2021	50.0%	50.0%	66.7%	47.6%	56.3%
		2020	80.0%	0.0%	71.4%	78.3%	74.0%
		2019	33.3%	50.0%	75.0%	43.5%	47.6%
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%	2021	54.5%	46.7%	86.2%	22.5%	48.4%
		2020	57.1%	81.3%	76.1%	92.4%	81.1%
		2019	57.1%	64.3%	92.3%	92.3%	83.9%
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%	2021	33.3%	70.0%	59.6%	60.5%	58.3%
		2020	27.8%	60.0%	51.2%	45.7%	46.1%
		2019	50.0%	100.0%	81.8%	70.5%	74.7%
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%	2021	100.0%	100.0%	100.0%	98.8%	99.4%
		2020	94.4%	100%	92.9%	98.6%	96.5%
		2019	78.6%	84.6%	97.3%	100.0%	94.8%
QPI 13: Mortality - Proportion of patients with Brain/CNS cancer who die within 30 days of **surgery.**	<5%	2021	4.9%	5.9%	9.0%	2.3%	5.0%
		2020	5.3%	0.0%	5.4%	0.9%	2.9%
		2019	4.3%	0.0%	1.4%	2.4%	2.2%

**Small numbers in some Boards - percentage comparisons over a single year should be viewed with caution.*

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. However, despite improvements in a number of QPI measures against historical results, specific challenges exist in all units. In particular, QPI 3(i) – Molecular Analysis, QPI 9 – Access to Adjuvant Treatment, QPI 11- Seizure Management and QPI 12 – Key Worker all remain challenging in all units.

In line with the agreed regional governance process, each NHS Board was asked to complete a Performance Summary Report (PSR), providing detailed comments where QPI targets were not met. In the main, feedback from the Boards indicates valid clinical reasons or that, in some cases, patient choice or co-morbidities have influenced patient management. Additionally, these Boards have indicated where positive action has already been taken at a local level to address any issues highlighted through the QPI data analysis. It is anticipated that these positive changes will result in improved performance going forward.

Action required:

QPI 1: Documentation of Performance Status

- SCAN to retain a rota for a nominated person to chair the MDT each week to further improve the documentation of KPS for 2022 cohort.

QPI 2: Multi-disciplinary Team Meeting (MDT)

- NHS GGC to share the outcome of the review and the associated improvement plan with SANON.

QPI 6: Maximal Surgical Resection

- SANON to liaise with the Neurosurgical team in Aberdeen and to support sub-specialisation of Neuro-oncology cases, which may improve resection rates and help Aberdeen meet the QPI requirements.

QPI 9: Access to Adjuvant Treatment

- In SCAN the Oncology team to make a priority list based on surgery dates/ biological priority and liaise with the pathology department with regard to pathology reports being ready for the MDM discussion.
- SANON to liaise with Oncology team in Aberdeen and Dundee to explore their resource needs and how to improve access to radiotherapy when the sole Neuro-oncology Consultant is on annual or study leave.

QPI 11: Seizure Management

- NHS GGC to develop resource with Epilepsy Neurology Consultants and Epilepsy Nurses to ensure the longer term sustainability of the service.
- SANON will carry out an audit of neurology and epilepsy specialist nurses in each NHS Board to better understand the current capacity challenges.

QPI 12: Key Worker

- The Aberdeen and Inverness Centre to address documentation issues.

- NHS GGC to confirm plans to recruit additional resource to support this service and ensure that MDT proforma is updated and populated at the MDT.

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.

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

Progress against these plans are 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. SANON plans to discuss challenging QPIs, where targets have not been met with Regional Cancer Leads and where appropriate the Territorial 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 2021, for the eighth 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 published in February 2021.

Twelve months of data is presented alongside data for previous years where results have remained comparable after the formal 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 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	Edinburgh Royal Infirmary (surgery from July 2020) and Western General Hospital (surgery until June 2020 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 435 adult cases diagnosed in Scotland each year between 2016 and 2020[4]. The 2021 audit identified 391 patients diagnosed with a new primary cancer of the brain or CNS in Scotland.

The distribution of the 391 newly diagnosed cases in 2021 is presented in Figure 1 by location of diagnosis across the fourteen NHS Boards. The West of Scotland Cancer Network (WoSCAN) recorded 43.7% of new diagnoses in 2021 with 171 new cases of brain and CNS cancers captured by audit. This is in line with the adult population distribution in this region as 2021 mid-year population estimates[8] show that 46.0% of the Scottish adult population reside within West of Scotland (WoS) region. It should be noted that 15 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, 2021.

NCA	Grampian	Highland	Tayside	Island Boards*	Total
No. of cases	42	18	34	6	100
SCAN	**Borders**	**D&G**	**Fife**	**Lothian**	**Total**
No. of cases	7	8	18	87	120
WoSCAN	**A&A**	**Forth Valley****	**GGC**	**Lanarkshire**	**Total**
No. of cases	20	15	108	28	171

** Island Boards- Orkney, Shetland and Western Isles*

**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 2021 data is detailed below in Table 1, and is classified according to the International Classification of Diseases for Oncology (ICD-O 3). The majority of cases have astrocytic/oligodendroglial 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, 2021.

	Region of Diagnosis							
	NCA		SCAN		WOSCAN		Scotland	
Tumour Type	n	%	n	%	n	%	n	%
Astrocytic and Oligodendroglial	57	57.0%	89	65.9%	119	76.3%	265	67.8%
Embryonal	0	0.0%	0	0.0%	2	1.3%	2	0.5%
Ependymal	3	3.0%	0	0.0%	2	1.3%	5	1.3%
Meningioma	0	0.0%	0	0.0%	1	0.6%	1	0.3%
Other Glioma	1	1.0%	1	0.7%	1	0.6%	3	0.8%
Other Astrocytic	0	0.0%	0	0.0%	1	0.6%	1	0.3%
Not Applicable	39	39.0%	45	33.3%	30	19.2%	114	29.2%
Not Assessable	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Not Recorded	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total No of Pts	**100**		**135**		**156**		**391**	

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 2021 audit assigned to each tumour grade. The majority of cases are Grade 4 (56.0%) which is associated with poorer outcomes. Cases have been assigned as "Not Applicable" where no sample has been sent to pathology for analysis.

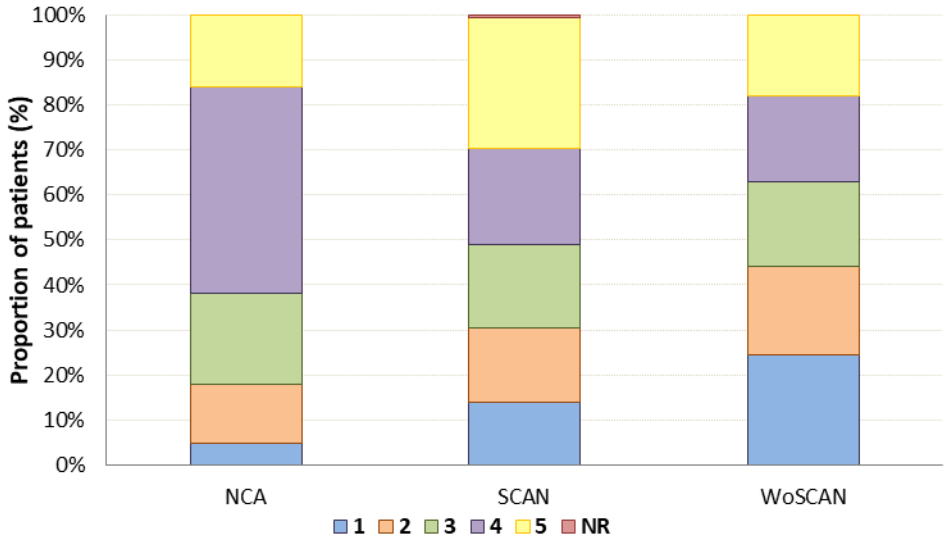
Table 3: Tumour grade for patients diagnosed with Brain/CNS cancer across Scotland by Region of Diagnosis, 2021.

