Northern Ireland Oesophago-Gastric Cancer Audit

Measuring the quality of care for patients diagnosed 2018-2019

(With comparisons to England, Wales, Scotland and previous NICR reports 2005)

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Glossary

CaPPS	Cancer Patient Pathway System
COPD	Chronic Obstructive Pulmonary Disease
EPRT	Endoscopic Radiological Palliative Pathway
GA	Gastric Atrophy
GI	Gastro-Intestinal
GIM	Gastric Intestinal Metaplasia
GP	General Practitioner
HGD	High Grade Dysplasia
HSC	Health and Social Care
HSCT	Health and Social Care Trust
KM	Kaplan Meier
MDT	Multi-Disciplinary Team
NHS	National Health Service
NI	Northern Ireland
NICaN	Northern Ireland Cancer Network
NICE	National Institute for Clinical Excellence
NICR	Northern Ireland Cancer Registry
NIPACS	Northern Ireland Picture Archive and Communications System
NOGCA	National Oesophago-Gastric Cancer Audit
OG	Oesophago-gastric
OGD	Oesophago-Gastric Duodenoscopy
OGJ	Oesophago-Gastric Junction
PAS	Patient Administrative System
QPI's	Quality Performance Indicators
QUB	Queen's University Belfast
RISOH	Regional Information System for Oncology and Haematology
RQIA	Regulation & Quality Improvement Authority
SCC	Squamous Cell Carcinoma
SW	Siewert Level
TVO	Tumour Verification Officer

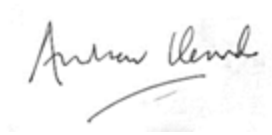
Foreword

It is with great pleasure that I welcome this report on the investigation, treatment and outcomes for patients from N. Ireland diagnosed with oesophageal and stomach cancers.

I thank the Regulation & Quality Improvement Authority and OG Cancer NI for the funding of this work within the N. Ireland Cancer Registry (NICR) which is funded by the Public Health Agency (PHA) for N. Ireland.

The expertise of the staff of the NICR enabled acquiring of funding, collation and analysis of data and skilled presentation of the results, continually linking with the clinical teams to ensure the availability of the data and interpretation of the results. We hope that the findings from this work which has enabled comparisons with similar audits in the rest of the UK will inspire confidence in the clinical practice here while also identifying areas for enhanced learning to improve patient outcomes.

It is worth noting that for audits to be effective they need to be cyclical. We hope that this audit will be repeated to show changes in service post-covid and to show how feedback has been implemented.



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Upper GI Clinical Reference Group Chair – Northern Ireland Cancer Network

December 2021

Acknowledgements

This report was compiled at the request of the NI Cancer Network (NICaN) Upper GI Group which was keen to monitor progress since the most recent Monitoring Care of Patients with Upper GI Cancers in Northern Ireland (NI) in 2005 audit report. I am grateful to the clinicians for their help in interpretation and final presentation. The N. Ireland Cancer Registry (NICR) is funded by the Public Health Agency (PHA) and this project was possible thanks to grants from:

- The Regulation & Quality Improvement Authority (RQIA) to measure the quality of care for patients with squamous cell carcinoma of the oesophagus, and adenocarcinoma of the oesophagus and oesophageal-gastric junction.
- OGCancerNI a local charity which aims to support, communicate and advocate on behalf of patients in Northern Ireland with oesophago-gastric cancer. This grant specifically aided the inclusion of gastric cancers.

The quality of data in this project is a result of the work of the NICR Tumour Verification Officers especially Donna Floyd, Paula Darragh and Ashley Levickas who meticulously extracted detailed information from electronic clinical records for analysis and presentation in this report. The analysis of data was undertaken by Sinéad Hawkins with guidance from Professor Helen Coleman.

A special word of gratitude to the QUB medical student Andrew Walker who aided in the data collection by quality assuring and adding to clinical data items including adding further items to increase accuracy of the surgery and oncology data. He was guided by Dr Richard Turkington consultant oncologist and assisted by Dr Anita Lavery medical oncology registrar of the Belfast Trust. Another thank you to Mr Ray Kennedy Belfast Trust surgeon who provided key data items for the surgery analysis.

The work of the N. Ireland Cancer Registry including the production of this report is the result of the work of the Registry team. I wish also to record my thanks to the NICR Steering Group and Council of the N. Ireland Cancer Registry who guide that work and the Public Health Agency which funds the work of the Registry. This work uses data provided by patients and collected by health services as part of their care and support

Anna Gavin

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December 2021

Background to NI Oesophageal Cancer Audits

The N. Ireland Cancer Registry (NICR) is the official statistics provider for cancer incidence, prevalence and survival across NI. It holds incidence data on cancers from 1993-2019 and has previously undertaken audits of the quality of cancer care for several cancers including oesophago-gastric (OG) cancer patients diagnosed 1996, 2001, and 2005 [(1)].

Previous audit reports can be accessed via this link:

https://www.qub.ac.uk/research-centres/nicr/research-audits/Audits/

The Northern Ireland Cancer Network (NICaN) expressed a wish for an updated cancer audit for OG cancer patients, to measure treatment changes and allow clinicians/service managers to benchmark their care against the peer nations of England/Wales and Scotland. Since 2005 care of oesophageal cancer patients has changed significantly with centralisation of surgery being one of the biggest factors of change.

NHS England and NHS Wales audit their OG cancer services through an annual National Oesophago-Gastric Cancer Audit (NOGCA)[(2)]. This is a professional body led audit with the Royal College of Surgeons, Association of Upper Gastrointestinal Surgeons, the British Society of Gastro-enterology and the Royal College of Radiologists. The most recent audit assessed care for patients diagnosed between March 2017 to April 2019.

NHS Scotland audits OG cancer patients care through 12 targeted questions called Quality Performance Indicators (QPIs). It is mandated through legislation and funded through NHS Scotland, with data collection responsibility lying with the three Regional Cancer Networks. The most recent report analyses the quality of care for OG cancer patients during 2013-2015[(3)].

The NICR received grants from The Regulation & Quality Improvement Authority (RQIA) to measure the quality of care for patients with Squamous Cell Carcinoma (SCC), and adenocarcinoma of the oesophagus and oesophago-gastric junction. It also received a grant from OGCancerNI, a local cancer charity, to audit the quality of care for patients diagnosed with gastric cancer. This work aims to provide a deep insight into the quality of care for these patient groups, and to facilitate comparisons of NI data with the most recent England and Wales NOGCA and NHS Scotland Upper GI Quality Performance Indicators, while also enabling comparison with historic data from the 2005 OG-NI audit.

Introduction to OG Cancer

Oesophageal and gastric (OG) cancers are among the most common cancer sites across the globe. In data assimilated by GLOBOCAN in 2020 excluding non-melanoma skin cancer, gastric cancer (otherwise known as stomach cancer) was the 5th most common incident cancer, and oesophageal cancer was the 8th most common incident cancer, representing 1,089,103 and 604,100 incident cancer cases worldwide, respectively[4].

In NI on average during 2015-2019 there were 154 males and 63 females diagnosed with oesophageal cancer per year[5], and there were 127 males and 73 females diagnosed with gastric cancer each year[6].

Oesophageal cancer has two main morphological subtypes; adenocarcinoma and squamous cell carcinoma together representing 90% of all oesophageal cancers[7]. Globally the majority (84%), of oesophageal cancer are squamous cell carcinomas compared to 15% of adenocarcinomas[8]. Adenocarcinoma occurs most commonly on the lower third of the oesophagus while squamous cell carcinoma is more evenly spread throughout the lower and middle third of the oesophagus with the upper third being a rare site for disease[7].

Gastric cancer is typically divided to cardia gastric cancer, and non-cardia gastric cancer with cardia gastric cancer arising in the proximal stomach and non-cardia gastric cancer arising in the body and distal stomach[8].

A UK population-based study by Brown K et al, calculated population attributable fractions for a combination of risk factors and estimated that 58.5% of oesophageal cancers and 54.2% of gastric cancers were due to lifestyle and environmental risk factors[9].

Smoking is a risk factor for OG cancers with the amount smoked and the duration of smoking affecting disease risk. Squamous cell carcinoma of the oesophagus risk attributed to smoking is higher compared to adenocarcinoma of the oesophagus, and gastric cancer [10,11]. Alcohol is a risk factor in squamous cell carcinoma , but is not considered a risk factor for adenocarcinoma of the oesophagus[11]. The effects of alcohol consumption on the oesophago-gastric junction have shown inconsistent results in studies, however, there is a strong correlation with alcohol and increased risk of cancer in the body of stomach [11]. Diets with a high intake of salt and salt based food such as cured meats increase the risk of gastric cancer [12] [13]. There is increased risk of oesophageal squamous cell carcinoma associated with drinking hot beverages, such as the South American drink maté [14]. In France, excessive consumption of Calvados has been linked with high levels of oesophageal cancers [15].

Barrett's oesophagus is a form of metaplasia, which is a recognised premalignant condition of oesophageal and oesophago-gastric junction adenocarcinoma, transforming via dysplasia to adenocarcinoma in a minority of cases. Squamous cell dysplasia is a pre-malignant condition of oesophageal squamous cell carcinoma[16]. Similarly, for gastric cancer, disease progression can occur via chronic gastritis, gastric atrophy (GA), gastric intestinal metaplasia (GIM) and dysplasia of the stomach[17]. Research is ongoing for risk stratified surveillance programmes to aid detection of pre-malignancy/early malignancy to aid cancer prevention and early diagnosis.

Survival for OG cancer is lower than for many other cancers. In NI five-year age-standardised net survival for patients diagnosed between 2010 and 2014 was 20.5% for oesophageal cancers, and 20.8% for gastric cancers.

Aims and Methods

Audit Aim

This Audit has two aims:

1) To review the process of care for OG cancer patients diagnosed in NI in 2018 & 2019 and compare changes since 2005.
2) To compare processes of care for this cohort of patients against NOGCA and NHS Scotland's QPI'S.

Methods

- Data items for collection were identified through the data dictionaries of the 2005 NICR audit, NOGCA and NHS Scotland's QPIs to allow comparability and agreed by the members of the NICaN OG Clinical reference group.
- A database was developed by NICR IT staff.
- OG cancer cases (ICD 10 codes: C15-C16) with an incident date of diagnosis of 01/01/2018 to 31/12/2019 were extracted from the NICR database.
- Datasets from the Regional Information System for Oncology and Haematology (RISOH), Patient Administrative System (PAS) and Radiotherapy datasets from both Northern Ireland Cancer Centres were linked to cancer registry data.
- A team of three NICR Tumour Verification Officer's (TVOs) then supplemented this dataset following review of the following electronic care systems:
  - The Multidisciplinary Team Meeting administration system - Cancer Patient Pathway System (CaPPS);
  - Labcentre: a regional database of all pathology reports in Northern Ireland;
  - Northern Ireland Picture Archive and Communications System (NIPACS) and Royal Victoria Hospital Imaging systems. These systems store radiology scans and associated data.

Once the dataset was completed by the TVO team a medical student under supervision from a Belfast Trust oncologist and aided by a medical oncology registrar then quality assured surgical data to include admission and discharge, surgery type and surgical complications. Oncology data were also quality assured with additional data given to include all lines of chemotherapy treatments. The data were then anonymised for analysis which took place in the secure environment of the N. Ireland Cancer Registry.

HSC Trust was determined by the patient's allocated primary Trust on CaPPS and where a patient did not have a CaPPS record Trust of residence was determined by postcode. This methodology was configured to ensure that patients who had treatments across multiple Trusts were not counted more than once in the audit, and Trusts had a reflective number of cases based on the numbers of patients that they have responsibility for their pathway. Note surgery is a centralised service.

Inclusion criteria for patients in the audit:

- All patients with a confirmed new incident primary cancer of the oesophagus and stomach (ICD-C15-C16), irrespective of cancer history of any site and diagnosed during 2018 and 2019.

Exclusion criteria:

- Patients with cancer of unknown primary origin.
- Patients with carcinoid/endocrine tumours, lymphoma, melanoma, or sarcoma.
- Patients with metastasis in the oesophagus or stomach originating from another primary site.
- Patients with carcinoma-in-situ, non-invasive tumours, or dysplasia.
- Patients with a basis for diagnosis of death certificate only due to low volume of information.

Table 1: Study Patients

	Oesophagus		Oesophago-gastric junction**		Stomach	
	2018	2019	2018	2019	2018	2019
Total number of patients	209	194	72	76	121	121
Exclusions morphology*	7	2	2	2	18	3
Total in audit population	202	192	70	74	103	118
Total reported on- Male	143 (71%)	137 (71%)	50 (71%)	60 (81%)	60 (58%)	69 (58%)
Total reported on - Female	59 (29%)	55 (29%)	20 (29%)	14 (19%)	43 (42%)	49 (42%)
Median age at diagnosis - Male	68	71	67	73	74	73
Median age at diagnosis -Female	69	72	68	64	70	71

*Exclusion criteria for morphology includes carcinoids, neuroendocrine carcinomas and sarcomas
**Oesophago-Gastric junction (OGJ) is defined by Siewert Classification Types I-III

There were 759 OG cancer patients included in the audit of which 375 were diagnosed in 2018 and 384 in 2019. The majority of oesophageal cancer patients diagnosed on average between 2018-2019 were male (71%) and the majority of stomach cancers patients are also male, however, the difference is less stark with 58% of cases being male.

Since the 2005 audit the number of stomach cancer cases has declined by 12% in keeping with global trends. However, the number of oesophageal cancer cases has increased by 36%, and the number of OGJ cancer cases has increased by 19%. When comparing to the 2018-2019 average there were an extra 32 patients diagnosed compared with 2005.

Table 2: Distribution of OG cancer cases of patients diagnosed 2018-2019 by tumour type, histological subtype and gender

	OES SCC	OES ACA + OGJ SW I, II	Stomach & SW III	Total Patients (2018-2019)
Total Males	68 (55%)	291 (80%)	150 (60%)	509 (69%)
Total Females	55 (45%)	74 (20%)	101 (40%)	230 (31%)
Total All	123 (100%)	365 (100%)	251 (100%	739* (100%)
Median Age Male	70	69	73	70
Median Age Female	72	67	70	69

*Note there were 20 oesophageal cancer patients who had a histology that were not ACA or SCC. Where analysis based on site and histology they will be included in the total columns only. Key OES SCC= Oesophageal Squamous Cell Carcinoma, OES ACA+ OGJ SWI, II=Oesophageal adenocarcinoma OGJ Siewert levels I-II, Stomach cancer & SWIII= OGJ (Siewert level II)

In Northern Ireland for patients diagnosed 2018-2019 table 2 shows that adenocarcinoma of oesophagus and OGJ is more commonly diagnosed in men (80%) than women (20%), while oesophageal squamous cell carcinoma is only slightly more common in men (55%) than women (45%).

Note for analysis where all histological subtypes are included in analysis will be split by Oesophagus and OGJ-Siewert levels I and II (SWI-II), and stomach+ OGJ Siewert level III (SWIII) as seen in Table 3 below.

Table 3: Distribution of OG cancers by site and gender

	Female	Male	Total
Oesophagus and OGJ SW I-II	139 (27%)	369 (73%)	508 (100%)
Stomach SW III	101 (40%	150 (60%)	251 (100%)
OG Cancers Total	240 (32%)	519 (68%)	759 (100%)

HSC Trust

Table 4 shows the distribution of patients in this audit based on their Trust of residence, and Trust of treatment. Trust of residence is determined by a patient's postcode and Health and Social Care (HSC) geographical boundaries. HSC Trust of treatment is determined by their assigned Trust according to the Cancer Patient Pathway System (CaPPS). CaPPS is the multi-disciplinary team's administrative tool used to track cancer patient pathways and it is therefore assumed in this audit that the 'HSC Trust of Treatment' is the Trust that has assumed responsibility for a patient's care/patient pathway. For the most part surgery and oncology treatments are centralised however endoscopy treatments and radiology may be managed by HSC Trust of treatment.

