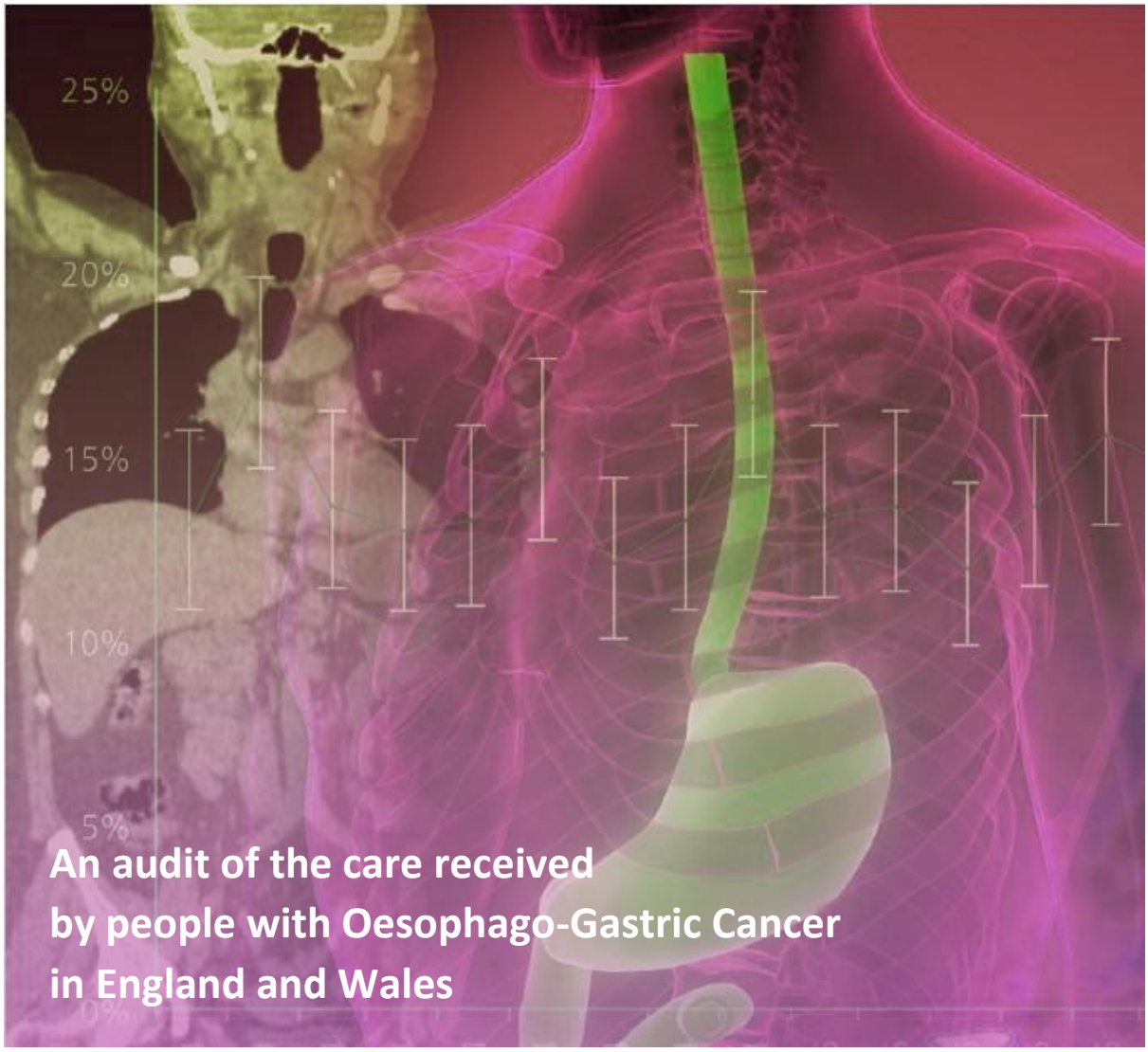
National Oesophago-Gastric Cancer Audit

2020



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HQIP
Healthcare Quality Improvement Partnership

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Contents

Acknowledgements

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HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies. www.hqip.org.uk/national-programmes

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Finally, we thank and remember Mr David Eaves, who sadly passed away this year.

Executive Summary

The National Oesophago-Gastric Cancer Audit (NOGCA) was established to evaluate the quality of care received by patients with oesophago-gastric (OG) cancer in England and Wales.

The Annual Report is written for four key audiences: those who deliver, receive, commission and regulate care. In addition to providing information about OG cancer services for patients and commissioners, it enables NHS organisations to benchmark their performance and identify areas where care could be improved.

The Audit collected data on individuals diagnosed in England and Wales with invasive epithelial cancer of the oesophagus, gastro-oesophageal junction (GOJ) or stomach, and patients diagnosed with high grade dysplasia (HGD) of the oesophagus. The primary focus of the 2020 Annual Report is the care received by adult patients diagnosed between April 2017 and March 2019 and their outcomes. For some outcomes, information is presented for patients diagnosed over a longer period to enable comparisons over time. For example, in the case of HGD, outcomes of endoscopic treatment are presented for a four-year period which enables comparison of the current cohort (2017 to 2019) with patients diagnosed in the previous two years (2015 to 2017). For outcomes of curative surgery among OG cancer patients, data are reported for a three year period (April 2016 to March 2019) to ensure that enough procedures are included in the analysis to produce robust statistics for individual NHS organisations.

Supplementary material, including tables containing individual trust results, and further information about the Audit can be found on its website: www.NOGCA.org.uk.

High grade dysplasia of the oesophagus: key findings

During the 2017-19 period, the Audit received information on 700 patients diagnosed with HGD of the oesophagus in England. This number has decreased over the last five years, from around 800 patients, and the number of HGD records submitted per million population shows variation across regions suggesting that case ascertainment is low in some areas.

Guidance on the management of patients with HGD was published by the BSG in 2014 [BSG/Fitzgerald et al 2014]. The guidance defined clinical standards on the initial diagnosis of HGD and treatment planning, and recommended that patients should be considered for endoscopic therapy in preference to either oesophagectomy or endoscopic surveillance. Performance in four key areas was covered by the Audit:

1. All cases of suspected HGD should be confirmed by two gastrointestinal pathologists

In the audit period 2017-19, 86.7% of patients with HGD had their original diagnosis confirmed by a second pathologist. As in previous years, the proportion was higher among younger patients. The proportion for patients aged 80 and over was 84.0%, which was an improvement on the figures for the preceding four years.

2. All patients with HGD should be discussed by a specialist multi-disciplinary team (MDT).

In the 2017-19 audit period, 91.3% of patients with newly diagnosed HGD were discussed at an upper gastrointestinal MDT meeting. This proportion has increased from 84.7% in 2015-17. There were regional differences in the proportion discussed at MDT, with the figure

exceeding 90% for 12 Cancer Alliances and being below 70% for two Alliances.

3. Endoscopic therapy for HGD is preferred over oesophagectomy or surveillance

Among patients diagnosed between 2015 and 2019, 73.8% had a plan of endoscopic therapy. The remaining planned treatments were: oesophagectomy for 2.0% of patients, surveillance for 11.0% and other treatments for 5.3%, while 8.0% of patients had a plan for no treatment or surveillance. There was some variation in the use of surveillance or no treatment across Cancer Alliances.

4. Endoscopic treatment should be performed in specialist centres treating at least 15 cases each year.

Based on the data submitted for the 2017-19 period, 10 of the 37 specialist OG cancer centres performed at least 15 endoscopic procedures per year, an improvement from 7 centres in last year's Audit period.

Oesophago-gastric cancer: key findings

All 131 NHS acute trusts in England and the 6 local health boards providing OG cancer care in Wales participated in the 2017-19 Audit period. Records were submitted for 20,528 patients, including 19,171 diagnosed in England and 1,357 in Wales. Case ascertainment was estimated to be 90% in England and over 85% in Wales.

1. Patterns of care at diagnosis

Among patients diagnosed in 2017-19, 64% were diagnosed following referral from a GP, 13% after emergency admission, and 23% from a non-emergency hospital setting. The rate of diagnosis following an emergency admission has remained largely unchanged over the last five Audit years, as has the proportion of patients diagnosed with early stage cancer. Regional variation continues to persist in the proportion of patients diagnosed after an emergency admission. Notably, the adjusted rates of emergency diagnosis in Wales are higher than in England. This may be due to differences in patient behaviours as well as practitioner factors. There may also be variation in the way that emergency referral routes are recorded.

2. Staging and treatment planning

As in previous years, a minority of organisations submitted limited data about staging investigations. In addition, clinical stage information was incomplete for 17% of patients. This needs to improve because this information is essential to understand patterns of care. Clinical stage information was more likely to be missing for older patients and those with non-curative treatment plans.

It is recommended that all patients diagnosed with OG cancer have a CT scan to assess the spread of disease. Overall, 94.9% of patients diagnosed in 2017-19 had an initial CT scan, and there was generally good compliance with this recommendation across NHS organisations.

For patients with oesophageal cancer, the use of PET-CT scans is recommended for patients being considered for curative treatment. In the 2017-19 cohort, 71.3% of patients with oesophageal cancer who had a plan for curative treatment were recorded to have had PET-CT, although there was variation across England and Wales.

Among patients in the 2017-19 cohort with clinical stage 0-2 disease, 83% of those aged under 70 years had a curative treatment plan, although this figure was lower among older patients. A similar pattern was seem among patients with stage 3 disease, with 72% of

those aged under 70 years having a curative treatment plan.

3. Time taken along the care pathway

The target waiting time from urgent referral to the start of treatment is 62 days in both England and Wales. In the 2017-2019 cohort, the distributions of waiting times from referral to first treatment were similar across the Cancer Alliances / Welsh regions. Overall:

- 60% of patients waited more than 62 days from referral to first curative treatment.
- 19% waited more than 104 days.
- In 7 of 24 regions, over a quarter of patients waited longer than 104 days to begin treatment.
- Among patients receiving non-curative oncological treatment, 42% waited longer than 62 days and 12% waited more than 104 days.

These waits are unacceptably long and NHS organisations which perform poorly against the national 62 day target should review their OG cancer pathway and take steps to ensure compliance with this target.

4. Curative Surgery

In the 3-year period (2016-2019) over which curative surgery is evaluated, surgical centres submitted data for 4,112 oesophagectomies and 2,163 gastrectomies. Rates of 90-day mortality after curative surgery were within the expected range from the national average for all NHS surgical centres (overall 90-day mortality rate was 3.3% for oesophagectomies and 1.7% for gastrectomies).

Information about 1-year survival after curative surgery is presented for the first time in this report. Figures were produced for the 2016-2019 Audit period, and show 82.7% of oesophageal cancer patients and 85.7% of stomach cancer patients survived at least one year after surgery. This measure provides insight into the adequacy of staging and appropriateness of curative surgery. Most of the NHS surgical centres had an adjusted 1-year survival rate that fell within the expected range (defined by the 99.8% control limit). There were two NHS trusts whose survival rates were above the upper 99.8% control limit, suggesting that they performed better than average during the Audit period.

Enhanced recovery after surgery (ERAS) protocols can reduce surgical complications and shorten length of hospital stay. Data on the use of ERAS protocols in OG cancer surgery were available for English centres for the last two Audit years (2017-2019). Use of the ERAS approach was reported for over two-thirds of patients, but was clustered within NHS trusts, with only 20 of 35 surgical centres reporting an ERAS pathway for more than 80% of surgical patients. Patients on an ERAS pathway had a shorter average length of stay following surgery. Patients on a protocolised ERAS pathway with daily documentation in medical notes had an average length of hospital stay that was around 1.5 days shorter than those on a non-ERAS pathway.

Other key surgical indicators for patients having curative surgery include the proportion of patients with a positive resection margin. In the 2016-19 Audit period, all surgical centres achieved positive longitudinal margin rates within the expected ranges from the national average for both oesophagectomy and gastrectomy. However, the overall positive longitudinal margin rate of 8.1% for gastrectomy exceeded the 5% target set out in the AUGIS recommendations. At 4.2%, the overall rate for oesophagectomy was within the target range. Indicators summarising positive circumferential margins and number of lymph nodes examined showed more variation than the longitudinal margin indicators, but have shown improvements in recent years.

5. Non-curative treatments

Among patients on a non-curative care pathway, palliative oncology was the most common treatment option. Among patients with a record of palliative oncology, chemotherapy was the most frequently used treatment for both oesophageal and gastric cancers (67% overall). The rates of completion of chemotherapy were relatively low (56%), and did not vary greatly by tumour type, patient age or clinical stage. The most frequently reported reasons for non-completion of chemotherapy were disease progression during treatment, acute chemotherapy toxicity and patient death. In the 2017-19 Audit cohort, 3.6% of patients died within 30 days of starting palliative chemotherapy.

While the use of triplet regimens has previously been recommended as a first line option for palliative chemotherapy, the benefit of these regimens has been questioned in recent years and several international studies recommend a doublet regimen as standard of care. Reflecting this change, the Audit data show that there is considerable regional variation in the use of triplet regimens. The use of doublet regimens has increased over the last five years, from 16.5% among patients diagnosed in 2014/15 to 25.8% among those diagnosed in 2018/19.

Recommendations

	Where in report	Primary audience
Audit participation		
1. Regularly assess records submitted to the National Oesophago-Gastric Cancer Audit to ensure (a) high case ascertainment, and (b) low levels of missing data on cancer stage, staging investigations and surgical pathology results.	Pages 13, 18, 26	Clinical leads, Multi-disciplinary teams (MDTs), local audit teams
Diagnosis and treatment of high grade dysplasia		
2. Review patients who do not have their diagnosis of high grade dysplasia diagnosed by a second pathologist, and examine the reasons for this to ensure that all patients have their diagnosis confirmed by two pathologists.	Page 14	Clinical leads, MDTs
3. Examine high rates of non-treatment among patients with high grade dysplasia in a local audit to ensure offers of endoscopic treatment are consistent with British Society of Gastroenterology recommendations.	Page 15	Clinical leads, MDTs
4. Ensure protocols on the referral of patients to local specialist centres for endoscopic treatment will produce annual volumes at these centres that meet recommended caseloads.	Page 17	NHS trusts / local health boards, commissioners
Diagnosis and treatment of oesophago-gastric cancer		
5. Review patients who were diagnosed after emergency admission to identify opportunities for improving earlier detection.	Page 23	GP practices, MDTs, Commissioners
6. Ensure all patients with oesophageal cancer being considered for curative treatment have a PET-CT scan. Hospitals with low reported use of PET-CT scans should investigate to determine the causes. Use of PET-CT scans for gastric cancer patients should be reviewed in line with recent evidence.	Page 26	MDTs, NHS trusts / local health boards
7. Review waiting times through the oesophago-gastric cancer care pathway and identify ways to reduce the proportion of patients waiting longer than 62 days from referral to treatment.	Page 32-33	MDTs, NHS trusts / local health boards, GPs, commissioners
8. Review options for implementing enhanced recovery after surgery (ERAS) protocols as standard care.	Page 35	Upper GI surgeons, AUGIS
9. Continue work towards standardising the methods of preparing surgical specimens following resection, particularly in relation to circumferential margins.	Page 38	Upper GI surgeons, pathologists, AUGIS
10. Work towards consensus-based practice in the use of triplet and doublet palliative chemotherapy regimens.	Page 47	Oncologists, MDTs, RCR, RCP

NOGCA | National Oesophago-Gastric Cancer Audit

2020 Annual Report: High-grade dysplasia of the oesophagus

The Audit received information about

700

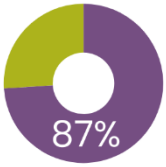
patients in England

diagnosed with high-grade dysplasia of the oesophagus between April 2017 and March 2019.

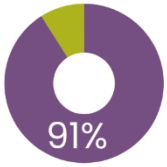
Patient characteristics

- Median age: 71 years
- 75% male
- 84% had a segment of Barrett's oesophagus
- 59% were diagnosed while on surveillance programmes and 41% via referral

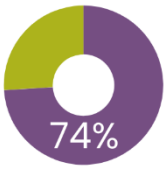
Recommended process of care



of patients had their diagnosis confirmed by a second pathologist



of patients were discussed at a multidisciplinary team meeting

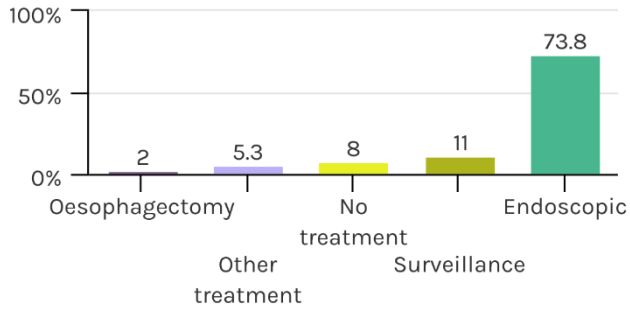


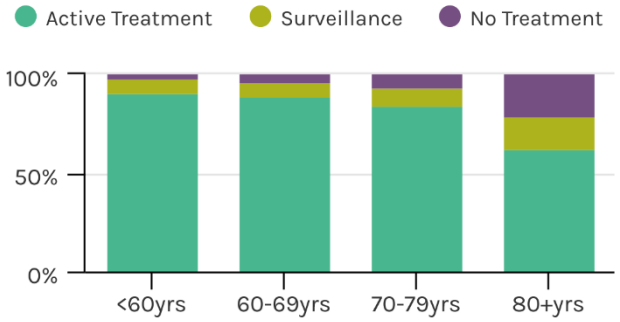
of patients had a plan for endoscopic therapy

About 1 in 2 patients placed under surveillance were unfit for active treatment

Primary treatment modality

Primary treatment among patients diagnosed between 2015 and 2019





The choice of an active treatment compared to surveillance or no treatment varied significantly by age at diagnosis.

Outcomes of endoscopic treatment

Outcomes after endoscopic mucosal resection / endoscopic submucosal dissection in 2017/19

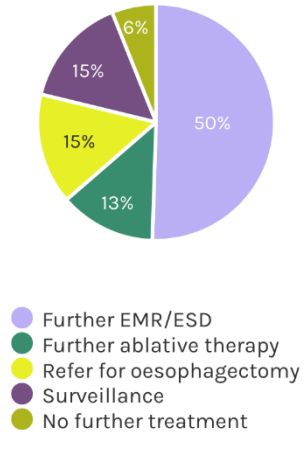
76% patients had a complete excision.

Complete excision rate was higher among HGD lesions that were flat or depressed.

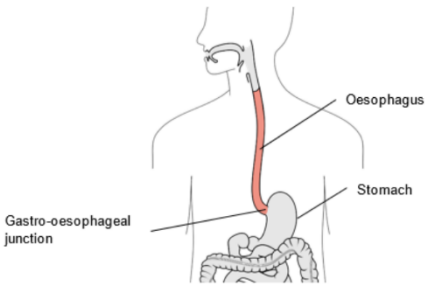
31% of removed tissue was found to contain cancer cells.

The proportion of patients referred for further EMR / ESD after incomplete excision doubled, compared to 2015/17.

Plan after incomplete excision



Glossary



High-grade dysplasia of the oesophagus - The presence of severely abnormal cells (precancerous cells) in the lining of the oesophagus. It can turn into cancer if it is left untreated.

Barrett's oesophagus - Changes in the cells on the inner lining of the lower part of the oesophagus.

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2020 Annual Report: Oesophago-gastric cancer

The Audit received information about

20,528

patients in England and Wales

diagnosed with oesophago-gastric (OG) cancer between April 2017 and March 2019, including 14,556 patients with oesophageal cancer and 5,972 patients with gastric cancer.