	Region of Diagnosis							
	NCA		SCAN		WOSCAN		Scotland	
	n	%	n	%	n	%	n	%
1	1	1.0%	0	0.0%	0	0.0%	1	0.3%
2	8	8.0%	14	10.4%	11	7.1%	33	8.4%
3	0	0.0%	7	5.2%	14	9.0%	21	5.4%
4	51	51.0%	68	50.4%	100	64.1%	219	56.0%
Not Applicable	39	39.0%	45	33.3%	31	19.9%	115	29.4%
Not Recorded	1	1.0%	1	0.7%	0	0.0%	2	0.5%
Total No of Pts	**100**		**135**		**156**		**391**	

Deprivation

The figures below shows the Scottish Index of Multiple Deprivation (SIMD) 2021 quintiles for patients diagnosed with brain and CNS cancer; with 1 equating to the most deprived postcodes and 5 equating to the least deprived.

Fig 2: Proportion of patients diagnosed with brain and CNS cancer in Scotland in 2021 by Deprivation Category



2.2 Incidence and survival

Brain and CNS cancers are relatively rare cancers with approximately 414 new cases diagnosed in Scotland in 2020[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 2020. It was ranked as the 16th most commonly diagnosed cancer in females and the 15th most commonly diagnosed cancer in males in Scotland in 2020[5].

The incidence of brain and CNS cancers has increased in females by 0.5% in the ten years from 2010 - 2020, with a decrease in the incidence for males by 11.8%. Overall there has been a decrease in incidence of 7.0%[5]. The mortality of Brain/CNS cancer has decreased for males by 11.2% while female mortality increased by 0.6% in the ten years from 2010 - 2020 with an overall decrease of 6.7%[5]. Brain and CNS cancers are ranked as the 15th most common cause of death from cancer and accounted for 2.2% of all deaths from cancer in 2020[5].

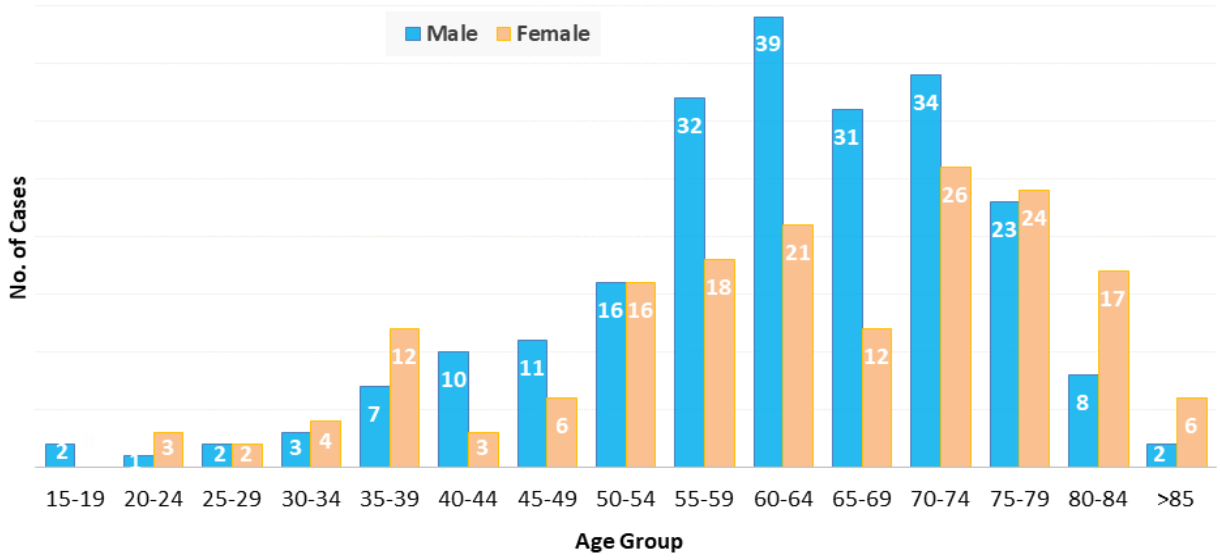
Relative survival at one year is increasing for brain and CNS cancers while relative survival at five years is decreasing for both males and females[6]. Table 4 shows the percentage change in survival rates for patients diagnosed between 2007 and 2011 compared to those diagnosed between 2013 and 2017.

Table 4: Percentage change in relative survival for brain and CNS cancer in Scotland at 1 year and 5 years from 2007-2011 to 2013-2017. Source data: PHS[6]

Age 15 – 99 years	Relative survival at 1 year (%)			Relative survival at 5 years (%)		
	2007 - 2011	2013 – 2017	% change	2007 - 2011	2013 – 2017	% change
Male	41.2%	42.9 %	+ 4.1 %	15.1%	13.9 %	- 8.0 %
Female	39.5%	38.4 %	+ 2.8 %	15.8%	15.1 %	- 4.4 %

This report includes all cases aged 15 and over and the age distribution for males and females diagnosed in 2021 in Scotland is illustrated in Figure 2. The incidence of brain and CNS cancer is higher in males with 56.5%, while 43.5% were females. Although the majority of cases do occur in older individuals for both sexes, it is noted that a quarter of brain and CNS cancers were diagnosed in individuals under the age of 55 years (25.0%).

Figure 3: Number of patients diagnosed with brain and CNS cancers in Scotland in 2021 by age group and sex.



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 6-8) data is presented.

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

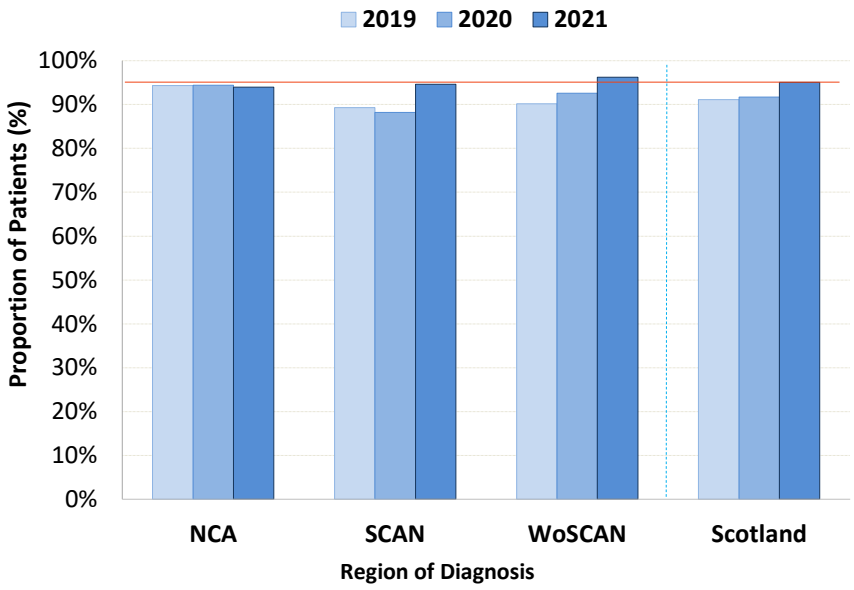
QPI 1: Documentation of Performance Status

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 MDT discussion.
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, 2019 - 2021.