Table 4: Table to show patient distribution for OG cancer diagnosed 2018-2019 by CaPPS assigned Trust of Treatment by Trust of residence determined by post code

		HSC Trust of Treatment					
		Belfast	Northern	South-Eastern	Southern	Western	Total
Trust of Residence	Belfast	152 (92%)	2	11	0	0	165
	Northern	21	158 (84%)	2	6	1	188
	South-Eastern	18	1	115 (84%)	3	0	137
	Southern	10	0	0	130 (93%)	0	140
	Western	5	0	0	2	122 (95%)	129
	Total	206	161	128	141	123	759

- The blue cells in table 4 show the proportion (%) of patients who are managed by a Multi-Disciplinary Team (MDT) within their area of residence.
- The majority of patients diagnostic and treatment pathways are managed by teams based in their Trust of residence. (Note surgery is centralised as are some oncology services).
- Almost all patients residing in the Southern and Western Trusts, were managed by an MDT team within their Trust.
- Belfast Trust had the largest proportion of cross-over with an additional 54 patients from other Trusts of residence.
- During 2018-2019 the Belfast Trust assumed treatment responsibility for the greatest number of OG cancer patient's treatment pathways (n=206) followed by Northern Trust (n=161), Southern Trust (n= 141), South-Eastern Trust (n=128) and Western Trust (n=123).

Table 5: Distribution of OG cancer cases diagnosed 2018 and 2019 by socio-economic deprivation quintile and site and histology

Deprivation Quintile	OES SCC	OES ACA + OGJ SW I,II	Stomach & SW III	All OG Cancer Patients (%)
Least Deprived 1	20.3%	19.7%	15.5%	18.45%
2	20.3%	18.4%	19.5%	19.1%
3	20.3%	19.7%	21.9%	20.7%
4	20.3%	25.2%	16.7%	21.5%
Most deprived 5	18.7%	16.7%	26.3%	20.1%

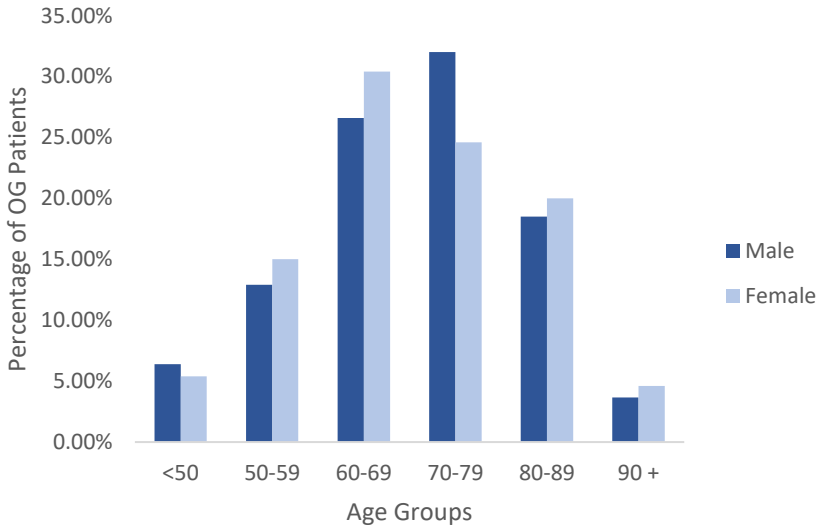
There is no significant association(p=0.75) with socio-economic deprivation and OG cancer type for patients diagnosed in NI in 2018 and 2019. Note this test statistic does not account for other factors such as age.

Patient Demographics

Table 6: Age distribution of OG cancer patients diagnosed from 2018-2019 by gender

Age at Diagnosis	Male	Female	Both Genders
<50	33 (6%)	13 (5%)	46 (6%)
50-59	67 (13%)	36 (15%)	103 (14%)
60-69	138 (27%)	73 (30%)	211 (28%)
70-79	166 (32%)	59 (25%)	225 (30%)
80-89	96 (18%)	48 (20%)	144 (19%)
90 +	19 (4%)	11 (5%)	30 (4%)
Total	519 (68%)	240 (32%)	759 (100%)

Figure 1. Age and sex distribution of OG cancer patients diagnosed 2018-2019

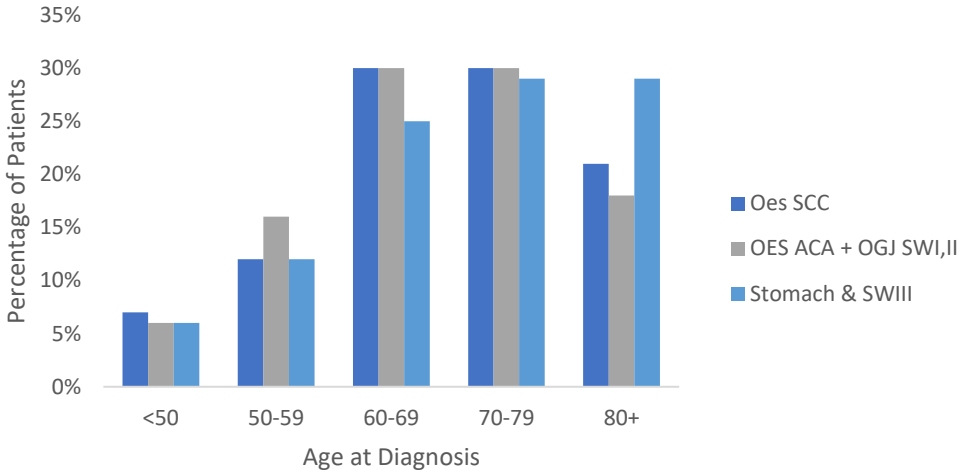


- In the 2018-2019 audit 519 OG cancer patients were male and 240 were female.
- 80% of OG cancer patients were diagnosed at 60 and over, and 53% of patients were diagnosed at 70 and over.
- The biggest male to female ratio was in the age group 70-79.

Table 7: Age distribution of OG cancer patients diagnosed 2018-2019 by site/histology

Age at Diagnosis	OES SCC	OES ACA + OGJ SW I,II	Stomach & SWIII
<50	8 (7%)	22 (6%)	16 (6%)
50-59	15 (12%)	57 (16%)	29 (12%)
60-69	37 (30%)	110 (30%)	62 (25%)
70-79	37 (30%)	110 (30%)	72 (29%)
80+	26 (21%)	66 (18%)	72 (29%)

Figure 2. Age of distribution for OG cancer patients diagnosed 2018-2019 by histology and site



57% of stomach cancer patients were aged 70 years and over compared to 51% of oesophageal SCC cancer patients and 48% of oesophageal and OGJ adenocarcinoma cancer patients.

Table 8: Number of OG Cancer patients presenting with other Co-Morbidities

Co-Morbidity*	No. Patients (%) 2005****	No. Patients (%) 2018-2019
No co-morbidity	Not known	209 (28%)
Barrett's Oesophagus***	24 (12%)	94 (12%)
COPD/Asthma	45 (23%)	70 (9%)
Chronic Renal Impairment	Not known	29 (4%)
Diabetes	29 (15%)	64 (8%)
Ischaemic Heart disease	Not known	44 (6%)
Cerebrovascular disease	Not known	15 (2%)
Peripheral Vascular disease	Not known	10 (1%)
Mental Illness	12 (6%)	30 (4%)
Hypertension	73 (37%)	184 (24%)
Significant other	Not known	371 (49%)
Previous malignant cancer (excluding non-melanoma skin cancer)**	Not known	101 (13%)

* Please note that some patients may present with more than one co-morbidity
**These numbers were derived from NICR Official statistics
*** These numbers were derived from Barrett's oesophagus register
****All data collected was via manual note review

- 72% of all OG cancer patients 2018-2019 had a record of another significant co-morbidity which had resulted in a hospital admission.
- The most common co-morbidity is hypertension.
- Significant other category includes an array of co-morbidities that are low in number and were not measured in the 2005 audit.
- Barrett's oesophagus was recorded as a co-morbidity in 12% of OG cancer diagnosed patients during 2015 and 2018-2019. This condition had the strongest association with OGJ and oesophageal cancer patients with 15% and 18% affected respectively.
- When comparing oesophageal and OGJ carcinoma patients by cell type: 22% of patients who had an adenocarcinoma of the oesophagus and OGJ had Barrett's oesophagus recorded, compared to 5% of patients with SCC of the oesophagus.

Table 9: OG Cancer Recorded Symptoms at Presentation for patients diagnosed 2018-2019 with comparisons to 2005

Symptoms*	Oesophagus 2005**	Oesophagus and OGJ 2018-2019	Stomach cancer 2005**	Stomach cancer 2018-2019	All patients (%) 2018-2019
Dysphagia	158 (80%)	322 (63%)	29 (21%)	64 (26%)	386 (51%)
Weight Loss	134 (68%)	222 (44%)	78 (56%)	109 (43%)	331 (44%)
Nausea and Vomiting	87 (44%)	65 (13%)	71 (51%)	52 (21%)	117 (15%)
Dyspepsia	48 (24%)	46 (9%)	37 (27%)	40 (16%)	86 (11%)
Loss of Appetite	70 (35%)	25 (5%)	76 (56%)	16 (6%)	41 (5%)
Anaemia	34 (17%)	43 (8%)	67 (48%)	66 (26%)	109 (14%)
Haematemesis/melaena	24 (12%)	12 (2%)	59 (42%)	17 (7%)	29 (4%)
Fatigue/lethargy	52 (26%)	16 (3%)	44 (32%)	21 (8%)	37 (5%)
Chest/abdominal pain	92 (46%)	81(16%)	60 (43%)	64 (26%)	145 (19%)

*Please note that some patients will have more than one symptom at presentation
**In 2005 methodology for data collection differed with physical manual note review compared to electronic in 2018-2019

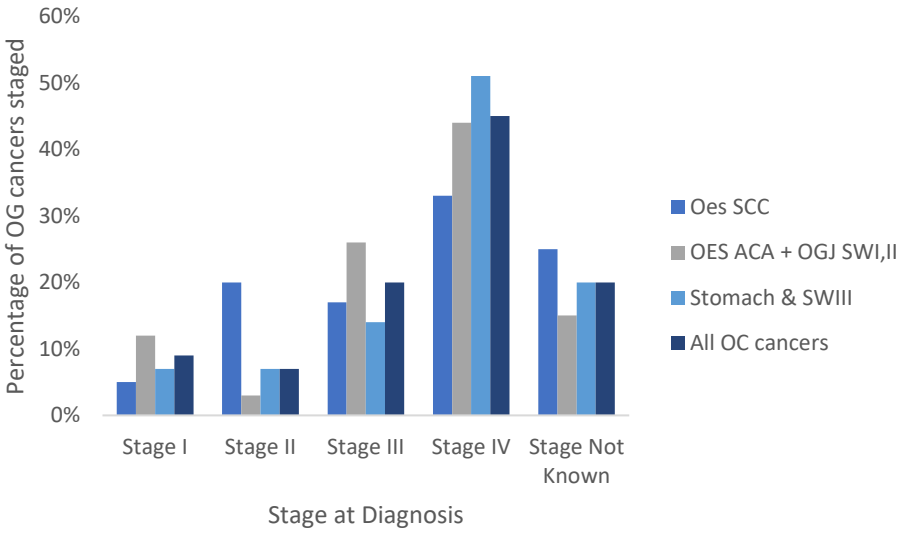
- During 2018-2019 over half (63%) of oesophageal cancer patients presented with dysphagia difficulty swallowing and almost half (44%) with weight loss. This compares with 80%/68% in 2005.
- Stomach cancer patients were most likely to present with weight loss (43%), anaemia - low red blood cells or haemoglobin due to iron deficiency (26%), pain in their abdomen and or chest (26%), dysphagia- difficulty swallowing (26%), nausea and vomiting (21%), and/or dyspepsia- indigestion/heartburn (16%).
- Oesophageal and OGJ cancer patients most commonly presented with dysphagia (63%) followed by pain in their chest and or abdomen (16%), and/or nausea and vomiting (13%).

Table 10: Stage at Diagnosis

Stage	OES SCC	OES ACA + OGJ SWI,II	Stomach & SW III	All OG Cancers*
Stage I	6 (5%)	45 (12%)	18 (7%)	69 (9%)
Stage II	24 (20%)	10 (3%)	18 (7%)	52 (7%)
Stage III	21 (17%)	94 (26%)	35 (14%)	150 (20%)
Stage IV	41 (33%)	161 (44%)	129 (51%)	340 (45%)
Stage Not Known	31 (25%)	55 (15%)	51 (20%)	148 (19%)
Total	123 (16%)	365 (48%)	251 (33%)	759 (100%)

*Note This column includes all histology's measured in this audit

Figure 3. Stage at diagnosis for OG Cancers Diagnosed 2018-2019 by Site and Histology



- The majority of stomach cancer diagnosed in 2018-2019 were diagnosed as stage 4 indicating metastatic spread (51%).

- 65% of all OG cancer patients were diagnosed at a locally advanced stage III & IV. Oesophageal adenocarcinoma and OGJ patients had the biggest proportion of advanced stage diagnosed accounting for 70% of patients diagnosed stage III & IV followed by stomach cancer patients at 65%, and oesophageal SCC patients at 50%.
- Oesophageal SCC patients had the highest rates of early stage (I/II) at diagnosis (24%), however, it also has the highest proportion of patients diagnosed with a stage not known. A stage not known is applied to a case when there is not sufficient diagnostic detail to allocate a stage.
- There has been a reduction since the last NICR OG cancer 2005 audit in the proportion of stomach cancer patients presenting at an advanced stage with 65% in 2018/2019 and 75% in 2005.
- There has been little change in the proportion of oesophageal and OGJ cancer patients being diagnosed at an advanced stage with 62% in 2005, and 65% in 2018/2019.

Figure 4. Stage by site of OG cancer and age group for patients diagnosed 2018-2019

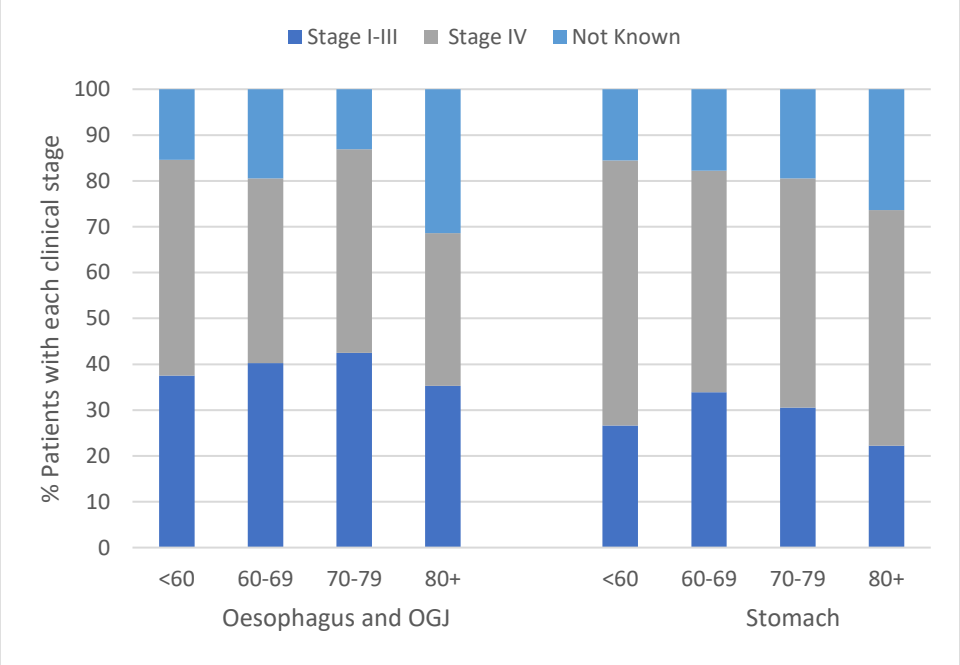


Figure 4 shows the stage distribution of OG cancers by age and by site of the primary tumour. It indicates that older patients are more likely to not have a stage allocated. Patients over 80 had the highest proportion of OG cancers with stage not known accounting for 31.4% of oesophageal and OGJ cancers, and 26.4% of stomach cancers.

