

Audit Report

Sarcoma Quality Performance Indicators

**Clinical Audit Data:
01 April 2021 to 31 March 2022**

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Sarcoma QPI Overview

Patients diagnosed April 2021 - March 2022

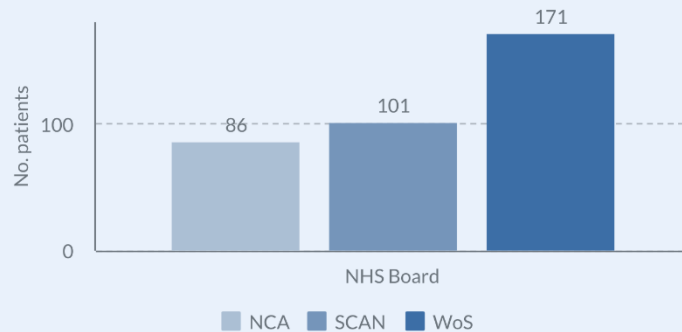
Number of patients **358**

Gender of Patients:

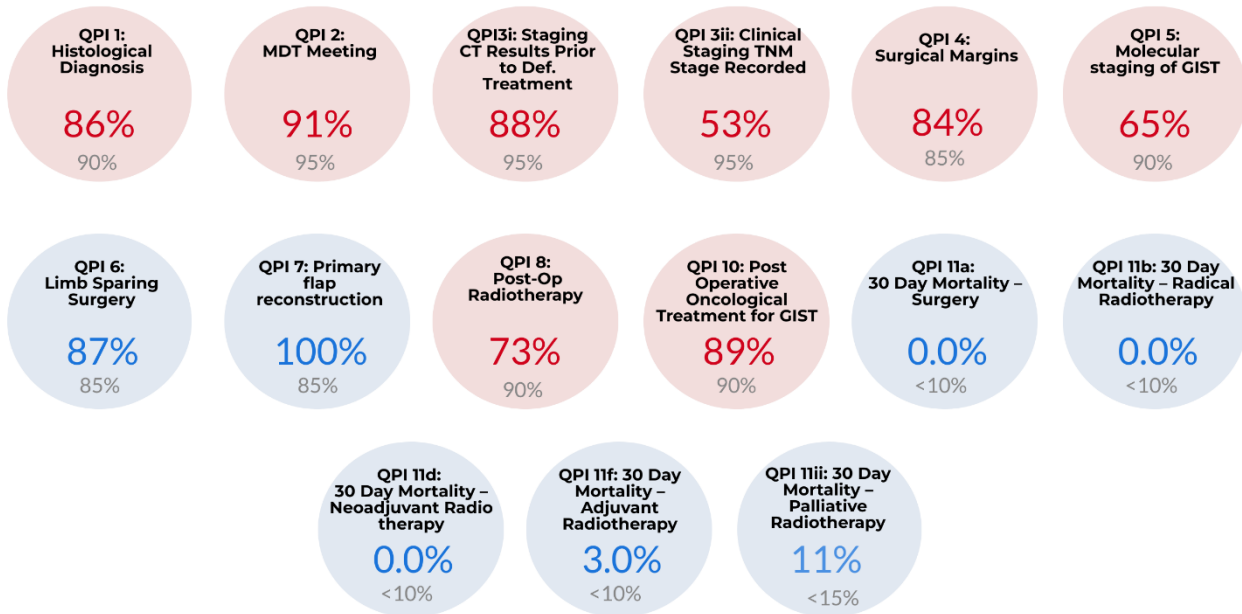
Male **51.4%**
Female **48.6%**

Median Age of Patients: **64**

Where are patients diagnosed



Scotland Performance (%)



Key Achievements:

8 of the 19 sarcoma QPI targets were met by all regional networks. QPI results indicate that the quality of sarcoma services across Scotland is good with all regions achieving targets for primary flap reconstruction, multi-agent chemotherapy for osteosarcoma and Ewings sarcoma and 30 day mortality following curative treatment.



Areas for Improvement:

QPI 3(ii) - Extremity soft tissue sarcoma is staged using the TNM staging system. A decline in performance was noted from 67% in 20/21 to 53% in 21/22.

QPI 5 - Patients with GISTs who have mutational analysis within 3 months of diagnosis. Performance across Scotland was 64.9% against the 90% target.



Executive Summary

Introduction

This report contains an assessment of the performance of Scotland wide sarcoma services using clinical audit data relating to patients diagnosed with sarcoma in the twelve months between 1st April 2021 and 31st March 2022.

Results

A summary of the sarcoma QPI performance for the 2021/22 audit period is presented below, with a more detailed analysis of the results set out in the main report. Data are analysed by location of diagnosis or treatment, and illustrate NHS Board or treatment-centre performance against each target and overall national performance for each performance indicator.

National - Performance Summary Report

Colour Key	
	Above QPI target
	Below QPI target

Quality Performance Indicator (QPI)	Performance by NHS Board					
	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
QPI 1 – Histological Diagnosis Proportion of patients with extremity sarcoma who have a histological diagnosis before undergoing a planned surgical resection.	90%	2021/22	67% (14/21)	100% (24/24)	89% (32/36)	86% (70/81)
		2020/21	93%	83%	97%	93%
		2019/20	86%	74%	96%	86%
QPI 2 – Multi-Disciplinary Team (MDT) Meeting Proportion of patients with extremity sarcoma who are discussed at a MDT meeting before definitive treatment.	95%	2021/22	78% (18/23)	100% (30/30)	91% (41/45)	91% (89/98)
		2020/21	94%	82%	93%	91%
		2019/20	87%	77%	96%	87%
QPI 3(i) – Clinical Staging Proportion of patients with extremity soft tissue who undergo staging CT where the results are available prior to definitive treatment.	95%	2021/22	79% (15/19)	83% (19/23)	97% (34/35)	88% (68/77)
		2020/21	91%	83%	97%	92%
		2019/20	87%	80%	84%	83%
QPI 3(ii) – Clinical Staging Proportion of patients whose extremity soft tissue sarcoma is staged using the TNM staging system.	95%	2021/22	68% (13/19)	35% (8/23)	57% (20/35)	53% (41/77)
		2020/21	46%	44%	87%	67%
		2019/20	67%	55%	92%	73%
QPI 4 – Surgical Margins (Hospital of Surgery) Proportion of patients with extremity sarcoma, who undergo surgical resection where R0* resection is achieved.	85%	2021/22	89% (16/18)	70% (16/23)	90% (36/40)	84% (68/81)
		2020/21	80%	89%	97%	91%
		2019/20	89%	91%	96%	92%
QPI 5 – Molecular Staging of GIST Proportion of patients with GISTs who have mutational analysis within 3months of diagnosis.	90%	2021/22	73% (8/11)	63% (5/8)	61% (11/18)	65% (24/37)
		2020/21	50%	80%	93%	78%
		2019/20	89%	79%	55%	70%

Quality Performance Indicator (QPI)	Performance by NHS Board					
	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
QPI 6 – Limb Sparing Surgery Proportion of patients with extremity sarcoma who undergo a primary limb-sparing surgery.	85%	2021/22	95% (18/19)	96% (22/23)	79% (34/43)	87% (74/85)
		2020/21	80%	95%	83%	85%
		2019/20	84%	88%	96%	90%
QPI 7 – Primary Flap Reconstruction Proportion of patients with extremity sarcoma who undergo successful primary flap reconstruction following surgical resection.	85%	2021/22	-	-	100% (25/25)	100% (31/31)
		2020/21	100%	-	100%	100%
		2019/20	-	-	100%	100%
QPI 8 – Post Operative Radiotherapy Proportion of patients with an extremity sarcoma who receive post operative radiotherapy within 3 months of surgery.	90%	2021/22	-	75% (6/8)	80% (4/5)	73% (11/15)
		2020/21	40%	83%	100%	78%
		2019/20	-	-	71%	57%
QPI 9(i) – Multi-Agent Chemotherapy for Osteosarcoma Proportion of patients with osteosarcoma who receive multi-agent chemotherapy.	90%	2021/22	n/a	-	-	-
		2020/21	-	n/a	-	-
		2019/20	-	n/a	60%	71%
QPI 9(ii) – Multi-Agent Chemotherapy for Ewings sarcoma Proportion of patients with ewings sarcoma who receive multi-agent chemotherapy.	90%	2021/22	-	n/a	-	-
		2020/21	n/a	-	-	-
		2019/20	-	n/a	-	-
QPI 10(i) – Post Operative Oncological Treatment for GIST Proportion of patients with high risk GIST who commence post operative imatinib.	90%	2021/22	-	-	-	89% (8/9)
		2020/21	-	-	89%	87%
		2019/20	100%	-	100%	100%
QPI 10(ii) – Post Operative Oncological Treatment for GIST Proportion of patients with high risk GIST who commence post operative imatinib within 3 months of surgery.	90%	2021/22	-	-	-	-
		2020/21	-	-	100%	100%
		2019/20	100%	100%	86%	93%
QPI 11a – 30 Day Mortality – Surgery Proportion of patients with sarcoma who undergo surgical resection who die within 30 days of surgical treatment.	<10%	2021/22	0% (0/33)	-	0% (0/137)	0% (0/173)
		2020/21	0%	0%	2%	1%
		2019/20	0%	0%	0%	0%