		2019	2020	2021
NCA	N	99	85	94
	D	105	90	100
	%	94.3%	94.4%	94.0%
SCAN	N	100	97	123
	D	112	110	130
	%	89.3%	88.2%	94.6%
WoS	N	129	138	150
	D	143	149	156
	%	90.2%	92.6%	96.2%
Scotland	N	328	320	367
	D	360	349	386
	%	91.1%	91.7%	95.1%

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

Overall national performance was 95.1% meeting the 95% target. Only WoSCAN met the 95% target with performance ranging from 94.0% in NCA to 96.2% in WoSCAN. SCAN narrowly missed the target with 94.6%. MDTs have reviewed cases not meeting the QPI and provided feedback.

The Edinburgh MDT stated that all cases have been reviewed and 7 cases did not have performance status recorded at time of first MDT discussion. A rota for a nominated person to chair the MDT each week was implemented last year. This led to improvement of the documentation of performance status for the 2021 cohort. SCAN will continue with this practice in order to further improve the documentation of performance status for the 2022 cohort.

The Inverness Centre commented that one case was an emergency admission and performance status was not recorded at MDT.

Action Required:

- SCAN to retain a rota for a nominated person to chair the MDT each week to further improve the documentation of KPS for 2022 cohort.

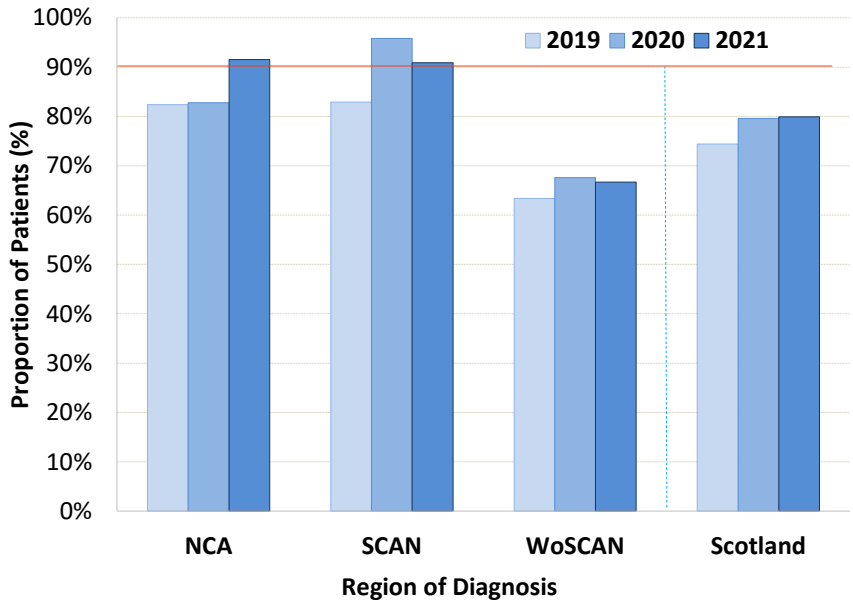
QPI 2: Multi-disciplinary Team Meeting (MDT)

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:	90%

Figure 5: Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery, 2019 – 2021



		2019	2020	2021
NCA	N	61	48	54
	D	74	58	59
	%	82.4%	82.80%	91.5%
SCAN	N	63	68	80
	D	76	71	88
	%	82.9%	95.80%	90.9%
WoS	N	71	75	84
	D	112	111	126
	%	63.4%	67.60%	66.7%
Scotland	N	195	191	218
	D	262	240	273
	%	74.4%	79.60%	79.9%

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

During the QPI formal review the decision was made to reduce the target from 95% to 90% from the 2020 cohort to account for patients that require urgent treatment.

NCA and SCAN met the 90% target with performance ranging from 66.7% in WoSCAN to 91.5% in NCA. The overall national performance was 79.9%.

The Glasgow MDT commented that all patients were discussed at the MDT. Those failing the QPI were discussed post operatively. A detailed review of cases not discussed before treatment indicated that the lack of regular scheduled theatre sessions for neurosurgical oncology resulted in surgeons having to make use of adhoc CEPOD theatre to schedule tumour cases. If regular lists had been available the majority of these cases could have been scheduled for theatre after MDT discussion, but in the interest of performing surgery in a timely manner such cases were often done on CEPOD. Furthermore 13% of the cases not meeting the QPI were carried out by Neurosurgeons without a sub-speciality interest in Neuro-oncology.

The Glasgow neurosurgical oncology team have had access to regular theatre slots since June 2022 and therefore the number of cases being performed on CEPOD should reduce going forward. In addition, the issue has been escalated within NHS GGC and a wider review of the service with the MDT is soon to be initiated, and an improvement plan will be developed. A review of the distribution of neurosurgery oncology cases amongst the consultant team will be carried out as part of this work.

Action required:

- NHS GGC to share the outcome of the review and the associated improvement plan with SANON.

QPI 3: Molecular Analysis

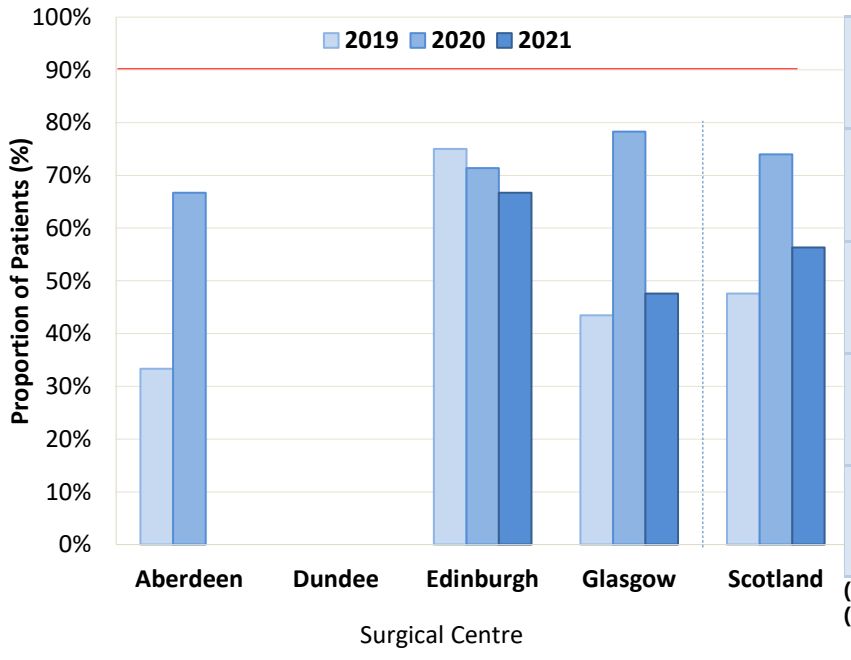
Combined loss of 1p/19q in gliomas is associated with a more favourable response to therapy (chemotherapy or radiotherapy) and is associated with considerably better prognosis when compared to tumours with intact 1p/19q. As such, where indicated, 1p/19q analysis should be carried out to help determine 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, 2019 – 2021



		2019	2020	2021
Aberdeen	N	3	4	-
	D	6	6	-
	%	33.3%	66.7%	-
Dundee	N	-	-	-
	D	-	-	-
	%	-	-	-
Edinburgh	N	6	15	14
	D	8	21	21
	%	75.0%	71.4%	66.7%
Glasgow	N	10	18	10
	D	13	23	21
	%	43.5%	78.3%	47.6%
Scotland	N	20	37	27
	D	42	50	48
	%	47.6%	74.0%	56.3%

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

No centres met the 90% target with performance ranging from 50.0% in Aberdeen and Dundee to 66.7% in Edinburgh. The overall national performance was 56.3%. 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.