Referral & MDT

Table 11: Source of Referral for OG Cancers diagnosed 2018-2019

Source of referral	Oesophageal + OGJ SW I, II	Stomach + SW III	Total
Direct from GP	266 (52%)	88 (35%)	354 (47%)
Emergency Admission	72 (14%)	76 (30%)	148 (19%)
Not Known	14 (3%)	9 (4%)	23 (3%)
Other*	122 (24%)	75 (30%)	197 (26%)
Total**	474	248	722

*other is made up of an array of referral pathways to include dentistry, incidental findings at radiology, and following secondary care referrals.
**Note patients who did not have a source of referral were excluded

The above table shows the method of referral to OG cancer services. The data for this were collected via CaPPS by the TVO team.

- The main method of referral for OG cancers diagnosed between 2018-2019 were via their General Practitioner, OG 52% and stomach cancers 35 %.
- 7% of all Oesophageal + OGJ cancers (n=37) were referred in via surveillance programmes for high grade dysplasia and Barrett's Oesophagus known premalignant lesions of the Oesophagus. This also picked up a small number of gastric cancers.
- In England and Wales during 2017-2019 13% of all OG cancers had a referral via emergency admission, this is lower compared to the NI average of 19%.
- Stomach cancer patients were more likely to be referred via A&E (30%) than oesophageal cancer patients (14%). In England and Wales during 2017-2019 19% of all stomach cancers had a referral via emergency admission, this is lower compared to the NI average of 30%.

Table 12: Number of OG Cancer Patients who had a hospital stay 30 days prior to their date of diagnosis

Hospital Stay	Oesophagus SCC	OES ACA + OGJ SW I,II	Stomach & SW III	All OG Cancers*
No Hospital Stay	17 (14%)	47 (13%)	39 (16%)	110 (14%)
Elective admission	71 (58%)	252 (69%)	115 (46%)	443 (58%)
Emergency admission	35 (28%)	66 (18%)	97 (39%)	206 (27%)
Total	123	365	251	759

*Note This column includes all histology's measured in this audit. Note date of diagnosis is the date of histology as per European Network of Cancer Registries rules

The above Table 12 shows the number of patients who had an admission to hospital for any medical reason up to 30 days prior to their date of diagnosis. The data for this measure are sourced from NICR official statistics. It is worth noting that for some patients they will be diagnosed during an elective (planned) medical procedure to alleviate/investigate a symptom, for others it could be an incidental finding. 39% of stomach cancers had an emergency admission prior to being officially

diagnosed with their stomach cancer. This is followed by SCC of oesophagus with 28%, and oesophagus & OGJ adenocarcinoma with 18%. This could in part explain the high proportion of OG cancer patients being diagnosed at an advanced stage (See Figure 3).

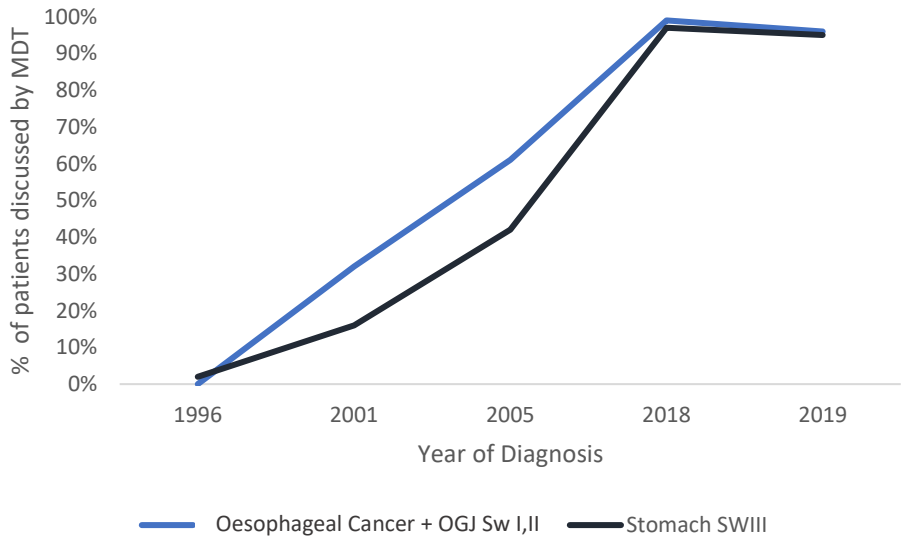
Multi-Disciplinary Team Meeting

Multi-disciplinary team meetings involve a group of health professionals from more than one clinical specialism which give advice and make decisions on recommended treatments to ensure the best standard of care of individual patients.

Table 13: Number of OG Cancer Patients that Receive a MDT by Site and OG Cancer Audit Years; 1996, 2001, 2005, 2018, 2019

	1996	2001	2005	2018	2019
Oesophageal Cancer + OGJ Sw I,II	2 (1%)	68 (32%)	120 (61%)	254 (99%)	242 (96%)
Stomach SWIII	4 (2%)	28 (16%)	58 (42%)	115 (97%)	127 (95%)

Figure 5. Number of OG Cancer Patients That Receive a MDT by Site and OG Cancer Audit Years; 1996, 2001, 2005, 2018, 2019



In Scotland there is a QPI stating, “Patients should be discussed by a multidisciplinary team prior to definitive treatment”. The target they set themselves is 95% [3].

Numerator for QPI: Number of Patients with oesophageal or gastric cancer discussed at MDT before definitive treatment including if no surgery, chemotherapy and radiotherapy is the planned care plan.

Denominator QPI: All OG cancer patients excluding those who died before first treatment (within 2 weeks of first diagnosis).

Table 14: Number of patients who had an MDT prior to definitive treatment plan

	Oesophagus + OG junction SW I,II (n=498)	Stomach SW III (n=241)
NI 2018 & 2019	464 (93%)	230 (95%)
Scotland 2015	943 (92.3%)	299 (89.5%)

NHS Scotland has not met its target for 95%, however it did note that this could be due to patients requiring emergency clinical intervention[3]. In Northern Ireland MDT discussion prior to definitive treatment is strong with 93% Oesophageal and OGJ patients, and 95% of stomach cancer patients receiving this service. Of the 33 patients who did not receive an MDT prior to treatment, 55% were referred from the Barrett's Oesophagus and High Grade Dysplasia (HGD) surveillance service indicating that definitive treatment took place there.

Staging Investigations

CT scanning

National Institute for Clinical Excellence (NICE) 2018 recommends that all OG Cancer Patients have a CT scan of chest, abdomen and Pelvis for full staging information.

Table 15: Number of OG Cancer Patients That Receive a Full Staging CT scan

	Oesophageal and OGJ SW I, II	Stomach SW III	All OG Cancer patients
NI 2018	250 (97%)	118 (100%)	368 (98%)
NI 2019	242 (96%)	129 (97%)	371 (97%)
NHS Scotland 2015	1019 (96.8%)	335 (95.7%)	1354 (96.5%)
NOGCA 2017-2019			94.9%*

*This number is an estimate due to data completeness issues

Table 16: Number of OG Cancer Patients That Receive a Full Staging CT scan by year NI

	Oesophageal And OGJ SI,II	Stomach SW III
NI Average 2018/2019	246 (97%)	124 (98%)
NI 2005	181 (91%)	122 (88%)

- Across NI there is strong performance for obtaining full staging CT scan diagnostic information on all patients indicating strong adherence to NICE guidelines.
- NI is comparable to other regions within the UK for adherence to full staging CT scanning[2,3].
- Since 2005 full staging CT scanning has increased for all OG cancer patients with an average additional 67 patients being scanned per year during 2018 and 2019 compared to 2005. This increase represents an improvement of 6% for Oesophageal and OGJ cancer patients and 10% for stomach cancer patients.

PET-CT

NICE 2018 guidance requires that all people with oesophageal and OGJ tumours that are suitable for curative treatment receive a PET-CT (except for T1a Tumours). For gastric cancer patients a PET-CT should be considered if metastatic disease is suspected to help ongoing management [18].

Table 17: PET-CT by Tumour Type

	Oesophageal and OGJ SW I, II	Stomach SW III	All OG Cancer patients
NI average 2018/2019	170 (67%)	10 (8%)	180 (47%)
NI 2005	110 (56%)	15 (11%)	125 (37%)

- The number of PET-CT scans being offered to oesophageal and OGJ patients during 2018/2019 has increased by 60 for each of 2018 and 2019 compared to 2005.
- The number of stomach cancer patients being offered a PET-CT has decreased on average by 5 per year.

Table 18: Number of PET-CT scans delivered to curative OG cancer patients in total during 2018 and 2019 by site

	Oesophageal & OGJ SI, SII (n=241)	Stomach SWIII (n=69)
NI 2018 & 2019	216 (90%)	10 (14%)
NOGCA 2017-2019	64.6%	30.5%

Northern Ireland shows excellent adherence to NICE guidance on PET-CT scanning for curative oesophageal and OGJ patients with 90% being offered compared to England/Wales at 64.6% [2]. However, there is great variation between regions across England & Wales (20%-98%). When excluding curative patients with a stage IA tumour as per NICE Guidance, NI compliance rises to 95%.

PET-CT Scanning for metastatic gastric tumours is low with only 14% of curative gastric cancer patients being offered a PET-CT scan compared to England & Wales 30.5%. PET-CT scanning gastric tumours may increase accuracy of staging by better identification of distant metastasis. 5% of stage IV gastric cancer patients had a PET-CT scan. This could be due to low levels of 18-FDG uptake in distal stomach cancers [19].

Oesophago-Gastro-Duodenoscopy (OGD)

Table 19: The number of OG cancer patients being offered an Oesophago Gastric Duodenoscopy (OGD) by audit year and by site

	Oesophageal & OGJ SI, SII	Stomach SWIII
NI annual average 2018/2019	246 (97%)	119 (95%)
NI 2005	196 (99%)	135 (97%)

The proportion of patients receiving an OGD is high in NI with 95% of gastric patients and 97% of Oesophageal and OGJ cancer patients receiving this procedure. Compared to 2005 an average of an extra 50 oesophageal and OGJ cancer patients per year during 2018 and 2019 received an OGD.

Endoscopic Ultrasound

NICE Guidance recommends that endoscopic ultrasound (EUS) should not solely be used to distinguish between T2 and T3 tumours for patients with oesophageal and gastro-oesophageal junctional tumours. It recommends that it should only be used to guide ongoing management [18].

Table 20: The average annual number of oesophageal and OGJ patients who undergone a EUS in 2018/2019 with comparisons to 2005, and NOGCA

	NI 2005	NI 2-year average 2018-2019	NOGCA 2017-2019
Number of Oesophageal OGJ SWI, II Patients (%)*	75 (38%)	34 (13%)	39%

*This includes all Oesophageal and OGD SW I, II patients.

Uptake of EUS is 26% lower in NI compared to England/Wales for oesophageal and OGJ patients [2]. Per year, an average of 34 EUS procedures are conducted on oesophageal and OGJ cancer patients as a part of their diagnostic work-up, this is 41 less EUS procedures when compared to 2005.

Staging Laparoscopy

Table 21: Annual average number of staging laparoscopy procedures NI

	Oesophageal & OGJ SW I, II	Stomach SW III	All OG cancer patients
Annual Average 2018/2019 NI	60 (23%)	43 (34%)	103 (27%)
TOTAL	508	251	759

On average per year during 2018-2019 there were 103 staging laparoscopies conducted on OG cancer patients. NICE guidance states that patients with potentially curable gastric cancer should be offered a staging laparoscopy [17].

Table 22: Laparoscopy rates in curative stomach cancer patients

	NI 2018 & 2019	NOGCA
Laparoscopy performed on stomach SW III cancer patients receiving curative treatment. (n=69)	49 (71%)	44.6%

Table 22 shows that NI has good compliance for the provision of staging laparoscopy with 71% of stomach cancer patients who had treatment with curative intent undergoing the procedure during 2018 and 2019. This is an increased performance compared to England and Wales which has an average of 44.6% [(2)]. The proportion of gastric cancers which present as an immediate emergency case with obstruction or bleeding was not measured in this audit report, they will account for a proportion of the 29% who underwent gastric surgery without laparoscopic access.

Timelines for Staging Investigations and MDT

Table 23: Timelines to Diagnosis for OG Cancer Patients diagnosed during 2018 and 2019 by site and histology

	Oesophagus SCC	OES ACA + OGJ SW I,II	Stomach & SW III	All OG Cancers*
Referral to MDT (Median)	27 days	25 days	24 days	24 days
Emergency admitted - Referral to MDT (Median)	13.5 days	14 days	10 days	11 days
Non-emergency Referral to MDT (Median)	30 days	28 days	29 days	29 days
Referral to MDT (IQR p25-75)	14-44 days	14-42 days	10-40 days	13-42 days
Referral to OGD (Median)	17 days	15 days	14 days	15 days
Referral to OGD (IQR p25-75)	4-26 days	5-28 days	3-32 days	4-29 days
Referral to CT (Median)	24.5 days	22 days	20 days	22 days
Referral to CT (IQR p25-75)	8.5-35.5days	13-36 days	4-33 days	9-36 days
Referral to PET-CT (Median)	37 days	36 days	37days	36days
Referral to PET-CT (IQR p25-75)	28-49 days	25-53.5 days	29-55 days	26-52days

KEY: IQR p25-75%: Interquartile range 25%-75% Note: Patients may require more than 1 OGD for diagnosis

Table 23 shows the median time taken from date of referral to date of MDT/Staging investigations. This data excluded anyone who had an investigation completed prior to date of referral. For this analysis the patient record required a valid date of referral and MDT for this measure. Notably this excludes 76 CT scans and 49 OGD's which patients had undergone prior to date of referral. It also excludes patients who received an investigation more than 6 months post their date of referral. There will be times where it is clinically appropriate for patients not to undergo investigations straight away. Those patients who are at the upper end of their associated ranges are in the minority.

Findings:

- Patients who have been referred via emergency admission had an MDT discussion on average 18 days earlier than patients who were referred to the MDT via other sources.
- Overall gastric cancers are discussed at MDT with less delay than oesophageal cancer patients. This is likely due to the higher proportion of gastric cancer patients being referred into the MDT by emergency admission (see Table 11).

- On average by the time an MDT has taken place, the majority of patients will have undergone their OGD and CT giving MDT professionals a good understanding of tumour progression and staging; vital information for deciding a patient's treatment plan.
- The main bottleneck for clinicians being able to stage patients in a timely way, is the time taken for patients to undergo a PET-CT scan with the median time being 36 days which is 12 days more than the median time for initial MDT discussion. This will ultimately delay the time taken for patients to receive their first treatment.

The shortest period for a gastric cancer patient to access a PET-CT scan post referral during 2018 to 2019 across NI was 18 days.

Table 24: Median days of referral to MDT discussion for patients diagnosed with OG cancer during 2018-2019 by HSC Trust

	Oesophagus SCC	OES ACA + OGJ SW I, II	Stomach & SW III	All OG Cancers*
Belfast Trust	22 days	23 days	23 days	23 days
Northern Trust	20 days	20 days	15 days	20 days
South-Eastern Trust	37 days	30 days	28 days	30.5 days
Southern Trust	28.5 days	25 days	24 days	25 days
Western Trust	27 days	27.5 days	27.5 days	27 days

*Note this column includes all histology's in this audit

- There is regional variation in the length of time it takes for a patient to be discussed by an MDT depending on their HSC Trust.
- OG cancer patients are initially discussed by the MDT within the shortest length of time in Northern Trust with 20 days from referral to MDT discussion. This is likely linked to shorter waiting times for CT and OGD (as seen in Tables 25 and 26) as this will provide a lot of information regarding stage of disease.
- The longest length of time to MDT is in South-Eastern Trust with patients waiting a median length of 30.5 days. This is likely linked to longer referral to PET-CT and CT times (as seen in Tables 26 and 27). Waiting longer for clinicians to discuss a patient's treatment plan increases the likelihood that the referral to treatment target of 62 days will not be met.

Table 25: Median number of days from referral to OGD for patients diagnosed with OG cancer during 2018-2019 by HSC Trust

Trust of treatment	Oesophagus SCC	OES ACA + OGJ SW I,II	Stomach & SW III	All OG Cancers*
Belfast Trust	12 days	14 days	14 days	14 days
Northern Trust	8 days	9.5 days	7 days	8 days
South-Eastern Trust	20.5 days	16 days	18 days	18 days
Southern Trust	19 days	15 days	15 days	15 days
Western Trust	20 days	17.5 days	21 days	19 days

*Note this column includes all histology's in this audit

- Northern Trust has the shortest median length of time from referral to OGD at 8 days.
- The median length of time for OG cancer types undergoing an OGD in Northern Trust and Belfast Trust is within 2 weeks.