Patient characteristics

Oesophageal cancer

- Median age: 71 years
- 71% male
- 37% stage 4 cancer

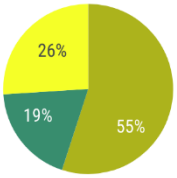
Stomach cancer

- Median age: 74 years
- 66% male
- 44% stage 4 cancer

Routes to diagnosis

Oesophageal cancer

Stomach cancer



Patients with stomach cancer are more likely to be diagnosed following an emergency admission than patients with oesophageal cancer.

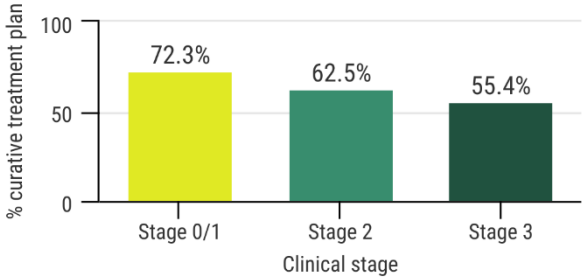
Adjusted rates of emergency diagnosis are higher in Wales than in England.

Time taken to move along the care pathway

Cancer waiting time targets set by NHS England and NHS Wales aim for patients to start treatment within 62 days of an urgent referral for suspected cancer.

Among patients diagnosed with OG cancer in 2017-2019:

Treatment planning



Among patients with stage 0-3 disease, 60% had a curative treatment plan.

Outcomes of curative surgery

Oesophagectomy

Median length of stay	90-day survival	Positive longitudinal margins
11 days	96.3%	4.2%

Gastrectomy

Median length of stay	90-day survival	Positive longitudinal margins
9 days	97.5%	8.1%

Glossary

Stage 4 cancer - This describes advanced cancers which have spread beyond the site of the original tumour to other organs/parts of the body. Treatment options are limited to therapies that might extend life or control symptoms but are unlikely to result in remission.

Oesophagectomy - The surgical removal of all or part of the oesophagus.

Gastrectomy - A surgical procedure to remove either a section or all of the stomach.

Margins - The edge of the tissue that is removed during surgery. A positive margin means that there are cancer cells at the edge of the removed tissue and more surgery may be needed.

1. Introduction

The National Oesophago-Gastric Cancer Audit (NOGCA) was established to evaluate the quality of care received by patients diagnosed with oesophago-gastric cancer and identify areas where NHS cancer services in England and Wales can improve. Oesophago-gastric (OG) cancer is the fifth most common type of cancer in the UK, with around 13,000 people diagnosed each year in England and Wales. In addition, the Audit examines the care received by patients diagnosed with oesophageal high grade dysplasia (HGD), due to the risk of progression to cancer if HGD is left untreated.

Cancer patients were eligible for inclusion in the Audit if they were diagnosed with invasive epithelial cancer of the oesophagus, gastro-oesophageal junction (GOJ) or stomach (ICD10 codes C15 and C16), and were aged 18 years or over. Patients with neuro-endocrine tumours or gastro-intestinal stromal tumours (GISTs) were not included in the Audit due to the different management of these tumours.

The 2020 Annual Report focuses primarily on the experience and outcomes of patients diagnosed with OG cancer or oesophageal HGD between April 2017 and March 2019.

1.1 The 2020 Annual Report

The aim of this report is to describe the care provided by NHS OG cancer services in England and Wales from the time of diagnosis to the end of a patient's primary treatment, and to identify regional variation in care for local investigation. It is written for those who provide, receive, commission and regulate OG cancer care. This includes clinicians and other healthcare professionals working within hospital cancer units, clinical commissioners, and regulators, as well as patients and the public who are interested in knowing how OG cancer services are delivered within the NHS. A separate Report for the Public and Patients will be published on the NOGCA website.

The Audit is run by the Association of Upper Gastrointestinal Surgeons of Great Britain & Ireland (AUGIS), the Royal College of Radiologists (RCR), the British Society of Gastroenterology (BSG), NHS Digital and the Clinical Effectiveness Unit of the Royal College of Surgeons of England (RCS). The delivery of the Audit is overseen by a Project Board whose role is to ensure NOGCA is well-managed. Advice on the clinical direction of the Audit, the interpretation of its findings and their dissemination is provided by a Clinical Reference Group (see Annex 1).

COVID-19

The COVID-19 pandemic has led to the complete reorganisation of many NHS services and changes in the health-seeking behaviour of the general public, with implications for OG cancer care.

The NOGCA 2020 Annual Report covers a pre-COVID-19 period (April 2017 to March 2019), therefore the results reported are not affected by the pandemic. However, next year's report will include patients whose care has been impacted during the peak COVID-19 period.

In order to understand how OG cancer treatment pathways have been affected and how services have adapted, the NOGCA team has conducted an organisational survey of all specialist OG cancer centres in England and Wales. The findings of this survey will be published on the NOGCA website and will inform the interpretation of results in the 2021 Annual Report.

1.2 Regional organisation of OG cancer services

OG cancer services within England and Wales are organised on a regional basis to provide an integrated model of care.

This report presents regional results for English NHS services using the 21 Cancer Alliances, which are responsible for coordinating cancer care and improving patient outcomes for local populations (https://www.england.nhs.uk/cancer/cancer-alliances-improving-care-locally/).

For Wales, three NHS services providing specialist surgical and oncology services are used to define geographical regions: Swansea Bay, Betsi Cadwaladr (North Wales) and South Wales Cardiff region.

A list of the geographical regions and the NHS organisations within them is provided in Annex 3.

1.3 Other information produced by the Audit

Supplementary material from the report, including tables containing individual trust results, and further information about the Audit can be found on its website: www.NOGCA.org.uk.

The NOGCA website also contains:

- Annual Reports from previous years
- Reports for the public and patients
- Information on the performance of each NHS organisation
- Resources to support local quality improvement initiatives
- Links to other sources of information about OG cancer such as Cancer Research UK

In addition to organisational-level outcomes, the Audit publishes outcome information about individual consultant surgeons currently working at each organisation.

This information can be found in the following places:

- AUGIS website: http://www.augis.org/surgical-outcomes-2019/
- MyNHS website: https://www.nhs.uk/Service-Search/performance/search

The results from the Audit are used by various other national health care organisations. In particular, the Audit has worked with HQIP and the Care Quality Commission (CQC) intelligence team to create a dashboard to support their inspections.

2. Management of HGD patients

Among patients with Barrett's oesophagus (a condition that affects the junction of the oesophagus and the stomach), the cells can become increasingly abnormal, a condition called dysplasia. High grade dysplasia (HGD) is the most severe form of dysplasia and, if untreated, around 1 in 20 patients develop oesophageal cancer in the year after diagnosis [Rastogi et al 2008].

To evaluate the care received by patients with HGD, the Audit uses performance indicators identified in the British Society of Gastroenterology (BSG) guidance on the management of Barrett's oesophagus [BSG/Fitzgerald et al 2014] and NICE clinical guidance on ablative therapy in the treatment of Barrett's oesophagus [NICE 2010] (see Box 2.1).

Box 2.1. Recommendations from BSG guidelines on the management of HGD

Recommendation	Indicator
All cases of suspected HGD should be confirmed by two gastrointestinal (GI) pathologists Grading dysplasia involves a degree of subjectivity. Studies have found that the rate of progression to cancer among patients with dysplasia is higher when diagnosis is confirmed by two pathologists.	% of patients whose diagnosis was confirmed by a second pathologist
All patients with HGD for whom therapy is considered should be discussed by a specialist multi-disciplinary team (MDT) for OG cancer Discussion by the MDT ensures that the most appropriate treatment options are considered for patients.	% of patients considered for treatment who are discussed by specialist MDT for OG cancer
Endoscopic treatment of HGD (endoscopic mucosal resection, radiofrequency ablation) is preferred over oesophagectomy or surveillance Compared to surgery, endoscopic treatment is associated with lower morbidity and mortality. There is no evidence to support the use of surveillance.	% of patients who received endoscopic treatment
Endoscopic treatment should be performed in high-volume tertiary referral centres (minimum 15 endoscopic procedures per year for HGD or early cancer) Complication rates after endoscopic treatments have been found to be higher among endoscopists with less experience.	Number of patients with HGD receiving endoscopic treatment at each NHS trust per year

2.1 Submission of data on HGD patients

The submission of data on HGD patients has so far been limited to English NHS trusts. In Wales, data collection has not been possible via the CaNISC IT system. In this report, we present data submitted to the Audit for patients diagnosed with HGD between April 2013 and March 2019. Some indicators are reported for more recent years only to reflect current practice and availability of data items.

The number of HGD records submitted to the Audit has decreased over time: 771 cases in the two-year period 2013-15, 748 in 2015-17, and 700 in 2017-19. There is unfortunately no reliable way to identify patients with HGD in other national health care datasets to assess case ascertainment [Chadwick et al 2017]. Consequently, we present the estimated incidence of HGD among people aged 40+ years per million population for each Cancer Alliance (Table 2.1) given that the population structure within each region is similar (Note: North Central London and North East London Cancer Alliances are reported together as there were fewer than 10 HGD records submitted for North East London). The number of HGD cases across the Alliances typically falls between 10 and 40 per million, although several Alliances have much lower rates. The most likely explanation for these low values is a comparatively worse case-ascertainment rate.

We encourage NHS trusts to address this issue. The number of HGD patients within each area corresponds to 1-4 per month, and therefore the submission of these data does not represent a substantial burden.

Table 2.1: HGD cases submitted to the Audit per million population by English Cancer Alliance

Cancer Alliance	Adults aged 40+ years	HGD cases per million, by year of diagnosis		
		2013-2015	2015-17	2017-2019
Cheshire and Merseyside	1,389,031	37.4	37.4	19.4
East Midlands	1,570,650	50.9	38.8	33.7
East of England - North	3,475,008	16.1	18.7	26.5
East of England - South	1,488,820	29.6	20.2	21.5
Greater Manchester	1,441,967	16.6	9.0	16.6
Humber, Coast and Vale	958,930	14.6	12.5	15.6
Kent and Medway	990,126	11.1	14.1	3.0
Lancashire and South Cumbria	936,934	17.1	29.9	33.1
North Central / North East London	1,562,838	34.6	3.2	9.6
North West and South West London	1,097,679	24.6	23.7	23.7
Northern	1,634,735	52.6	48.9	50.2
Peninsula	1,037,742	30.8	28.9	10.6
Somerset, Wiltshire, Avon and Gloucester	1,333,184	21.8	37.5	46.5
South East London	870,132	26.4	69.0	57.5
South Yorkshire and Bassetlaw	1,178,359	24.6	22.1	25.5
Surrey and Sussex	1,192,789	10.9	14.3	4.2
Thames Valley	938,388	14.9	32.0	41.6
Wessex	1,460,613	51.3	45.2	24.6
West Midlands	2,615,051	15.7	18.7	17.6
West Yorkshire and Harrogate	1,217,768	23.0	18.9	14.0

High grade dysplasia is more common among older individuals. For the period 2017-19, the median age at diagnosis was 71 years (IQR 63 to 77) and 75% of the 700 patients were male. Given the age profile, it is not surprising that 51% of patients had at least one significant comorbidity, of whom

- 25% had cardiovascular disease
- 11% had chronic obstructive pulmonary disease, and
- 10% had diabetes.

The majority of diagnosed patients (59%) had been on a Barrett's surveillance programme. The remaining 41% were diagnosed after referral from a general practitioner.

2.2 Diagnosis

Table 2.2 shows the proportion of patients who had their original diagnosis confirmed by a second pathologist. In general, this standard of care is being delivered to patients, and there has been some improvement particularly for patients aged 80 years or more. In the 2017-19 audit period:

- 84% of patients were reported to have a Barrett's segment.
- 49% of patients had a flat mucosa, 46% had a nodular lesion, and 5% had a depressed lesion.

The above characteristics are similar to those reported in other studies.

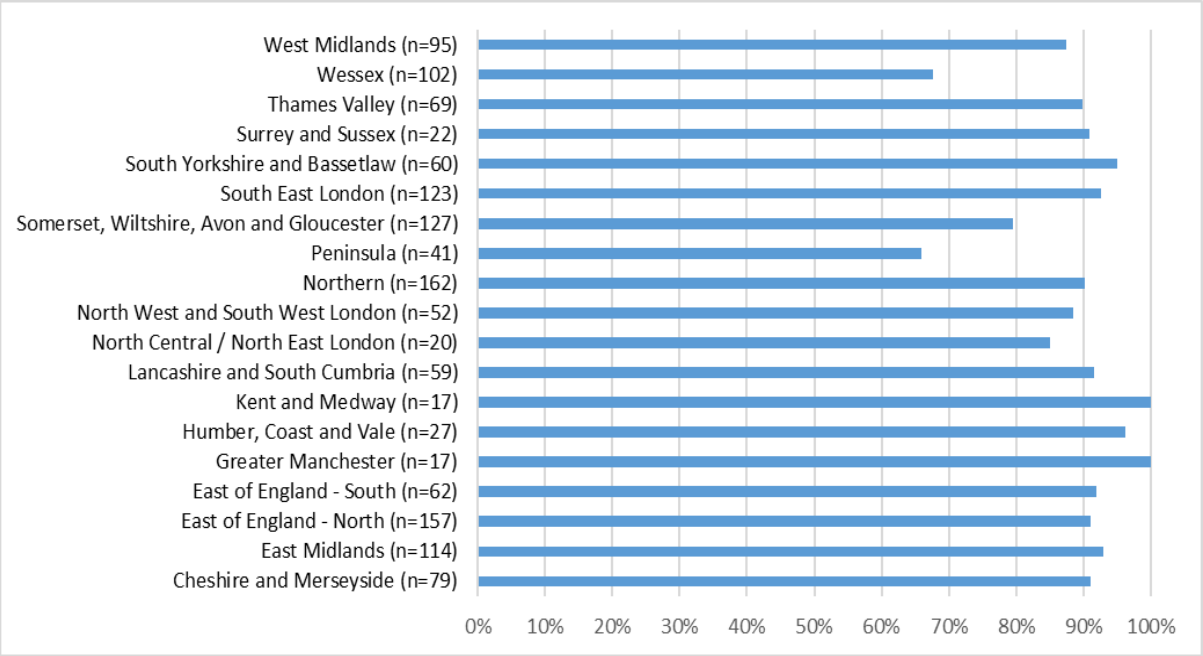
2.3 Treatment planning

Between 2017 and 2019, 91% of newly diagnosed HGD patients had a treatment plan agreed at an upper gastrointestinal MDT meeting, an increase from previous periods (Table 2.2). This proportion was lower among the surveillance group (78.8%), compared to the active treatment group (94.1%).

Table 2.2: Proportion of patients whose original diagnosis was confirmed by a second pathologist by age at diagnosis and year of diagnosis, and proportion of patients with treatment plan agreed at MDT

	Year of diagnosis		
	2013-15	**2015-17**	**2017-19**
Age of patient at diagnosis (years)			
Under 60 years	90.6%	94.6%	89.8%
60-69	84.9%	88.5%	84.8%
70-79	85.3%	84.2%	87.8%
80 or over	76.4%	83.2%	84.0%
All patients	84.2%	86.7%	86.7%
Treatment plan agreed at MDT			
Yes	86.8%	84.7%	91.3%

Figure 2.1. Proportion of patients whose treatment plan was agreed at an MDT meeting for patients diagnosed between April 2015 and March 2019, by Cancer Alliance of diagnosis



There was some variation across the Cancer Alliances, with twelve regions reporting that plans were agreed by the MDT for over 90% of patients, while two Alliances reported that only two thirds of their patients had plans agreed by the MDT (Figure 2.1).

2.4 Primary treatment modality

Endoscopic treatment is recommended as the first line treatment for HGD in preference to either surgery or surveillance alone [BSG / Fitzgerald 2014]. NHS services were generally performing in line with this recommendation, reporting primary treatments among patients diagnosed between 2015 and 2019 as follows:

- 73.8% of patients had a plan of endoscopic therapy (almost all being either endoscopic resection (82.6%) or radiofrequency ablation (17.4%))
- 2.0% of patients (n=28) had a plan of surgery (oesophagectomy). Pathology results from the resected tissue revealed 43% had HGD, 28% had oesophageal cancer (8/28 patients) and the results were unknown for 8 patients
- 5.3% of patients had another treatment (argon plasma coagulation, photodynamic therapy, laser therapy, cryotherapy)
- 11.0% of patients had a plan of surveillance alone
- 8.0% of patients had no treatment or surveillance planned.

Among patients who had a recorded reason for being placed on surveillance (58/152), 47% reported the reason as patient choice while 53% were unfit for active treatment. 84% of patients who had a plan for surveillance alone, had their next planned surveillance endoscopy within 6 months of the first endoscopic surveillance.

The choice of active treatment over surveillance or no treatment was strongly associated with age at diagnosis (Figure 2.2). There was also some variation in the choice of treatment modality across Cancer Alliances (Figure 2.3).

Figure 2.2. Initial primary treatment by age at diagnosis for patients diagnosed between April 2015 and March 2019

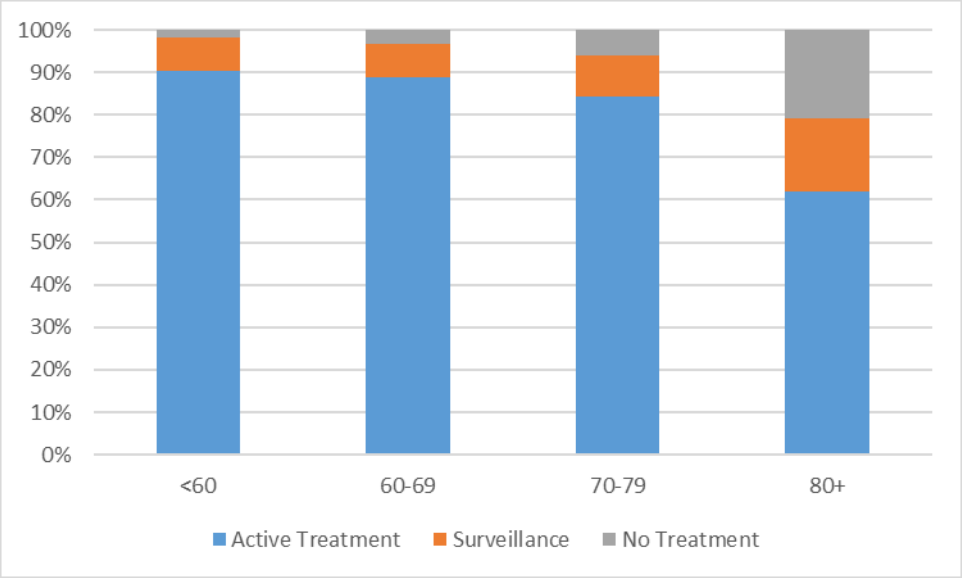
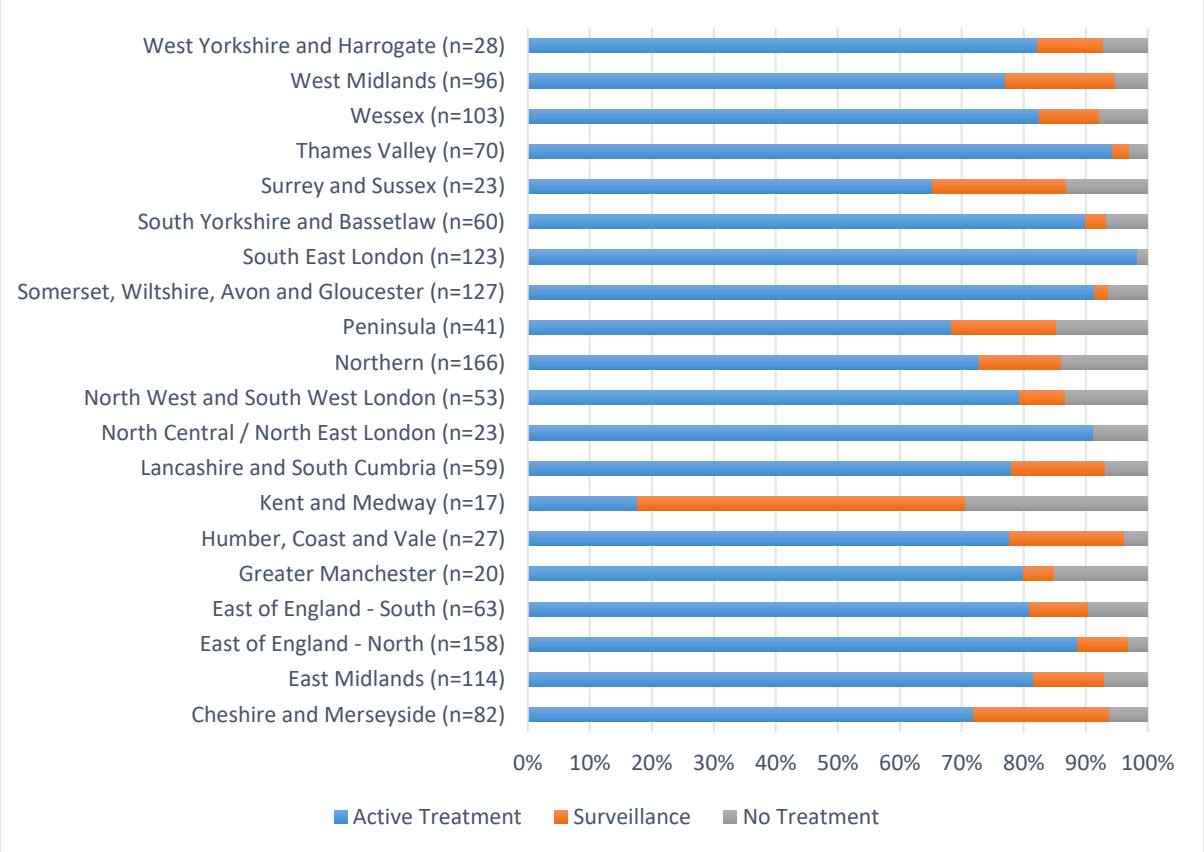


Figure 2.3. Initial primary treatments for patients diagnosed between April 2015 and March 2019 (unadjusted proportions), by Cancer Alliance of diagnosis



Among patients who underwent active treatment, 90.5% had their treatment plan agreed at an MDT meeting.