Quality Performance Indicator (QPI)	Performance by NHS Board					
	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
QPI 11b – 30 Day Mortality – Radical Radiotherapy Proportion of patients with sarcoma who undergo radical radiotherapy with curative intent who die within 30 days of treatment.	<10%	2021/22	-	-	-	0% (0/5)
		2020/21	-	-	-	0%
		2019/20	-	-	-	0%
QPI 11d – 30 Day Mortality – Neo-adjuvant Radiotherapy Proportion of patients with sarcoma who undergo neo-adjuvant radiotherapy with curative intent who die within 30 days.	<10%	2021/22	-	-	0% (0/12)	0% (0/17)
		2020/21	-	-	0%	0%
		2019/20	-	0%	0%	0%
QPI 11f – 30 Day Mortality – Adjuvant Radiotherapy Proportion of patients with sarcoma who undergo adjuvant radiotherapy with curative intent who die within 30 days	<10%	2021/22	0% (0/6)	0% (0/10)	0% (0/10)	0% (0/26)
		2020/21	0%	0%	0%	0%
		2019/20	0%	0%	6%	3%
QPI 11g – 30 Day Mortality – Chemoradiotherapy Proportion of patients with sarcoma who undergo biological therapy with curative intent who die within 30 days.	<10%	2021/22	-	n/a	n/a	-
		2020/21	0%	n/a	n/a	0%
		2019/20	n/a	n/a	n/a	n/a
QPI 11h – 30 Day Mortality – Biological Therapy Proportion of patients with sarcoma who undergo biological therapy with curative intent who die within 30 days.	<10%	2021/22	17% (1/6)	-	11% (1/9)	11% (2/19)
		2020/21	-	0%	0%	0%
		2019/20	-	0%	0%	0%
QPI 11(ii)a – 30 Day Mortality – Palliative Radiotherapy Proportion of patients with sarcoma who undergo palliative radiotherapy die within 30 days of treatment.	<15%	2021/22	0% (1/5)	9% (1/11)	9% (1/11)	11% (3/27)
		2020/21	-	20%	13%	13%
		2019/20	-	33%	17%	24%

**Small numbers in some Boards/Regions - percentage comparisons over a single year should be viewed with caution.
(-) dash denotes a denominator of less than 5. Figures have been removed to ensure confidentiality.*

Conclusions and Action Required

Cancer audit data underpins much of the development and service improvement work of the NMCN and regular reporting of activity and performance is a fundamental requirement of an MCN to assure the quality of care delivered. The Scottish Sarcoma Network (SSN) remains committed to improve the quality and completeness of clinical audit data to ensure continued robust performance assessment and the identification of areas for service improvement.

It is evident that many of the QPI targets set have been challenging for centres to achieve and a number of areas for improvement have been highlighted. It should however be noted that given the rarity of sarcoma, numbers included within the measurement of the majority of indicators are small and therefore percentages should be compared with caution.

Data capture has improved which provides a good foundation from which to measure service improvement. All regions met QPI targets for primary flap reconstruction, multi agent chemotherapy for Ewing's sarcoma and 30 day mortality following curative treatment.

Some variance in performance does exist across the regions and, as per the agreed Regional governance process, each NHS Board was asked to complete a Performance Summary Report, providing a documented response where performance was below the QPI target. NHS Boards provided detailed comments indicating valid clinical reasons, or in some cases patient choice or co-morbidities, have influenced patient management. Remaining actions are summarised below and are outlined in the main report under the relevant section.

Action required:

QPI 1 – Histological Diagnosis

- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

QPI 2 – Multidisciplinary Team Meeting

- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

QPI 3(i) – Clinical Staging

- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

QPI 3(ii) – Clinical Staging

- NHS Grampian and NHS Tayside to provide detailed feedback on patients not meeting the QPI.
- SCAN and WoSCAN to examine the detailed data to establish which elements of TNM are not being captured and verify if this is an audit data capture issue rather than an issue with clinical practice or MDT documentation

QPI 5 – Molecular Staging of Gastrointestinal Stromal Tumour

- NHS Grampian and NHS Highland to provide detailed feedback on patients not meeting the QPI.
- NHSGGC to provide clarification with regards to reasons for test failure, establish if there was an issue with the test process and confirm if this is resolved.

Completed Action Plans should be returned to WoSCAN in a timely manner to allow the plans to be reviewed at the Regional Cancer Oversight Group.

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

1. Introduction

This report contains an assessment of the performance of Scotland wide sarcoma services using clinical audit data relating to patients diagnosed with sarcoma between 1st April 2021 and 31st March 2022. These audit data underpin much of the regional development/service improvement work of the National Managed Clinical Network (NMCN) and regular reporting of activity and performance is a fundamental requirement of a NMCN to assure the quality of care delivered across the three regions.

Twelve months of data were measured against v3.0 of the sarcoma quality performance indicators (QPIs) which were implemented for patients diagnosed on or after 01 April 2017. This was the eighth consecutive year of analysis following the initial Healthcare Improvement Scotland (HIS) publication of sarcoma QPIs in 2014.

2. Background

Sarcomas are a rare group of cancers that arise from connective tissue, including: bone, cartilage, muscle, blood vessels, nerves and fat which are broadly divided into bone, soft tissue and gastrointestinal stromal tumour (GIST). In 2021/22 the audit identified 358 patients diagnosed with a new primary invasive sarcoma in Scotland.

Sarcomas account for around 1% of all new cancer diagnoses in the UK⁵. In Scotland bone and connective tissue cancers are ranked 24th most common cancer, accounting for only 0.6% of all cancers diagnosed in 2020³. The incidence of bone and connective tissue has decreased in males by 20.6% over the last decade but has risen by 9.3% in females. Bone and connective cancer was ranked as the twentieth most common cause of death from cancer in 2020, and the 10-year percentage change in mortality rates show increases of 6.3% and 10.7% for males and females respectively.

The most common site of sarcoma is the extremities which provides the focus for the majority of QPI data analysis.

The table below details the five centres carrying out sarcoma treatment in Scotland. These are considered the centres for specialist treatment, which includes surgery, systemic anti-cancer therapy (SACT) and radiotherapy. Patients may receive diagnostic and palliative care in their local hospital where appropriate; however the majority of patients are referred to one of the five centres for specialist management.

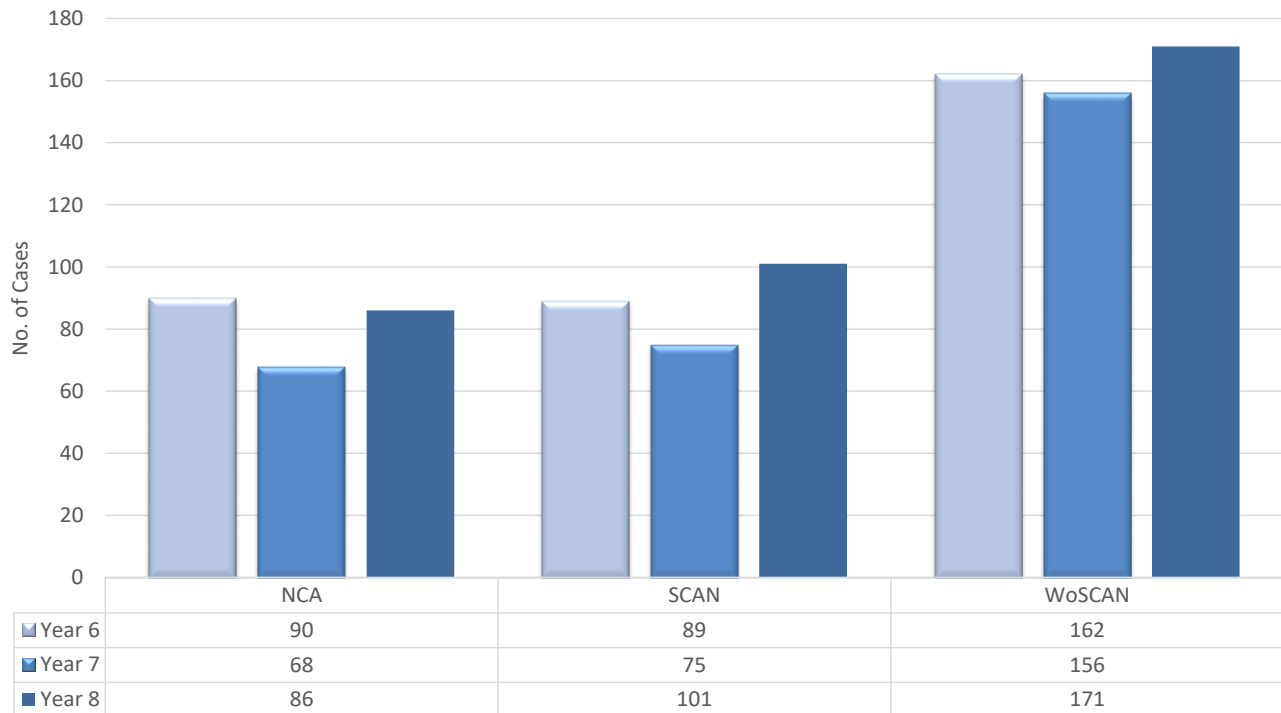
Table 1: Sarcoma treatment centres.

Centre	Constituent Hospital(s)
Aberdeen	Aberdeen Royal Infirmary (ARI), Royal Aberdeen Children's Hospital (RACH), Woodend Hospital
Dundee	Ninewells Hospital (NWH)
Edinburgh	Surgery: Royal Infirmary of Edinburgh (RIE) Oncology: Western General Hospital (WGH) Royal Hospital for Sick Children (RHSC)
Glasgow	Surgery: Gartnavel General Hospital (GGH); Queen Elizabeth University Hospital (QEUH); Glasgow Royal Infirmary (GRI); and Golden Jubilee National Hospital (GJNH) Royal Hospital for Children (RHC) Oncology: Beatson West of Scotland Cancer Centre (BWoSCC)
Inverness	Raigmore Hospital

2.1 National Context

A total of 358 cases of sarcoma were recorded through audit as diagnosed in Scotland between 01 April 2021 and 31 March 2022. The number of patients diagnosed within each NHS Region is presented in Figure 1.