Table 26: Median days for referral to CT scan for patients diagnosed with OG cancer during 2018-2019 by HSC Trust

Trust of treatment	Oesophagus SCC	OES ACA + OGJ SW I,II	Stomach & SW III	All OG Cancers*
Belfast Trust	14.5 days	19 days	16 days	16.5 days
Northern Trust	16 days	21 days	18 days	19 days
South-Eastern Trust	37 days	28 days	16 days	29 days
Southern Trust	25 days	21 days	19 days	22 days
Western Trust	23 days	24 days	25 days	25 days

*Note this column includes all histology's in this audit

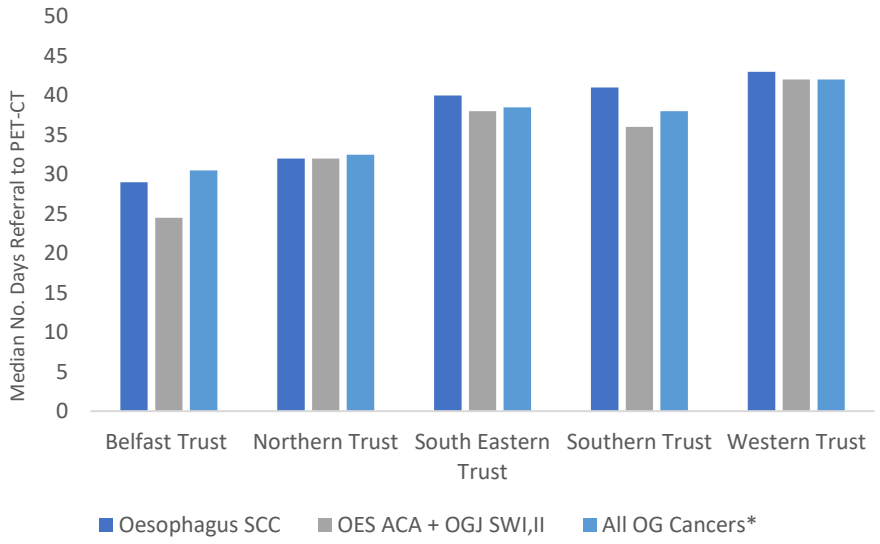
- Belfast Trust has the shortest median length of time from referral to CT scan for OG cancer patients.
- South-Eastern Trust has the longest median length of time from referral to CT scan representing 29 days post referral. This length of time most affected patients with oesophageal squamous cell carcinoma who had to wait on average 37 days during 2018 and 2019.

Table 27: Median days to PET-CT scan referral for patients diagnosed with OG cancer during 2018-2019 by HSC Trust

Trust of Treatment	Oesophagus SCC	OES ACA + OGJ SW I,II	All OG Cancers*
Belfast Trust	29 days	24.5 days	30.5 days
Northern Trust	32 days	32 days	32.5 days
South-Eastern Trust	40 days	38 days	38.5 days
Southern Trust	41 days	36 days	38 days
Western Trust	43 days	42 days	42 days

*Note this column includes all sites and histology's in this audit

Figure 6. Median Number of days from Referral to PET-CT by HSC Trust



- The numbers for patients with gastric cancer who had undergone a PET-CT scan were too low for separate analysis by HSC Trust and they have been included in the overall numbers.
- There are large variations in the median time for patients to undergo a PET-CT scan based on histology of tumour and HSC Trust.
- Belfast Trust OG cancer patients have the shortest median length of time from referral to PET-CT scanning with an overall median time of 30.5 days, with oesophageal + OGJ adenocarcinoma patients taking the shortest time at 24.5 days.
- Patients that require a PET-CT scan from the Western Trust take on average 11.5 days longer to undergo a PET-CT compared to patients who are from Belfast Trust.

Figure 7. Median length of time from referral to diagnostic procedure by HSC Trust of treatment for all OG cancer cases

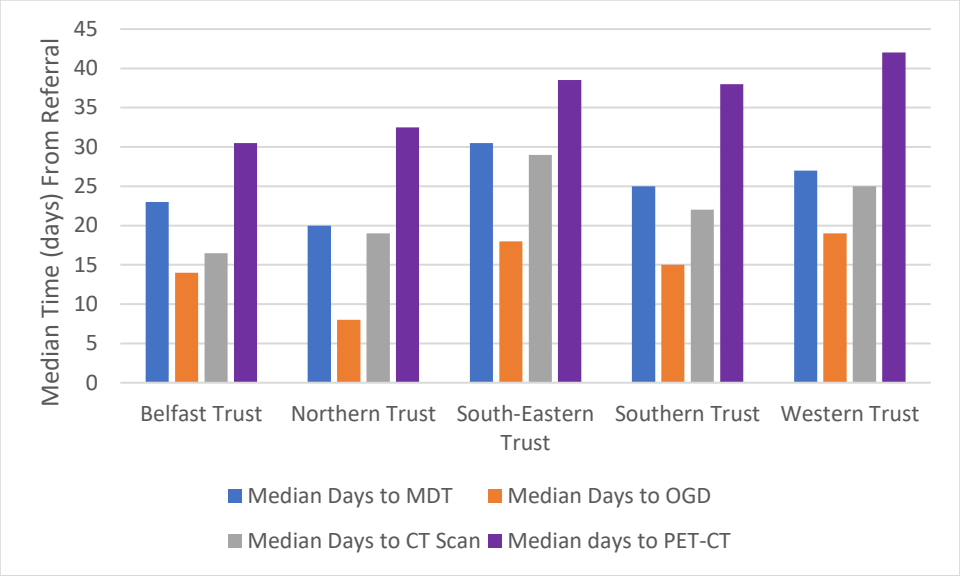


Figure 7 shows the variation in time for diagnostic procedures by Trust as discussed when summarising Tables 24-27.

Treatment

Treatment Plan

Table 28: Treatment plan intent by tumour type for patients diagnosed with OG cancer 2018-2019

	OES SCC	OES +OGJ SW I,II ACA	Stomach SW III	All OG cancers*
Curative intent NI 2018-2019	65 (53%)	175 (48%)	69 (27%)	310 (41%)
No Active Treatment (Best supportive care)	34 (28%)	99 (27%)	91 (25%)	286 (38%)
Non-Curative Anti Cancer	24 (20%)	91 (25%)	47 (19%)	163 (21%)
Total	123 (100%)	365 (100%)	251 (100%)	759 (100%)

* This includes all morphologies in this audit

41% of all OG cancers patients diagnosed during 2018 and 2019 had a plan for treatment with curative intent. This compares with 38.5% for patients diagnosed between 2017-2019 in England and Wales [(2)]. In Scotland during 2015 23% of stomach cancer patients and 26% of oesophageal cancer patients were treated with curative intent [(3)]. Northern Ireland had higher curative intent rates than Scotland with 27% of stomach cancer patients and 47% of all oesophageal cancer (including patients who do not have an adenocarcinoma or SCC) having a treatment plan with curative intent. In Scotland this is a QA measure where they target 35% of all OG cancer patients are treated with curative intent. In 2015 they did not meet this target and commented that curative treatment rates are dependent on stage at presentation and improvement could be made by diagnosing cancers earlier [(3)].

Table 28 shows variation of treatment plan intent when comparing tumour type, with patients who have an oesophageal SCC more likely to be put on a curative treatment plan (53%) in comparison with gastric cancer patients who were less likely to have a curative treatment plan (27%).

In NI during 2018-2019 83% of patients diagnosed stage I-III had a curative treatment plan. This is higher in comparison to England/Wales where 60% of patients diagnosed in 2017-2019 had a curative plan intent [(2)].

For patients diagnosed with stage IV disease, 40% had non-curative anti-cancer treatment (targeted cancer site with aim of symptom control e.g. palliative chemo, stenting, laser therapy), and 52% had no active treatment with best supportive care.

Curative Treatment Plan

Figure 8. Proportion of patients with curative treatment plans by tumour type, disease stage and age group

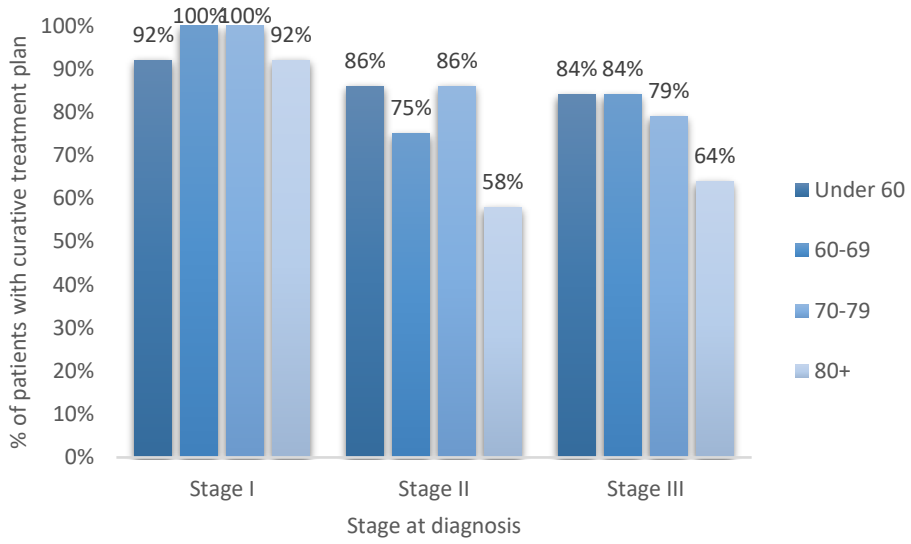
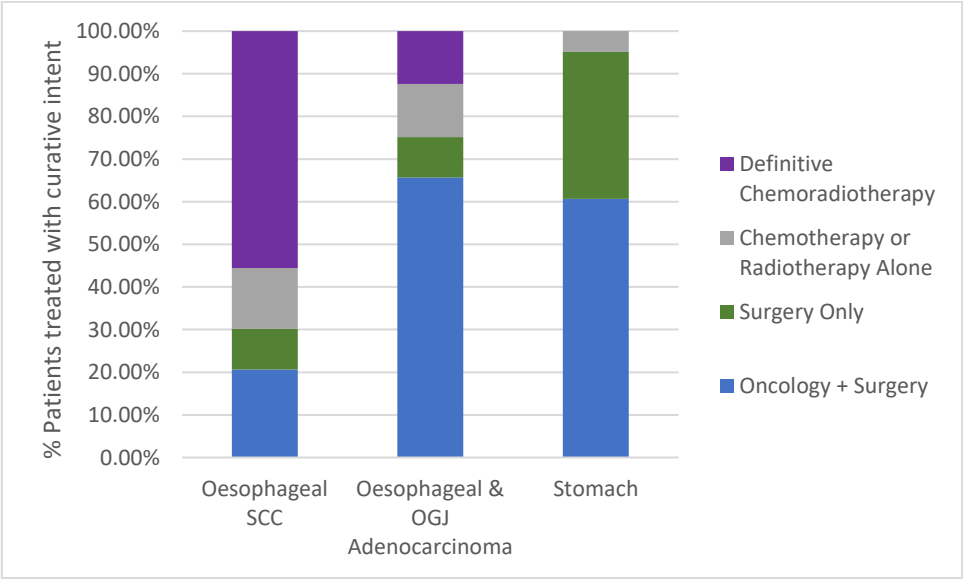


Figure 8 shows variation in curative treatment plan intent for patients diagnosed with stage II and stage III cancers by age. Patients diagnosed at 80+ years old are less likely to have a curative plan intent at stages II and III compared to patients diagnosed at less than 80 years old.

Figure 9. Treatment modality for patients with curative intent for patients diagnosed 2018-2019 by tumour type*



*This bar chart does not include patients treated by Endoscopic mucosal resection (EMR) only as a curative treatment plan, and patients who were originally categorised as curative intent but received no active treatment

Figure 9 shows the treatment plan variation for OG cancers by tumour site and histology. NICE guidelines advise that Oesophageal SCC patients are treated with chemoradiation for proximal tumours, and for tumours of the mid/lower oesophagus with either chemoradiotherapy alone or combined with surgery. The above graph shows excellent adherence to NICE Guidelines for Oesophageal SCC patients with 90% of curative patients having these treatment modalities[18].

Multimodal therapy that combines either chemotherapy or chemoradiotherapy with surgery was the dominant treatment for patients with adenocarcinoma of the oesophagus and OGJ and the stomach. This is also in line with NICE guidance[18].

Table 29: Median days for referral to diagnosis by referral type for all OG cancer patients diagnosed 2018-2019 with comparison to England/Wales 2017-2019

	Referral Time to Diagnosis NI 2018 & 2019		**Referral Time to Diagnosis NOGCA 2017-2019 [2]**	
	Median	IQR p25-75*	Median	IQR p25-p75*
GP Referral: Urgent	23 days	14-38 days	17 days	11-26 days
After Emergency Admission	7 days	4-18 days	7 days	3-14 days

*Interquartile range 25%-75%

- Numbers were too low to do a measurement for GP referrals that are routine.
- Date of diagnosis is defined as the cancer registry date of diagnosis, the cancer registry date of diagnosis was chosen instead of the clinical date of diagnosis on CaPPS, as the clinical date of diagnosis on CaPPS often was the date the pathology report was received from the biopsy taken at OGD, as opposed to the date the sample was taken which is the internationally accepted date of diagnosis. Note some patients may have more than one biopsy to confirm diagnosis.
- The median time to diagnosis post emergency admission is the same for NI as for England and Wales at 7 days.
- For patients whose referral is classed as “urgent” from their General Practitioner, NI OG cancer patients have a median waiting time from referral to diagnosis which is 6 days greater than the median time for patients who reside in England and Wales.
- 25% of NI OG cancer patients wait 38 days or more for their OG cancer diagnosis when their GP referral is classed as urgent.

Table 30: Median waits in days for OG cancer patients treatment pathway from referral to 1st treatment by treatment type and treatment intent for patients diagnosed 2018-2019 with comparisons to England/Wales (NOGCA 2017-2019)[2]

	Diagnosis to Treatment-Plan/decision to treat		Diagnosis to 1st Treatment		Referral to 1st Treatment	
	Median	IQR p25-75*	Median	IQR p25-75*	Median	IQR p25-75*
Curative: Surgery only. (NI 2018-2019)	33 days	7-59 days	56 days	4-92 days	89 days	61-130 days
Curative: Surgery only. (NOGCA 2017-2019)	27 days	8 - 47 days	58.5 days	38 - 91 days	83 days	58 - 127 days
Curative definitive or neo-adjuvant oncology (NI 2018-2019)	43 days	33-56 days	48.5 days	58.5 –77.5 days	79 days	62- 102 days
Curative definitive or neo-adjuvant oncology (NOGCA 2017-2019)	25 days	14 - 38 days	51 days	41 - 66 days	68 days	57 to 87 days
Palliative: Oncology (NI 2018-2019)	30 days	20- 44 days	44 days	30 - 56 days	62 days	48- 79 days
Palliative: Oncology (NOGCA 2017-2019)	14 days	5-27 days	42 days	29- 57 days	60 days	47- 80 days
Palliative ERPT (NI 2018-2019)	26 days	16 – 40 days	34 days	20 - 69 days	54.5 days	32- 84 days
Palliative ERPT (NOGCA 2017-2019)	7 days	2-16 days	17 days	7-32 days	35 days	21-53 days

Key: **EPRT: Endoscopic/Radiologic Palliative Therapy e.g. stenting** KEY: IQR p25-75%: Interquartile range 25%-75%

- Patients in NI with a curative surgery-only treatment plan had to wait longer from diagnosis to a treatment decision date in comparison to patients from England/Wales (difference in median time = 6 days). However, once the treatment plan is decided, NI patients have a median waiting time which is 8.5 days less for their surgery compared to England/Wales. NI patients have a median waiting time which is 6 days longer from date of referral to their surgery date.
- The wait for a treatment decision is longer for patients from NI across all treatment types indicating a longer length of time for staging investigations.
- Across all treatment types, NI patients have a longer median time from referral to their first treatment.
- NI OG cancer patients who undergo EPRT have a median waiting time for their treatment plan post clinical date of diagnosis which is almost 3 weeks longer than for English/Welsh patients.