The BSG guidelines recommend that endoscopic treatments are undertaken within NHS trusts treating 15 or more patients each year. There were ten specialist OG cancer centres that met this standard based on the data submitted for the 2017-19 period. Among the 37 centres, there were 17 that treated at least 15 patients in one or more years from 2013.

It is possible that more NHS trusts are meeting this recommended volume of activity. The figures only include those endoscopic procedures performed for oesophageal HGD/early cancer and not those procedures undertaken for gastric or duodenal HGD/early cancer.

There were 47 non-specialist hospitals that reported performing endoscopic treatments for HGD patients between 2013 and 2019. However, only 12 of them had an annual volume that met the "15 patients" standard.

2.5 Outcomes after Endoscopic Resection/Dissection

The Audit received information about 844 patients having endoscopic resections for the 4-year period 2015-19. The outcome of these procedures was reported for 572 patients (67%) and is summarised in Table 2.3.

In the 2017-19 audit period,

- 76% of resections resulted in a complete excision.
- The proportion of patients referred for additional EMR/ESD procedures after incomplete excision has doubled in comparison to the 2015-17 period.

There was some evidence that the complete excision rate varied by the type of HGD lesion:

- The complete excision rate was 66% for lesions of a nodular appearance and 76% for flat / depressed lesions.

Table 2.3. Outcomes after endoscopic mucosal resection / endoscopic submucosal dissection for patients diagnosed with HGD between April 2015 and March 2019

	2015-17	2017-19
Procedures / outcome reported	423/354	421/224
Complete excision	65%	76%
Histology finding		
HGD (or other finding)	74%	69%
Intramucosal carcinoma	23%	29%
Submucosal carcinoma	3%	2%
Plan after incomplete excision		
Further EMR/ESD	24%	50%
Further ablative therapy	31%	13%
Refer for oesophagectomy	12%	15%
Surveillance	17%	15%
No further treatment	16%	6%

3. Participation in the OG cancer prospective audit

Patients were eligible for inclusion in the Audit if they were diagnosed with invasive epithelial cancer of the oesophagus, gastro-oesophageal junction (GOJ) or stomach (ICD10 codes C15 and C16), and were aged 18 years or over. Patients with neuro-endocrine tumours or gastro-intestinal stromal tumours (GISTs) were not included in the Audit due to the different behaviour and management of these tumours.

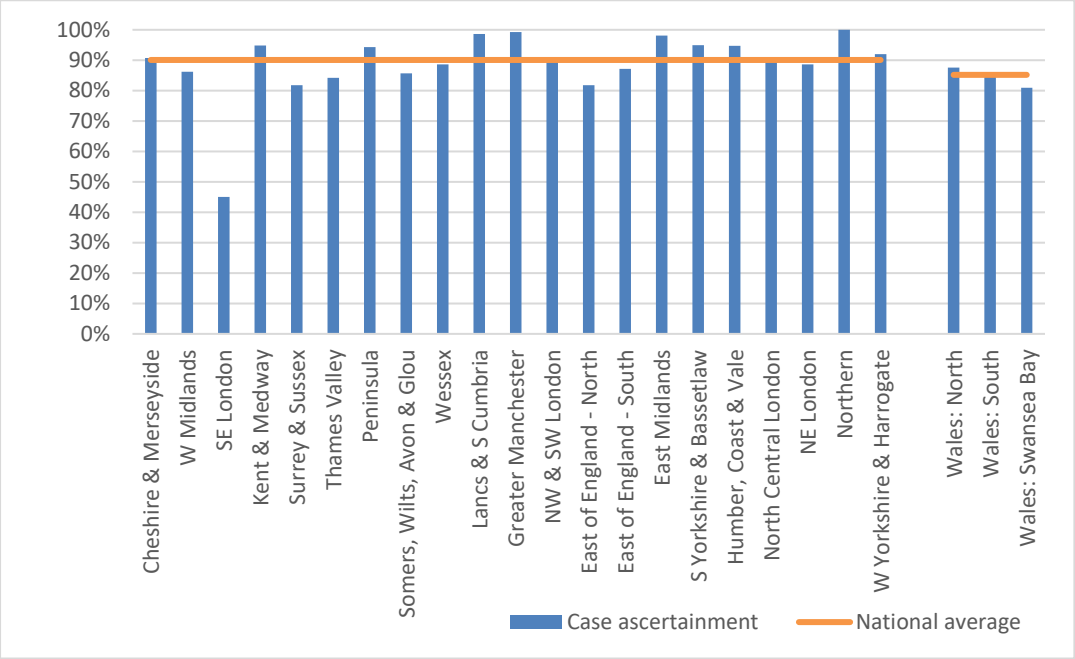
The 2020 Audit Report focuses on patients diagnosed with oesophago-gastric (OG) cancer in England and Wales over two years, between 1 April 2017 and 31 March 2019. Records were submitted for 20,528 patients, including 19,171 diagnosed at 131 NHS trusts in England and 1,357 diagnosed at 6 local health boards in Wales.

3.1 Case ascertainment

Case ascertainment for the period April 2017 to March 2019 was estimated to be 90.1% in England and 85.2% in Wales, but there was variation across the geographical regions, as shown in Figure 3.1. The estimated case ascertainment rates for each NHS trust / local health board are available in the online Data Tables, available at: www.nogca.org.uk/reports/2020-annual-report/.

Estimates of case ascertainment in England were derived by comparing the number of tumour records submitted to the Audit with records of histologically confirmed epithelial OG cancer in the National Cancer Registration and Analysis Service (NCRAS) dataset. For patients diagnosed in Wales, the expected number of patients was estimated using the Patient Episode Database for Wales (PEDW) database, identifying those patients with a diagnosis code for OG cancer (ICD 10 codes C15 or C16) recorded in the first episode. Case ascertainment estimates for Wales will be slightly too low because it is not possible to identify and remove patients with non-epithelial cancers in PEDW.

Figure 3.1: Estimated case ascertainment by English and Welsh geographical regions, 2017-19



3.2 Completeness of submitted records

Table 3.1 shows data completeness for a selection of data items collected for patients diagnosed between April 2017 and March 2019. While data completeness was generally good, the table highlights a minority of organisations that are not achieving the same standards as others.

The completeness of data items related to surgical treatment is important because this information is used to produce consultant and organisation-level indicators. Outcome indicators for curative surgery also rely on information in the pathology records. While pathology records were submitted for most patients who underwent surgery, completeness of pathological staging information was variable across centres. It is important that surgical centres ensure they return all pathology and surgical records associated with patients undergoing curative surgery.

Table 3.1: Summary of data completeness for selected data items for the 2017-19 audit period

Tumour data items	**Completeness overall across 138 organisations**	**No. of diagnosing NHS organisations with at least 80% completeness**
Referral source	98%	133
Staging investigations	90%	110
Pre-treatment TNM stage	83%	100
Surgical data items	**Completeness overall across 39 surgical centres**	**No. of NHS surgical centres with at least 90% completeness**
Nodal dissection	87%	26
Status at discharge	88%	28
Discharge date	94%	33
Pathological record	94%	30
Pathological TNM stage	85%	17

4. Patients with oesophago-gastric cancer

OG cancer predominantly affects older people and occurs more frequently in men than in women, though there is some variation by tumour type (Table 4.1).

The incidence of oesophageal cancer, particularly cancers located at the gastro-oesophageal junction, has increased since the early 1990s, though rates have levelled off over the last decade. During the same period, the incidence of stomach cancers has decreased by more than 50% [Cancer Research UK, 2020a]. This shift reflects changes in the prevalence of risk factors, notably reductions in *H. pylori* infections leading to fewer cases of stomach cancer [Cancer Research UK, 2020b].

This long term change in the relative distribution of oesophageal and stomach cancer can be seen within the Audit, with gastric tumours accounting for a smaller proportion in the last five years, declining from 26.9% in 2014/15 to 24.0% in 2018/19.

Figure 4.1: Illustration of the main locations of OG tumours

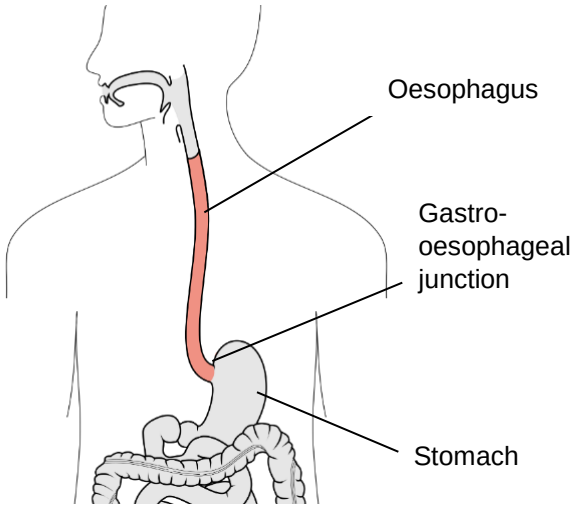


Table 4.1: Summary of patient characteristics by type of OG tumour in England and Wales for the audit period 2017-19

	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)	Total
Male (%)	49%	70%	81%	66%	70%
Median age (yrs)	71	74	71	74	72
Age group					
<60	15%	11%	17%	17%	16%
60-69	27%	23%	27%	19%	25%
70-79	34%	36%	34%	33%	34%
80+	24%	24%	22%	31%	25%

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ) [Siewert et al 1996]. See glossary for details.

The distribution of clinical (pre-treatment) disease stage is shown below in Table 4.2. It highlights the challenge for clinicians in managing OG cancer, with over one third of patients being diagnosed with stage 4 (metastatic) disease. This may be an underestimate because 17% of patients did not have complete clinical stage information and there is likely to be a higher proportion of patients with metastatic disease in this group because patients who will receive only palliative or best supportive care are less likely to undergo staging investigations.

There have been a number of initiatives in recent years to promote early diagnosis, most notably the national "Be Clear on Cancer" campaign in 2015, which aimed to raise awareness of the risk factors and early symptoms of OG cancer [Cancer Research UK 2019c]. However, among Audit patients there has not been a noticeable change in the proportion of patients diagnosed with early stage cancer in the five years from April 2014.

Table 4.2: Pattern of clinical stage by type of OG tumour in England and Wales for the audit period 2017-19

Clinical Stage (pre-treatment)	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)	Total
Stage 0/1	8%	9%	9%	12%	9%
Stage 2	21%	12%	13%	21%	17%
Stage 3	41%	35%	39%	23%	35%
Stage 4	30%	44%	39%	44%	39%
Total	3,796	1,527	9,233	5,972	20,528
Missing	614	317	1,362	1,272	3,565

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ) [Siewert et al 1996]. See glossary for details.

5. Routes to diagnosis

There are several routes that can lead to a diagnosis of OG cancer. Typically, an individual presents to their general practitioner (GP) with symptoms that may indicate cancer. Guidelines recommend that GPs refer patients with suspected OG cancer as early as possible [NICE 2018; Allum et al 2011]. In other cases, diagnosis may occur following a referral by a hospital consultant, from a non-emergency setting or as a result of a surveillance endoscopy. Diagnosis can also follow an emergency admission to hospital, with acute symptoms that are often the result of late stage disease. Late stage disease is associated with poorer outcomes, therefore services should aim to reduce the proportion of diagnoses made after an emergency admission.

Table 5.1 summarises the routes to diagnosis for the 2017-2019 Audit cohort. The majority of patients were diagnosed following referral by their GP, typically on either the "two-week wait" suspected cancer pathway or (in Wales) an urgent referral.

The proportion of patients with stomach cancer diagnosed after an emergency admission was almost double the figure for patients with oesophageal cancer. The risk was also strongly associated with age, with the highest proportions of emergency diagnoses among those aged over 80 years. Patients from socially deprived areas and those with comorbid conditions were also more likely to be diagnosed after an emergency admission.

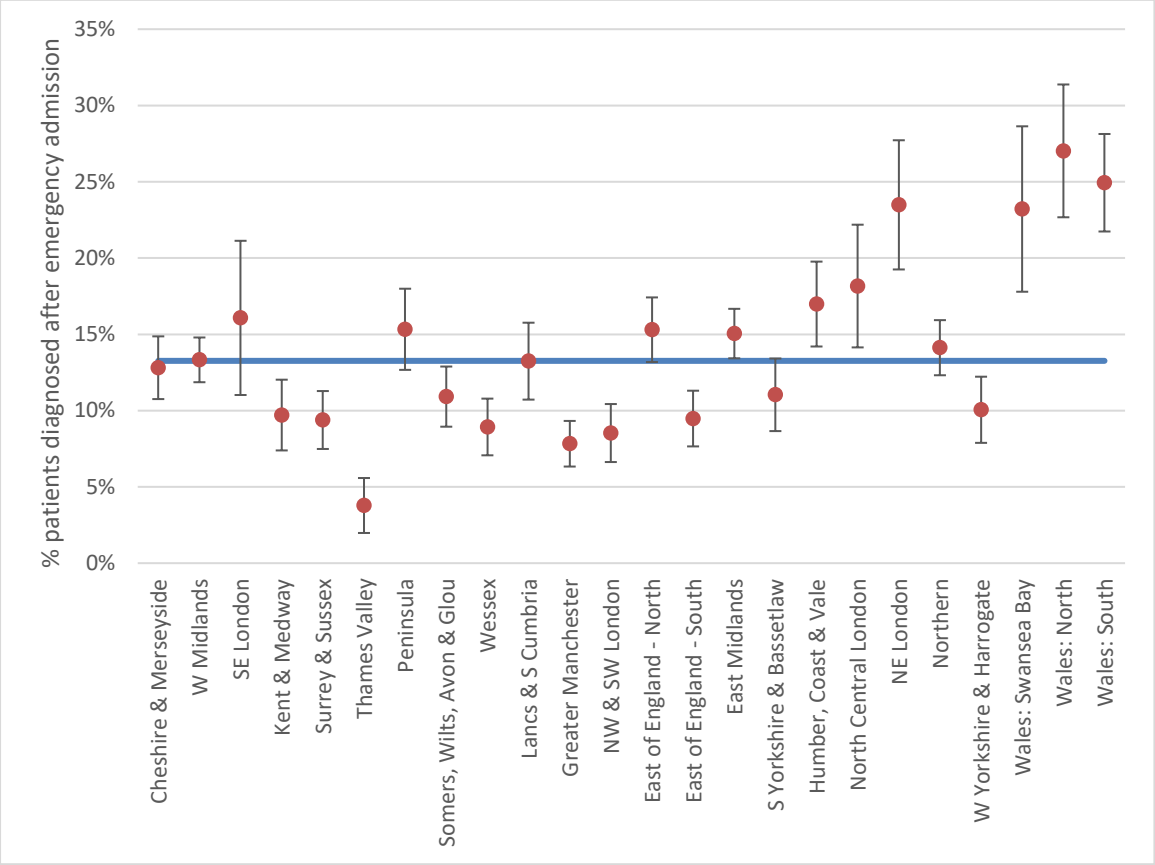
As in previous years, there was regional variation in the proportion of emergency diagnoses (Figure 5.1), even after adjusting for patient characteristics such as the site of cancer, presence of comorbidities and sociodemographic characteristics. Notably, the rates of emergency diagnosis in Wales continue to be higher than in England. This regional variation may be due to unmeasured patient factors, but it is also possible that it reflects regional differences in how people respond to their symptoms and seek help from health services, as well as differences in how patients are managed and referred within general practice. There may also be differences in the way emergency referral routes are recorded, which are being reviewed by information specialists in Wales.

Table 5.1: Routes to diagnosis among OG cancer patients diagnosed between April 2017 and March 2019 in England and Wales

Route to diagnosis	**Oes SCC**	**Oes ACA Upper/Mid**	**Oes ACA Lower (w SI,SII)**	**Stomach (w SIII)**	**Total**
GP referral	69%	67%	67%	55%	64%
Urgent / 2 week wait	*64%*	*62%*	*62%*	*49%*	*59%*
Routine	*5%*	*5%*	*5%*	*6%*	*5%*
Emergency admission	10%	12%	11%	19%	13%
Other	21%	22%	22%	26%	23%
Total cases	3,796	1,527	9,233	5,972	20,528
Missing values	47	34	154	137	372

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ).

Figure 5.1: Proportion of patients diagnosed after an emergency admission by Cancer Alliance / Welsh region. Graph shows adjusted rates with 95% confidence interval (CI). Blue line shows national average.



6. Staging investigations

Following a diagnosis of OG cancer, patients should undergo appropriate staging investigations to identify the extent of the disease and determine if it is potentially amenable to curative therapy. Clinical guidelines recommend that:

- All patients diagnosed with OG cancer should have an initial CT scan to assess the spread of disease and look for evidence of metastatic disease
- If the cancer is localised and the patient is suitable for curative treatment, further investigations are performed to determine the stage of the cancer (see Box 6.1)

The overall proportion of patients who had CT scans in the 2017-2019 audit cohort was 86.9%. However, this overall figure is likely to underestimate the true proportion as the quality of the data on staging investigations submitted to the Audit varied across NHS organisations (Chapter 3.2), with some reporting a high proportion of patients undergoing no investigations. Using data from NHS organisations that reported staging investigations for at least 80% of patients, the estimated proportion was 94.9%.