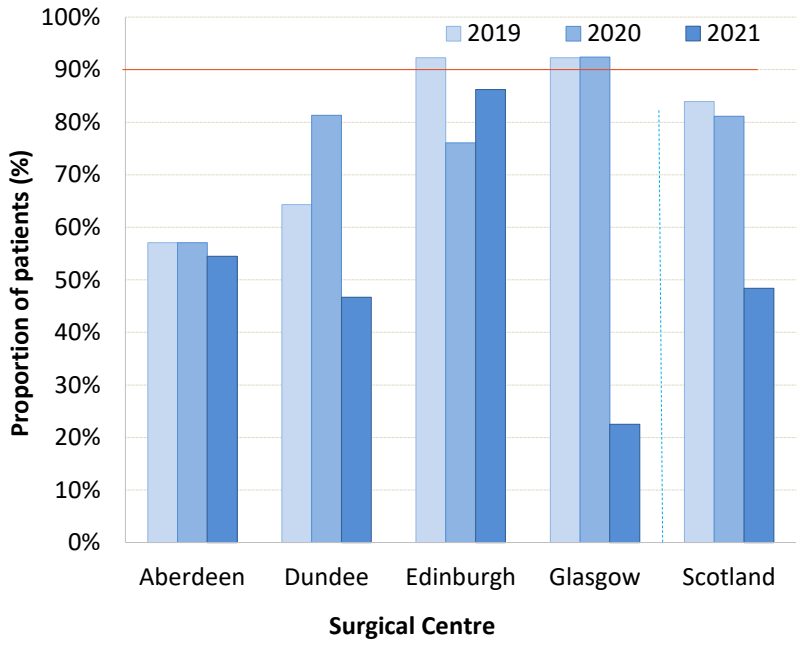
The Aberdeen and Dundee MDT reviewed the cases and clinical reasons provided included sample failing, molecular analysis not required or was undertaken just out with the 21 day period specified in the QPI.

The Edinburgh MDT commented that all cases have been reviewed and seven cases failed the target. 1p19q analysis done offsite by the Cytogenetics department and the need to use paraffin blocks and preparation time associated with that, if the fresh tissue is unavailable for analysis are the contributing factors for delays in reporting. The Centre added that Neuropathology will feed back to Cytogenetics on the requirements for these targets and clearly state requirements on request forms. Pathology will advise on correct labelling of the tissue for these pathology requests.

The Glasgow Laboratory Genetics service reviewed results in detail and noted that the decline in performance during 2021 was associated with the temporary switch to samples being processed in NHS Lothian due to the unstable assay in Glasgow. The increased transit time and increased workload on the Lothian lab (with no increase in resource), resulted in significantly poorer turnaround times. The Glasgow lab advised that there has been a steady improvement in turnaround times since the lab recommenced analysing samples with a new assay in Glasgow from March 2022. Improvements are anticipated in the next reporting cohort, however the QPI remains challenging due to resource issues within laboratory genetics and the significant expansion in somatic workload.

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, 2019 - 2021.



		2019	2020	2021
Aberdeen	N	20	16	18
	D	35	28	33
	%	57.1%	57.1%	54.5%
Dundee	N	9	13	7
	D	14	16	15
	%	64.3%	81.3%	46.7%
Edinburgh	N	48	35	56
	D	52	46	65
	%	92.3%	76.1%	86.2%
Glasgow	N	84	73	23
	D	91	79	102
	%	92.3%	92.4%	22.5%
Scotland	N	161	137	104
	D	192	169	215
	%	83.9%	81.1%	48.4%

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

The overall national performance was 48.4%. No region met the 90% target. Performance in the centres ranged from 22.5% in Glasgow to 86.2% in Edinburgh.

The Aberdeen MDT reviewed the 15 cases not meeting the QPI. MGMT was available within 5 days of the 21 day target for the majority of cases. Sampling was not possible for one case and the remaining cases had a more substantial delay of 7 to 11 days. Since testing is carried out in Edinburgh there is limited scope for improvement by the Aberdeen centre.

The Dundee Centre noted they have started a joint audit with the Aberdeen Centre to examine the sample handling process between the treatment centres and Edinburgh to identify and resolve potential delays.

Edinburgh MDT comments reflect feedback in part 1. The centre also added that digital pathology technology has been implemented and MGMT analysis can now be requested at the same time as immunohistochemistry. This led to an anticipated improvement for this year.

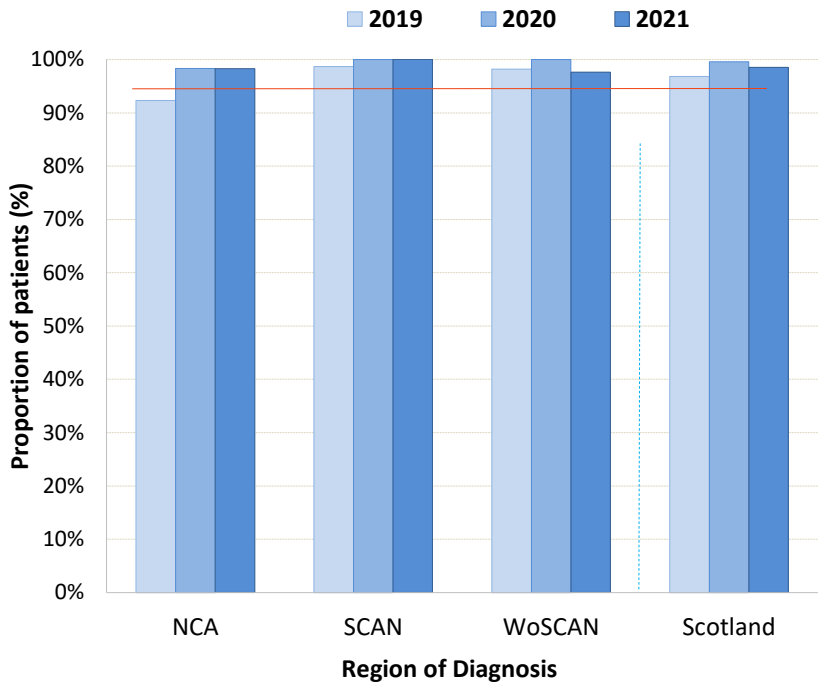
The Glasgow MDT feedback reflected the comments on part one of the QPI.

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), 2019 – 2021



		2019	2020	2021
NCA	N	60	57	58
	D	65	58	59
	%	92.3%	98.3%	98.3%
SCAN	N	75	73	90
	D	76	73	90
	%	98.7%	100.0%	100.0%
WoSCAN	N	109	111	122
	D	111	111	125
	%	98.2%	100.0%	97.6%
Scotland	N	244	241	270
	D	252	242	274
	%	96.8%	99.6%	98.5%

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

All regions met the 95% target. Performance ranged from 97.6% in WoSCAN to 100.0% in SCAN. The overall national performance was 98.5%.