Resection Type

In the audit period of OG cancer patients diagnosed in NI between 2018 and 2019 a total of 180 patients underwent curative resections, of which 94 were performed on 2018 patients and 86 were performed on 2019 patients. This represents an average 20% increase in the number of curative surgeries performed in NI compared to the 75 conducted in 2005.

Table 31: Number of Curative Resections by resection type for OG cancer patients diagnosed 2018-2019

Surgery type	Number of curative OG cancer patients
Oesophagectomy	108 (60%)
Oesophagogastrostomy	5 (3%)
Gastrectomy	64 (36%)
Other	3 (1.67%)
Total	180

Table 32 below shows that the proportion of patients having a curative surgery type is influenced by the OG cancer site and histology with approximately one third of oesophageal SCC patients undergoing a curative resection, compared to 59% of patients with adenocarcinoma of oesophagus and OGJ, and 84% of patients with gastric cancer.

Table 32: Number of curative resections by resection type for NI OG cancer patients diagnosed 2018-2019

Tumour site and histology of patients with curative cancer	Number of OG cancer patients who had a curative resection
Oesophageal SCC (n=65)	19 (29%)
Oesophageal + OGJ ACA SW I, II (n=175)	103 (59%)
Stomach (n=69)	58 (84%)

Hospital of Operation

Table 33: Hospital of Major OG surgery in NI in 2005 compared to 2018 & 2019 by tumour site

Hospital	NI 2005 No. Procedures		NI 2018_2019	
	Oesophagus	Stomach	Oesophagus	Stomach
BCH n (col %)	10 (20%)	7 (14%)	113 (93%)	53 (91%)
RVH n (col %)	25 (51%)	14(29%)	9 (7%)	3 (5%)
Other n (col %)	14 (28%)	28 (57%)	0 (0%)	2 (3%)
All Hospitals n (col%)	49 (100%)	49 (100%)	122 (100%)	58 (100%)

In 2005 oesophageal cancer patients had their surgery across 5 hospital sites with Table 33 showing the majority (51%) of patients having their surgical resection in the Royal Victoria Hospital. By 2018-2019 the number of hospitals that oesophageal cancer patients had their surgery in had reduced to 2 within the same Trust of care: The Belfast Trust with the majority 93% being operated on in Belfast City Hospital, and the remaining 7% being operated on in The Royal Victoria Hospital.

In 2005 stomach cancer patients had their surgery across 10 hospital sites, with the largest proportion (29%) being operated on in the Royal Victoria Hospital. 28 (57%) stomach cancer patients were operated on across 8 different hospital sites including Altnagelvin, Antrim, Craigavon, Daisy Hill, Erne, Lagan Valley, Mater, and Ulster Hospitals. In 2018-2019 this had changed, with stomach cancer patients being operated on in 4 hospitals, with 91% being operated on in Belfast City Hospital and 5% being operated on in The Royal Hospital, which is also within the Belfast Trust. Only two patients were operated on outside of the Belfast Trust.

These changes show how services have changed with the centralisation of OG cancer Surgery within Belfast City Hospital in 2016.

Surgery Pathology Indicators

Lymph Node Yield

Table 34: Number of OG cancer patients who underwent curative oesophagectomy & gastrectomy where lymph node removal is => 15 by year and country

	Lymph node yield =>15 Oesophagectomy	2-Field Lymph node Dissection	Lymph node yield =>15 Gastrectomy	D2- Lymph node Dissection
NI 2018 & 2019	103 (95%)	102 (94.4%)	57 (89%)	51 (79.7%)
NI 2005	20 (41%)	N/A	23 (47%)	N/A
NHS England & Wales 2017-2019[2]	3,635 (88.4%)	3,891 (96.4%)	1,815 (83.9%)	1,896 (87.7%)
NHS Scotland 2015[3]	Not measured	N/A	57 (76%)	N/A

During 2018 & 2019 95% of curative oesophagostomy patients in NI had equal to or more than 15 lymph nodes removed, while 89% of gastrectomy patients had 15 or more nodes removed. These are high rates when comparing to patients resected in England & Wales during 2017-2019, and Scotland during 2015.

In 2015 NHS Scotland treated 75 patients with curative stomach surgery, of which 76% had 15 or more lymph nodes removed. In Scotland the target for this measure is 80%. NI have passed this target for gastric cancer node removal and have improved this practice by 42% since 2005. Lymph Node yield is also high for oesophagectomy patients with 95% compliance compared with 41% in 2005.

Resection Margins

Table 35: Table to show longitudinal and circumferential margin status in OG cancer patients by surgery type and UK region

	Oesophagectomy NI 2018/2019 (n=108)	Oesophagectomy 2017-2019 NOGCA [2]	Oesophagectomy 2015 NHS Scotland [3]	Gastrectomy NI 2018/2019 (n=64)	Gastrectomy 2017-2019 NOGCA [2]	Gastrectomy 2015 NHS Scotland [3]
Longitudinal margins negative	106 (98.1%)	95.8%	N/A	57 (89%)	91.8%	69 (92.0%)*
Circumferential Margin negative	70 (64.8%)	75.8%	N/A	N/A	N/A	N/A
Longitudinal and circumferential margin negative	70 (64.8%)	N/A	74 (62.2)**	N/A	N/A	N/A

*NHS Scotland land target for this KPI is 90%
**NHS Scotland target for this KPI is 70%

- An oesophagectomy longitudinal margin status of 98.1% negativity is similar to England & Wales at 95.8%
- A gastrectomy status of 89% is also comparable to England/Wales at 91.8%, and to Scotland at 92.0%.
- NI during 2018 and 2019 just missed the 90% Scottish target for longitudinal margin status at 89% for oesophagectomies, however, there are very small numbers in this population. Both Scotland and NI missed the negative longitudinal and circumferential margin status target set by Scotland at 70% with NI achieving 64.8% and Scotland achieving 62.2%.

Surgical Complications

Table 36: Proportions of curative OG cancer patients who had a post-operative complication for patients diagnosed 2018-2019

	Oesophagectomy (n=108)	Gastrectomy (n=64)	All Curative Surgeries (n=180)
Anastomotic Leak	12 (11.1%)	7 (10.9%)	19 (10.6%)
Chyle Leak	8 (7.4%)	0 (0%)	0 (0%)
Pneumonia	16 (14.8%)	2 (3.1%)	18 (10.0%)
Pleural Effusion	46 (42.6%)	10 (15.6%)	58 (32.2%)
Other Complications	63 (58.3%)	21 (32.8%)	88 (48.9%)
Any Complication*	92 (85.2%)	30 (46.9%)	127 (70.6%)

*Please note some patients may have more than one complication post-operatively

Table 36 demonstrates that in NI 70.6% of curative OG cancer patients who undergo a major surgery with the aim to cure their disease have a post-operative complication. Post-operative complications are more common in patients who undergo an oesophagostomy procedure (85%) compared to gastrectomy (46.9%) with both procedure types having pleural effusion account for the highest proportion of post-operative complications recorded in medical notes (oesophagostomy: 42.6%, gastrectomy: 15.6%). Specific complication rates are not published in other UK OG cancer audits.

Length of stay

Table 37: Mean number of inpatients days for patients who undergo a curative OG cancer operation by procedure type and post-operative complication status for patients diagnosed NI 2018-2019

Procedure type	Surgical Post-operative complication status	Number of patients (n)*	Mean days of inpatient stay (days)
Oesophagectomy	Post-operative surgical complication	91	17.5
Oesophagectomy	No Post-operative surgical complication	16	16.0
Gastrectomy	Post-operative surgical complication	30	16.1
Gastrectomy	No Post-operative surgical complication	34	11.4
All major surgery types	Post-operative surgical complication	126	17.0
All major surgery types	No Post-operative surgical complication	53	12.6

* Note: There was one patient where a length of stay could not be obtained

The overall mean length of stay for all OG cancer patients irrespective as to whether or not they have a post-operative complication is 15.7 days. Table 37 shows that patients that have a post-operative complication have a longer inpatient length of stay compared to those who do not have a complication. OG cancer patients who have a post-operative complication stay a mean 17 days as in inpatient, compared to 12.6 days for patients who do not have a post-operative complication.

Table 38: The proportion of patients with a surgical length of inpatient stay of =<21 days by surgery type for patients diagnosed in NI 2018-2019 and Scotland 2015

	NI 2018-2019	Scotland 2015
Oesophagectomy	81%	82%
Gastrectomy	84%	84%

In Scotland there is a quality indicator that length of hospital stay should be as short as possible. It states that 60% of patients should be discharged within 21 days. NI and Scotland both comfortably meet this measure and have comparable length of stays for operative patients by surgery type (Table 38). It is worth noting that Scotland are reducing this quality indicator to 14 days for future audits. If this were the case NI would still comfortably meet this measure for patients who have gastrectomy's with 71% of gastrectomy patients diagnosed 2018-2019 having a length of stay equal to or less than 14 days. However, for patients who undergo oesophagectomy 50% of patients diagnosed 2018-2019 meet this measure, meaning that NI would not meet this QA standard for patients undergoing oesophagectomy.

It is worth noting that for this NI OG audit there are no data available for patients undergoing protocoled enhanced recovery. This is a measure that England and Wales complete as a part of NOGCA [(2)].

30/90-day mortality following curative surgery

Post-operative morality comparisons with England/Wales

Table 39: 30/90 day mortality following curative surgery by surgery type for NI patients diagnosed 2018-2019 with comparisons to England/Wales patients diagnosed 2017-2019*[(2)]

	Oesophagectomy n=108	Gastrectomy N=64	All Major Surgeries n=180
30-day mortality Northern Ireland n (%)	2.8%	1.6%	2.2%
30-day mortality England/Wales %	2.0% (1.6 to 2.4)	1.2% (0.7 to 1.7)	N/A
90-day mortality Northern Ireland n (%)	2.8%	1.6	2.2%
90-day mortality England/Wales %	3.7% (3.1 to 4.3)	2.5% (1.8 to 3.1)	N/A

*Patients followed up to 31/12/2020

Post-operative morality comparisons with Scotland

Table 40: 30/90 day mortality following curative surgery by surgery type for NI patients diagnosed 2018-2019 with comparisons to Scottish patients diagnosed 2015[3]

	Oesophageal cancer patients n=108	Stomach Cancer patients N=64
30 day mortality Northern Ireland n(%)	3 (2.8%)	1 (1.6%)
30 day mortality Scotland %	3.4%	1.3%
90 day mortality Northern Ireland n (%)	3 (2.8%)	1 (1.6%)
90 day mortality Scotland %	6.0%	4.5%

*Patients followed up to 31/12/2020

Despite having the same results, analysis for Table 39 and Table 40 varied differently as Table 39 mortality was analysed by resection type to allow comparisons with patients operated in England and Wales, and Table 40 was analysed by site of diagnosis for patients who had curative surgery to allow for comparison with Scotland. It is difficult to comment on differences in OG cancer surgery mortality between UK regions due to the very low numbers in this population. In NI for patients diagnosed 2018-2019 there is 2.2% mortality within 30 days of surgery performed with curative intent, with no further deaths by 90 days.

Survival differences from date of diagnosis by resection status

Table 41: Post-operative observed survival from date of diagnosis for oesophageal and stomach cancer patients diagnosed 2018-2019 with comparisons to 2005

		Resection Patients		No curative resection		All Patients	
	Time	**2005**	**2018-2019**	**2005**	**2018-2019**	**2005**	**2018-2019**
Oesophagus And OGJ	30 days	97%	100%	90%	93%	92%	94%
	60 days	96%	100%	79%	84%	86%	88%
	6 months	91%	99%	25%	63%	46%	72%
	1 year	79%	92%	8%	42%	41%	54%
Stomach	30 days	83%	100%	72%	90%	78%	92%
	60 days	69%	100%	43%	80%	59%	84%
	6 months	57%	99%	23%	58%	36%	67%
	1 year	42%	90%	14%	36%	28%	48%

Table 41 shows that from date of diagnosis there have been improvements in survival for OG cancer patients between 2005 and 2018/2019. Statistical significance analysis could not be completed as the confidence intervals are not present in the 2005 audit report. Proportional differences in survival from date of diagnosis include:

- 13% increase in 1-year survival (from 79% to 92%), and 8% increase in 6-month survival (from 91% to 99%) for patients who undergo surgical resection for Oesophageal and OGJ cancer.
- 48% increase in 1-year survival (from 42% to 90%), and 42% increase in 6-month survival (57% to 99%) for patients who undergo surgical resection for stomach cancer.
- 34% increase in 1-year survival (8% to 42%) and 38% increase in 6-month survival (25% to 63%) in patients who do not have a resection for oesophageal and OGJ cancer. This could be in part due to the large proportion of patients with squamous cell carcinoma having definitive chemo-radiotherapy as their curative treatment (See Figure 9).
- 22% increase in 1-year survival (14% to 36%), and 35% increase in 6-month survival (23% to 58%) for stomach cancer patients who do not undergo a curative resection.
  Overall increase in 1-year survival of 13% in patients with cancer of the oesophagus and OGJ.
  Overall increase of 20% in 1-year survival in patients with stomach cancer since 2005.

Please see Figure 10 below to visualise these differences in observed survival.

Figure 10. Survival for 2018-2019 Oesophageal Cancer patients in comparison to 2005 patients by resection status at 6 and 12 intervals

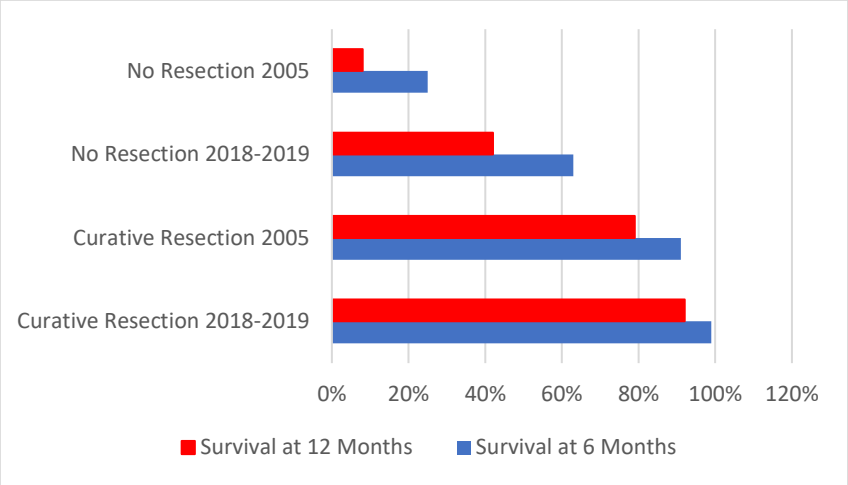


Figure 11. Kaplan Meier (KM) Curve showing observed survival estimates (days) from date of diagnosis for oesophageal and OGJ cancer diagnosed 2018-2019 by resection status

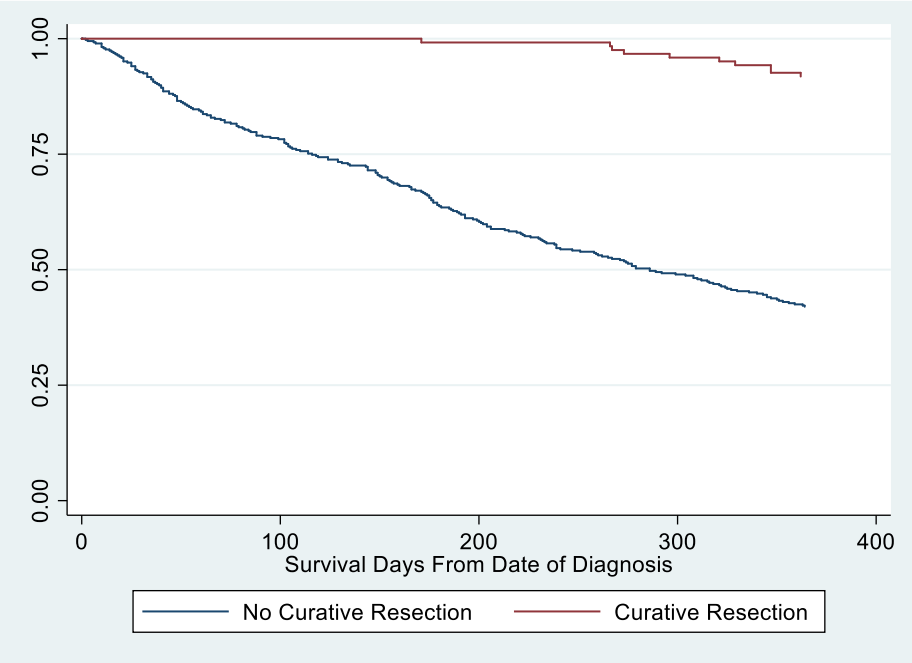


Figure 11 and Table 41 show that patients who undergo curative resection have much better survival rates compared to patients who do not undergo curative resection. At 1-year post diagnosis 42% of patients who did not undergo curative resection were still alive compared to 92% who did undergo curative resection. These differences in survival rates are statistically significant (p<=0.001).