The proportion of patients who underwent a CT scan by NHS trust / local health board is available in the online Data Tables: www.nogca.org.uk/reports/2020-annual-report/.

Box 6.1: Recommended staging investigations for oesophageal and gastric cancer [NICE 2018]

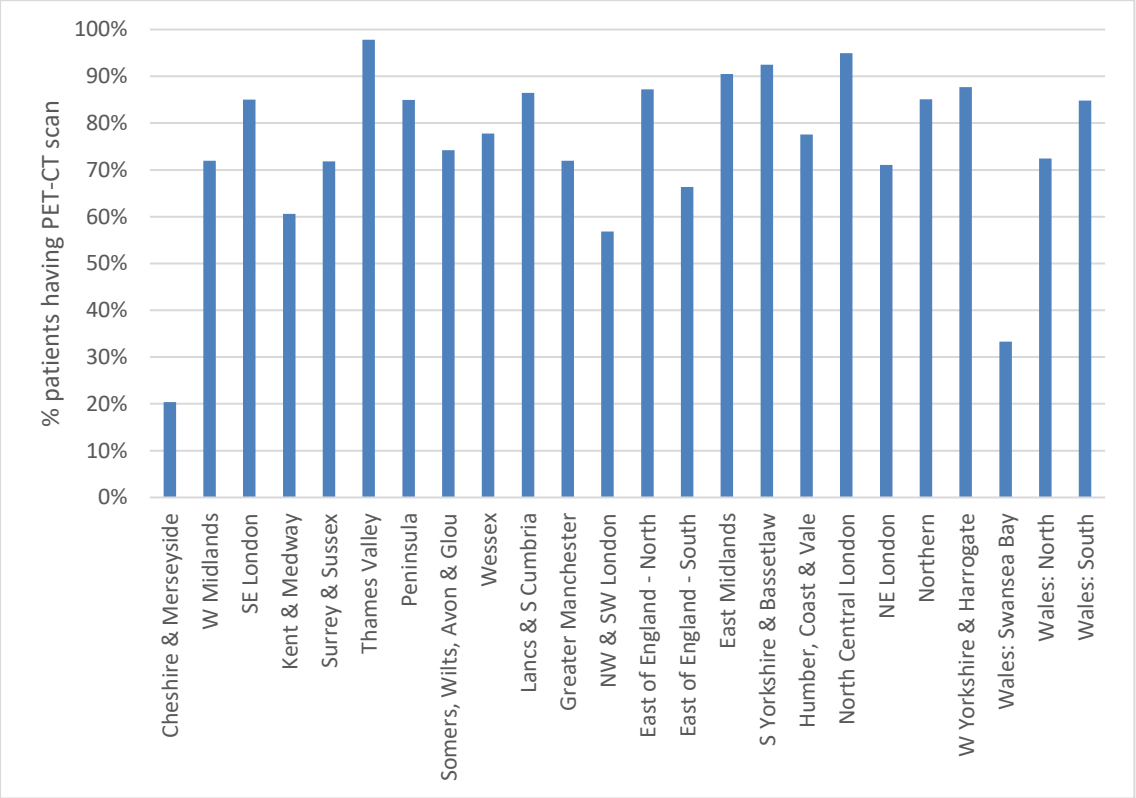
- CT scan of chest, abdomen and pelvis to provide an initial local assessment, and look for evidence of nodal and metastatic spread
- Offer a PET-CT scan to people with oesophageal and gastro-oesophageal junctional tumours that are suitable for curative treatment (except for T1a tumours).
- Do not offer endoscopic ultrasound only to distinguish between T2 and T3 tumours in people with oesophageal and gastro-oesophageal junctional tumours.
- Only offer endoscopic ultrasound (EUS) to people with oesophageal and gastro-oesophageal junctional cancer when it will help guide ongoing management.
- Offer staging laparoscopy to all people with potentially curable gastric cancer.
- Only consider a PET-CT scan in people with gastric cancer if metastatic disease is suspected and it will help guide ongoing management.

If a CT scan indicates there is no metastatic disease and the patient is considered sufficiently fit to be a candidate for curative treatment, they will undergo further staging investigations. The current NICE guidance recommends that PET-CT scans should be offered to people with oesophageal tumours that are suitable for curative treatment, while endoscopic ultrasound should only be offered if it helps guide ongoing management (see Box 6.1). Staging laparoscopy should be offered to all people with potentially curable stomach cancer.

The figures from the 2017-19 audit period show that practice is broadly consistent with NICE recommendations. Among patients with oesophageal cancer who had a curative treatment plan, 64.6% were recorded to have PET-CT. This figure increased to 71.3% for organisations that reported staging investigations for at least 80% of patients, although there was variation between regions (Figure 6.1). Use of endoscopic ultrasound was reported for 39.0% of these patients.

Among patients with stomach cancer, staging laparoscopy was reported for 44.6% of patients who had a curative treatment plan, while 30.5% had a PET-CT. The evidence on the benefit of PET-CT for patients with stomach cancer is still evolving and recent studies suggest it might identify metastases missed by other forms of staging investigation in patients being consider for curative treatment [Bosch et al 2020].

Figure 6.1: Use of PET-CT scans among patients with oesophageal cancer who had curative treatment diagnosed between April 2017 and March 2019, by Cancer Alliance / Welsh region



7. Treatment planning

Treatment options for people diagnosed with OG cancer depend on several factors, including the extent of the disease, performance status (patient's level of function in terms of self-care and daily activities), comorbidities, nutritional status and patient preferences. For patients with localised disease who are relatively fit, the recommended treatment is generally surgery, with or without oncological therapy (see Box 7.1). For patients with squamous cell carcinoma of the oesophagus, definitive chemoradiotherapy is also an option. Endoscopic treatment may be suitable for patients whose tumours are limited to the mucosa, with little risk of spread to the lymph nodes.

For patients with metastatic disease or those who are not sufficiently fit for surgery, there are a number of treatment options. Palliative chemotherapy can improve survival and is suitable for patients with a reasonable level of fitness. Therapies for managing symptoms such as dysphagia include endoscopic or radiological interventions (e.g. stents) and radiotherapy.

7.1 Clinical stage

Data on clinical stage provide essential information to allow interpretation of treatment decisions, although staging can be complex due to the need for clinical interpretation of multiple staging investigations. Curative treatment options require a patient's cancer to be localised (stage 1-3), while options for patients with metastatic disease (stage 4) are limited to therapies that might extend life or control symptoms but are unlikely to result in remission.

The completeness of the data on clinical stage supplied by NHS organisations during the 2017-19 audit period is shown in Figure 7.1. Overall, 82.6% of records had clinical stage information, but the proportion varied across the regions, ranging from just 65% to over 97%. Clinical stage information was more likely to be missing among older patients (Figure 7.2), and among patients with a record of non-curative treatment intent: 80.3% of patients with non-curative treatment plans had clinical stage information, compared to 86.4% of patients with curative plans.

Box 7.1: Recommended curative treatment options for OG cancer [NICE 2018]

Oesophageal squamous cell carcinomas:

- Definitive chemoradiation for proximal oesophageal tumours.
- For tumours of the middle or lower oesophagus, either chemoradiotherapy alone or combined with surgery.

Oesophageal adenocarcinoma and GOJ tumours:

- Preoperative chemotherapy or chemoradiation is recommended to improve long term survival after surgery, compared to surgery alone.
- Peri-operative chemotherapy (pre and post-operative) can also be recommended as it increases survival for junctional tumours.

Gastric cancer:

- Peri-operative chemotherapy is recommended to improve survival compared to surgery alone.
- In patients at high risk of recurrence who have not had neoadjuvant chemotherapy, adjuvant chemoradiotherapy may be considered as it has been shown to improve survival in non-Western populations.

Figure 7.1: Clinical stage information for the audit period 2017-19, by geographical region

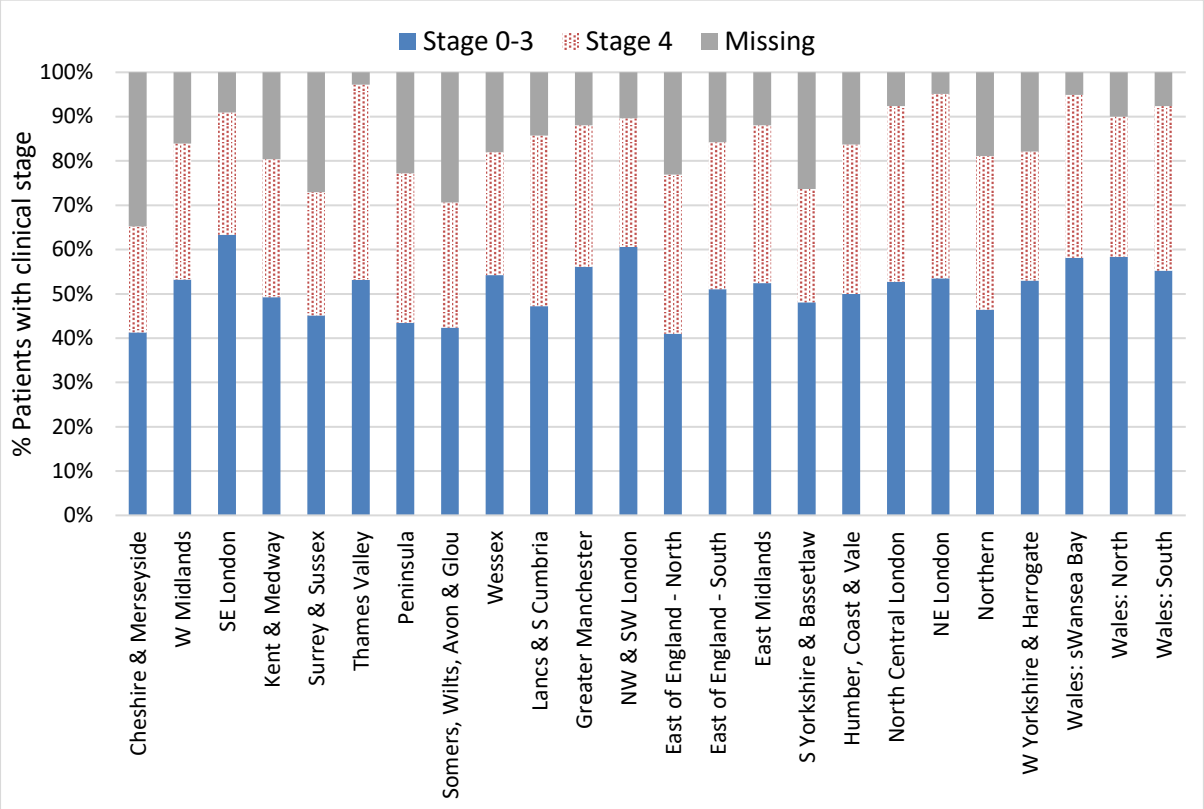
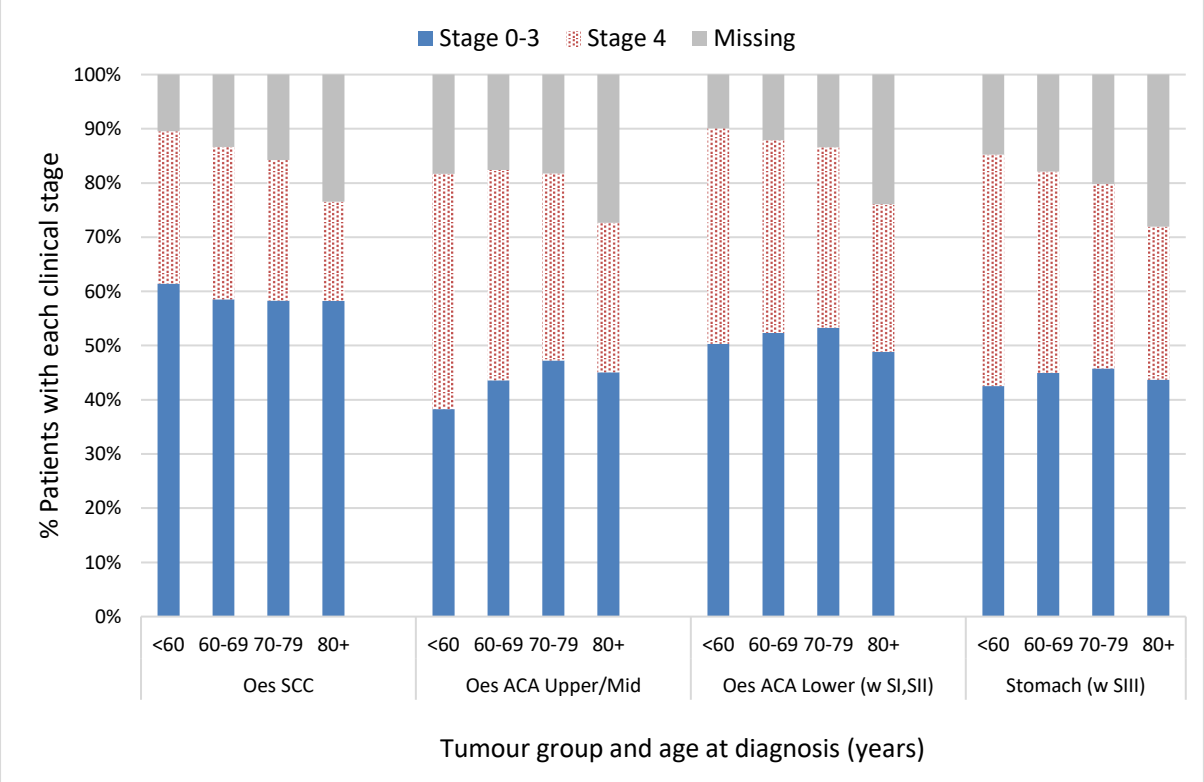


Figure 7.2: Clinical stage by type of OG tumour and age group, for the audit period 2017-19 in England and Wales



7.2 Treatment plans

Overall, 38.5% of patients diagnosed in the 2017-19 audit period had a plan for treatment with curative intent, with some variation by tumour type (Table 7.1). This proportion has shown a small increase over the last five audit years, from 37.7% among patients diagnosed in 2014/15 to 40.0% among those diagnosed in 2018/19.

Among patients with early stage disease (stage 0-3), 60% had a curative treatment plan. However, there was substantial variation by age, with curative treatment being much less common among the oldest patients (Table 7.2).

Planned modes of curative treatment varied by tumour type (Figure 7.3). Consistent with recommendations for patients with squamous cell carcinomas (SCC), definitive chemoradiotherapy was the most common planned treatment, particularly among older patients. Multimodal therapy that combines either chemotherapy or chemoradiotherapy with surgery was the dominant treatment among patients with a tumour in the lower oesophagus or stomach, except among the oldest patients for whom surgery only was the most common treatment.

For patients with a non-curative treatment plan, oncological therapy (chemotherapy or radiotherapy) was the planned therapy for 56% of patients during the 2017-19 audit period. Another 18% of patients had either surgery or endoscopic / radiological palliative therapies, while the remaining 26% had a plan for best supportive care. These overall figures mask large variation between patient groups, with active treatment plans being far less common for patients aged 80 years or over (Figure 7.4).

Table 7.1: Proportion of patients with curative treatment plans during the audit period 2017-19

Treatment plan	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)	Total
Total patients	3,796	1,527	9,233	5,972	20,528
Curative intent	40.4%	32.0%	41.8%	33.9%	38.5%
By clinical stage					
0/1	72.9%	69.0%	78.9%	64.6%	72.3%
2	62.8%	56.4%	64.2%	61.4%	62.5%
3	48.6%	44.9%	61.6%	50.6%	55.4%
4	10.9%	10.4%	12.5%	4.1%	9.5%
(missing data)	614	317	1,362	1,272	3,565

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ) [Siewert et al 1996]. See glossary for details.

Table 7.2: Proportion of patients with curative treatment plans, by tumour type, disease stage and age group

		Clinical Stage		
Tumour	Age	0/1	2	3
Oes SCC				
	Under 60	84%	80%	63%
	60-69	81%	78%	59%
	70-79	70%	68%	52%
	80+	35%	26%	19%
Oes ACA Upper/Mid				
	Under 60	91%	88%	62%
	60-69	82%	77%	59%
	70-79	74%	64%	46%
	80+	39%	22%	15%
Oes ACA Lower				
(w SI,SII)	Under 60	93%	87%	80%
	60-69	88%	85%	74%
	70-79	80%	69%	61%
	80+	38%	26%	18%
Stomach				
(w SIII)	Under 60	90%	82%	72%
	60-69	86%	81%	60%
	70-79	75%	66%	51%
	80+	42%	25%	21%

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ) [Siewert et al 1996]. See glossary for details.