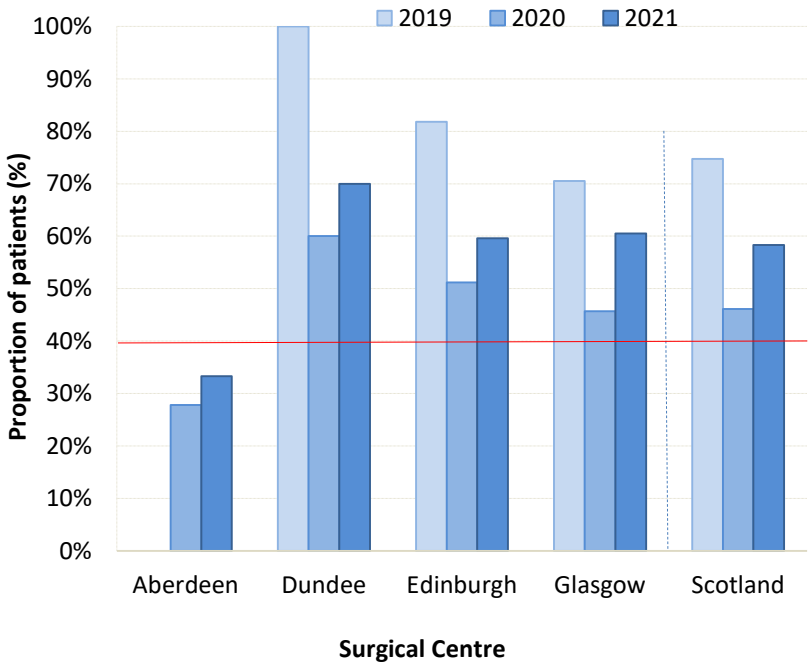
QPI 6: Maximal Surgical Resection

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.
Target:	40%

Figure 10: Proportion of patients with malignant glioma undergoing surgical resection where ≥90% reduction in tumour volume is achieved, 2019 – 2021.



		2019	2020	2021
Aberdeen	N	-	5	5
	D	-	18	15
	%	-	27.8%	33.3%
Dundee	N	5	6	7
	D	5	10	10
	%	100.0%	60.0%	70.0%
Edinburgh	N	18	22	31
	D	22	43	52
	%	81.8%	51.2%	59.6%
Glasgow	N	31	32	52
	D	44	70	86
	%	70.5%	45.7%	60.5%
Scotland	N	56	65	95
	D	75	141	163
	%	74.7%	46.1%	58.3%

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

At formal review the exclusion ‘patients in whom surgeons’ intent is partial resection / debulking surgery’ was removed. This allows for benchmarking against the 40% international standard and is easier to define and measure comparably between the 3 regions.

The Dundee, Edinburgh and Glasgow MDTs met the 40% target. Aberdeen centre did not meet the QPI with a performance of 33.3%. The overall national performance was 58.3% meeting the 40% target.

The Aberdeen MDT reviewed the ten failed cases and commented that 90% resection was not achievable without major neurological deficit in 9 cases. Further tumour resection was possible in one case but overall volume resected fell just under 90%. The Centre noted that they will continue to aim for maximal safe resection where possible.

Action required:

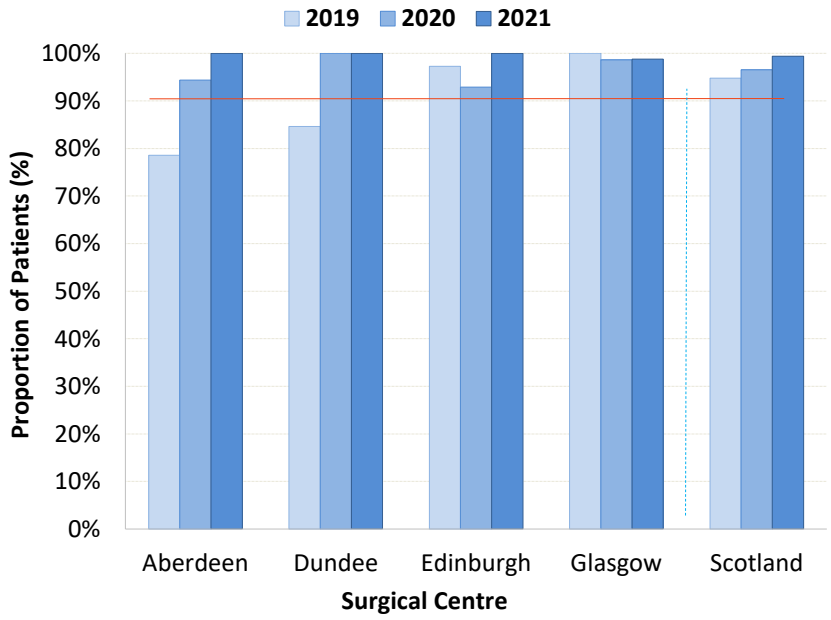
- SANON to liaise with the Neurosurgical team in Aberdeen and to support sub-specialisation of Neuro-oncology cases, which may improve resection rates and help Aberdeen meet the QPI requirements.

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, 2019- 2021.



		2019	2020	2021
Aberdeen	N	22	17	15
	D	28	18	15
	%	78.6%	94.4%	100.0%
Dundee	N	11	11	9
	D	13	11	9
	%	84.6%	100.0%	100.0%
Edinburgh	N	36	39	52
	D	37	42	52
	%	97.3%	92.9%	100.0%
Glasgow	N	94	69	85
	D	94	70	86
	%	100.0%	98.6%	98.8%
Scotland	N	163	136	161
	D	172	141	162
	%	94.8%	96.5%	99.4%

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

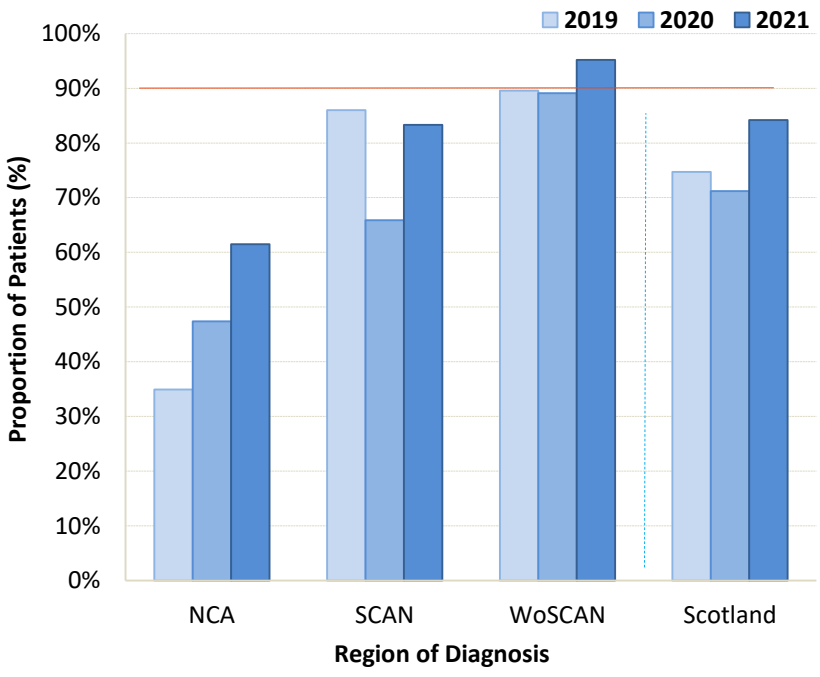
All regions met the 95% target with Aberdeen, Dundee and Edinburgh centres achieving 100%. The overall national performance was 99.4%.

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:	90%

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, 2019 – 2021.