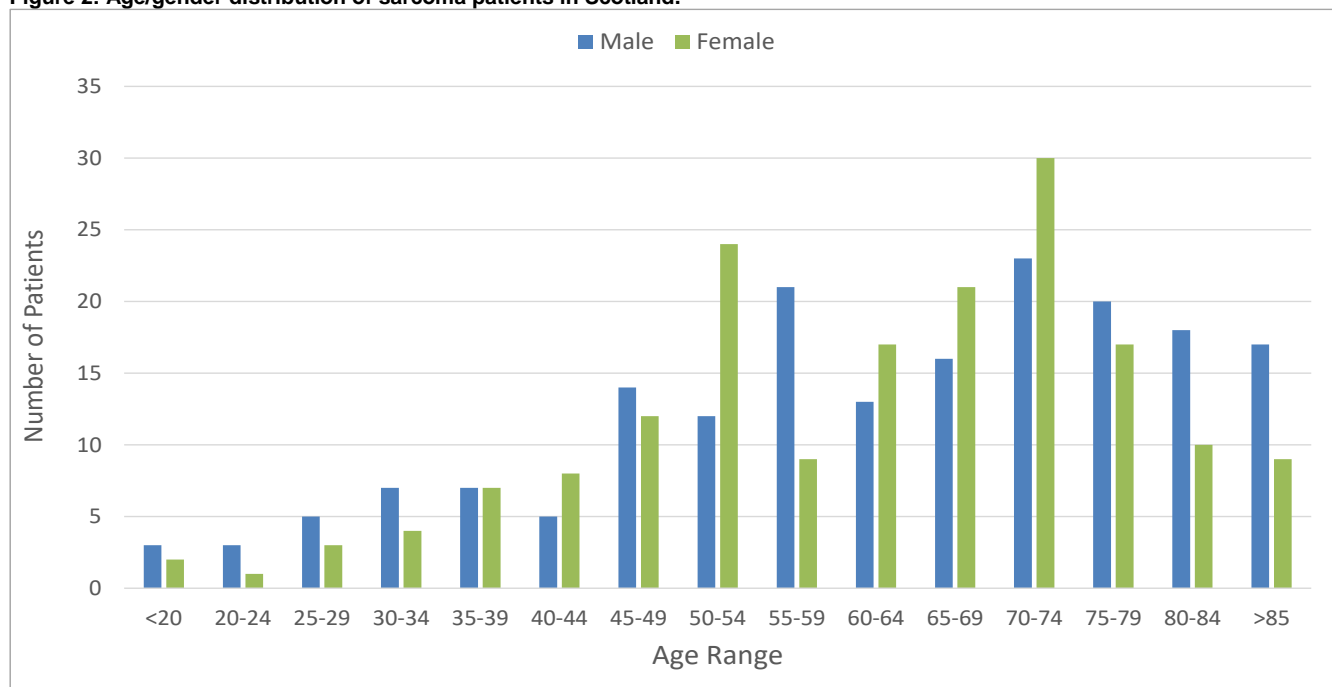
Figure 1: Number of patients diagnosed with sarcoma by NHS Region of diagnosis.



2.2 Age and Gender Distribution

Figure 2 illustrates the distribution of sarcoma cases by age group and gender. In Year 8 occurrence of sarcoma is slightly higher in males (51.4% of cases) than in females (48.6% of cases). 77.4% of cases diagnosed in Year 8 were in patients aged over 50 years.

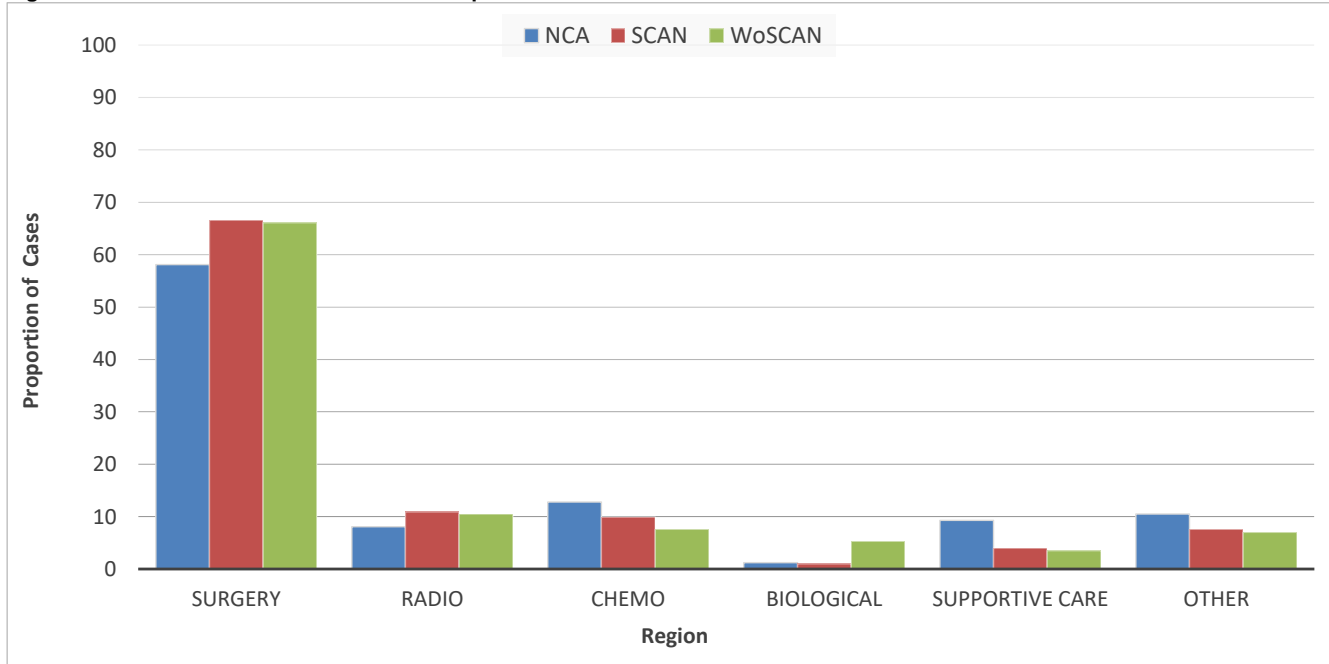
Figure 2: Age/gender distribution of sarcoma patients in Scotland.



2.3 Mode of First Treatment

Figure 3 shows the distribution of first treatment for patients diagnosed with sarcoma. In all three regions the majority of sarcoma patients received surgery as their first treatment.

Figure 3: Mode of First Treatment of sarcoma patients in Scotland.



The other category includes chemoradiotherapy (0.8%), endoscopic (1.7%), watch and wait (3.1%) Patient died before treatment (1.1%), Patient declined treatment (1.1%) and treatment not recorded (0.3%).

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

4.1 Performance against Quality Performance Indicators

Results of the analysis of sarcoma QPIs 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 at a national or regional level both graphically and in table format. Centre level data has been reviewed by local teams however given the small numbers involved it has not been presented at this level. Aggregated centre level data is also presented to allow a more robust assessment of performance'. Specific regional and national actions have been identified to address issues highlighted through the data analysis.

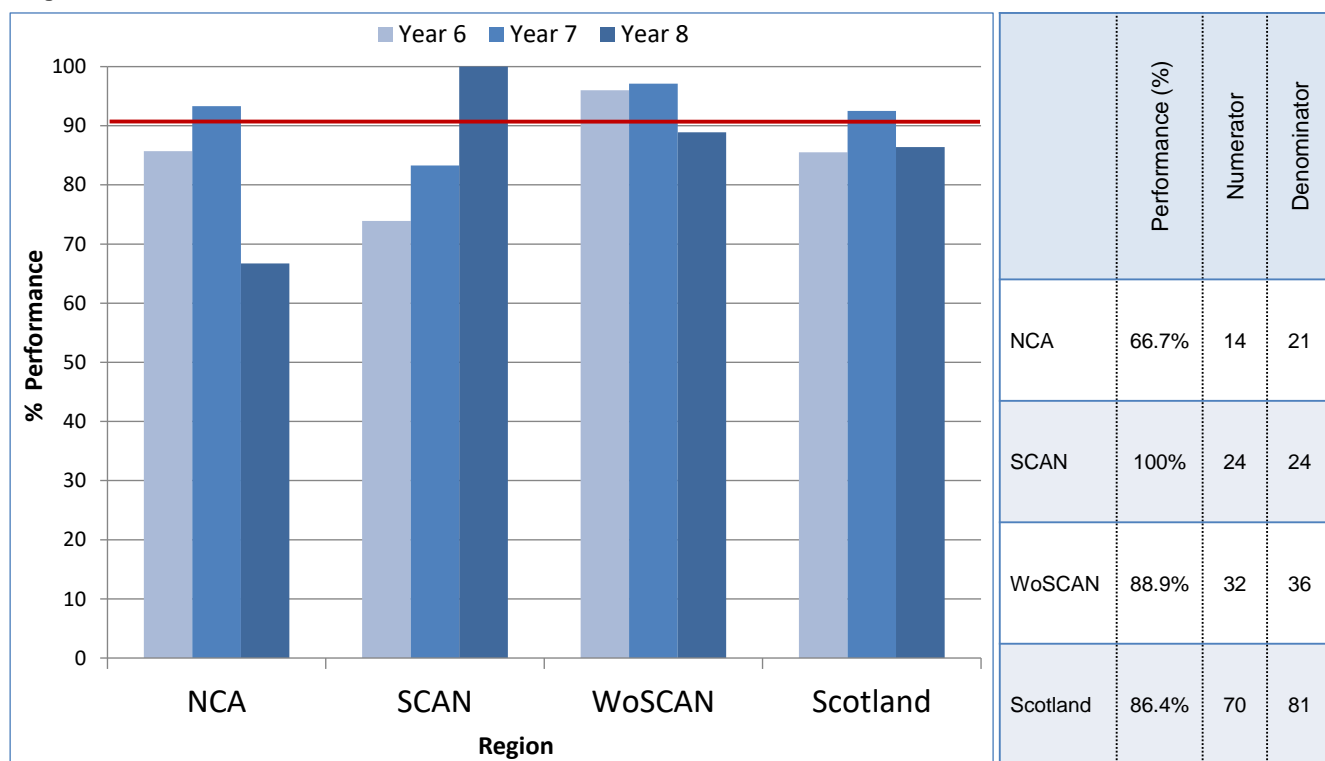
Where the number of cases meeting the denominator criteria for any indicator is between one and four, the percentage calculation has not been shown on any associated charts or tables. This is to avoid any unwarranted variation associated with small numbers and to minimise the risk of disclosure. Any charts or tables impacted by this are denoted with a dash (-). Any commentary provided by NHS Boards relating to the impacted indicators is however included as a record of continuous improvement.