Figure 7.3: Planned modality for patients with curative treatment intent during the 2017-19 audit period, by age and tumour location

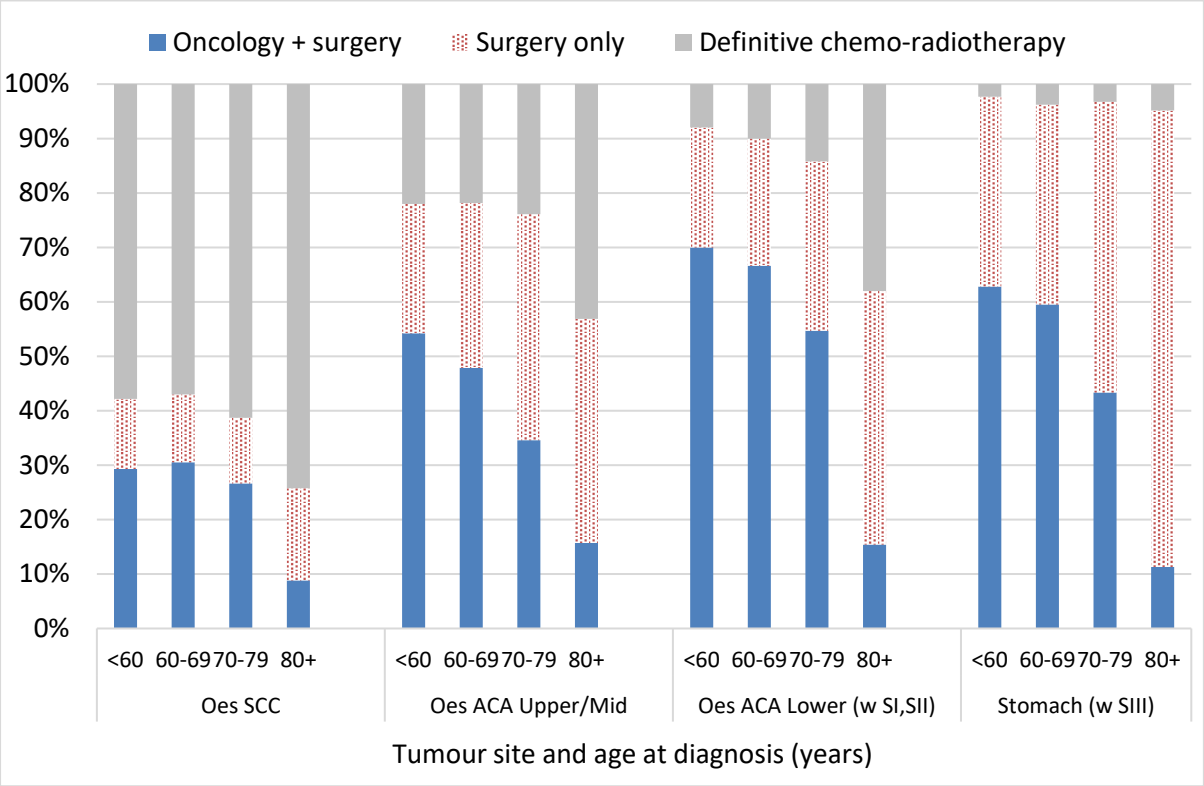
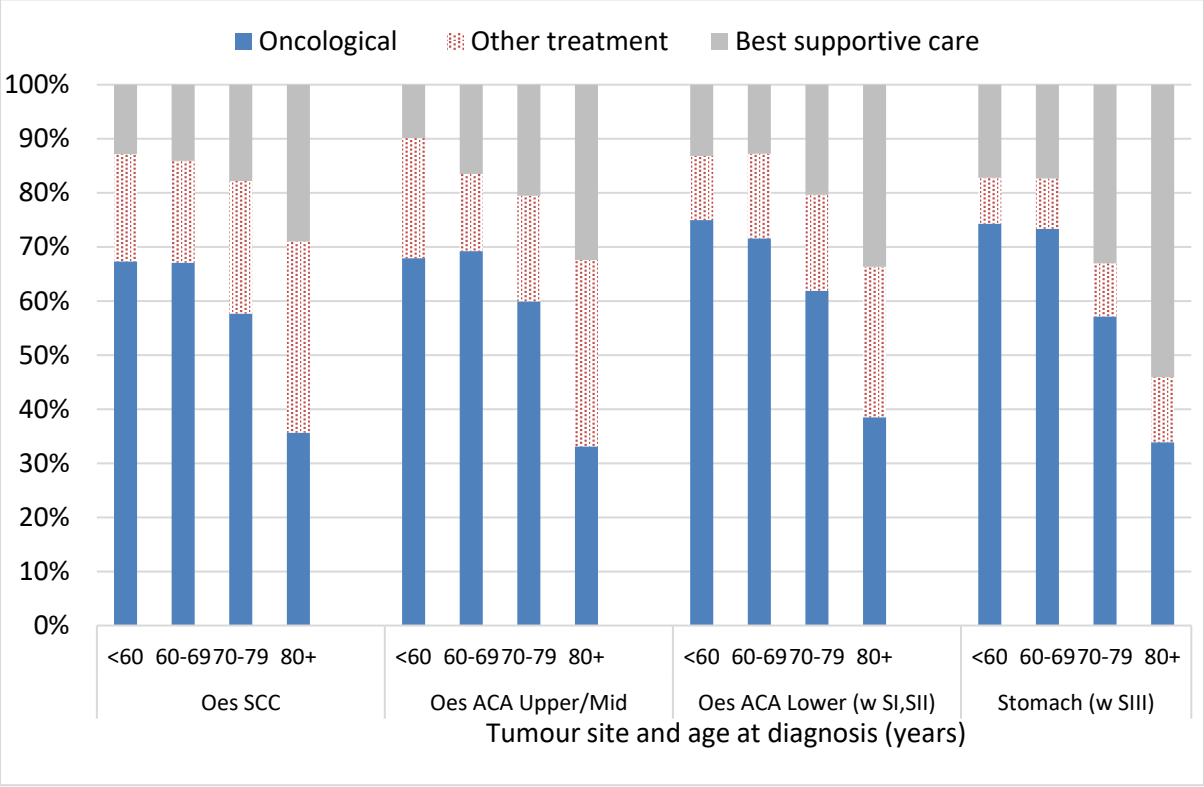


Figure 7.4: Planned modality for patients with non-curative treatment intent during 2017-19 audit period, by age and tumour location



7.3 Waiting times along the care pathway

Several waiting time targets have been established for cancer services in England and Wales to ensure patients with suspected cancer are seen promptly. English services have the aim of ensuring at least 85% of patients diagnosed after an urgent "2-week" GP referral begin treatment within 62 days [NHS England 2019]. In Wales, the target is for treatment to begin within 62 days for 95% of patients who have been referred urgently due to suspected cancer, though waiting times may be suspended for limited medical or social reasons [NHS Wales 2018]. NHS England is planning to implement a 28 day target from referral to diagnosis for patients with cancer [NHS England 2019], while NHS Wales will implement a 62 day Single Cancer Pathway from the 'point of suspicion of cancer' to the start of treatment for all suspected cancers [NHS Wales 2019].

The NOGCA dataset captures four key dates along the patient pathway:

- Referral date to OG cancer team
- Date of diagnosis
- Date of treatment plan (treatment MDT meeting)
- Date of first treatment

These dates allow us to describe the patterns of waiting times along the OG cancer care pathway. For the 2017-19 audit cohort, these patterns were similar to those reported in previous years, and are described in Table 7.3.

- The time from referral to diagnosis was longest for patients seen via a routine GP referral, with 25% of patients waiting longer than 53 days
- The average waiting time from referral to diagnosis for urgent GP referrals was 17 days, with 75% of patients waiting less than 26 days
- Patients who had a curative treatment plan had a longer wait from diagnosis to an agreed treatment plan than those with a non-curative plan. This is expected given the additional staging investigations that would be involved for patients undergoing curative treatment.
- The 'average' (median) time from diagnosis to the start of primary therapy typically took between 1 and 2 months for surgical and oncological treatments, with slightly longer waiting times associated with surgery.

Table 7.3: Patterns of waiting times along the care pathway for the 2017-19 Audit cohort

Time in days from	Referral to diagnosis	
	Median	IQR
GP referral: urgent	17	11 to 26
GP referral: routine	27.5	10 to 53
After emergency admission	7	3 to 14
Other consultant referral	7	1 to 21

Time in days from	Diagnosis to treatment plan		Diagnosis to first treatment		Referral to first treatment	
	Median	IQR	Median	IQR	Median	IQR
Curative: Surgery only	27	8 to 47	58.5	38 to 91	83	58 to 127
Curative: Definitive or neoadjuvant oncology	25	14 to 38	51	41 to 66	68	57 to 87
Palliative: oncology	14	5 to 27	42	29 to 57	60	47 to 80
Palliative: ERPT	7	2 to 16	17	7 to 32	35	21 to 53

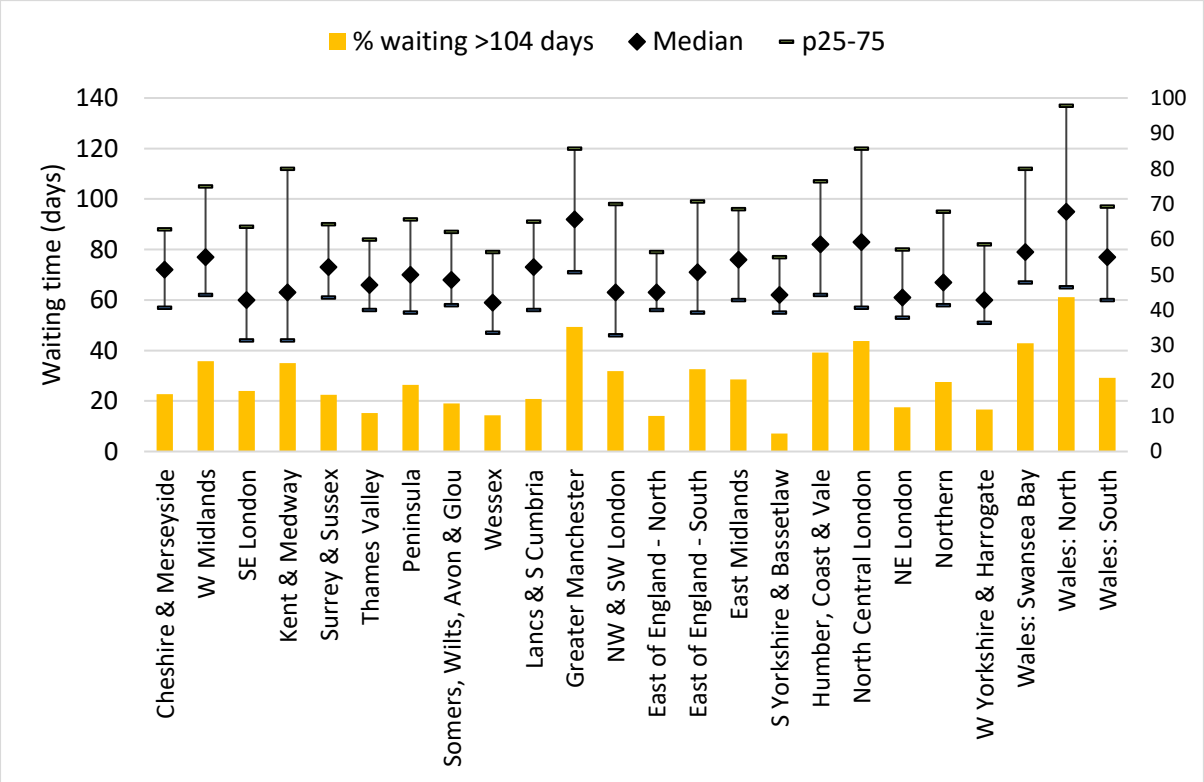
KEY: ERPT – Endoscopic / radiologic palliative therapy

Distributions of waiting times from referral to curative treatment (Figure 7.5) were similar across Cancer Alliances / Welsh regions.

However, there were excessive waiting times for a significant proportion of patients in some regions. Overall, 59.9% of patients waited more than 62 days from referral to primary curative treatment, while 19.1% of patients waited more than 104 days. In 7 of 24 regions, over a quarter of patients waited longer than 104 days.

Among patients having non-curative oncological treatment, 42.3% waited longer than 62 days from referral to the start of treatment and 11.6% waited longer than 104 days.

Figure 7.5: Median (IQR) waiting times from referral to start of curative treatment for patients diagnosed between April 2017 and March 2019 and % patients waiting >104 days, by Cancer Alliance / Welsh region



KEY: p25-75 – interquartile range

8. Curative surgery

For patients diagnosed in the three year Audit period between April 2016 and March 2019, there were 6,617 surgical records submitted, of which 94.8% were recorded as resections (oesophagectomy or gastrectomy) with curative intent. The types of surgical procedure recorded in the Audit are described in Table 8.1, together with the dominant type of lymphadenectomy.

As in previous years, the majority of oesophagectomies were performed using the 2-stage Ivor-Lewis transthoracic approach. Procedures for stomach tumours were typically total or distal gastrectomies.

Minimally invasive (MI) operations are performed using laparoscopic instruments under the guidance of a camera inserted through several small (1-2cm) incisions rather than using a large incision characteristic of an open surgical approach. A total MI oesophagectomy involves thoracoscopy for the chest-phase of the operation and laparoscopy for the abdominal phase. However, an oesophagectomy may be performed using an MI technique for only either the abdominal or chest phase. This is commonly called a hybrid operation.

In the 2016-2019 surgical cohort, 15.5% of all curative oesophagectomies were full MI procedures, while 28.1% were hybrid operations. A small proportion of oesophagectomies (2.7%) began using an MI approach and were converted to open surgery. For curative gastrectomies, 16.5% were full MI procedures and 1.8% were converted from MI to open surgery.

Table 8.1: Summary of surgical procedures and type of lymphadenectomy performed in patients diagnosed from April 2016 to March 2019, in England and Wales

Type or procedure	**No. of operations**	**2-field dissection**
Left thoracic abdominal	262 (6%)	97.2%
2-Stage Ivor-Lewis	3,533 (86%)	97.9%
3-Stage McKeown	238 (6%)	74.6%
Transhiatal	77 (2%)	n/a
All curative oesophagectomies	4,112	
Cancer unresectable at surgery	20	
	No. of operations	**D2-dissection**
Total gastrectomy	1,019 (47%)	91.0%
Distal gastrectomy	873 (40%)	84.7%
Extended gastrectomy	190 (9%)	93.5%
Other gastrectomy	81 (4%)	63.6%
All curative gastrectomies	2,163	
Bypass	96	
Cancer unresectable at surgery	226	

8.1 Enhanced recovery after surgery (ERAS)

Increasing evidence indicates that enhanced recovery after surgery (ERAS) protocols are effective in reducing rates of complications and shortening length of stay after OG cancer surgery [Markar et al 2015]. ERAS protocols may include several components to aid recovery, such as pre-operative counselling, pre-operative carbohydrate loading, early mobilisation after surgery, and a standardised targeted post-operative pathway.

Data on the use of ERAS protocols are available for English surgical centres for the last two Audit years (2017/18 and 2018/19).

In the 2017-2019 Audit data, use of the ERAS approach was more common than the standard (non-ERAS) pathway following curative surgery (Table 8.2). The majority of ERAS protocols involved daily documentation in medical notes, and completion rates were high for both oesophagectomy and gastrectomy patients.

However, the use of ERAS protocols was clustered within NHS trusts, with 29 out of 35 English surgical centres adopting this approach (20 centres reported use of an ERAS protocol for more than 80% of patients).

The expected mean length of stay following surgery was shorter for patients on an ERAS pathway, for both oesophagectomy and gastrectomy, and for patients with and without surgical complications (Table 8.3). The difference was particularly marked for patients on an ERAS pathway with daily documentation.

Table 8.2: Use of ERAS protocols following curative surgery in patients diagnosed between April 2017 and March 2019 in England

	Oesophagectomy		Gastrectomy	
Number of patients	2,767		1,401	
What best describes the surgical pathway that this patient followed?				
A protocolised enhanced recovery with daily documentation in medical notes	1,406	58.4%	583	50.8%
A protocolised enhanced recovery without daily documentation in medical notes	325	13.5%	202	17.6%
A standard (non-ERAS) surgical pathway	676	28.1%	363	31.6%
Missing	360		253	
Did the patient complete the ERAS pathway?				
Yes	1,314	84.8%	581	85.1%
No: but partial completion	190	12.3%	92	13.5%
No: non-completion	45	2.9%	10	1.4%
Missing	182		102	

Table 8.3: Expected length of stay (days) following curative surgery for patients diagnosed between April 2017 and March 2019, by the type of surgical pathway. Figures estimated for a patient aged 65 years

	Oesophagectomy		Gastrectomy	
Surgical pathway	**No SC**	**With SC**	**No SC**	**With SC**
A protocolised enhanced recovery with daily documentation in medical notes	12.2	20.6	9.8	18.2
A protocolised enhanced recovery without daily documentation in medical notes	13.1	26.3	10.7	23.9
A standard (non-ERAS) surgical pathway	13.6	27.3	11.2	24.9

KEY: SC – surgical complication. Expected length of stay predicted using linear regression model that incorporated age at diagnosis, type of procedure and type of postoperative pathway

8.2 Short-term outcomes of surgery

NOGCA has benchmarked surgical outcomes for NHS trusts / local health boards since it began in 2011, and has documented steady improvements in these outcomes over time. Since 2013, outcome data have also been published for active surgical consultants in England on the AUGIS and NHS Choices websites.

Figure 8.1 shows the risk-adjusted 30-day postoperative mortality rate for OG cancer surgical centres in England and Wales. The mortality rate for each centre is plotted against the number of operations, as the precision of estimates improves with larger numbers. All of the centres had an adjusted 30-day mortality rate that fell within the expected range (defined by the 99.8% control limit).

Similarly, for the adjusted 90-day mortality outcome, all surgical centres performed within the expected range (Figure 8.2).

The mortality rates for each procedure and overall are shown in Table 8.4.

Figure 8.1: Funnel plot of adjusted 30-day mortality after curative surgery for OG cancer for patients diagnosed between April 2016 and March 2019 for NHS organisations in England and Wales.

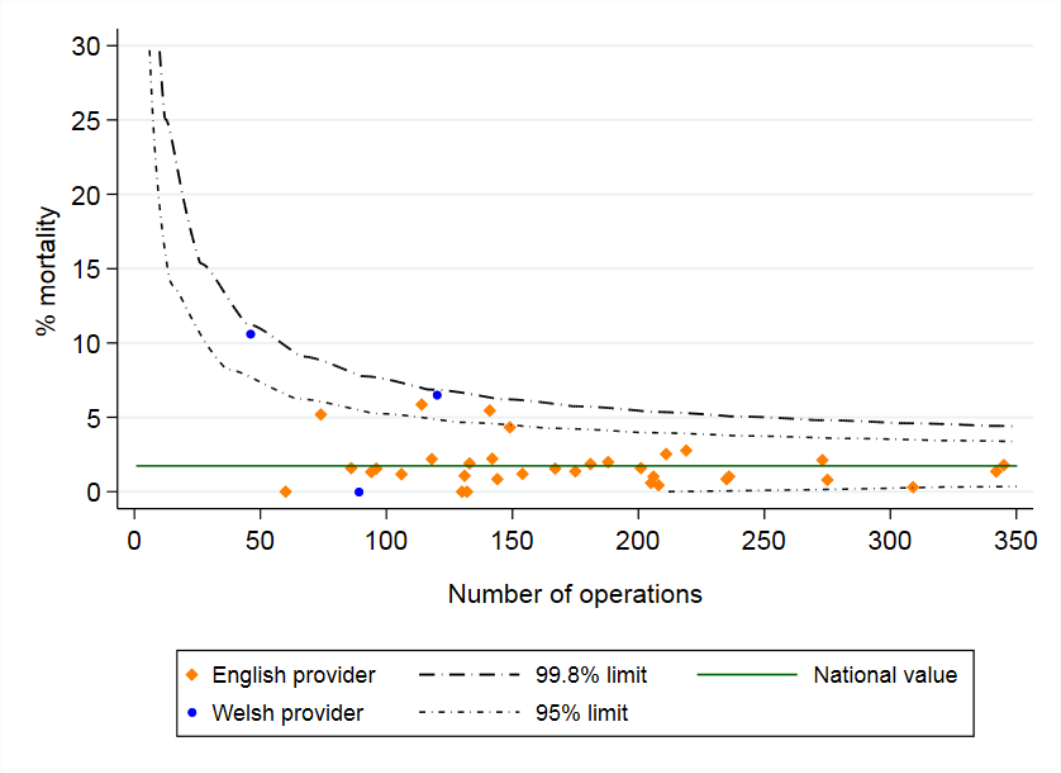


Figure 8.2: Funnel plot of adjusted 90-day mortality after curative surgery for OG cancer for patients diagnosed between April 2016 and March 2019 for NHS organisations in England and Wales.