Figure 12. KM Curve showing observed survival estimates (days) from date of diagnosis for stomach cancer diagnosed 2018-2019 by resection status

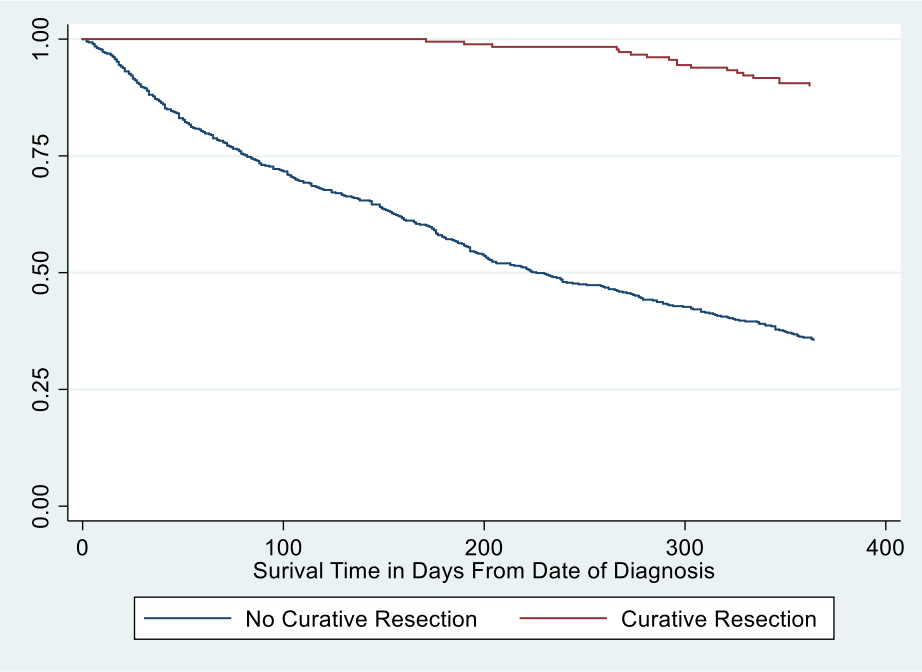
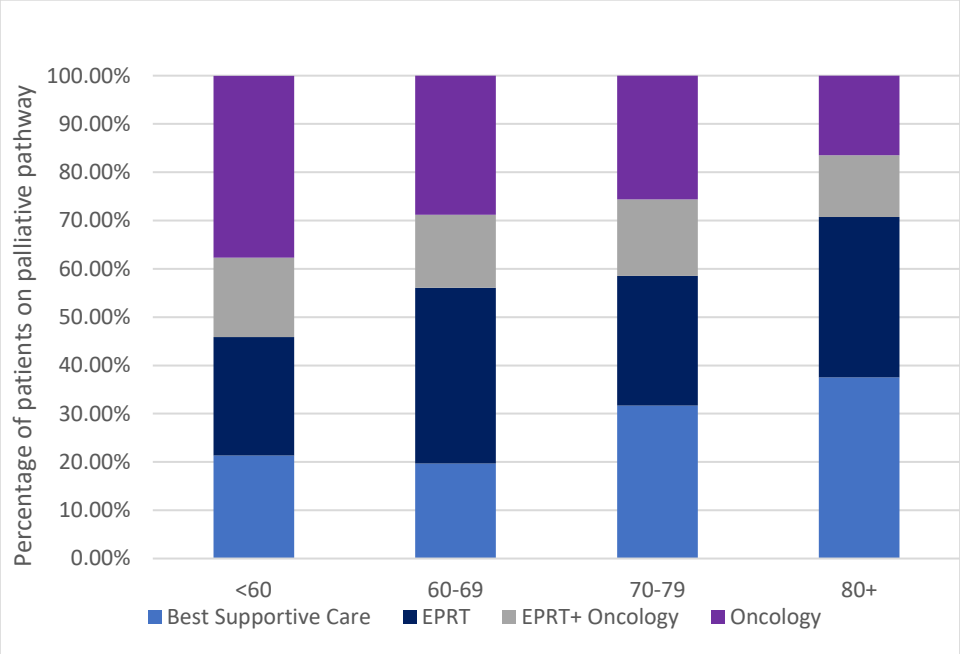


Figure 12 and Table 41 show that stomach cancer patients who undergo surgical resection have much improved survival rates compared with patients who did not have a curative surgical resection. At one year 36% of patients who did not have a curative resection were still alive compared to 90% of patients who did have a curative resection. This difference is statistically significant (p<=0.001).

Non-Curative OG Cancer Treatment Plans

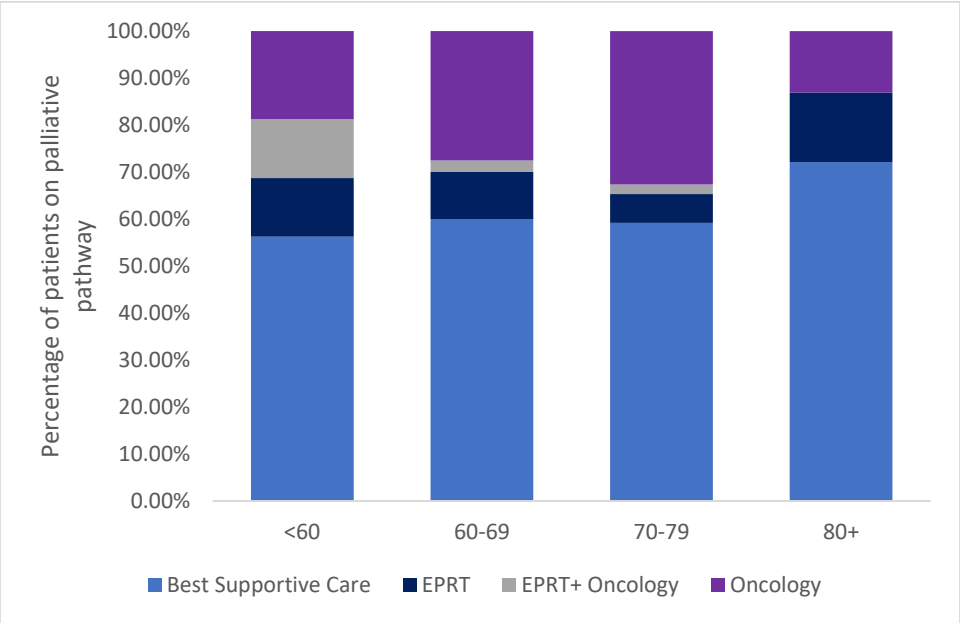
The majority of patients diagnosed in NI are diagnosed at an advanced stage (See Figure 3) or are too frail for curative treatment options. These patients are managed using non-curative intent (palliative intent) aimed at controlling symptoms.

Figure 13. Palliative therapies including best supportive care delivered to oesophageal and OGJ cancer patients (n=267) diagnosed 2018-2019 by age category



Key: EPRT=Endoscopic/radiological palliative pathway

Figure 14. Palliative therapies including best supportive care delivered to stomach cancer patients (n=182) diagnosed 2018-2019 by age category



Key: EPRT=Endoscopic/radiological palliative pathway

Treatment plan analysis:

- Figure 13 shows that for oesophageal and OGJ cancer patients on a palliative pathway, a higher proportion of younger patients receive oncology as an intervention in comparison to older patients (aged <60 years: 54%, aged 80+ years: 28%).
- Figures 13-14 show endoscopic or radiological pathways (ERPT) which include treatments which is predominantly stenting are much more predominant in oesophageal and OGJ patients in comparison to stomach cancer patients.
- As age increases for palliative oesophageal cancer patients, the proportion of patients who receive best supportive care as their pathway also increases.
- Figure 14 shows the majority of palliative stomach cancer patients across all age groups received best supportive care as a part of their treatment pathway (no active treatment beyond immediate relief of symptoms), with proportions increasing as age increases (56% of patients under 60 undergo best-supportive care pathways compared with 72% of patients aged 80+). The differences between advancing age and palliative stomach cancer patients being offered best supportive care is statistically significant (p=0.025).

Endoscopic Radiologic Palliative Pathway (ERPT)

In NI during 2018 & 2019, 98.6% of OG cancer patients had a stenting procedure as their ERPT. This is similar to England and Wales where 97% of patients diagnosed in 2017-2019 who had ERPT also had a stent insertion. A stent is used to open a blockage caused by the tumour with the aim to relieve symptoms.

Table 42: Proportion of palliative OG cancer patients who undergo EPRT for patients diagnosed 2018-2019 by tumour histology and site, with comparisons to England/Wales[2]

	Adenocarcinoma of Oesophagus and OGJ (n=190)	**SCC of Oesophagus (n=58)**	**Stomach Cancer (n=182)**	**All Palliative OG Cancers** (n=449)**
Patients who undergone ERPT NI 2018-2019*	88 (46%)	29 (50%)	26 (14%)	146 (33%)
Patients who undergone ERPT NOGCA 2017-2019	1,142 (17.8%)	512 (21.8%)	242 (6.0%)	N/A

*Note this table only includes patients who had ERPT post-date of diagnosis
**Note this column includes all histology's measured in this audit

In NI ERPT rates are high across all tumour types for OG cancers diagnosed in 2018-2019 (Table 42) compared to the NOGCA audit proportions for patients diagnosed in England and Wales. Overall, 1 in 3 Northern Irish OG cancer patients undergo ERPT as a part of their palliative treatment plan. 46% of adenocarcinoma oesophageal and OGJ patients diagnosed in NI had an ERPT therapy. This is a higher proportion compared with England/Wales, who had 17.8% treated with ERPT; a difference of 28.2%. These differences could in part be due to the small numbers of patients diagnosed in NI, and the high percentage of patients presenting with symptoms and late stage (Table 8 and Figure 3). However, more investigation should be carried out to determine why NI has proportionally larger figures for EPRT than in England and Wales.

Oncology

Table 43: Table to show the proportion of OG cancer patients who received chemotherapy or radiotherapy as part of their treatment pathway by treatment intent

	Curative treatment plan. n=310 , (% col)	Palliative treatment plan n=449 (% col)	Total patients (n=759)
Chemotherapy (total)	209 (67%)	146 (33%)	355 (47%)
Radiotherapy (total)	96 (31%)	54 (12%)	150 (20%)

Table 43 shows that 47% of all OG cancer patients diagnosed in 2018-2019 received chemotherapy as a part of their treatment plan including 209 (67%) of patients who had a treatment plan with curative intent and 146 (33%) who had a treatment plan with palliative intent. Also 1 in 5 patients who had OG cancer had radiotherapy as a part of their treatment plan including, 96 (31%) who had a treatment plan with curative intent and 54 (12%) had a treatment plan with palliative intent.

Table 44: Proportion of patients who have had chemotherapy as a part of their treatment pathway for patients diagnosed NI 2018-2019 by type of pathway and treatment intent

	Curative intent (n=209)	Palliative intent (n=146)
Neo-adjuvant with surgery	132 (63%)	N/A
Adjuvant with surgery	8 (4%)	N/A
Chemotherapy alone	9 (4%)	125 (86%)
Chemo-radiotherapy	60 (29%)	21 (14%)

The majority of OG cancer patients who have chemotherapy with curative intent do so in conjunction with surgery (63%). The majority of patients who have chemotherapy as a part of their palliative anti-cancer treatment plan have chemotherapy alone (86%).

Previously the use of triplet chemotherapy prescriptions (with Epirubicin) where recommended as the 1st line option for palliative OG cancer patients, while NICE Guidelines still recommend both triplet and doublet regimes [18], international evidence suggests that doublet regimens could be favoured to reduce toxicity [20]. Table 45 below shows that the use of triplet chemotherapy prescriptions has been phased out between 2018-2019 with 33% of patients receiving a triplet chemotherapy prescription in 2018 compared to 3% in 2019.

Table 45: Proportions of patients who had a doublet or triplet palliative chemotherapy regime in NI by year of diagnosis

	2018 (n=75)	2019 (n=71)
Palliative Doublet Chemotherapy Regime	50 (67%)	69 (97%)
Palliative Triplet Chemotherapy Regime	25 (33%)	2 (3%)

Anti Her2-Targeted Therapy

NICE Guidelines recommend that for palliative and locally advanced gastric and OGJ tumours that are Her2 positive, they should be given targeted Trastuzumab[18].

Table 46: Proportion of palliative stomach and OGJ adenocarcinoma patients who have their tissue tested positive for Her2 overexpression and received targeted therapy treatment for patients diagnosed 2018-2019

	Number of Stomach and OGJ patients SW I-III* (%)
Number of patients with adenocarcinoma who had a histological basis of diagnosis that were tested for Her2+ (n=198)	132 (66.7%)
Number of patients that were tested for Her2+ that were positive (n=132)	22 (17%)
Number of patients that were Her2+ that received targeted immunotherapy treatment (n=22)	11 (50%)

*Key SWI-III Siewert Levels I-III of oesophago-gastric junction

Two-thirds of palliative stomach and OGJ cancer patients who have the cancer cell type of adenocarcinoma have their tissue sample tested for Her2+ positivity. Of these patients there is a 17% positivity rate. 50% of palliative stomach and OGJ cancer patients who test positive for Her2+ received trastuzumab.

Oncology Outcomes

Table 47: Outcome of chemotherapy treatment for patients diagnosed 2018-2019 by treatment intent

	Curative Treatment Pathway n=209	Palliative Treatment Pathway n=146
Completed chemotherapy as prescribed	142 (68%)	52 (36%)
Treatment not completed due to toxicity	35 (17%)	29 (20%)
Treatment completed (not as prescribed)	23 (11%)	14 (10%)
Treatment not completed due to patient choice	3 (1%)	8 (5%)
Treatment not completed due to progressive disease	2 (1%)	29 (20%)
Treatment not completed due to patient death	0 (0%)	11 (8%)
Treatment not completed –Other	4 (2%)	3 (2%)

- Table 47 shows that a higher proportion of curative OG cancer patients complete their chemotherapy treatment prescription as planned compared with palliative patients with 68% of curative completing their planned chemotherapy prescription compared to 36% of palliative patients.
- 20% of palliative patients do not complete their chemotherapy prescription due to disease progression. This is a similar proportion of people as reported in the 2017-2019 NOGCA report where 19.8% of English and Welsh patients undergoing palliative chemotherapy also did not complete their chemotherapy treatment as planned due to progression.
- 20% of NI palliative patients did not complete their chemotherapy prescription due to toxicity. In NOGCA this figure was 12.4% for English/Welsh patients diagnosed 2017-2019.
- Unfortunately, 8% of Northern Irish patients died during their palliative chemotherapy treatment. In NOGCA this figure was 12.2% for English/Welsh patients diagnosed 2017-2019.