QPI 1 – Histological Diagnosis

Histological typing of extremity sarcomas is essential for planning appropriate treatment and to provide important information relating to prognosis¹. A histological diagnosis should be obtained before a planned surgical resection takes place as unplanned surgery has been shown to affect morbidity and mortality¹. The 90% target set for the QPI accounts for small superficial lesions where the diagnosis of sarcoma may not be reasonably suspected clinically¹.

QPI Title:	Patients with extremity sarcoma should have a histological diagnosis before undergoing a planned surgical resection.
Numerator:	Number of patients with extremity sarcoma who undergo a planned surgical resection who have a histological diagnosis before surgical resection takes place.
Denominator:	All patients with extremity sarcoma who undergo a planned surgical resection.
Exclusions:	Patients with cutaneous sarcomas.
Target:	90%

Figure 4: Proportion of patients with extremity sarcoma that should have a histological diagnosis before undergoing a planned surgical resection.



Across Scotland 86.4% of patients with extremity sarcoma had a histological diagnosis prior to undergoing a planned surgical resection, just below the target of 90%. Slight regional variation in performance against this indicator was noted, with SCAN achieving 100% while NCA and WoSCAN both fell below the target level.

NHS Grampian commented that all cases have been reviewed and all cases not meeting the QPI were diagnosed at surgery and sarcoma was not suspected at the time of excision.

WoSCAN Boards provided detailed clinical reasons for patients proceeding to surgery without a histological diagnosis. In some cases patient age and extent of the tumour influenced the clinical decision and in other cases the radiological diagnosis of chondrosarcoma was made ahead of surgery.

Action Required:

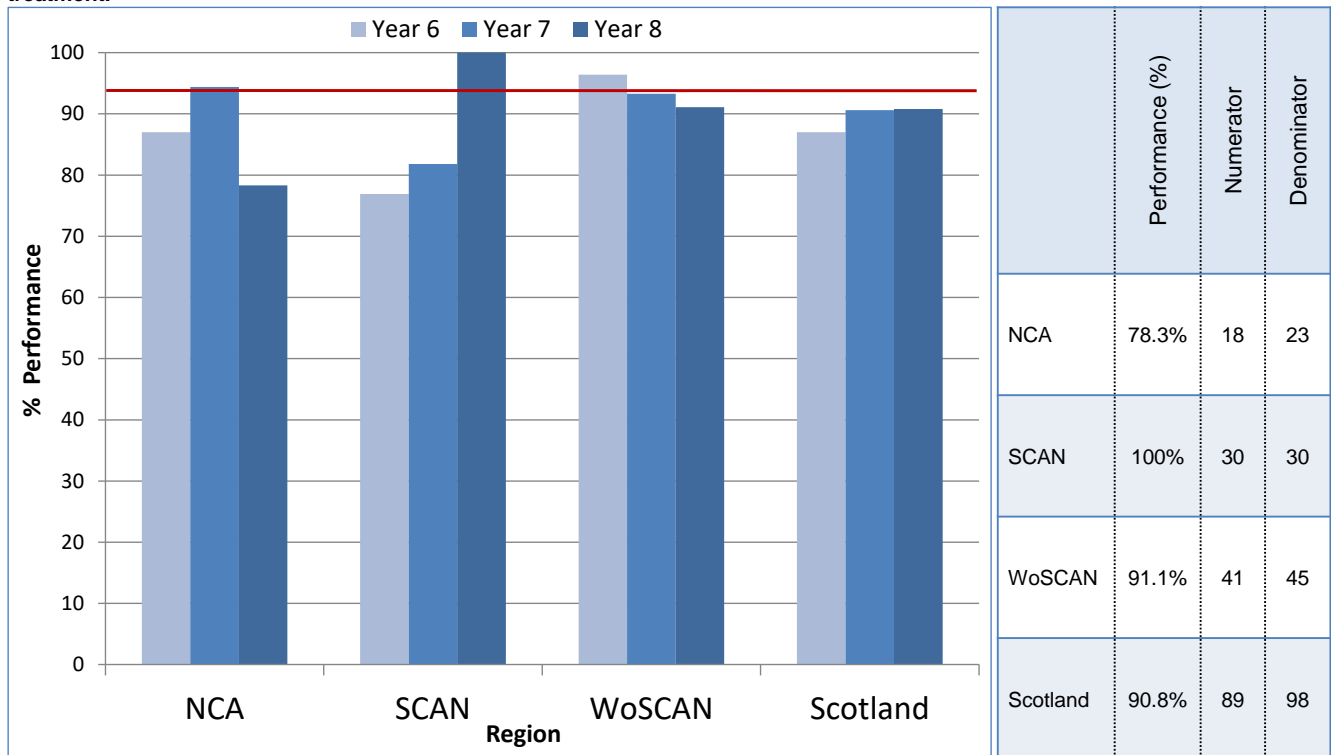
- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

QPI 2 – Multidisciplinary Team Meeting

Evidence suggests that patients with cancer managed by a multidisciplinary team have a better outcome. There is also evidence that the multidisciplinary management of patients increases their overall satisfaction with their care¹. Discussion prior to definitive treatment decisions being made provides reassurance that patients are being managed appropriately¹. The target for this QPI is 95%, which accounts for situations where patients require treatment urgently¹.

QPI Title:	Patients with extremity sarcoma should be discussed by a multidisciplinary team (MDT) prior to definitive treatment.
Numerator:	Number of patients with extremity sarcoma discussed at the MDT before definitive treatment.
Denominator:	All patients with extremity sarcoma.
Exclusions:	Patients who died before first treatment. Patients with cutaneous sarcomas.
Target:	95%

Figure 5: Proportion of patients with extremity sarcoma that should be discussed by a multidisciplinary team (MDT) prior to definitive treatment.



Performance across Scotland was 90.8% against the 95% QPI target with 89 of 98 patients diagnosed with extremity sarcoma in Year 8 being discussed at MDT meeting before definitive treatment. SCAN achieved 100% compliance and showed year on year improvement. NCA and WoSCAN were both below target.

NHS Grampian reviewed all cases not discussed at MDT prior to definitive treatment and appropriate clinical reasons were documented, including cases where malignancy was not suspected at time of surgery but were discussed at MDT after surgery.

WoSCAN commented that pre-treatment discussion was not possible because of clinical circumstances in the cases not meeting the QPI for example an incidental finding of sarcoma at surgery or due to the urgency of treatment.

Action Required:

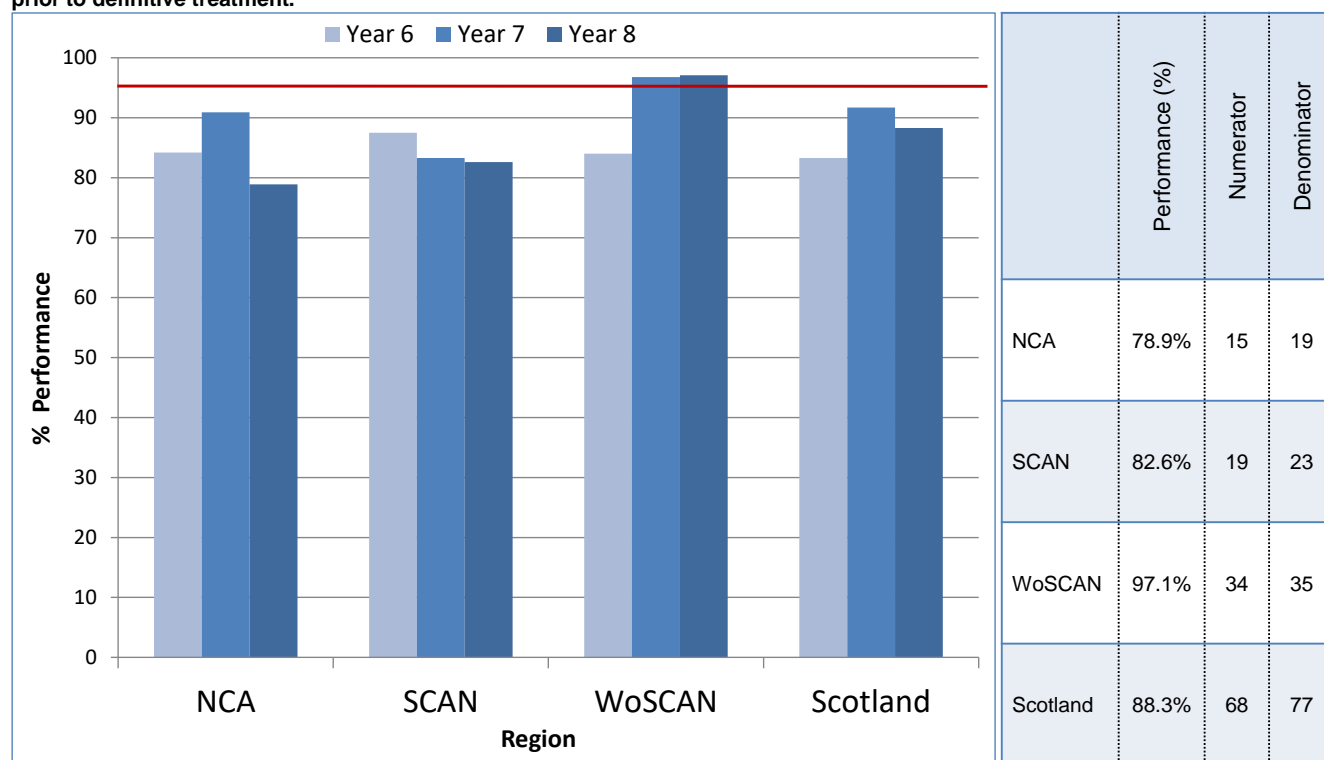
- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

QPI 3 – Clinical Staging

Staging has an important role in determining the most effective treatment for soft tissue sarcoma and provides information on prognosis¹. Patients with a confirmed soft tissue sarcoma should be staged with a CT chest to exclude pulmonary metastases prior to definitive treatment. Clinical staging should follow the principles of TNM classification; this aids the determination of prognosis and choice of therapy¹.