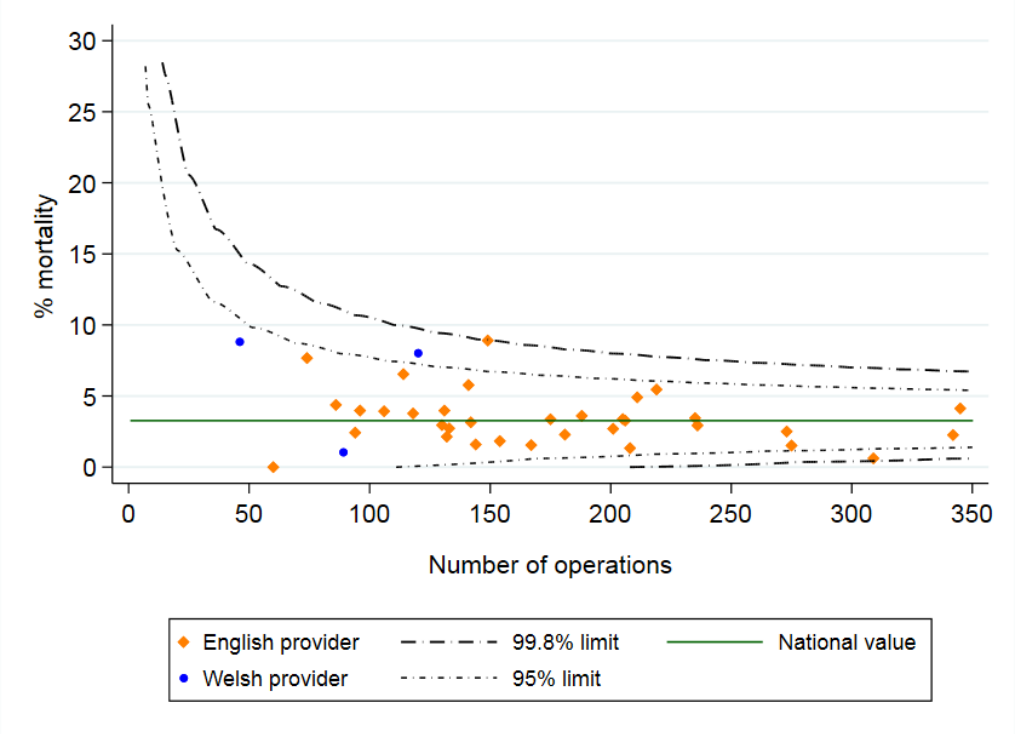


Table 8.4: Postoperative outcomes after curative surgery for patients diagnosed from April 2016 to March 2019 in England and Wales

	Oesophagectomy	Gastrectomy	Overall
30-day mortality (95%CI)	2.0% (1.6 to 2.4)	1.2% (0.7 to 1.7)	1.7% (1.4 to 2.1)
90-day mortality (95% CI)	3.7% (3.1 to 4.3)	2.5% (1.8 to 3.1)	3.3% (2.8 to 3.7)
Pathology indicators			
Nodes examined ≥15	88.4% (87.4 to 89.4)	83.9% (81.4 to 84.7)	86.6% (85.7 to 87.5)
Longitudinal margins positive	4.2% (3.6 to 4.9)	8.1% (6.9 to 9.4)	5.5% (4.9 to 6.1)
Circumferential margins positive*	24.2% (22.8 to 25.6)	n/a	n/a

* excludes NHS organisations that reported 0% positive circumferential margins

Since 2017, the Audit has published results on four additional surgical indicators:

1. Proportion of patients with 15 or more lymph nodes removed and examined (both oesophagectomies and gastrectomies). A high lymph node yield enables accurate staging and is associated with improved survival [Rizk et al 2010; Brenkman et al 2017]
2. Proportion of patients with positive longitudinal margins (oesophagectomies)
3. Proportion of patients with positive circumferential margins (oesophagectomies)
4. Proportion of patients with positive longitudinal margins (gastrectomies)

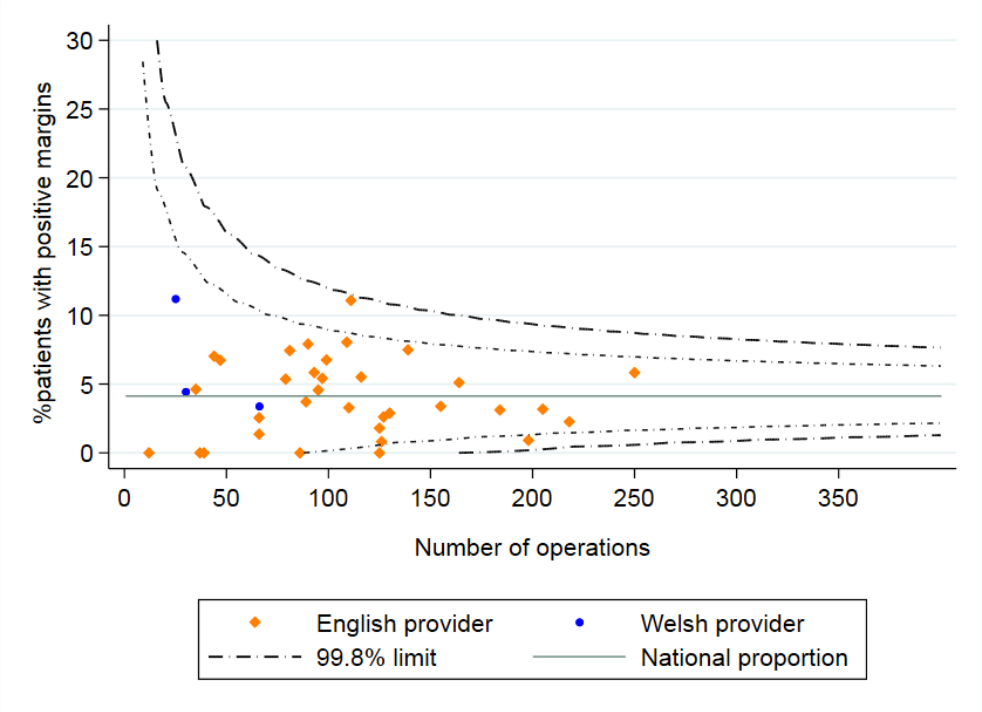
These indicators were selected to support the implementation of the recommendations in the AUGIS 2016 "Provision of Services" document [AUGIS 2016].

Risk-adjusted longitudinal margin indicators fell within the expected ranges (99.8% control limits) for both oesophagectomies and gastrectomies in the 2016-2019 surgical cohort (see Figure 8.3). As reported last year, the overall positive longitudinal margin rate of 8.1% for gastrectomy exceeded the 5% target set by AUGIS (Table 8.4). The rate was higher for total gastrectomy (9.0%, 7.3 to 11.0) than for distal gastrectomy (6.6%, 5.0 to 8.5%). The overall rate of positive longitudinal margins for oesophagectomy was within the 5% target.

Compared with longitudinal margin indicators, circumferential margin and lymph node indicators continue to show large variation (Figure 8.4), but both have shown improvement over the last five years. The proportion of patients with 15 or more lymph nodes examined has increased from 82.3% among patients diagnosed in 2014/15 to 88.0% among those diagnosed in 2018/19. The proportion of patients with positive circumferential margins has decreased from 28.7% to 22.8%. While these improvements are encouraging, there remains significant variation in the way surgical specimens are prepared for histological assessment and this leads to inconsistency in the assessment of these pathological variables. Greater consistency and standardisation of these methods is required for surgical centres to benchmark themselves with confidence.

Figure 8.3: Funnel plots showing the organisational rates of positive longitudinal margins for patients diagnosed in England and Wales between April 2016 and March 2019.

Adjusted rate of positive longitudinal margins after oesophagectomy



Adjusted rate of positive longitudinal margins after gastrectomy

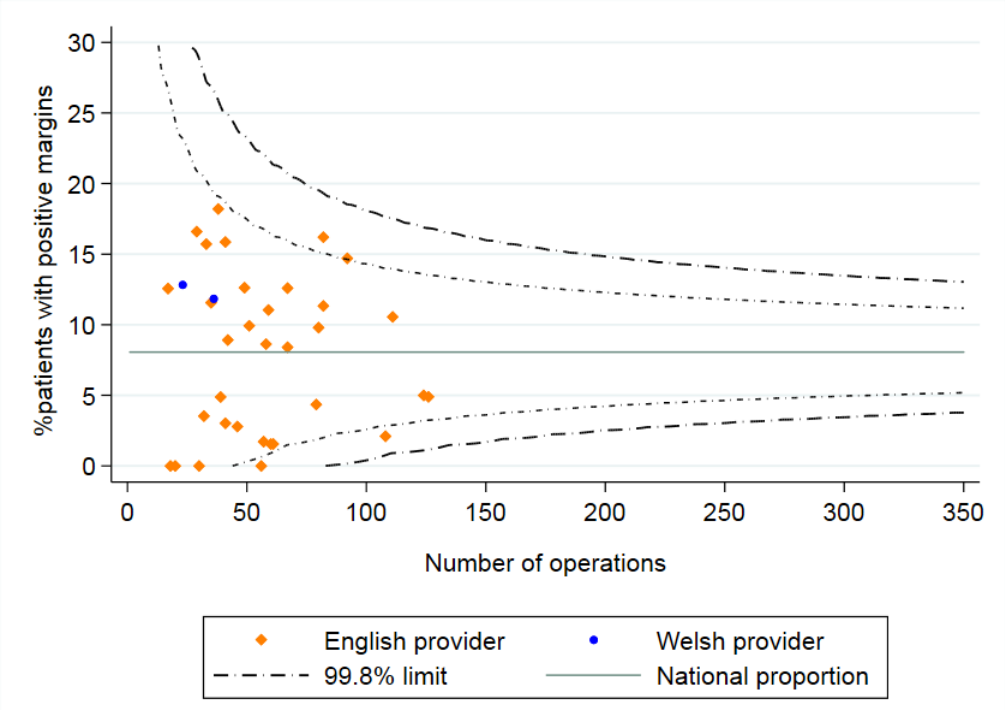
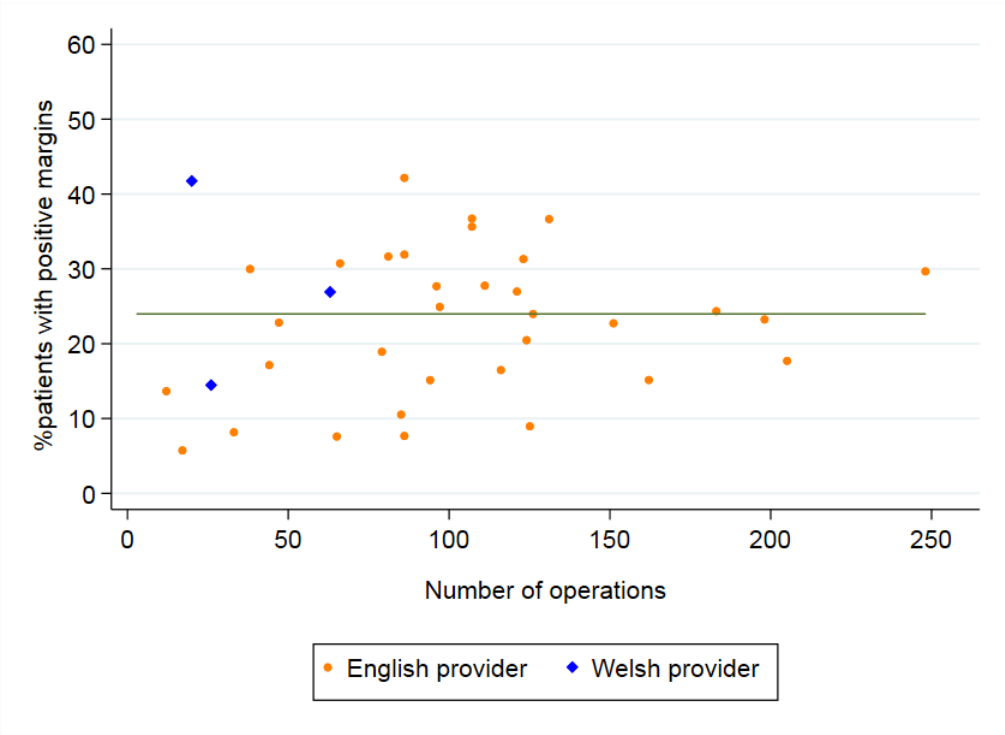
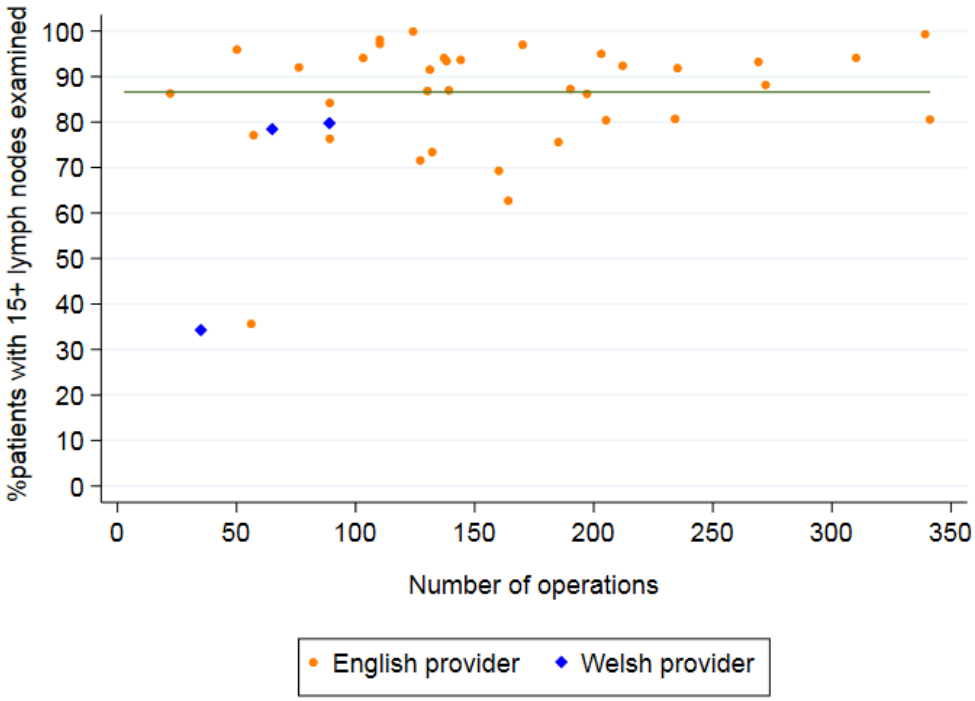


Figure 8.4: Organisational rates of positive circumferential margin and lymph nodes examined for patients diagnosed in England and Wales between April 2016 and March 2019

Adjusted rate of positive circumferential margin after oesophagectomy.



Unadjusted rate of lymph nodes examined after oesophagectomy & gastrectomy



8.3 Longer term outcomes after surgery

To date, NOGCA has focused on evaluating short-term surgical outcomes for NHS trusts / local health boards. While these outcomes can reflect real differences in the quality of hospital care, it is increasingly recognised that using short and long-term outcomes in combination gives greater insight into how effectively hospital services treat patients [Porter 2010].

In this Annual Report, we present information about 1-year survival after surgery for surgical centres in England and Wales. This measure provides insight into the adequacy of cancer staging and appropriateness of curative surgery. The 1-year survival figures were produced using the same cohort of surgical patients (individuals diagnosed from April 2016 to March 2019 in England and Wales) but it was necessary to remove 71 patients because their audit data could not be linked to a record in the ONS death register.

Longer term survival rates for each procedure are shown in Table 8.5, the figures being estimated using Kaplan-Meier approach because of the limited follow-up time of patients diagnosed more recently. Figure 8.5 shows the survival curves for the whole three year period. As might be expected, the proportion of patients who died steadily increases over time.

Figure 8.6 shows the risk-adjusted 1-year survival rate for OG cancer surgical centres in England and Wales. The rate for each centre is plotted against the number of operations, as the precision of estimates improves with larger numbers. The figures were adjusted for patient age, sex, tumour site, comorbidity, ASA grade, performance status, pathological T stage, the number of positive lymph nodes, and the receipt of neoadjuvant therapy.

Most of the centres had an adjusted 1-year survival rate that fell within the expected range (defined by the 99.8% control limit). There were two NHS trusts whose rates were above the lower 99.8% control limit. This suggests these organisations performed better than average during the 2016-19 audit period and might offer lessons that could be shared more widely.

Table 8.5. Kaplan-Meier estimates of the percentage of patients diagnosed between April 2016 and March 2019 who survived after curative surgery. Figures shown with 95% confidence intervals

Time after surgery	Oesophageal cancer	Stomach cancer
1 year	82.7% (81.4 – 83.8)	85.7% (84.1 – 87.2)
2 years	67.2% (65.6 – 69.9)	70.5% (68.2 – 72.6)
3 years	57.4% (55.3 – 59.5)	63.0% (60.2 – 66.6)

Figure 8.5. Proportion of patients who were alive up to three years after curative surgery among patients diagnosed between April 2016 and March 2019 in England and Wales

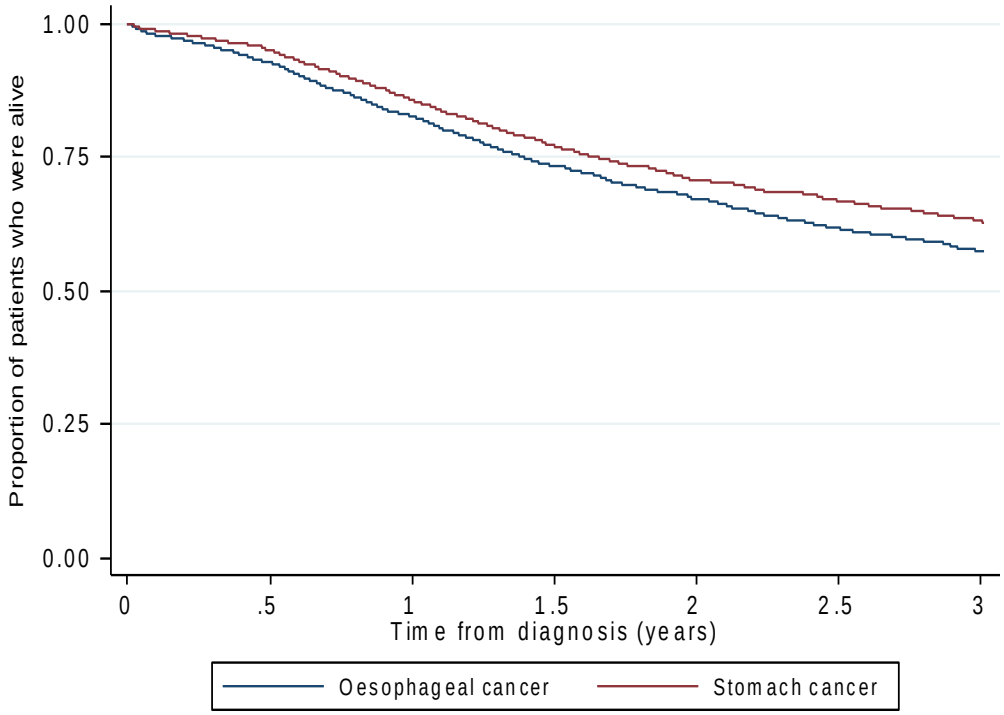
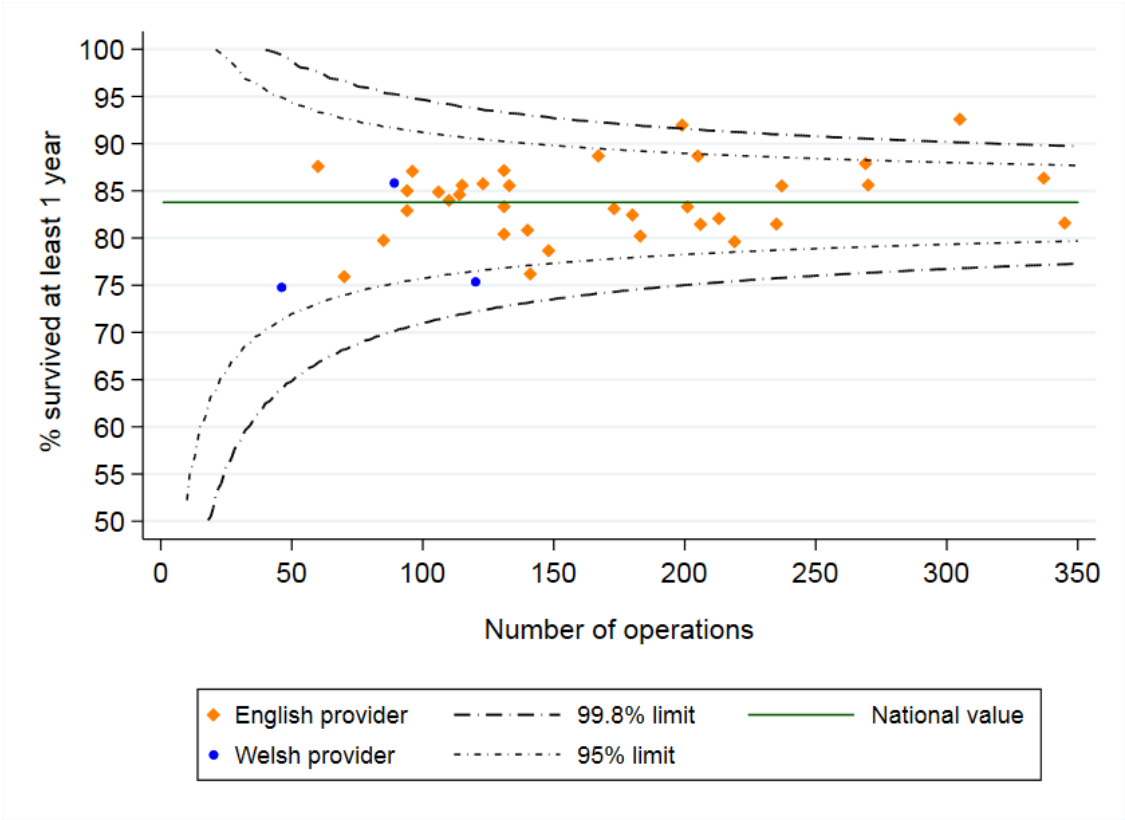


Figure 8.6. Risk-adjusted 1-year survival after curative surgery among patients diagnosed between April 2016 and March 2019 in England and Wales, by surgical centre.