		2019	2020	2021
NCA	N	15	18	24
	D	43	38	39
	%	34.9%	47.4%	61.5%
SCAN	N	43	29	50
	D	50	44	60
	%	86.0%	65.9%	83.3%
WoSCAN	N	69	57	80
	D	77	64	84
	%	89.6%	89.1%	95.2%
Scotland	N	127	104	154
	D	170	146	183
	%	74.7%	71.2%	84.2%

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

The target reduced to 90% from the 2020 cohort to account for patients who are clinically unfit post-operatively for oncological treatment.

The overall performance was 84.2%, with all the Regions showing improvement from the previous year**.** However, all regions except WoSCAN failed to meet the 90% target. Performance ranged from 61.5%

in NCA to 95.2% in WoSCAN. MDTs have reviewed cases not meeting the target and provided feedback.

The Aberdeen, Inverness and Dundee Centres reviewed cases and provided detailed clinical feedback. Factors such as delay in receiving pathology results, staffing availability, radiotherapy planning capacity as well as patient related factors all impacted on timelines for adjuvant treatment. It is anticipated that improvements in timelines for pathology reporting and new radiotherapy planning facilities in ARI will all contribute to improvements against this performance indicator.

The Aberdeen and Dundee Centres highlighted that this QPI is also affected as they have only one neuro-oncologist with no cross cover for leave. In NCA the single-handed Oncologists are been reviewed as part of the Getting It Right For the North initiative.

The Edinburgh MDT commented that in the majority of cases the factor for delay was the day of the week when surgeries were performed when rescheduling of the MDM from Friday to Wednesday added two days to pathways for patients operated on Thursdays and Fridays. The Centre added that going forward Oncology will make a priority list based on surgery dates/ biological priority and liaise with the pathology department with regard to pathology reports being ready for MDM discussion.

Action Required:

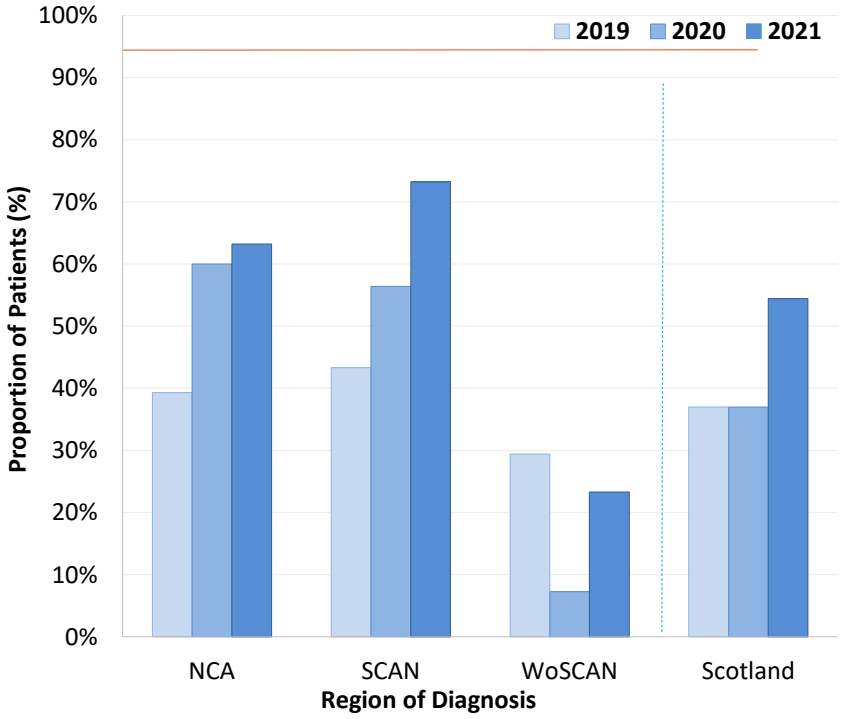
- In SCAN the Oncology team to make a priority list based on surgery dates/ biological priority and liaise with the pathology department with regard to pathology reports being ready for the MDM discussion.
- SANON to liaise with Oncology team in Aberdeen and Dundee to explore their resource needs and how to improve access to radiotherapy when the sole Neuro-oncology Consultant is on annual or study leave.

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, 2019- 2021.



		2019	2020	2021
NCA	N	11	12	12
	D	28	20	19
	%	39.3%	60.0%	63.2%
SCAN	N	13	22	30
	D	30	39	41
	%	43.3%	56.4%	73.2%
WoSCAN	N	10	3	7
	D	34	41	30
	%	29.4%	7.3%	23.3%
Scotland	N	34	37	49
	D	92	100	90
	%	37.0%	37.0%	54.4%

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

No Regions met the 95% target. Performance ranged from 23.3% in WoSCAN to 73.2% in SCAN. The overall national performance was 54.4%.

The Aberdeen MDT reviewed six cases and noted that access to relevant documentation had prevented neurology contact being recorded for QPI analysis in a small number of cases. The remaining cases were managed with single agent anti-convulsants by the treating neurosurgeon with good seizure control. The Centre added that they will continue to work to improve referral to the ESN team however waiting list pressures make this QPI challenging to meet.

The Inverness Centre commented that Neurology capacity continues to be affected due to COVID-19.

The Edinburgh MDT commented that the majority of cases were seen by an ESN however this was out with the timeframe specified within the QPI. A small number of cases were not seen due to patients dying shortly after diagnosis or ESN unable to make contact with the patients by telephone.

SCAN added that the majority of patients are now having phone consultations. The ECNO CNSs have a formal referral template for the ESN service in order to give advance notice and identify patients with complex issues. The ESNs will continue to provide a very supportive service to the patients and families. SCAN may have difficulty maintaining this QPI performance given the loss of resource with no plans for replacement.

The Glasgow MDT reported that given the limited resource, it is challenging to offer reviews on all patients presenting with brain cancer and seizures. Glasgow stated that they have plans to develop resource with Epilepsy Neurology Consultants and Epilepsy Nurses.

Action:

- Glasgow to develop resource with Epilepsy Neurology Consultants and Epilepsy Nurses to ensure the longer term sustainability of the service.

- SANON will carry out an audit of neurology and epilepsy specialist nurses in each NHS Board to better understand the current capacity challenges.

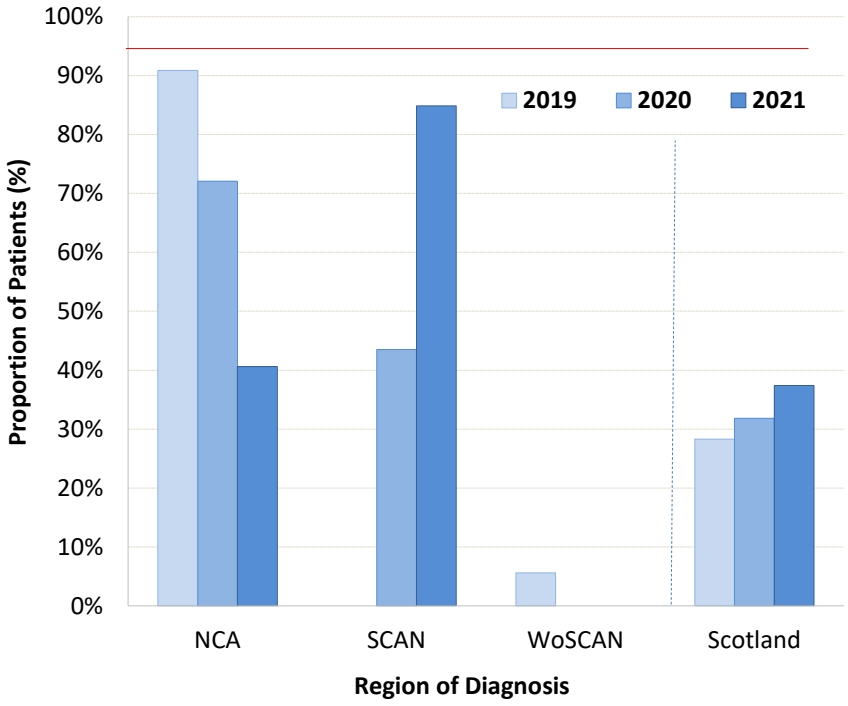
QPI 12: Key Worker

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, 2019 – 2021.