QPI Title:	(i) Patients with extremity soft tissue sarcoma should be staged by CT scan.
Numerator:	Number of patients with extremity soft tissue sarcoma who undergo staging CT scan where the results are available prior to definitive treatment.
Denominator:	All patients with extremity soft tissue sarcoma.
Exclusions:	Patients with rhabdomyosarcomas, patients with cutaneous sarcomas.
Target:	95%

Figure 6: Proportion of patients with extremity soft tissue sarcoma who undergo staging CT scan where the results are available prior to definitive treatment.



Overall in Scotland, 88.3% of patients with extremity soft tissue sarcoma who underwent staging CT scan had the results available prior to definitive treatment. Only WoSCAN met the QPI target of 95%.

NHS Grampian commented that all patients did have staging CTs carried out not but not before definitive treatment.

SCAN commented that four patients did not have staging CTs carried out before the definitive treatment. All patients were known to MDM team and discussed prior to treatment.

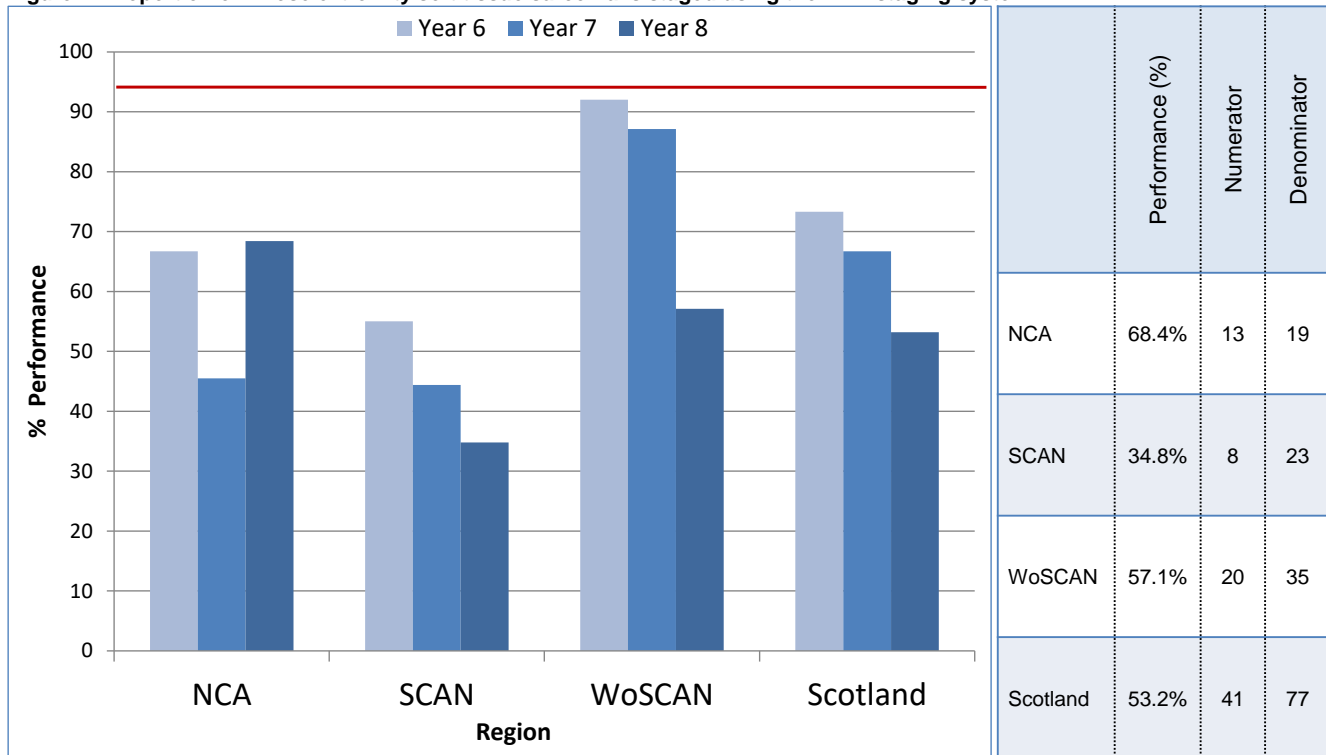
Action Required:

- NHS Tayside to provide detailed feedback on patients not meeting the QPI.

Part two looks at the number of patients with extremity soft tissue sarcoma who were clinically staged using TNM staging system.

QPI Title:	(ii) Patients with extremity soft tissue sarcoma should be clinically staged using the TNM staging system.
Numerator:	Number of patients with extremity soft tissue sarcoma who are clinically staged using the TNM staging system.
Denominator:	All patients with extremity soft tissue sarcoma.
Exclusions:	Patients with rhabdomyosarcomas, patients with cutaneous sarcomas.
Target:	95%

Figure 7: Proportion of whose extremity soft tissue sarcoma is staged using the TNM staging system.



Recording of TNM staging for sarcoma is still extremely variable across NHS Scotland. National performance is 53.2% which is below the QPI target of 95%. No region met the target with SCAN and WoSCAN showing a decrease in performance on the previous years result.

SCAN commented that all cases have been reviewed. Reasons provided include cases where the MDT decision was to proceed with treatment if staging clear. These patients went on to have CT chest followed by surgery and were not discussed again at MDT before the definitive treatment. Cases that

had Mx recorded for indeterminate lung nodules on CT, lymphadenopathy and synchronous metastatic cancer diagnosis, however the dataset has no option to record Mx therefore cM had to be recorded as not recorded. Other reasons include patients that did not have TNM recorded, but have pre-operative staging CTs reported prior to definitive treatment and cases where TNM was recorded after treatment.

WoSCAN commented that 2 patients died before any treatment could be considered and were not staged. One patient did not have a pre-treatment staging scan. In the remaining 12 cases the exact reasons for incomplete TNM are not known as these are normally completed at each National Sarcoma MDT. The reasons may relate to there being no actual mechanism to identify and rectify missing cases on a regular basis.

SCAN proposed a change at formal review be considered to allow TNM to be recorded for audit purposes if available at post surgery MDT. This would allow for these patients to meet the QPI. This should improve the documentation of TNM for the 2022/2023 cohort.

Action Required:

- NHS Grampian and NHS Tayside to provide detailed feedback on patients not meeting the QPI.
- SCAN and WoSCAN to examine the detailed data to establish which elements of TNM are not being captured and verify if this is an audit data capture issue rather than an issue with clinical practice or MDT documentation.

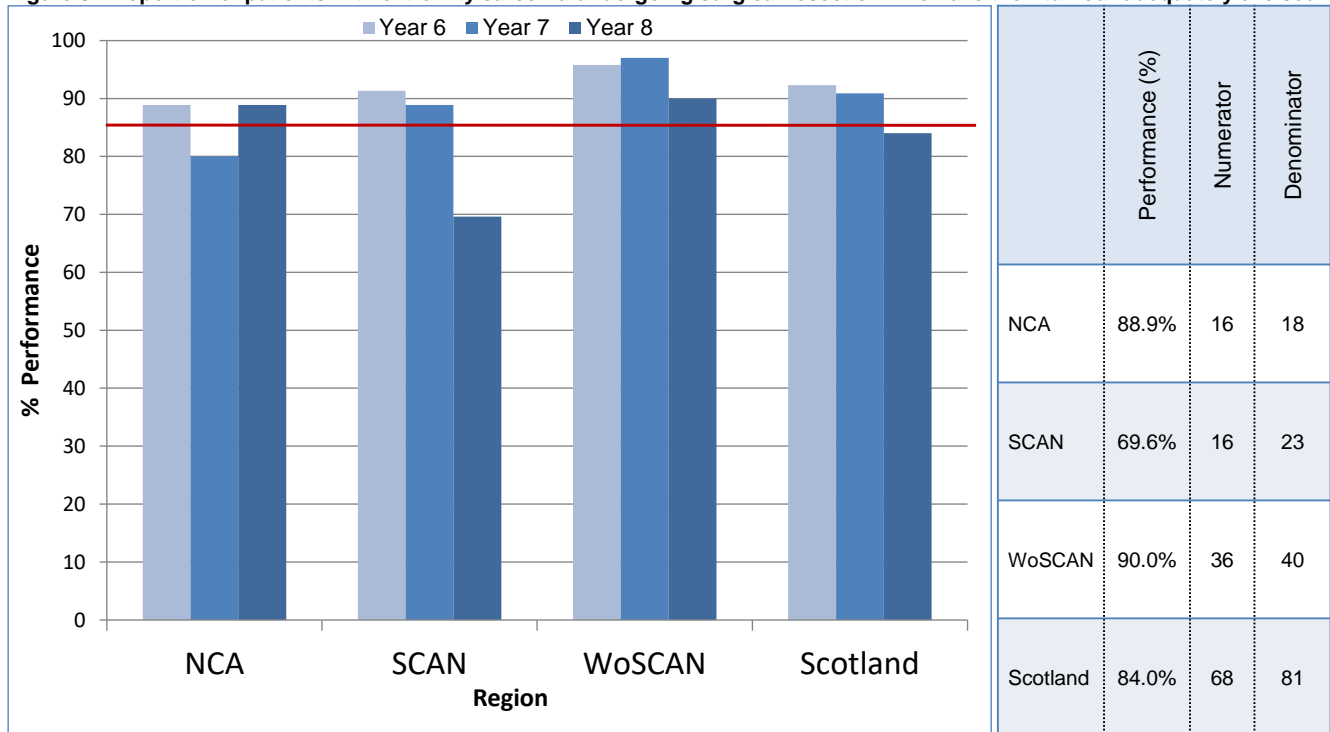
QPI 4 – Surgical Margins

The surgical margin achieved within surgical resection impacts on local recurrence rates and survival of patients¹. It is important that surgical procedures are planned in advance of surgery, this allows for the necessary treatment planning to take place before the initiation of treatment¹.