Perspective from Mr Nick Maynard

Consultant Upper GI Surgeon at Oxford University Hospitals NHS Foundation Trust

Short term outcomes from surgery for oesophago-gastric cancer in England and Wales continue to be excellent, and it is clear from the Report that the surgery is appropriately radical with excellent nodal yields and low margin positivity in the majority of centres. The use of minimally invasive surgery for oesophago-gastric resections remains stubbornly low.

ERAS protocols in oesophago-gastric cancer surgery are now well established and of proven benefit. It is clear from the Report that when they are utilised properly, hospital stay is reduced, but disappointingly only 58% of patients followed a protocolised enhanced recovery with daily documentation in medical notes and only 20/35 centres reported ERAS pathway in more than 80% of patients. ERAS pathways should be part of standard care, and Trusts should look to improve on these figures.

We welcome the publication for the first time of longer term outcomes, and in particular detailed 1 year survival rates. 1 year outcomes are increasingly reported around the world and reflect not only short term surgical outcomes but also adequacy of staging and appropriate selection of patients for radical treatment. Although a staging PET-CT scan is now considered to be essential for patients with oesophageal cancer for whom curative treatment is planned, only 71.3% were recorded to have PET-CT. This should be higher, and it now should be considered unacceptable for patients undergoing radical treatment for oesophageal cancer not to have a staging PET-CT scan. This will improve 1 year survival.

These results are amongst the best in the world and the resectional units in England and Wales should be extremely proud of what they have achieved.

9. Non-curative OG cancer treatment patterns and outcomes

The majority of patients diagnosed with OG cancer have advanced disease or are too frail for curative treatment. These patients are therefore managed with non-curative treatment intent, receiving therapies aimed at controlling symptoms (e.g. relief of pain or difficulty swallowing), improving quality of life, and lengthening the duration of survival.

Various treatments are available to patients on a non-curative care pathway (see Box 9.1). The choice of therapy will depend on a patient's condition and preferences [Allum et al 2011].

In the 2017-19 Audit cohort, palliative oncological therapy (chemotherapy, radiotherapy) was the most common treatment option, recorded for 33% of patients on a non-curative pathway. However, the pattern was dependent on tumour site, stage of disease and patient's age (Figure 9.1). The majority of older (more frail) patients had a plan for "best supportive care" (no active treatment beyond the immediate relief of symptoms). Endoscopic or radiologic palliative therapies (ERPT) were predominantly used for patients with oesophageal cancer.

Box 9.1: Non-curative treatment options for people with OG cancer

Palliative chemotherapy can improve survival in locally advanced gastric cancer by 3-6 months, compared to Best Supportive Care alone. Similar results are seen in oesophageal cancer.

External beam radiotherapy can be used to relieve dysphagia, but its effect is slower to act than the insertion of an oesophageal stent.

Brachytherapy can be used to treat dysphagia symptoms and improve quality of life in people expected to live more than 3 months.

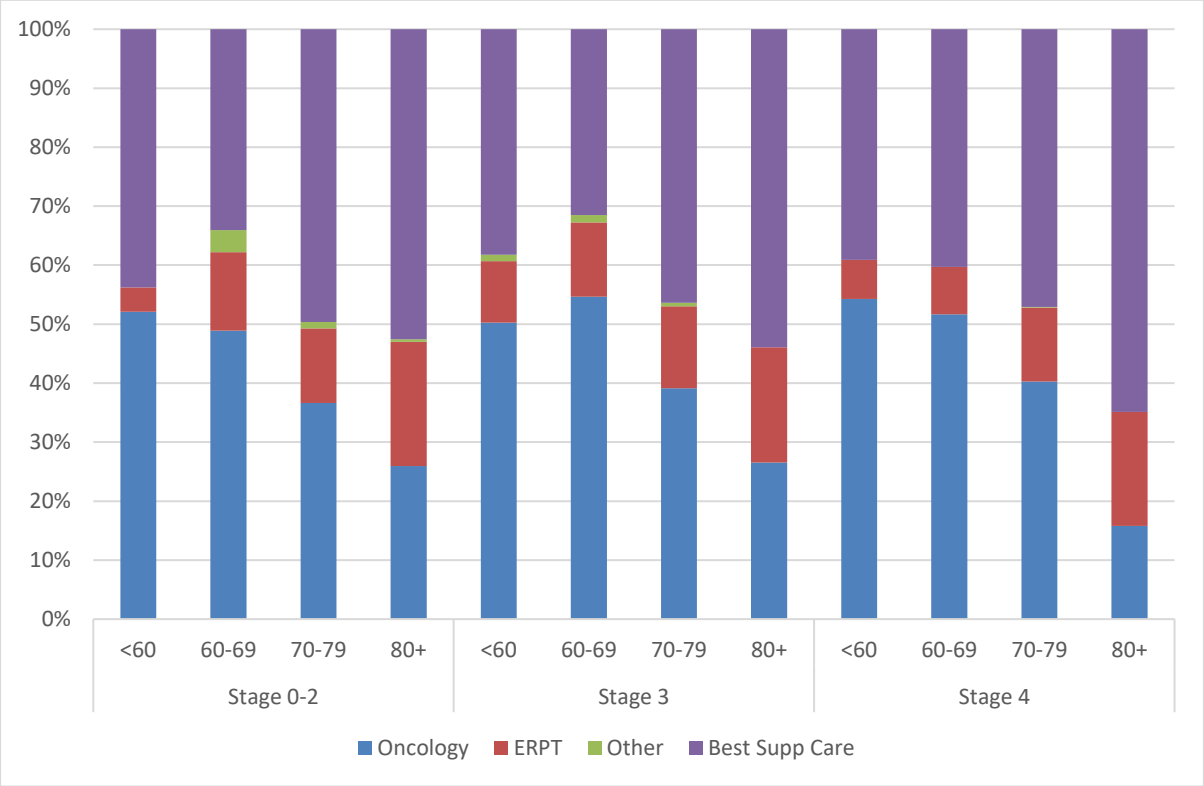
Endoscopic / radiological palliative therapy

Stents provide immediate relief of dysphagia and are recommended for people with a short life expectancy.

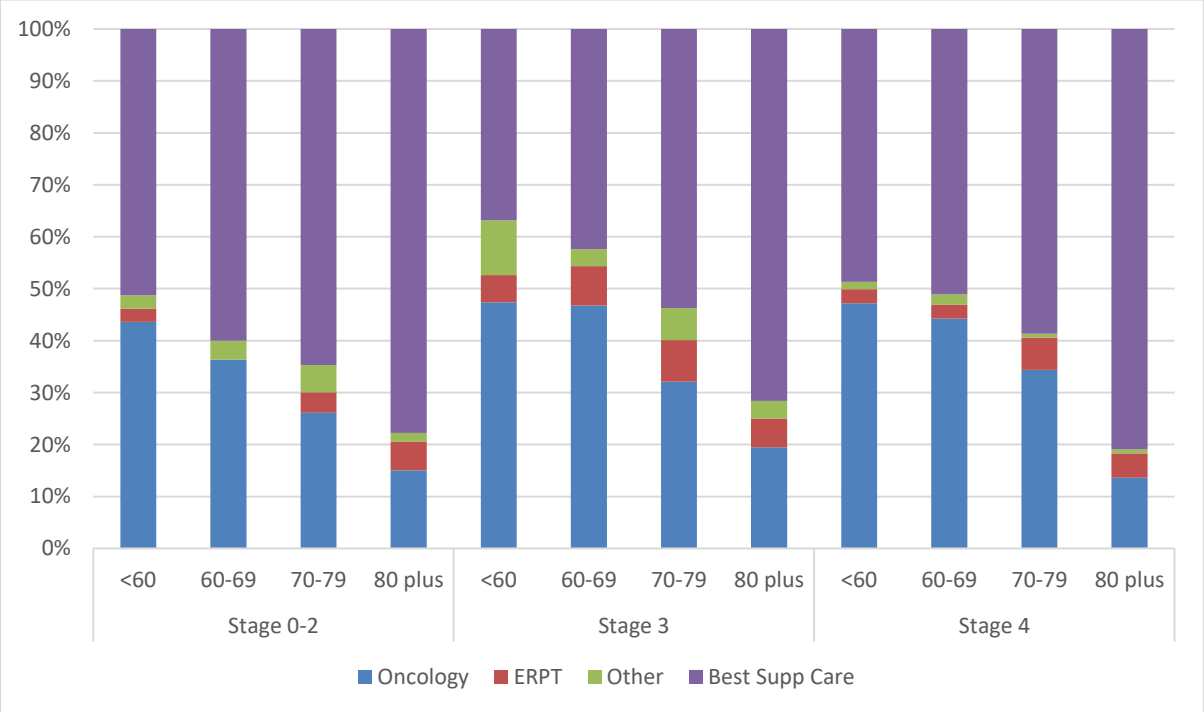
Laser therapy and *argon plasma coagulation* (APC) can both be used to relieve dysphagia particularly when it is due to tumour overgrowth after a stent has been inserted.

Figure 9.1: Pattern of recorded palliative therapies (including best supportive care) among patients with oesophageal and stomach tumours in audit period 2017-19

Patients with oesophageal tumours (including Siewert I / II)



Patients with stomach tumours (including Siewert III)



KEY: ERPT – endoscopic / radiologic palliative therapies

9.1 Endoscopic / Radiologic Palliative therapies (ERPT)

Among patients in the 2017-19 Audit cohort who had a record of endoscopic or radiological (ER) treatment and non-curative treatment intent, 97% had a stent insertion (Table 9.1). While stent insertion can provide rapid symptom relief, brachytherapy is an equally effective treatment with potentially longer lasting benefits [Sinha et al 2019]. However, it is rarely used, accounting for less than 1% of ER procedures in the Audit.

Table 9.1: Summary of palliative endoscopic and radiological treatments received by patients diagnosed with OG cancer between April 2017 and March 2019 and non-curative treatment plan, by tumour type

	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)
Total patients with non-curative treatment plan	2,264	1,038	5,372	3,947
ERPT records	512	194	948	242
% patients w ERPT record	21.8%	18.1%	17.1%	6.0%
Stent insertions	494	188	916	235
% stent of all ERPT	96.5%	96.9%	96.6%	97.1%

KEY: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma, SI, SII, SIII - Siewert classification of the gastro-oesophageal junction (GOJ).

9.2 Palliative oncology

Among patients with a planned treatment of palliative oncology and an oncological record in the Audit, chemotherapy was the most frequent treatment for both oesophageal and gastric cancers (Table 9.2). Over two-thirds of patients who received palliative oncology had chemotherapy. Radiotherapy was used less frequently, particularly among patients with gastric cancer.

Completion rates for palliative radiotherapy were high across all tumour types (97.1% overall) (Table 9.2). The proportion of patients completing palliative chemotherapy was comparatively low, at 56.1% over the same period. Chemotherapy completion rates did not vary greatly by tumour type, patient age or clinical stage. Among patients unable to complete chemotherapy, disease progression during treatment was the most frequently cited reason (19.8%), followed by acute chemotherapy toxicity (12.4%), patient death (12.2%) and patient choice (9.2%).

In the 2017-19 Audit cohort, 3.6% of patients receiving palliative chemotherapy (95% CI 2.9 to 4.3) died within 30 days of starting treatment. This figure was 1.6% (1.0 to 2.5) among those who completed their treatment as planned, compared to 6.2% (4.7 to 8.0) among those who did not complete their treatment.

Table 9.2: Palliative oncological treatment received by OG cancer patients diagnosed between April 2017 and March 2019, by tumour type

	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)	All
Chemotherapy	405 (51%)	215 (68%)	1,321 (68%)	803 (76%)	2,744 (67%)
Radiotherapy	344 (43%)	94 (30%)	593 (31%)	245 (23%)	1,276 (31%)
Chemo-radiotherapy	41 (5%)	7 (2%)	24 (1%)	12 (1%)	84 (2%)
Immunotherapy	1 (0.1%)	0	1 (0.1%)	1 (0.1%)	3 (0.1%)
Outcome of chemotherapy					
% Completed	52.6%	58.9%	57.9%	54.2%	56.1%
Outcome of radiotherapy					
% Completed	97.2%	93.2%	97.9%	96.6%	97.1%

9.3 Palliative chemotherapy regimens

Palliative chemotherapy regimens may be triplet regimens (consisting of a platinum-based agent, a fluoropyrimidine and an anthracycline) or doublet regimens (consisting of a platinum-based agent and a fluoropyrimidine). Until recently, the use of triplet regimens has been recommended as a first line option, but the benefit of adding an anthracycline has been increasingly questioned and many international studies recommend a doublet regimen as standard of care [Smyth et al 2020].

Palliative chemotherapy regimens recorded in the Systemic Anti-Cancer Therapy (SACT) dataset were examined for 7,012 patients in England, diagnosed over a five year period from April 2014 to March 2019. Overall, 56.8% of patients had records indicating use of a triplet regimen, while 20.6% received doublet regimens. Trastuzumab was used for 8.8% of patients, taxane-based regimens for 6.4%, and other regimens for the remaining 7.4%.

The use of doublet regimens increased over the five year period, from 16.5% among patients diagnosed in 2014/15 to 25.8% among those diagnosed in 2018/19 (Figure 9.2). Doublet regimens were more commonly used among older patients and those with squamous cell carcinomas (Table 9.3).

As reported last year, there was regional variation in the use of doublet regimens for adenocarcinomas, ranging from <1% to 38% among patients aged under 75 years, and from 0 to 62% among patients aged 75 and over (Figure 9.3). In the context of changing recommendations, it is unsurprising that there is variation in the use of these regimens across the country. However, this finding suggests a continued need for work towards consensus based practice in this area.

Figure 9.2: Palliative chemotherapy regimens recorded in the Systemic Anti-Cancer Therapy database, by Audit year

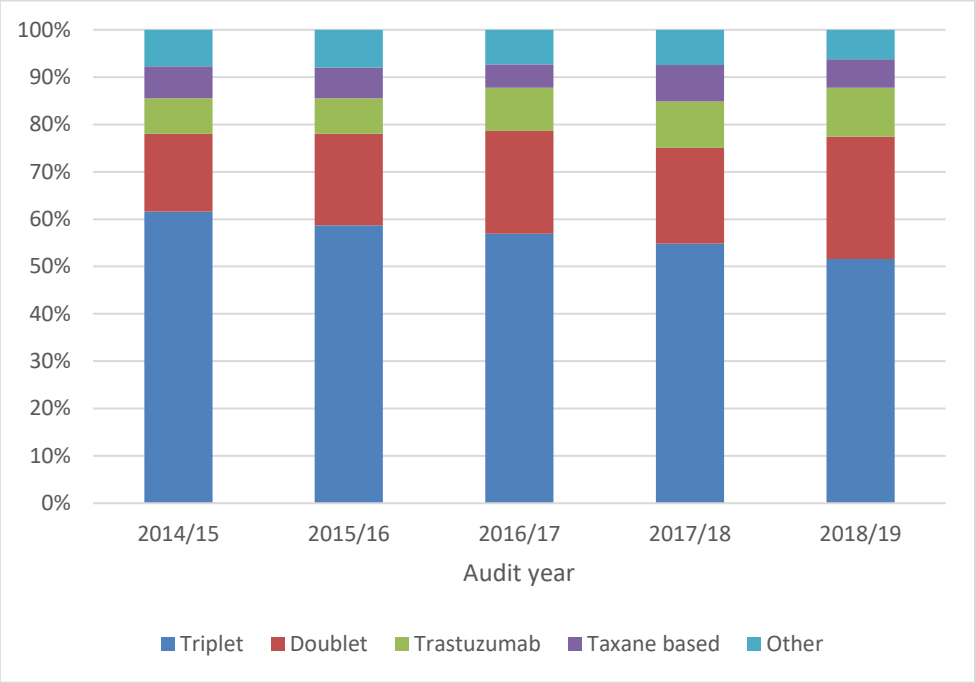
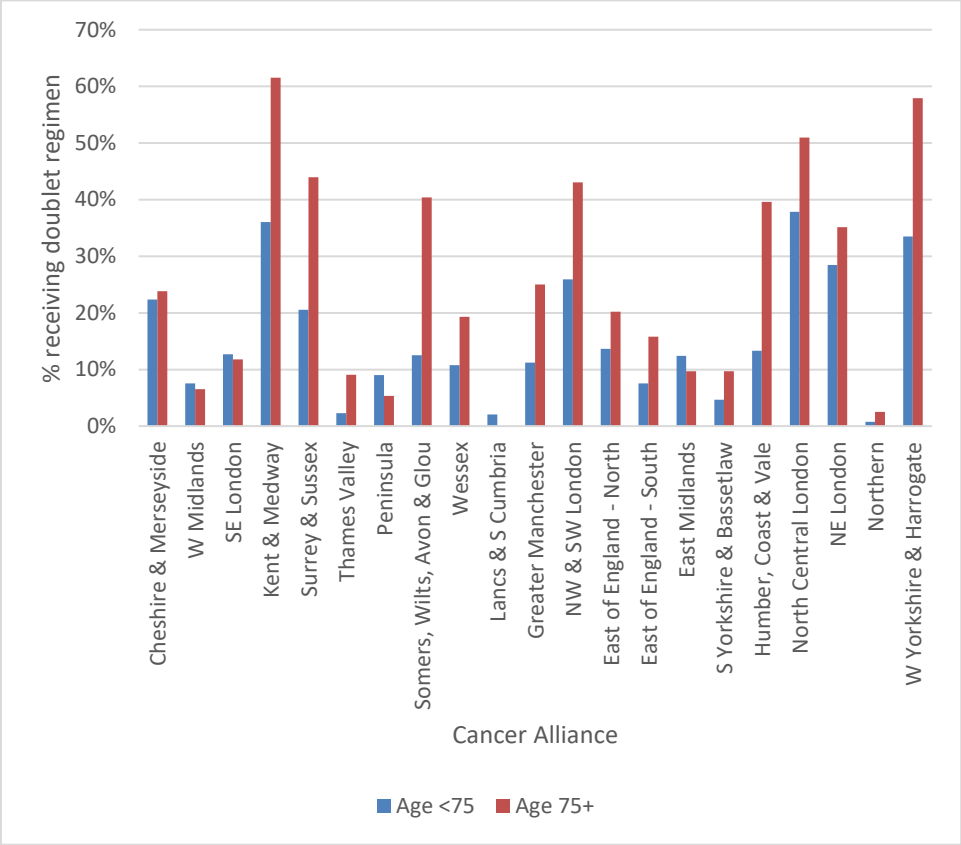


Table 9.3: Proportion of patients diagnosed between April 2014 and March 2019 receiving doublet palliative chemotherapy regimens, by tumour type and age

Age	Oes SCC	Oes ACA Upper/Mid	Oes ACA Lower (w SI,SII)	Stomach (w SIII)	Overall
Under 60	36.0%	19.8%	10.9%	14.7%	16.7%
60-69	47.2%	19.1%	13.5%	14.2%	19.3%
70-79	47.5%	17.3%	19.0%	15.5%	22.2%
80+	51.6%	23.7%	29.6%	34.6%	33.8%
Overall	44.5%	18.8%	15.7%	16.6%	

Figure 9.3: Use of doublet palliative chemotherapy regimens by age group and Cancer Alliance of diagnosis, for patients with adenocarcinoma diagnosed between April 2014 and March 2019



10. Presentation of results as a “composite indicator”

While each of the performance indicators reported by the Audit provides comparative information on a particular element of the care received by OG cancer patients, it can be difficult to gain an holistic view of how an organisation is performing. The Audit is aiming to address this in various ways. Last year, we produced an organisation data viewer that presents the indicators in a more organised fashion. This year, we are supplementing this with a composite summary. This has been produced initially for the specialist OG cancer centres but, if successful, will be extended to cover all NHS trusts / local health boards.