		2019	2020	2021
NCA	N	70	44	26
	D	77	61	64
	%	90.9%	72.1%	40.6%
SCAN	N	0	37	79
	D	84	85	93
	%	0.0%	43.5%	84.9%
WoSCAN	N	6	0	0
	D	108	109	124
	%	5.6%	0.0%	0.0%
Scotland	N	76	81	105
	D	269	255	281
	%	28.3%	31.8%	37.4%

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

No centres met the 95% target with performance ranging from 0.0% in WoSCAN to 72.10% in NCA. The overall national performance was 31.8%.

The Aberdeen MDT commented that the specialist Nurse has had input with all patients however a technical problem prevented this from being documented. This has been addressed and improvements in documentation anticipated.

The Inverness MDT commented that resource issues had impacted on the documentation of key worker contact on MDT forms. This will be addressed going forward.

The Glasgow MDT commented that assignment of the relevant key worker is dependent on the individual outcome and treatment decision at the MDT. Work is ongoing to improve the documentation in relation to key workers and improvement is anticipated going forward. The Centre added that a new Clinical Oncology Nurse has been employed at the Institute of Neuro Sciences with a proposal to recruit a second Nurse Practitioner in the future in order to have a sustainable service with appropriate allocations.

The Edinburgh MDT noted that a new tick box was added to MDM forms to record the Key worker at the time of the MDM which led to significant improvement of the identification of a key worker for the 2021 cohort. All of SCAN patients have an identified key worker even if not documented at the time of the first MDM. The centre added that they will continue to ensure that key worker is consistently recorded for all eligible patients at the time of MDT discussion.

Action Required:

- The Aberdeen and Inverness Centre to address documentation issues.
- NHS GGC to confirm plans to recruit additional resource to support this service and ensure that MDT proforma is updated and populated at the MDT.

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) Chemoradiotherapy (iii) Radiotherapy
Exclusions:	No exclusions
Target:	<5%

Table 5: Proportion of patients with brain/CNS cancer who die within 30 days of surgery, 2019 – 2021.

	Aberdeen			Dundee			Edinburgh			Glasgow			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%	N	D	%
2019	2	46	4.3%	0	26	0.0	1	70	1.4%	3	127	2.4%	6	269	2.2%
2020	2	38	5.3%	0	17	0.0%	4	74	5.4%	1	113	0.9%	7	242	2.9%
2021	2	41	4.9%	1	17	5.9%	8	89	9.0%	3	131	2.3%	14	278	5.0%

Overall national performance was noted as 5.0%, narrowly missing the target, with performance ranging from 2.3% in Glasgow to 9.0% in Edinburgh.

Edinburgh MDT reviewed all cases and stated that central location and size of tumour, rapid deterioration and low KPS are noted as contributing factors for not meeting the QPI. The Centre added that it is not unreasonable to offer biopsy to younger patients who understand the risk. To allow appropriate patient selection SCAN will look at independent prognostic factors and make decisions based on that. With small numbers that can generate disproportionate percentages and the aggressive nature of these tumours results are expected to fluctuate.

The Dundee Centre provided detailed feedback for the single patient not meeting the target.

Table 6: Proportion of patients with brain/CNS cancer who die within 30 days of chemoradiotherapy, 2019 – 2021.

	NCA			SCAN			WoSCAN			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%
2019	0	24	0.0%	1	38	2.6%	2	57	3.5%	3	119	2.5%
2020	0	30	0.0%	1	23	4.3%	0	43	0.0%	1	96	1.0%
2021	1	26	3.8%	1	39	2.6%	4	69	5.8%	6	134	4.5%

The overall national performance was 4.5%. All Regions except WoSCAN were within the <5% target, with performance ranging from 2.6% in SCAN to 5.8% in WoSCAN.

The Glasgow Centre reviewed cases and provided details of clinical factors that had contributed to the four deaths within 30 days of chemoradiotherapy.

The Aberdeen centre clinically reviewed the single case not meeting the QPI criteria. The Centre stated that the case appears to be completely unrelated to the neuro-oncology treatment.

Table 7: Proportion of patients with brain/CNS cancer who die within 30 days of radiotherapy, 2019 – 2021.

	NCA			SCAN			WoSCAN			Scotland		
	N	D	%	N	D	%	N	D	%	N	D	%
2019	2	21	9.5%	3	32	9.4%	2	26	7.7%	7	79	8.9%
2020	0	14	0.0%	2	48	4.2%	1	32	3.1%	3	94	3.2%
2021	1	13	7.7%	6	42	14.3%	1	27	3.7%	8	82	9.8%

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

Overall national performance was 9.8%, failing to meet the <5% target. Only WoSCAN met the target with performance ranging from 3.7% in WoSCAN to 14.3% in SCAN.

The Inverness centre reviewed and provided detailed feedback on the case not meeting the QPI criteria.

The Edinburgh Centre clinically reviewed the 6 cases and commented that two patients died of disease progression and four patients died of complications of GBM. The Centre stated that all were appropriately treated and death was not treatment related.

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].

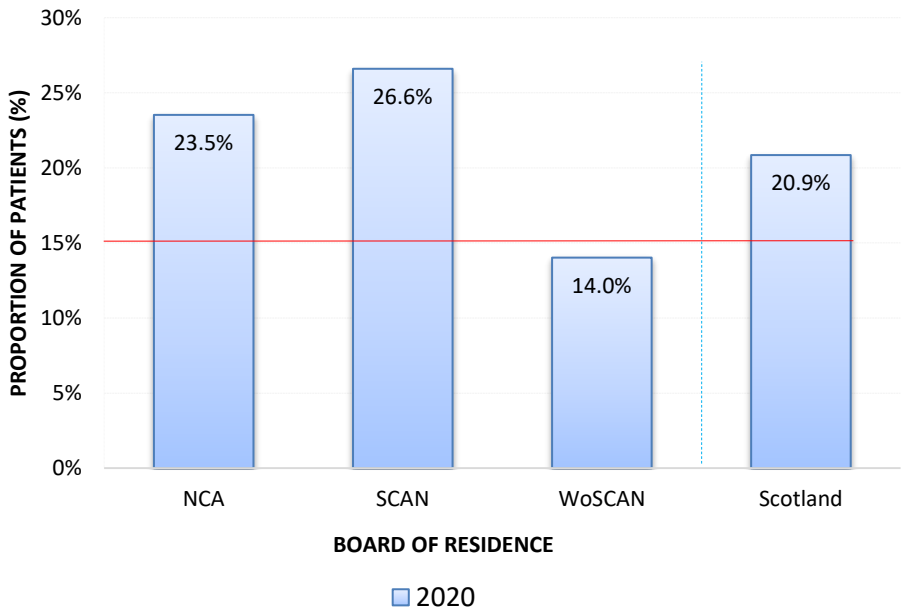
Clinicians are therefore encouraged to enter patients into well designed trials and to collect longer term follow up data. High accrual activity into clinical trials is used as a goal of an exemplary clinical research site.