The target level for this QPI is set at 85% to account for situations where it is agreed due to anatomical constraints a planned positive surgical margin is acceptable.

QPI Title:	Patients with extremity sarcoma undergoing surgical resection should have their tumour adequately excised.
Numerator:	Number of patients with extremity sarcoma who undergo surgical resection where R0* resection is achieved.
Denominator:	All patients with extremity sarcoma who undergo surgical resection.
Exclusions:	Patients with cutaneous sarcomas.
Target:	85%

Figure 8: Proportion of patients with extremity sarcoma undergoing surgical resection who have their tumour adequately excised.



Performance across Scotland was 84% against the 85% QPI target with 68 of 81 patients diagnosed with extremity sarcoma undergoing surgical resection having their tumour adequately excised. SCAN were the only region that did not meet that target achieving 69.6%.

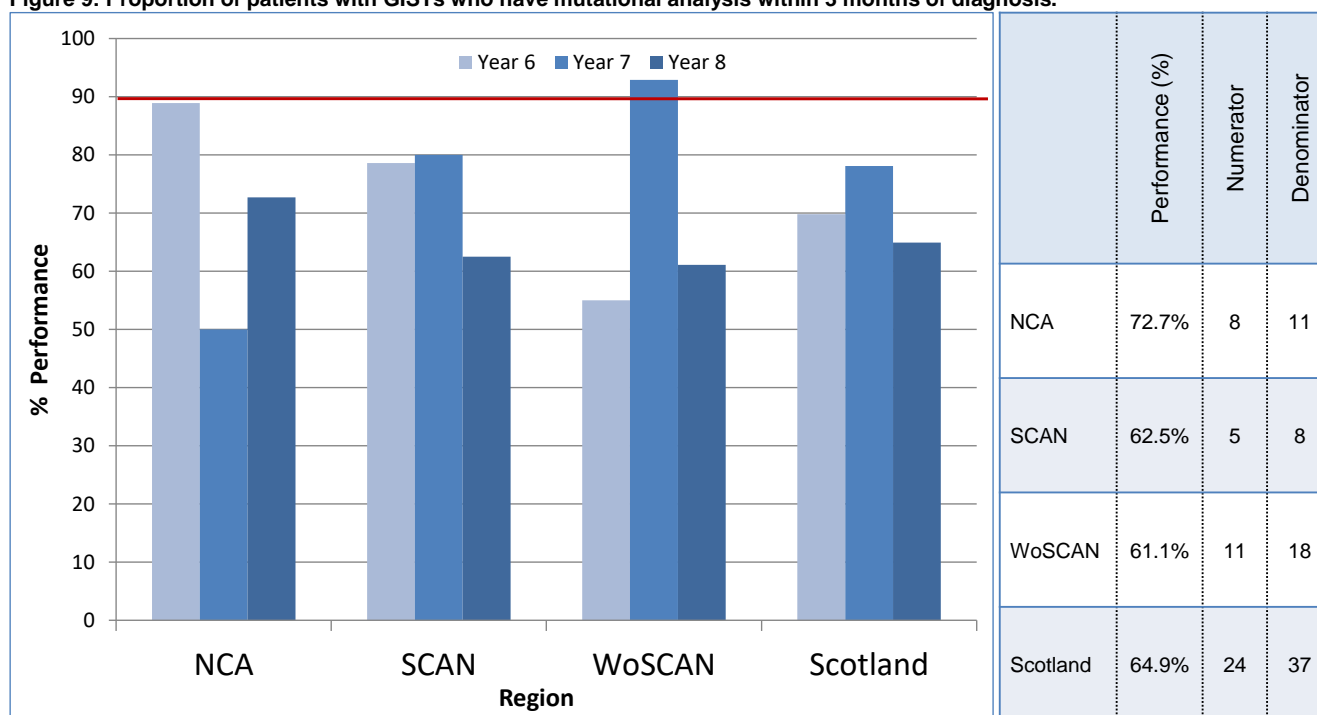
SCAN commented that the reasons for cases not meeting the QPI were due to large tumours, disseminated disease, patient choice not to proceed to any form of amputation and cases where further surgery was not recommended. All patients have been reviewed and the treatment centre concluded that all were treated appropriately.

QPI 5 – Molecular Staging of Gastrointestinal Stromal Tumour

All small bowel GISTs and all intermediate and high risk GISTs, regardless of location, should have mutational analysis. This will provide information on the tumour and will allow for a more detailed prognosis. In addition, mutational analysis can provide important information that will influence the type of treatment to use¹.

QPI Title:	Proportion of patients with GISTs who have mutational analysis within 3 months of diagnosis.
Numerator:	Number of patients with GISTs who have a mutational analysis within 3 months of diagnosis
Denominator:	All patients with GISTs.
Exclusions:	Patients with low risk non metastatic GISTs.
Target:	90%

Figure 9: Proportion of patients with GISTs who have mutational analysis within 3 months of diagnosis.



Performance across Scotland was 64.9% against the 90% QPI target with 24 of 37 patients diagnosed with GISTs having mutational analysis within 3 months of diagnosis. No regional network met the target.

SCAN and WoSCAN both reviewed cases and provided detailed commentary on why cases were not meeting the QPI. Reasons provided included patients that had biopsy only and then declined treatment, cases diagnosed by FNA and there was insufficient tissue for mutational analysis, cases where the patient was unfit for any oncological treatment, so mutational analysis would not have informed treatment planning and cases where patients had mutational analysis performed more than 3 months after diagnosis.

Action Required:

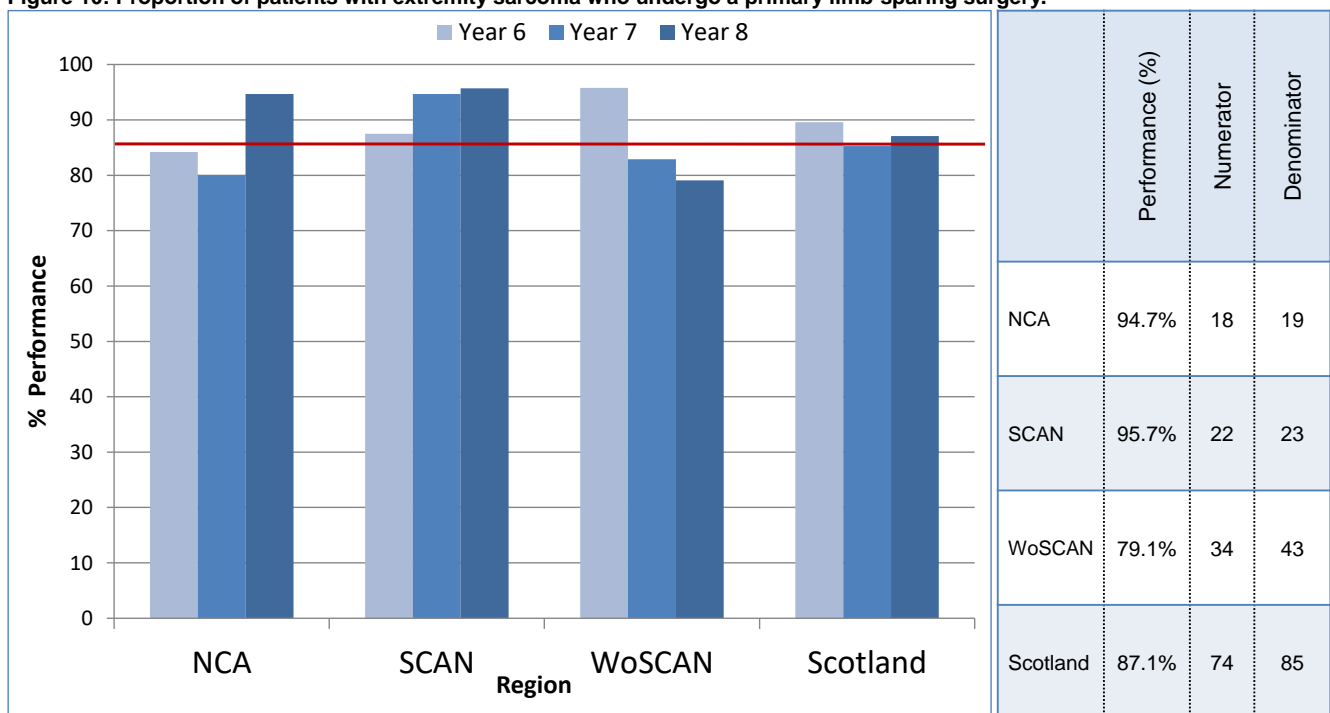
- NHS Grampian and NHS Highland to provide detailed feedback on patients not meeting the QPI.
- NHSGGC to provide clarification with regards to reasons for test failure, establish if there was an issue with the test process and confirm if this is resolved.