Table 48: Chemotherapy 30-day mortality by treatment intent by UK region and treatment intent

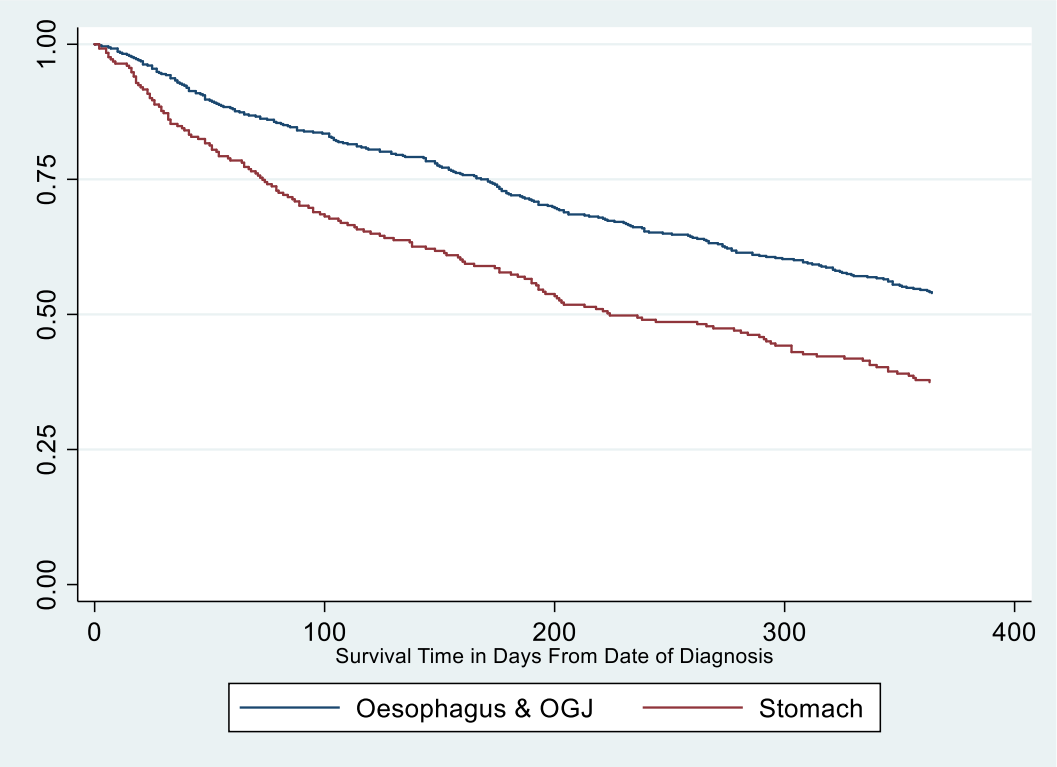
	Curative Treatment Intent	Palliative Treatment Intent
NI 2018-2019 patients alive for less than 30 days since commencing treatment for **oesophageal and OGJ cancer**	<1%	<2%
NI 2018-2019 patients alive for less than 30 days since commencing treatment for **stomach cancer**	0%	<5%
Scotland 2015 patients alive for less than 30 days since commencing treatment for **oesophageal and OGJ cancer**	<1.5%	<10%
Scotland 2015 patients alive for less than 30 days since commencing treatment for **stomach cancer**	< 1%	<20%

Table 48 shows the 30-day mortality rates for patients who have had chemotherapy as a part of their treatment plan. It is worth noting that this is a quality indicator measure in Scotland and for curative treatment plans the target is <10% and for palliative treatment plans the target is <20%. NI comfortable meets both quality assurance measures. It is worth noting for future Scottish OG cancer audits the target will decrease for curative treatment from <10% to <5%, and for palliative treatments it will reduce from <20% to <5%. For both treatment sites and treatments intents NI still meets this quality assurance measure.

Survival Analysis

Estimated KM survival for OG cancer patients diagnosed 2018-2019 by tumour site

Figure 15.



p=<0.0001 Log Rank

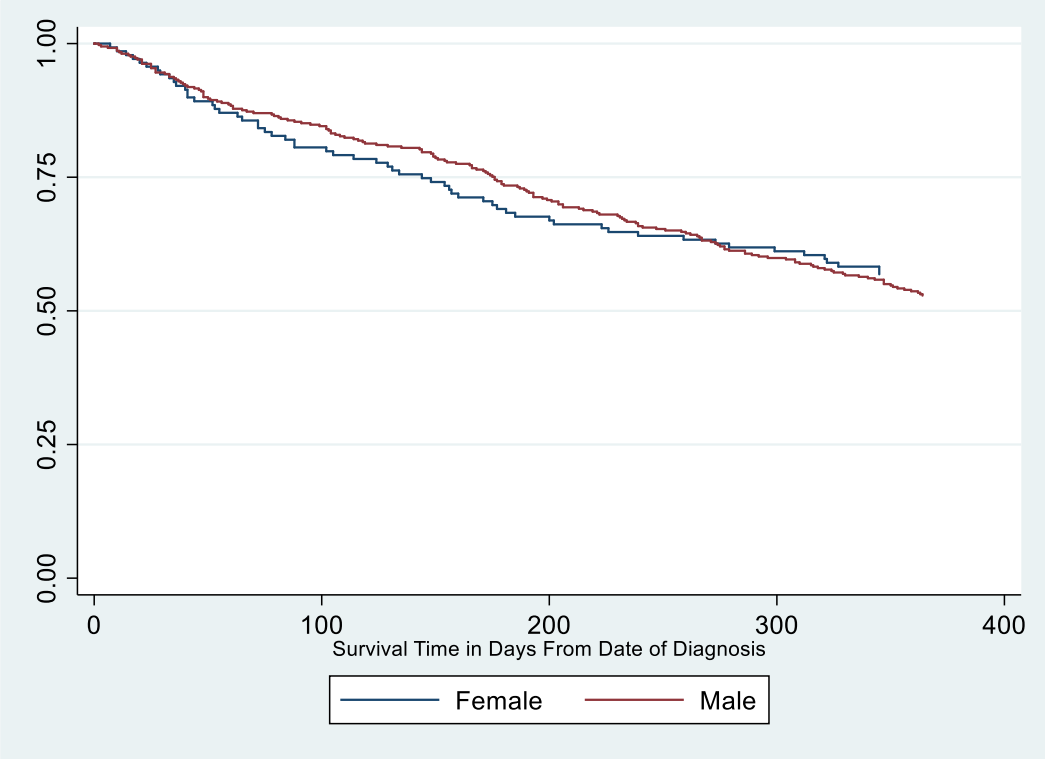
Table 49.

Site	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Oesophagus	90 days	84.06%	80.57%	86.96%
	180 days	72.24%	68.13%	75.92%
	365 days	53.94%	49.50%	58.16%
Stomach	90 days	70.12%	64.04%	75.37%
	180 days	57.77%	51.41%	63.60%
	365 days	37.45%	31.48%	43.40%

During 2018-2019 stomach cancer patients had a lower overall survival compared to oesophageal cancer patients. This difference is statistically significant (p=<0.001).

Estimated (KM) survival of oesophageal and OGJ patients diagnosed 2018-2019 by gender

Figure 16.



P=0.2921 Log Rank

Table 50.

Gender	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Female	90 days	80.58%	72.97%	86.24%
	180 days	69.06%	60.66%	76.03%
	365 days	56.83%	48.18%	64.58%
Male	90 days	85.37%	81.33%	88.59%
	180 days	73.44%	68.62%	77.64%
	365 days	52.85%	47.62%	57.79%

There is no statistical significance difference between male and female oesophageal and OGJ cancer survival for patients diagnosed between 2018-2019 (p=0.2921).

Estimated (KM) survival of stomach cancer patients diagnosed 2018-2019 by gender

Figure 17.

P=0.1365 Log Rank

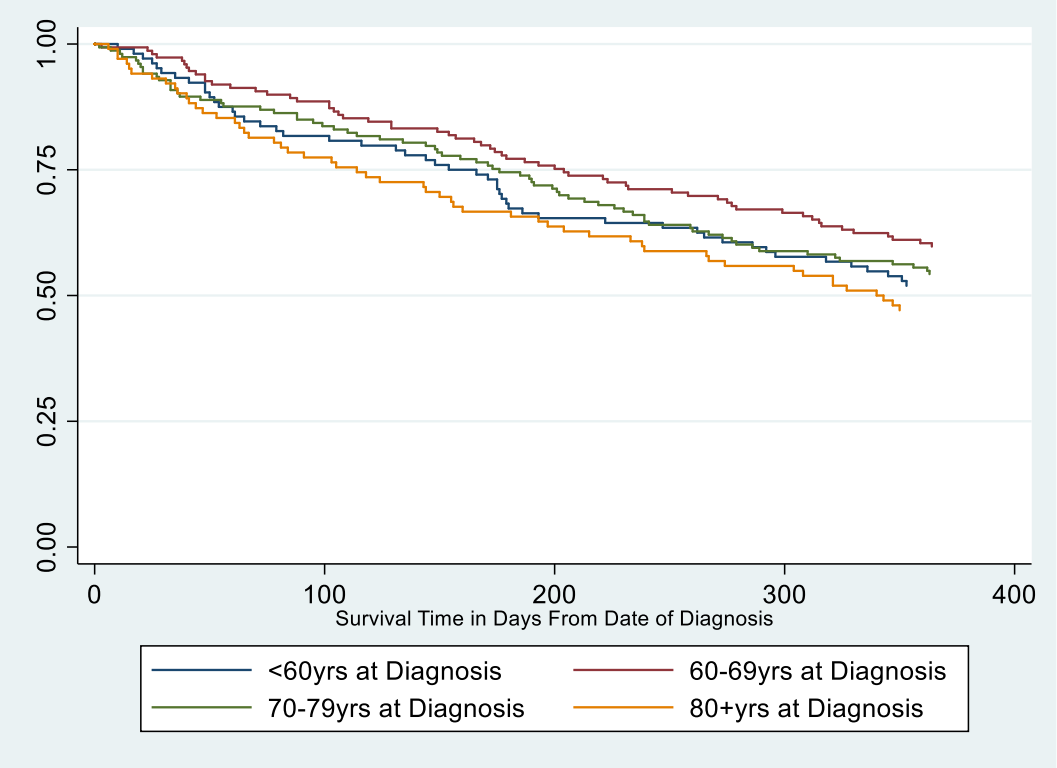
Table 51.

Gender	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Female	90 days	65.35%	55.21%	73.73%
	180 days	51.49%	41.36%	60.70%
	365 days	30.69%	22.01%	39.79%
Male	90 days	73.33%	65.48%	79.67%
	180 days	62.00%	53.73%	69.22%
	365 days	42.00%	34.04%	49.74%

There is no statistical significance between males and females stomach cancer survival for patients diagnosed between 2018-2019 (p=0.1365).

Estimated (KM) survival of oesophageal and OGJ patients diagnosed 2018-2019 by age at diagnosis

Figure 18.



P=0.0612 Log Rank Test

Table 52.

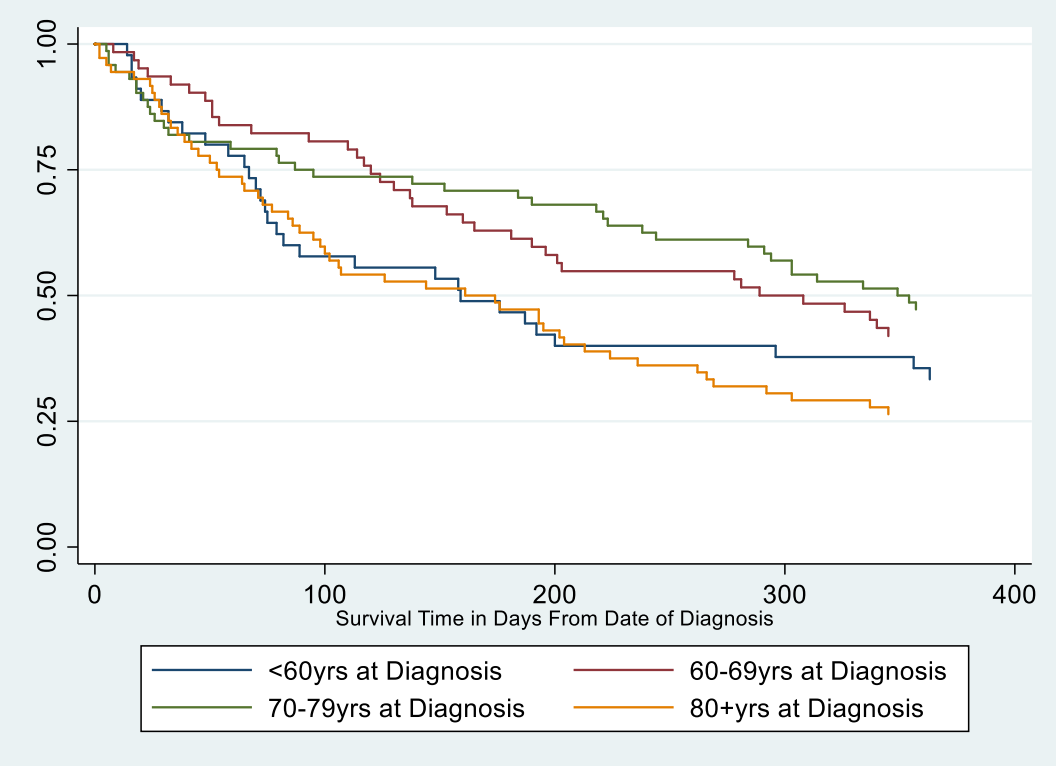
Age at Diagnosis (years)	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
<60	90 days	81.73%	72.87%	87.93%
	180 days	67.31%	57.39%	75.41%
	365 days	51.92%	41.93%	61.00%
60-69	90 days	88.59%	82.29%	92.75%
	180 days	77.18%	69.57%	83.12%
	365 days	59.73%	51.40%	97.10%
70-79	90 days	84.97%	78.25%	89.74%
	180 days	74.51%	66.82%	80.68%
	365 days	54.25%	46.03%	61.75%
80+	90 days	78.43%	69.12%	85.23%
	180 days	66.67%	56.62%	74.90%
	365 days	47.06%	37.14%	56.35%

(Table 52)

Differences in survival by age group is not statistically significant (p=0.0612) for oesophageal and OGJ patients.

Estimated (KM) survival of stomach cancer patients diagnosed 2018-2019 by age at diagnosis

Figure 19.



P=0.1101 Log Rank Test

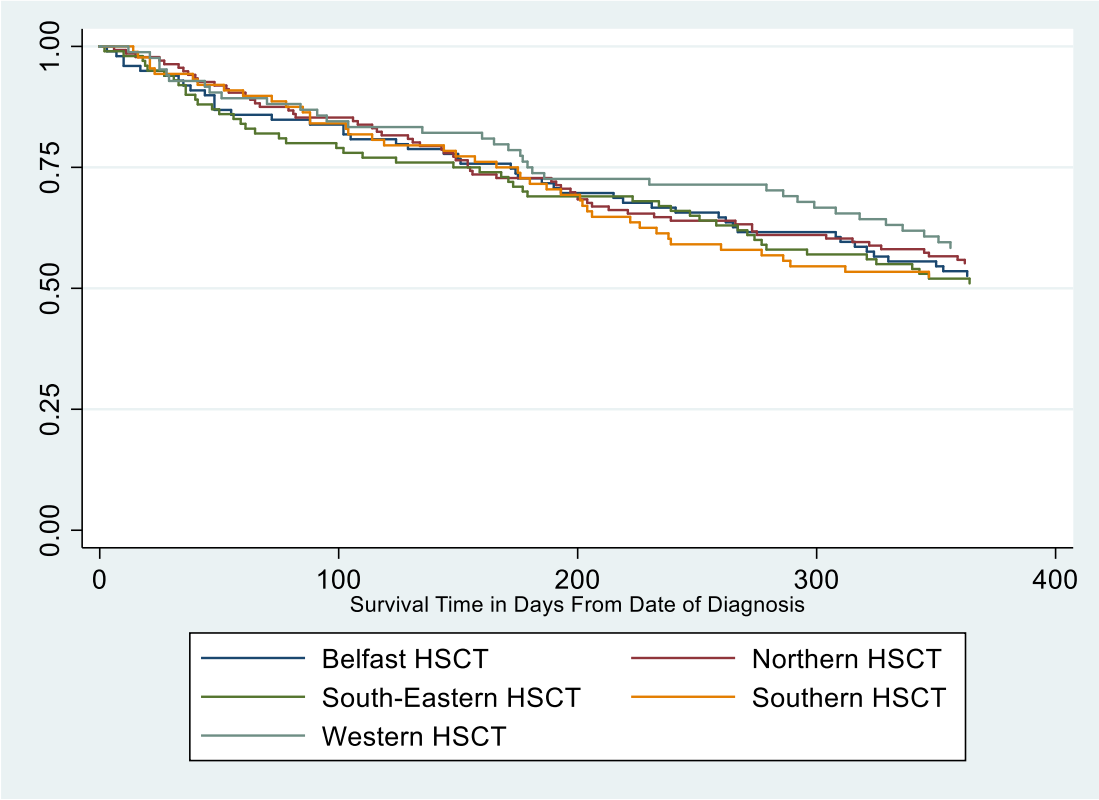
Table 53.