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 PHS 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, 2020



Target 15%	Consented		
	N	D	%
NCA	28	119	23.5%
SCAN	37	139	26.6%
WoSCAN	23	164	14.0%
Scotland	**88**	**422**	**20.9%**

Access to clinical trials will continue to be monitored via other national reporting systems and will no longer be reported within the QPI process going forward.

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
KPS	Karnofsky Performance Status
MCN	Managed Clinical Network
MDT	Multidisciplinary Team
MGMT	O6-methylguanine-DNA methyltransferase
MRI	Magnetic Resonance Imaging
NCA	North Cancer Alliance
NCQSG	National Cancer Quality Steering Group
NMCN	National Managed Clinical Network
PHS	Public Health Scotland
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

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

8. ScotPHO, Public Health Information for Scotland. Mid 2021 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-2021

9. Copyright

Appendix 1: Meta Data

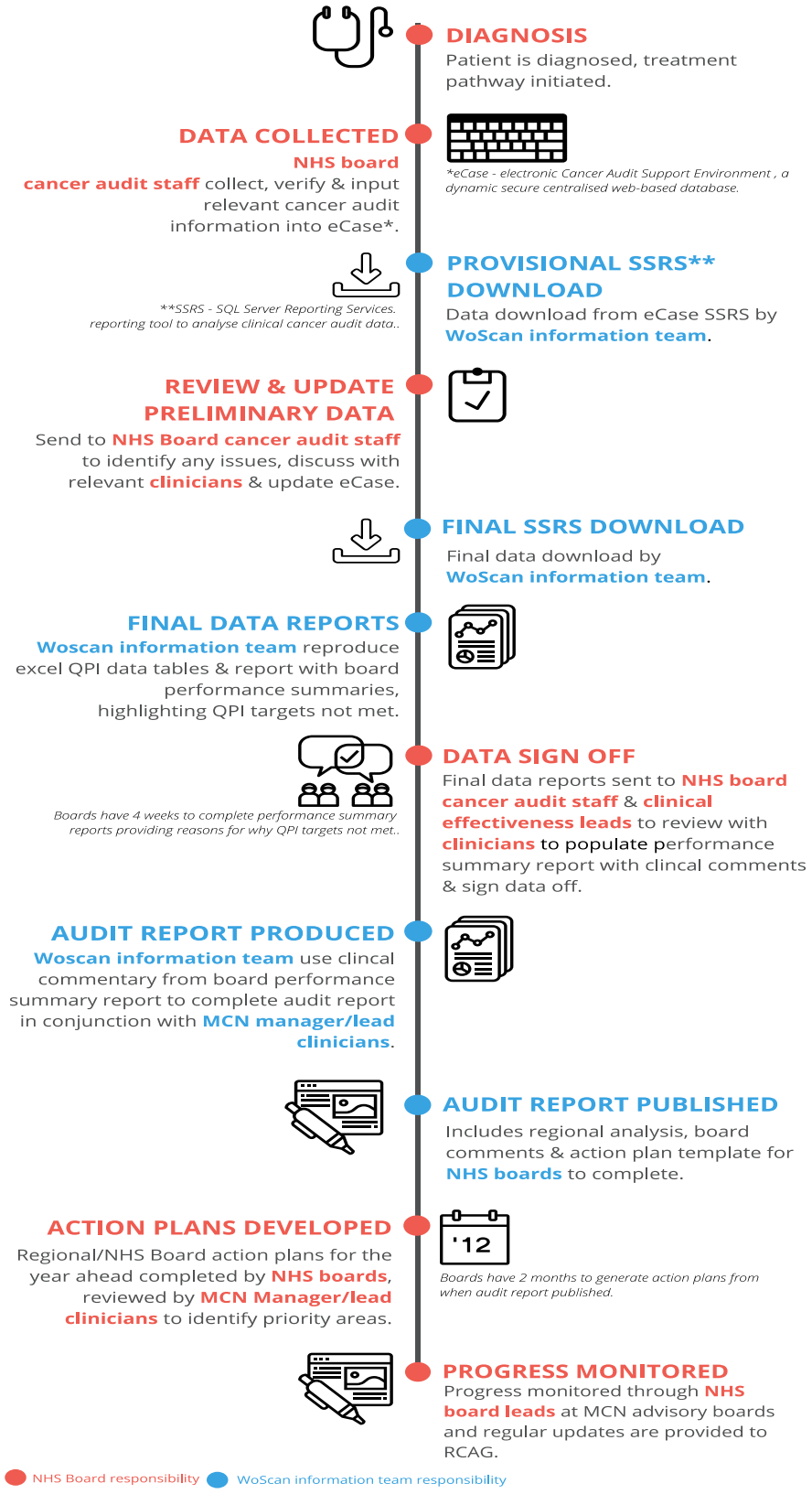
<table>
<tr><td>Report Title</td><td>Cancer Audit Report: Brain and Central Nervous System Cancers Quality Performance Indicators</td></tr>
<tr><td>Time Period</td><td>Patients diagnosed between 01 January 2021 to 31 December 2021</td></tr>
<tr><td>Data Source</td><td>Cancer Audit Support Environment (eCASE). A secure centralised web-based database which holds cancer audit information in Scotland.</td></tr>
<tr><td>Data extraction date</td><td>The data contained within this report was extracted from eCASE at 2200 hrs on 16/05/2022.</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 PHS,), 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>100</td><td>135</td><td>156</td><td>391</td></tr>
<tr><td>Cases from PHS (2016-2020)*</td><td>119</td><td>139</td><td>164</td><td>422</td></tr>
<tr><td>Case ascertainment</td><td>84.0%</td><td>97.1%</td><td>95.1%</td><td>92.7%</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 - Glasgow

1st January - 31st December 2021

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 2: Multi-disciplinary Team Meeting (MDT)	NHS GGC to share the outcome of the review and the associated improvement plan with SANON.						
QPI 11: Seizure Management:	Glasgow to develop resource with Epilepsy Neurology Consultants and Epilepsy Nurses to ensure the longer term sustainability of the service.						
QPI 12: Key Worker	NHS GGC to confirm plans to recruit additional resource to support this service and ensure that MDT proforma is updated and populated at the MDT.						

Action / Improvement Plan - Edinburgh

1st January - 31st December 2021

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	To retain a rota for a nominated person to chair the MDT each week to further improve the documentation of KPS for 2022 cohort.						
QPI 9: Access to Adjuvant Treatment	The Oncology team to make a priority list based on surgery dates/ biological priority and liaise with the pathology department with regard to pathology reports being ready for the MDM discussion.						

Action / Improvement Plan - Aberdeen

1st January - 31st December 2021

Area:	**Aberdeen 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 12: Key Worker	The Aberdeen Centre to address the recording of the QPI on the database and with MDT co-ordinators.						

Action / Improvement Plan - SANON

1st January - 31st December 2021

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 6: Maximal surgical Resection	SANON to liaise with the Neurosurgical team in Aberdeen and to support sub-specialisation of Neuro-oncology cases, which may improve resection rates and help Aberdeen meet the QPI requirements.						
QPI 9: Access to adjuvant treatment	SANON to liaise with Oncology team in Aberdeen and Dundee to explore their resource needs and how to improve access to radiotherapy when the sole Neuro-oncology Consultant is on annual or study leave.						

QPI No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
QPI 11: Seizure Management	SANON will carry out an audit of neurology and epilepsy specialist nurses in each NHS Board to better understand the current capacity challenges.						