QPI 6 – Limb Sparing Surgery

Studies have shown that surgical treatment for approximately 90-95% of patients involves limb sparing surgery¹. Rates of amputation have decreased over the years and this treatment approach is typically reserved for patients with locally advanced disease that cannot be managed by limb sparing surgery¹. Patients who undergo limb sparing surgery have reportedly improved quality of life post treatment, uncompromised survival rates and local tumour control, as well as, an asymptomatic and functional limb¹.

QPI Title:	Patients with extremity sarcoma should have primary limb-sparing surgery.
Numerator:	Number of patients with extremity sarcoma who undergo a primary limb-sparing surgery.
Denominator:	All patients with extremity sarcoma.
Exclusions:	Patients who died before first treatment and patients with cutaneous sarcomas.
Target:	85%

Figure 10: Proportion of patients with extremity sarcoma who undergo a primary limb-sparing surgery.



Overall performance across Scotland was 87.1% which successfully meets the 85% QPI target for the third consecutive year. WoSCAN were the only region that did not meet that target achieving 79.1%.

WoSCAN commented that in all cases amputation was the only, or the oncologically safest, surgical option.

QPI 7 – Primary Flap Reconstruction

After surgical resection, reconstructive surgery may be needed to cover wounds, preserve function and/or improve the cosmetic outcome¹. When conducting reconstructive surgery, surgeons should consider the flap success rate as one factor in choosing the best construction for any individual patient¹.

For the purpose of reporting this QPI a successful primary flap has been defined as a patient who does not need to return to theatre for unplanned surgery. The target level for this QPI is 85%; this is to account for situations where re-exploration of flaps is undertaken due to vascular insufficiency.

QPI Title:	Patients with extremity sarcoma should have successful primary flap reconstruction following surgical resection.
Numerator:	Number of patients with extremity sarcoma who undergo successful* primary flap reconstruction.
Denominator:	All patients with extremity sarcoma who undergo primary flap reconstruction.
Exclusions:	Patients with cutaneous sarcomas.
Target:	85%

*Successful has been defined as patients who do not need to return to theatre for unplanned surgical debridement of a sufficient volume of the flap reconstruction such that secondary reconstruction is required.

Due to the small numbers meeting the denominator criteria in each year of analysis individual regional results cannot be presented at this time. Overall Scotland performance was 100% (31 out of 31) with all patients undergoing a successful primary flap reconstruction.

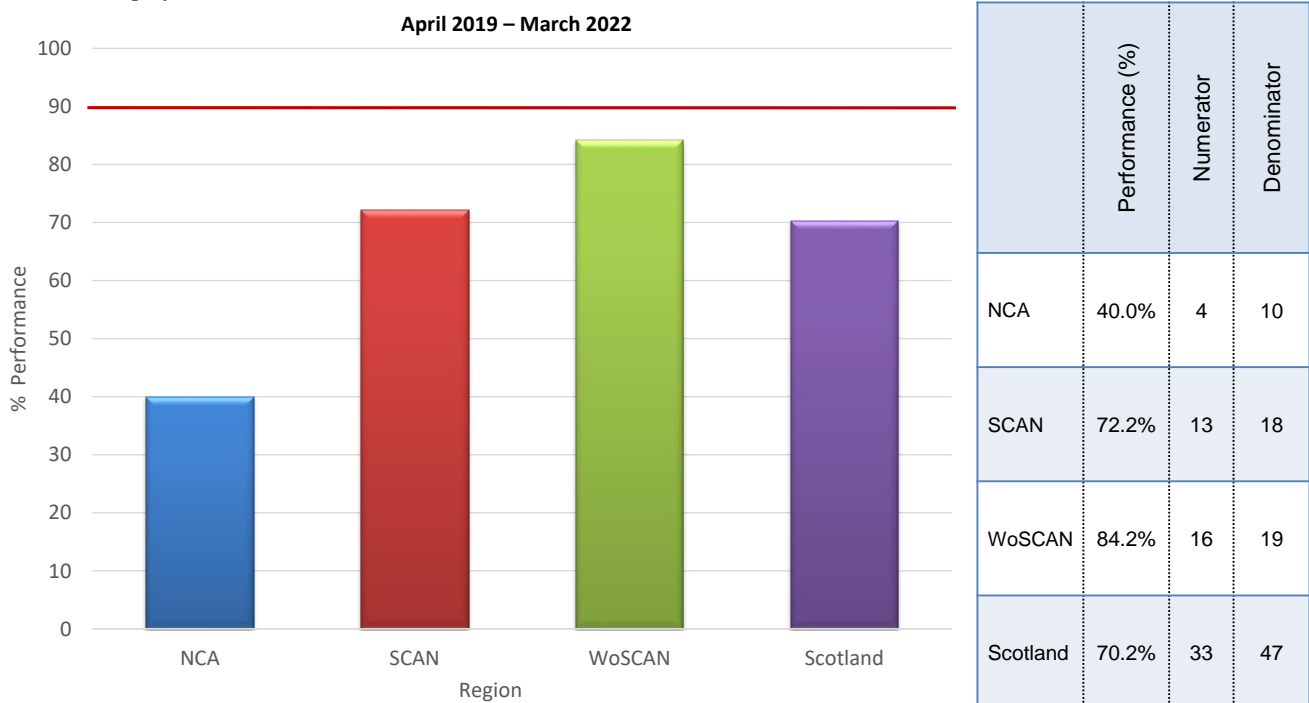
QPI 8 – Post-Operative Radiotherapy

Post-operative radiotherapy is advocated for those with a deep tumour (any size, grade 2 or 3), who have had an R0 or R1 excision. Evidence suggests that post-operative radiotherapy should start within 3 months of surgery¹. The target level for this indicator is set at 90% to account for situations where co-morbidities, severe post-operative complications or frailty can mean the patient is not suitable for post-operative radiotherapy.

QPI Title:	Patients with extremity sarcoma should receive radiotherapy within 3 months of surgery.
Numerator:	All patients aged 16 and over, with extremity sarcoma who commenced post-operative radiotherapy within 3 months of surgery.
Denominator:	All patients aged 16 and over, with extremity sarcoma who undergo post-operative radiotherapy.
Exclusions:	Patients with cutaneous sarcomas. Patients with osteosarcomas. Patients with Ewing's sarcoma. Patients with chondrosarcomas.
Target:	90%

* Deep can be defined as: deep to fascia, this is determined radiologically.

Figure 11: Proportion of patients aged 16 and over, with extremity sarcoma who commenced post-operative radiotherapy within 3 months of surgery.



Due to the small numbers meeting the denominator criteria in each year of analysis individual year results cannot be presented therefore Figure 11 shows aggregated three year results.

Overall in Scotland 70.2% of patients aged 16 and over, with extremity sarcoma commenced post-operative radiotherapy within 3 months of surgery. No region met the target with 3 year performance in NCA noted as 40%.

The majority of cases not meeting the target were noted as being just outside the 90 days and detailed clinical reasons were provided for the delays, including post-surgical complications unavoidably delaying adjuvant treatment and wound healing/mobility issues limiting the ability to tolerate MR/planning CT in the treatment position.

QPI 9 – Multi-agent Chemotherapy for Osteosarcoma or Ewing’s sarcoma

Only a very small number of patients were included within the measurement of this QPI across Scotland and therefore individual regional results cannot be presented at this time. At a national level, data shows that 3 of 3 patients with osteosarcoma under the age of 40 underwent multi-agent chemotherapy resulting in a performance of 100% against the 90% target.

Results for Ewing’s sarcoma show that 100% (2 out of 2) of patients under the age of 50 underwent multi-agent chemotherapy.

QPI 10 – Adjuvant Oncological Treatment for Gastrointestinal Stromal Tumour

Adjuvant imatinib therapy given for a period of three years compared to one year, significantly improved the recurrence free survival in adult patients at significant risk of relapse following resection of GIST¹.

QPI Title:	Patients with high risk GIST should commence post-operative imatinib within 3 months of surgery.
Numerator:	Number of patients aged 16 and over with high risk GIST who undergo surgery that receive post-operative imatinib.
Denominator:	All patients aged 16 and over with high risk GIST who undergo surgery.
Exclusions:	Patients enrolled in a clinical trial.
Target:	90%

Only a very small number of patients were included within the measurement of this QPI across Scotland and therefore individual regional results cannot be presented at this time. At a national level, data shows that 8 of 9 patients aged 16 and over with high risk GIST who underwent surgery received post-operative imatinib, resulting in a performance of 88.9% against the 90% target.

The second part of the QPI looks at those patients who received post-operative imatinib and commenced this within 3 months of surgery. Overall in Scotland 88.9% (8 out of 9) of patients commenced imatinib within 3 months of surgery.

QPI 11 – 30 Day Mortality

Treatment related mortality is a marker of the quality and safety of the whole service provided by the MDT¹. Treatment should only be undertaken in individuals that may benefit from that treatment, that is, treatments should not be undertaken in futile situations. This QPI is intended to ensure treatment is given appropriately, and the outcome reported on and reviewed¹.

The QPI is split into 2 separate sections; the first measures the proportion of patients who die within 30 days of treatment with curative intent and the second those patients who die within 30 days of palliative treatment. The target level is less than 10% for curative treatments and less than 15% for palliative treatments.

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 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 Title:	30 day mortality following curative treatment for sarcoma.
Numerator:	Number of patients with sarcoma who undergo surgical resection or oncological treatment with curative intent who die within 30 days of treatment.
Denominator:	All patients with sarcoma who undergo surgical resection or oncological treatment with curative intent.
Exclusions:	No exclusions.
Target:	<10%

Overall in Scotland the 30 day mortality target for patients undergoing treatment with curative intent (surgery, radical radiotherapy neo-adjuvant radiotherapy, adjuvant radiotherapy and chemoradiotherapy) was achieved for all treatment types. There were no deaths recorded within 30 days of treatment with curative intent.