Age at Diagnosis (years)	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
<60	90 days	57.78%	42.11%	70.61%
	180 days	46.67%	31.72%	60.30%
	365 days	33.33%	20.18%	47.04%
60-69	90 days	82.26%	70.26%	89.76%
	180 days	62.90%	49.65%	73.57%
	365 days	41.94%	29.60%	53.77%
70-79	90 days	75.00%	63.30%	83.45%
	180 days	70.83%	58.86%	79.90%
	365 days	47.22%	35.38%	58.17%
80+	90 days	62.50%	50.27%	72.53%
	180 days	47.22%	35.38%	58.17%
	365 days	26.39%	16.87%	36.89%

Differences in survival by age group are not statistically significant (p=0.1101) for stomach cancer patients diagnosed in 2018-2019.

Estimated (KM) survival of Oesophageal and OGJ cancer patients diagnosed 2018-2019 by Trust of residence

Figure 20.



P=0.5576 Log Rank Test

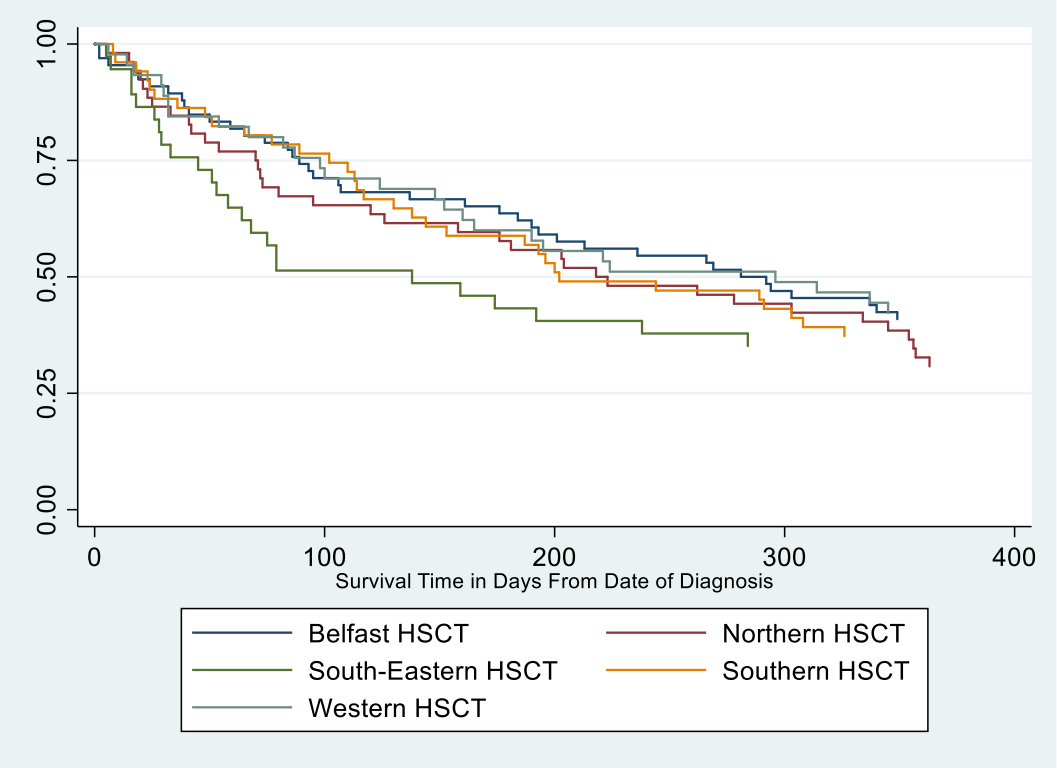
Table 54.

Trust of Residence (By Postcode)	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Belfast HSCT	1 year (365days)	52.53%	42.26%	61.79%
Northern HSCT	1 year (365days)	55.15%	46.40%	63.04%
South-Eastern HSCT	1 year (365days)	51.00%	40.83%	60.28%
Southern HSCT	1 year (365days)	52.81%	41.96%	62.54%
Western HSCT	1 year (365days)	58.33%	47.06%	68.02%

Differences in survival by Trust of residence are not statistically significant (p=0.5576) for oesophageal and OGJ cancer patients diagnosed 2018-2019.

Estimated (KM) survival of stomach cancer patients diagnosed 2018-2019 by Trust of residence

Figure 21.



P=0.8244 Log Rank

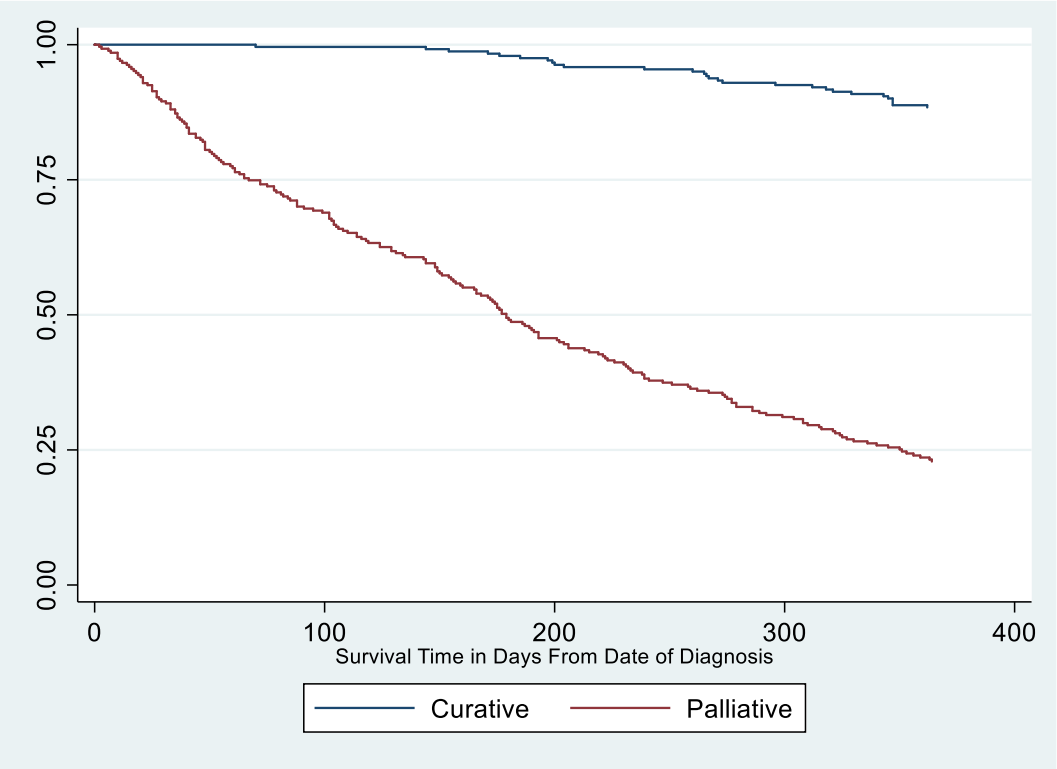
Table 55.

Trust of Residence (By Postcode)	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Belfast HSCT	1 year (365days)	40.91%	29.04%	52.40%
Northern HSCT	1 year (365days)	30.77%	18.90%	43.43%
South-Eastern HSCT	1 year (365days)	35.14%	20.40%	50.25%
Southern HSCT	1 year (365days)	37.25%	24.26%	50.24%
Western HSCT	1 year (365days)	42.22%	27.76%	55.99%

Differences in survival by Trust of residence is not statistically significant (p=0.8244) for stomach cancer patients diagnosed 2018-2019.

Estimated (KM) survival of oesophageal and OGJ cancer patients diagnosed 2018-2019 by Treatment Intent

Figure 22.



P=<0.001 Log Rank

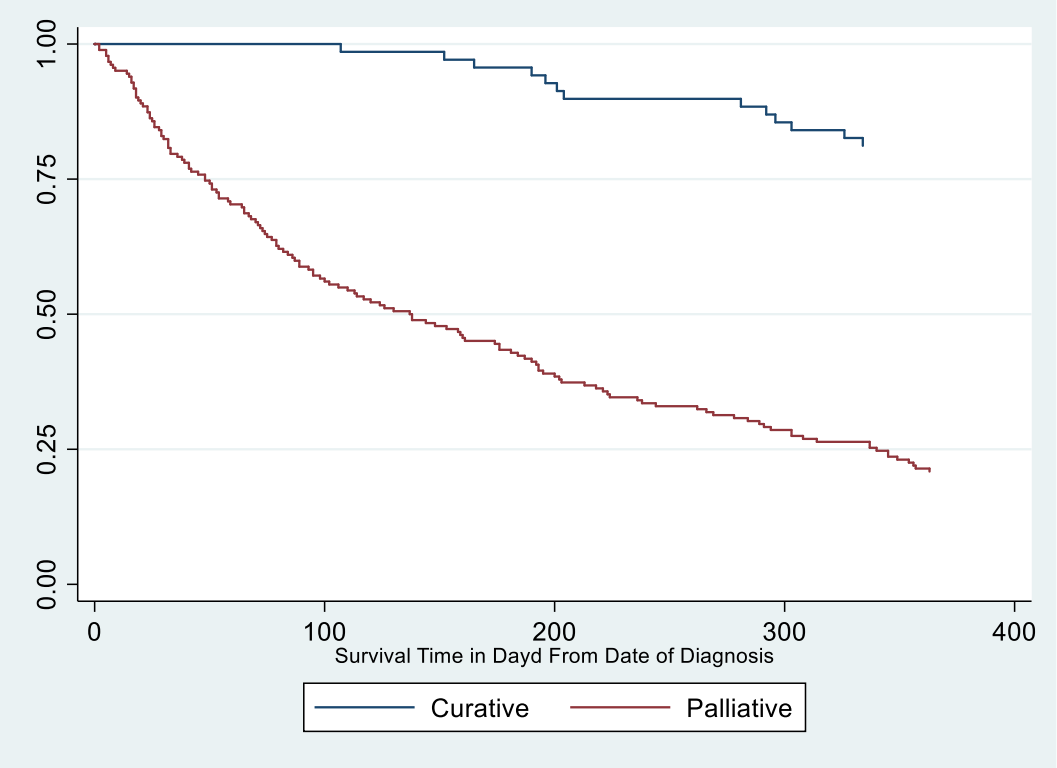
Table 56.

Treatment Intent	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Curative	90 days	99.59%	97.09%	99.94%
	180 days	97.93%	95.09%	99.13%
	365 days	88.38%	83.62%	91.83%
Palliative	90 days	70.04%	64.15%	75.15%
	180 days	49.06%	42.94%	54.89%
	365 days	22.85%	18.01%	28.04%

Oesophageal OGJ cancer patients who are treated with a curative intent have an estimated 1-year survival of 88% compared to patients treated with a palliative treatment intent who have an estimated survival 1-year of 23%. This result is statistically significant P=<0.00005.

Estimated (KM) survival of stomach cancer patients diagnosed 2018-2019 by Treatment Intent

Figure 23.



P=<0.001 Log Rank

Table 57.

Treatment Intent	Time	Survival (%)	Confidence interval lower (95%)	Confidence interval higher (95%)
Curative	90 days	100%	-	-
	180 days	95.65%	87.12%	98.58%
	365 days	81.16%	69.78%	88.59%
Palliative	90 days	58.79%	51.28%	65.54%
	180 days	43.41%	36.13%	50.45%
	365 days	20.88%	15.31%	27.05%

Stomach cancer patients who are treated with a curative intent have an estimated 1-year survival of 81% compared to patients treated with a palliative intent who have an estimated survival 1-year of 21%. This result is statistically significant P=<0.00005.

Summary and Recommendations:

Patient characteristics at presentation:

- Oesophago-gastric cancer patients are a complex group of patients of which the majority are 60+ years of age, present with at least one symptom prior to diagnosis and the majority are diagnosed at an advanced stage (See Figure 2, Table 9 and Figure 3).
- The majority of OG cancer patients present with at least one co-morbidity (72%), of which at least 1 in 10 had a previous malignancy excluding non-melanoma skin cancer (See Table 8).
- 27% of all OG cancer patients had an emergency admission to hospital in the 30 days prior to their diagnosis (for all medical reasons) (See Table 12).
- Patients who are diagnosed at an advanced stage are more likely to be treated with a palliative intent. Patients who are treated with palliative intent have a significantly poorer survival (see Table 28 and Figure 22-23).

Recommendation:

- A review of evidence to further understand how to diagnose more OG cancers at an early stage.

OG cancer patient diagnostic pathway results:

- During 2018-2019, 97% of OG cancer patients had an MDT discuss their treatment plan, a large improvement from 2005 where 61% of oesophageal and OGJ cancer patients had an MDT and 42% of stomach cancer patients had an MDT (see Table 13 and Figure 5).
- NI meets NICE Guidance for diagnostic tests being carried out utilising CT, PET-CT for curative oesophageal cancer patients, OGD, and laparoscopy for stomach cancer patients (See Tables13-22).
- Compliance of provision of PET-CT of stomach cancer patients is low (8%), NICE guidance recommends that stomach cancer patients should be considered for PET CT if metastasis is suspected to help with ongoing management[18] (See Table 17).
- OG cancer waits are high in NI with this cohort of patients never meeting 95% targets for waits from referral to treatment[21]. This could be explained in part by this audits analysis of median waits from referral to diagnostic interventions. The median regional wait for OGD is 15 days, CT is 22 days and PET-CT is 36 days (see Table 23).
- There is regional variation in the median length of time a patient waits for a diagnostic procedure (See Tables 24-27 and Figures 6-7).
- Across all treatment types, NI OG cancer patients wait longer from referral to their 1st treatment in comparison to English and Welsh patients. NI Patients wait longer from diagnosis until the MDT has decided on their treatment plan than English and Welsh patients. However, once the treatment plan is decided they wait less time to receive their first treatment. Reducing the time for diagnostic interventions could see large improvements in time from referral to 1st treatments for NI OG cancer patients (see Table 30).

Recommendations:

- Review of length of time patients wait for diagnostic interventions and variation of regional waiting times.

Surgery:

- There has been a 20% increase in the number of major curative surgeries taking place in NI compared to 2005 (See Table 31). Since 2005 the surgery service in NI has centralised with 93% of oesophageal surgeries and 91% of stomach cancer surgeries taking place in Belfast City Hospital (See Table 33).
- NI meets compliance for lymph node yield being greater than 15 (See Table 34).
- 70.6% of OG cancer patients have a post operative complication with 85% of oesophagectomy patients compared to 47% of stomach cancer patients (See Table 36).
- Post-operative 30day/90day mortality in NI is low at 2.2% for both measures. This is comparable to England/Wales and Scotland (See Table 39-40).

Recommendation:

- Inclusion of protocolised enhanced recovery for post-surgical inpatients in next OG cancer audit.

Palliative Treatment Pathways:

- Endoscopic/radiologic palliative therapies (ERPT) rates in NI for palliative patients are high 33% in NI in comparison to 17.8% in England/Wales (See Table 42).
- There has been a change in practice in the delivery of triplet chemotherapy regimes in NI with 33% of patients in 2018 receiving a palliative triplet chemotherapy regime, compared to 2% in 2019. This is due to increasing evidence of toxicity (See Table 45).

Recommendation:

- Investigate why a high proportion of NI OG cancer patients undergo ERPT.

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