QPI Title:	30 day mortality following palliative treatment for sarcoma.
Numerator:	Number of patients with sarcoma who undergo palliative treatment who die within 30 days of treatment.
Denominator:	All patients with sarcoma who undergo palliative treatment.
Exclusions:	No exclusions.
Target:	<15%

Overall in Scotland 11.1% of patients (3 out of 27) who received palliative radiotherapy died within 30 days of treatment achieving the <15% target. The <15% target was met by also met by all three regions.

5. Next Steps

The NMCN will actively take forward regional actions identified and NHS Boards are asked to develop local Action/Improvement Plans in response to the findings presented in the report. A summary of actions for each NHS Board has been included within the Action Plan templates in Appendix 3.

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 patients with sarcoma for their contribution to the clinical audit process.

Abbreviations

ACaDMe	Acute Cancer Deaths and Mental Health
BWoSCC	Beatson West of Scotland Cancer Centre
CMG	Clinical Management Guideline
CT	Computed Tomography
eCASE	Electronic Cancer Audit Support Environment
GIST	Gastrointestinal Stromal Tumour
HIS	Healthcare Improvement Scotland
PHS	Public Health Scotland
MDT / MDM	Multidisciplinary Team / Multidisciplinary Meeting
NCA	North Cancer Alliance
NCRI	National Cancer Research Institute
NMCN	National Managed Clinical Network
QPI (s)	Quality Performance Indicator (s)
RCOG	Regional Cancer Oversight Group
SACT	Systemic Anti-Cancer Therapy
SCAN	South East Scotland Cancer Network
SCRN	Scottish Cancer Research Network
SSN	Scottish Sarcoma Network
TNM	Classification of Malignant Tumours (Tumour Node Metastasis)
WHO	World Health Organisation
WoSCAN	West of Scotland Cancer Network

References

1. Healthcare Improvement Scotland. Sarcoma Quality Performance Indicators, v3.0; June 2018 [Accessed on: 24th January 2023]. Available at: http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/cancer_qpis/quality_performance_indicators.aspx
2. Information Services Division. National Data Definitions for the Minimum Core Data Set for Sarcoma Quality Performance Indicators [Accessed on: 24th January 2023]. Available at: <https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/>
3. Information Services Division, Cancer Statistics, Summary statistics for bone and connective tissue cancer - Scotland. [Accessed on: 24th January 2023]. Available at: <http://www.isdscotland.scot.nhs.uk/Health-Topics/Cancer/Cancer-Statistics/Bone-and-Connective-Tissue/>
4. Cancer Research UK. Soft Tissue Sarcoma Statistics. [Accessed on: 24th January 2023]. Available at: <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/soft-tissue-sarcoma>

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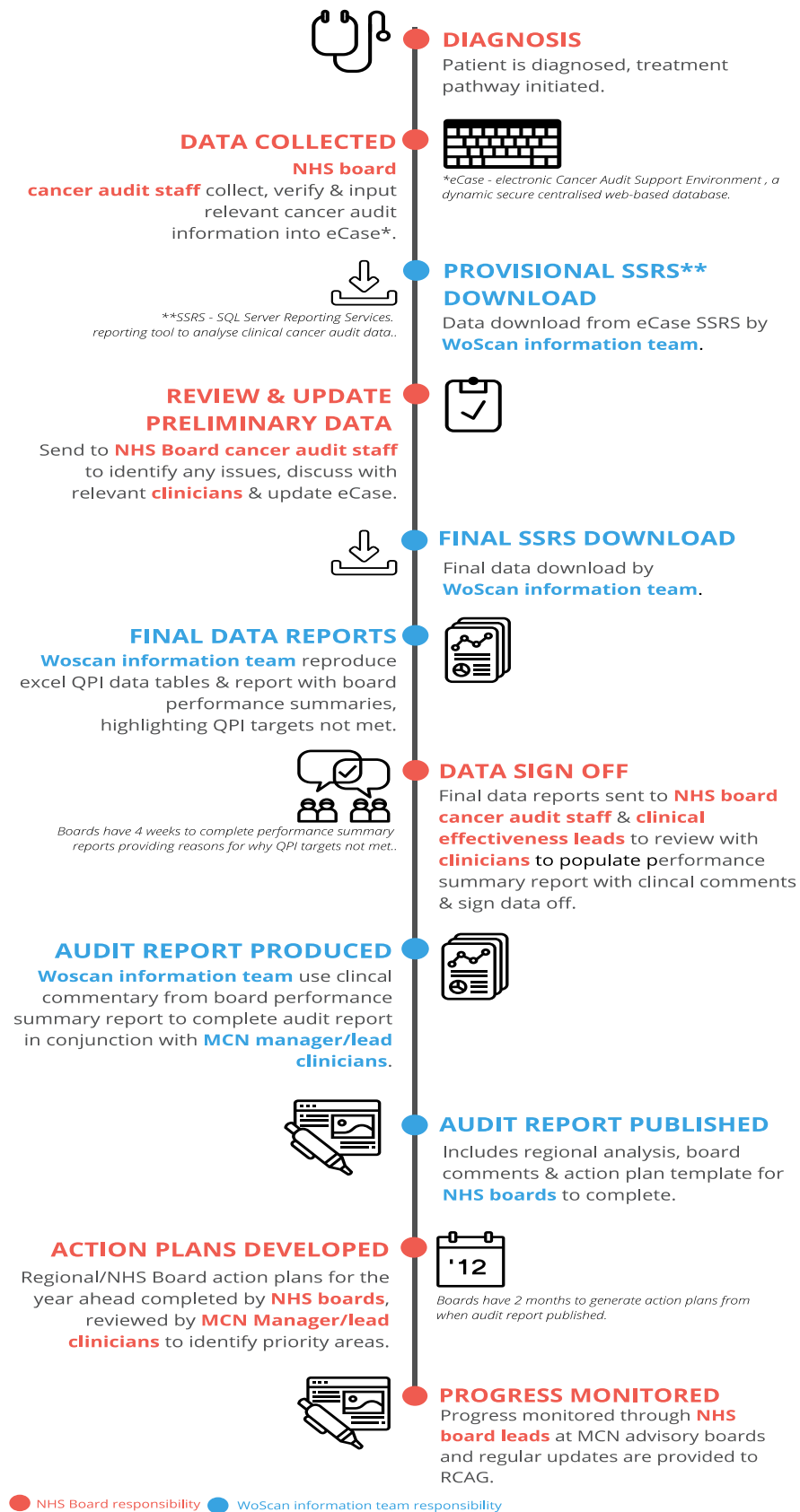
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Appendix 1: Meta Data

Report Title	Cancer Audit Report: Sarcoma Quality Performance Indicators
Time Period	Patients diagnosed between 01 April 2021 and 31 March 2022
Data Source	Electronic Cancer Audit Support Environment (eCASE). A secure centralised web-based database which holds cancer audit information in Scotland.
Data extraction date	2200 hrs on 28 September 2022
Methodology	<p>Analysis was performed centrally 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.</p> <p>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.</p> <p>The final data analysis was disseminated for NHS Board verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area. Please see info graphic in appendix 2 for a more detailed look at the reporting process.</p>

Appendix 2: Cancer Audit Timeline



Appendix 3: NHS Board Action Plans

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

Action / Improvement Plan

Region:	NCA
Action Plan Lead:	
Date:	

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

No	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see key)
			Start	End			
	<i>Action</i>	<i>Detail specific actions that will be taken by the NHS Board.</i>	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each specific action.</i>	<i>Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.</i>	<i>Insert No. from key above</i>
1.	QPI 1 – Histological Diagnosis NHS Tayside to provide detailed feedback on patients not meeting the QPI.						
2.	QPI 2 – Multidisciplinary Team Meeting NHS Tayside to provide detailed feedback on patients not meeting the QPI.						
3.	QPI 3(i) – Clinical Staging NHS Tayside to provide detailed feedback on patients not meeting the QPI.						
4.	QPI 3(ii) – Clinical Staging NHS Grampian and NHS Tayside to provide detailed feedback on patients not meeting the QPI.						

No	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see key)
			Start	End			
5.	QPI 5 – Molecular Staging of Gastrointestinal Stromal Tumour NHS Grampian and NHS Highland to provide detailed feedback on patients not meeting the QPI.						

Action / Improvement Plan

Region:	SCAN
Action Plan Lead:	
Date:	

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

No	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see key)
			Start	End			
	<i>Action</i>	<i>Detail specific actions that will be taken by the NHS Board.</i>	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each specific action.</i>	<i>Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.</i>	<i>Insert No. from key above</i>
1.	QPI 3(ii) – Clinical Staging SCAN to examine the detailed data to establish which elements of TNM are not being captured and verify if this is an audit data capture issue rather than an issue with clinical practice or MDT documentation.						

Action / Improvement Plan

Region:	WoSCAN
Action Plan Lead:	
Date:	

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

No	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see key)
			Start	End			
	<i>Action</i>	<i>Detail specific actions that will be taken by the NHS Board.</i>	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each specific action.</i>	<i>Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.</i>	<i>Insert No. from key above</i>
1.	QPI 3(ii) – Clinical Staging WoSCAN to examine the detailed data to establish which elements of TNM are not being captured and verify if this is an audit data capture issue rather than an issue with clinical practice or MDT documentation.						
2.	QPI 5 – Molecular Staging of Gastrointestinal Stromal Tumour NHSGGC to provide clarification with regards to reasons for test failure, establish if there was an issue with the test process and confirm if this is resolved.						