The process of developing the composite indicator began with an initial proposal from AUGIS and members of the specialist commissioning group for OG cancer services in NHS England, and covered an array of indicators that were identified as important for the assessment of service quality across the patient care pathway. The initial list of indicators was refined to reflect both clinical priorities and the availability of data within the Audit.

It was decided to organise the selected indicators into domains and produce a separate summary score for each domain. The domains reflected:

1. Participation in the Audit (case ascertainment and data quality)
2. Diagnosis and staging
3. Outcomes of curative surgery

It was decided to focus on these areas initially and consider expansion into oncological care and palliative interventions in the next phase of development.

To produce an overall indicator for each domain, it is necessary to convert the values from the individual indicators into scores that can be combined. To aid transparency, we adopted a simple process in which the indicator values were assigned scores from 1 (worst performance) to 5 (best performance). Indicators in the audit participation domain or related to the process of care are mapped to scores based on absolute thresholds of the values. For risk-adjusted indicators, the scores have been based on how the organisation’s value relates to the funnel plot control limits (number of SDs from the average).

Example indicators and thresholds for categorisation are summarised in Table 10.1.

The overall score for each domain was then produced by simply summing up these indicator scores. In other words, each indicator is given the same weight and contributes equally to the overall score. Figure 10.1 gives an example of the composite indicator for the domain on audit participation.

The composite indicator values for the surgical centres can be found on the NOGCA website, alongside a more extensive description of the composite indicator methodology.

Table 10.1: Example indicators and thresholds for OG cancer composite indicator

		Threshold boundaries			
Domain 1: Audit participation	**1 (worst)**	**2**	**3**	**4**	**5 (best)**
% Case ascertainment rate		< 65%	65-75%	75-84%	85-100%
No. patients having a curative procedure	<60	60-119	120-179	180-239	240+
% Surgical patients w/ status at discharge	<65%	65-75%	75-84%	85-94%	95-100%
% Surgical patients w/ discharge date	<65%	65-75%	75-84%	85-94%	95-100%
% Surgical patients w/ pathology record	<65%	65-75%	75-84%	85-94%	95-100%
Domain 2: Diagnosis and staging					
Adjusted % patients diagnosed after emergency admission	> 3 SD		2-3 SD		As expected
% Patients having CT scan	< 50%	50-64%	65-79%	80-89%	90-100%
% Eligible patients having PET-CT	< 50%	50-64%	65-79%	80-89%	90-100%
Median time, referral to curative therapy (days)	>90	80-89	70-79	60-69	Under 60
Domain 3: Surgical outcomes					
Adjusted 30 day mortality rate	> 3 SD		2-3 SD		As expected
Adjusted 90 day mortality rate	> 3 SD		2-3 SD		As expected
% Patients w/ 15+ lymph nodes examined		<65%	65-79%	80-89%	90-100%
Adjusted % positive long. margins (Oes)	> 3 SD		2-3 SD		As expected
Adjusted % positive long. margins (Gast)	> 3 SD		2-3 SD		As expected

Figure 10.1. Illustration of the composite summary scores for the domain on audit participation for a selection of surgical centres

	Domain 1: Quality of Audit participation					
NHS Trust/Health Board name	**% Case ascertainment rate**	**No. of patients having a curative procedure**	**% Surgical patients with Status at discharge**	**% Surgical patients with discharge date**	**% Surgical patients with Pathology record**	**Domain Score**
Manchester University NHS Foundation Trust	5	3	5	5	5	23
Royal Surrey County Hospital NHS Foundation Trust	3	3	5	5	4	20
University Hospitals Bristol NHS Foundation Trust	4	3	5	5	5	22
Bradford Teaching Hospitals NHS Foundation Trust	4	3	4	4	5	20
The Royal Bournemouth and Christchurch Hospitals NHS	4	2	5	5	1	17
Aintree University Hospital NHS Foundation Trust	4	2	5	5	2	18
Barking, Havering and Redbridge University Hospitals NHS	5	2	5	5	5	22
Cambridge University Hospitals NHS Foundation Trust	5	4	4	5	5	23
University Hospital Southampton NHS Foundation Trust	4	3	5	5	5	22
Sheffield Teaching Hospitals NHS Foundation Trust	4	4	5	5	5	23

Annex 1: Organisation of the Audit

The National OG Cancer Audit is one workstream of the National GastroIntestinal Cancer Audit Programme, alongside the National Bowel Cancer Audit. The Programme is overseen by a single Project Board to ensure it fulfils the scope of the work commissioned by HQIP.

In addition, the NOGCA is assisted by a Clinical Reference Group (CRG), the membership of which is drawn from clinical groups involved in the management of oesophago-gastric cancer and patient organisations.

Members of Clinical Reference Group for OG cancer workstream

Jan van der Meulen	London School of Hygiene & Tropical Medicine, Chair
Sam Ahmedzai	Palliative Care
William Allum	National Cancer Action Team
Adam Christian	Royal College of Pathologists
Bernadette Fairley	CNS Representative
Jamie Franklin	Radiologist
James Gossage	AUGIS
Fiona Huddy	British Dietetic Association Oncology Group
Hywel Morgan	Deputy Director - Wales Cancer Network
Caroline Rogers	HQIP - Associate Director
Richard Roope	RCGP/CRUK Clinical Lead for Cancer
John Taylor	OPA Patient Representative
Sarah Walker	HQIP - Project Manager

with members of the project team.

Members of Project Board for the National GI Audit Programme

Neil Mortensen	Senior Council Member of RCS, Chair
Robert Arnott	Patient Representative (ACP)
Chris Dew	Programme head, NHS Digital
Martyn Evans	Welsh Representative
Richard Hardwick	AUGIS Representative
Hywel Morgan	Deputy Director - Wales Cancer Network
Alison Roe	Ops Manager - NHS Digital
Caroline Rogers	HQIP - Associate Director
Diana Tait	RCR Representative
Sarah Walker	HQIP - Project Manager
James Wheeler	ACPGBI Executive Lead for COP

with members of the OG Cancer project team and Bowel Cancer project team.

Annex 2: Audit methods

Inclusion criteria

The Audit prospectively collects both clinical and demographic details for patients diagnosed with invasive epithelial oesophago-gastric (OG) cancer (ICD-10 codes C15 and C16), or high grade dysplasia (HGD) of the oesophagus. Patients are eligible for inclusion if they were diagnosed in an NHS hospital in England or Wales, and were aged 18 or over at diagnosis.

Data collection

All NHS acute trusts in England involved in the care of both curative and palliative OG cancer patients are required to upload patient information into the Clinical Audit Platform (CAP) managed by NHS Digital. Information on the care pathway and outcomes are entered prospectively either manually or via a 'csv' file generated from other information systems. As many hospitals can be involved in the care of one patient, the hospital responsible for diagnosis or treatment uploads the relevant data, which is then anonymised by NHS Digital. Data for each patient is then collated and analysed by the Clinical Effectiveness Unit (CEU), Royal College of Surgeons. Information on the pro-forma for data collection, and the data dictionary are available from www.nogca.org.uk.

Welsh data were provided by the Cancer Network Information System Cymru (CaNISC). This dataset did not provide access to information on surgical complication rates, details of chemotherapy or radiotherapy regimens or on patients diagnosed with oesophageal HGD. Consequently, results requiring these data are not reported for Welsh patients.

National data opt-out

National data opt-out allows patients in England who do not want their personal confidential information to be used for purposes other than their individual care to register this wish with NHS Digital. Application of the national data opt-out means that some patient data are removed from NOGCA and all linked datasets, and reduces the number of patients for whom data are presented.

Linkage to other data sets

The Audit dataset is linked to various other national datasets. This process reduces the burden of data collection, enables the quality of the data submitted by hospitals to be checked by comparing data items shared by the different datasets, and allows the Audit to derive a richer set of results.

The Audit dataset was linked to extracts from the:

- Registration and Death Register to provide accurate statistics on cancer survival
- Hospital Episode Statistics (HES) to provide additional information on hospital care both before and after the date of diagnosis, and to validate activity data provided by hospitals (eg, dates of procedures)
- Welsh hospital administrative database (Patient Episode Database for Wales PEDW)
- The national radiotherapy dataset (RTDS) that provides information on the episodes of radiotherapy received by patients

- The national systemic cancer dataset (SACT) that provides information on the regimens of chemotherapy delivered to patients
- The National Cancer Registration and Analysis Service dataset (NCRAS) to provide information on all cancer registrations in England and determine case ascertainment in the Audit

Data were linked using a hierarchical deterministic approach, which involved matching patient records using various patient identifiers (NHS number, sex, date of birth, and postcode).

Use of Hospital Episode Statistics

Hospitals Episode Statistics (HES) is the national hospital administrative database for all acute NHS trusts in England. Each HES record describes the period during which an admitted patient is under the care of a hospital consultant (an episode). Clinical information is captured using the International Classification of Disease (ICD-10) diagnostic codes and the Classification of Surgical Operations and Procedures (OPCS-4). The records of an individual patient are allocated the same anonymised identifier which enables the care given to patients to be followed over time.

Patients with oesophago-gastric (OG) cancer were identified in HES by searching records for the ICD diagnosis codes C15 and C16 in the first diagnostic field. As it is possible for a patient to have multiple HES episodes during a single admission to hospital, in order to determine the number of OG cancer patients in HES over the relevant timeframe, the date of diagnosis was taken as the admission date of the episode in HES where OG cancer was first recorded in the first diagnostic field.

Statistical analysis of data

The results of the Audit are presented at different levels:

1. by Cancer Alliance for England, with Wales considered as three separate areas (Swansea Bay, North Wales and South Wales), and
2. by English NHS trust / Welsh local health board.

The values of the various process and outcome indicators are typically expressed as rates and are presented as percentages. Averages and rates are typically presented with 95% confidence intervals (CI) to describe their level of precision. When shown graphically, regional rates are plotted against the overall national rate, with regions ordered according to the number of patients for whom data were submitted. English patients were allocated to the Cancer Alliance based on their NHS trust of diagnosis and not by region of residence. Welsh patients were similarly allocated to the region based on the local health board of diagnosis.

In descriptive analyses of continuous variables, the distribution of values is described using appropriate statistics (eg, mean and standard deviation or median and interquartile range). We follow the Office for National Statistics policy on the publication of small numbers to minimise the risk of patient identification from these aggregate results.

The statistical significance of differences between patient groups or geographical regions were tested using appropriate tests (such as a t-test for the difference between two continuous variables and a chi-squared test for the differences between proportions).

We derived risk-adjusted figures for each NHS surgical centre for the 30-day and 90-day mortality indicators and the longitudinal and circumferential margin indicators. The rates were adjusted to take into account differences in the case mix of patients treated at each centre using multivariable logistic models. The models were used to estimate the likelihood of the outcome (eg, death, a positive margin) for each individual having surgery, and these probabilities were then summed to calculate the predicted number of events for each NHS trust. The regression models were developed from the following patient characteristics: age at diagnosis, performance status, ASA grade, any comorbidities, tumour site, pathology T stage, number of positive nodes and receipt of neoadjuvant therapy

The risk-adjusted outcomes after curative surgery are presented using funnel plots. Two funnel limits were used that indicate the ranges within which 95.0% (representing a difference of two standard deviations from the national rate) or 99.8% (representing a difference of three standard deviations) would be expected to fall if variation was due only to sampling error. The control limits were calculated using the "exact" Binomial method. Following convention, we use the 99.8% limits to identify 'outliers' as it is unlikely for an NHS organisation to fall beyond these limits solely by chance.

If the Audit identifies an NHS organisation as an outlier, we follow the process outlined in the NOGCA outlier policy (available on www.nogca.org.uk website). This is based on HQIP's guidance on outlier management for National Clinical Audits (https://www.hqip.org.uk/outlier-management-for-national-clinical-audits/) and involves giving the organisation an opportunity to review their data and ensure the submitted records are complete and free of errors. If the organisation remains an outlier after this review, the Audit will contact the organisation's clinical governance lead, Medical Director and Chief Executive. The CQC and Welsh Government will also be informed.

The results of NHS trusts with a case volume of less than 10 were not included in the funnel plots because such small samples lead to unreliable statistical estimates due to the play of chance.

Annex 3: List of regional areas and NHS organisations

Cancer Alliance or Welsh Region	NHS Trust/ Health Board code	NHS Trust/Health Board name
Cheshire and Merseyside	RBT	Mid Cheshire Hospitals NHS Foundation Trust
	RJN	East Cheshire NHS Trust
	RBL	Wirral University Teaching Hospital NHS Foundation Trust
	RBN	St Helens and Knowsley Hospitals NHS Trust
	REM	Aintree University Hospital NHS Foundation Trust
	RJR	Countess of Chester Hospital NHS Foundation Trust
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust
	RVY	Southport and Ormskirk Hospital NHS Trust
	RWW	Warrington and Halton Hospitals NHS Foundation Trust
	REN	The Clatterbridge Cancer Centre NHS Foundation Trust **
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust
	RFS	Chesterfield Royal Hospital NHS Foundation Trust
	RNQ	Kettering General Hospital NHS Foundation Trust
	RNS	Northampton General Hospital NHS Trust
	RTG	University Hospitals of Derby and Burton NHS Foundation Trust
	RWD	United Lincolnshire Hospitals NHS Trust
	RWE	University Hospitals of Leicester NHS Trust
	RX1	Nottingham University Hospitals NHS Trust
East of England - North	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
	RDE	East Suffolk and North Essex NHS Foundation Trust
	RGN	North West Anglia NHS Foundation Trust
	RGP	James Paget University Hospitals NHS Foundation Trust
	RGR	West Suffolk NHS Foundation Trust
	RGT	Cambridge University Hospitals NHS Foundation Trust
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust
East of England - South	RC9	Luton and Dunstable University Hospital NHS Foundation Trust
	RWG	West Hertfordshire Hospitals NHS Trust
	RWH	East and North Hertfordshire NHS Trust
	RQW	The Princess Alexandra Hospital NHS Trust
	RD8	Milton Keynes Hospital NHS Foundation Trust
	RC1	Bedford Hospital NHS Trust
	RAJ	Southend University Hospital NHS Foundation Trust
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust
	RQ8	Mid Essex Hospital Services NHS Trust
Greater Manchester	R0A	Manchester University NHS Foundation Trust
	RM3	Salford Royal NHS Foundation Trust
	RMC	Bolton NHS Foundation Trust
	RMP	Tameside and Glossop Integrated Care NHS Foundation Trust
	RRF	Wrightington, Wigan and Leigh NHS Foundation Trust
	RW6	Pennine Acute Hospitals NHS Trust
	RWJ	Stockport NHS Foundation Trust
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust
	RCD	Harrogate and District NHS Foundation Trust
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust
	RWA	Hull and East Yorkshire Hospitals NHS Trust

Cancer Alliance or Welsh Region	NHS Trust/ Health Board code	NHS Trust/Health Board name
Kent and Medway	RN7	Dartford and Gravesham NHS Trust
	RPA	Medway NHS Foundation Trust
	RVV	East Kent Hospitals University NHS Foundation Trust
	RWF	Maidstone and Tunbridge Wells NHS Trust
Lancashire and South Cumbria	RXL	Blackpool Teaching Hospitals NHS Foundation Trust
	RXN	Lancashire Teaching Hospitals NHS Foundation Trust
	RXR	East Lancashire Hospitals NHS Trust
	RTX	University Hospitals of Morecambe Bay NHS Foundation Trust
North Central London	RAL	Royal Free London NHS Foundation Trust
	RAP	North Middlesex University Hospital NHS Trust
	RKE	Whittington Health NHS Trust
	RRV	University College London Hospitals NHS Foundation Trust
North East London	R1H	Barts Health NHS Trust
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust
	RQX	Homerton University Hospital NHS Foundation Trust
North West and South West London	R1K	London North West Healthcare NHS Trust
	RAS	The Hillingdon Hospitals NHS Foundation Trust
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust
	RYJ	Imperial College Healthcare NHS Trust
	RAX	Kingston Hospital NHS Foundation Trust
	RJ6	Croydon Health Services NHS Trust
	RJ7	St George's Healthcare NHS Trust
	RVR	Epsom and St Helier University Hospitals NHS Trust
Northern	R0B	South Tyneside and Sunderland NHS Foundation Trust
	RNN	North Cumbria Integrated Care NHS Foundation Trust
	RR7	Gateshead Health NHS Foundation Trust
	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust
	RTF	Northumbria Healthcare NHS Foundation Trust
	RTR	South Tees Hospitals NHS Foundation Trust
	RVW	North Tees and Hartlepool NHS Foundation Trust
	RXP	County Durham and Darlington NHS Foundation Trust
Peninsula	RA9	Torbay and South Devon NHS Foundation Trust
	RBZ	Northern Devon Healthcare NHS Trust
	REF	Royal Cornwall Hospitals NHS Trust
	RH8	Royal Devon and Exeter NHS Foundation Trust
	RK9	University Hospitals Plymouth NHS Trust
Somerset, Wiltshire, Avon & Gloucestershire	RA3	Weston Area Health NHS Trust
	RA4	Yeovil District Hospital NHS Foundation Trust
	RA7	University Hospitals Bristol NHS Foundation Trust
	RH5	Taunton and Somerset NHS Foundation Trust
	RD1	Royal United Hospitals Bath NHS Foundation Trust
	RN3	Great Western Hospitals NHS Foundation Trust
	RVJ	North Bristol NHS Trust
	RTE	Gloucestershire Hospitals NHS Foundation Trust
	RNZ	Salisbury NHS Foundation Trust
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust
	RJ2	Lewisham and Greenwich NHS Trust
	RJZ	King's College Hospital NHS Foundation Trust

Cancer Alliance or Welsh Region	NHS Trust/ Health Board code	NHS Trust/Health Board name
South Yorkshire and Bassetlaw	RFF	Barnsley Hospital NHS Foundation Trust
	RFR	The Rotherham NHS Foundation Trust
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust
	RDU	Frimley Park Hospital NHS Foundation Trust
	RTK	Ashford and St Peter's Hospitals NHS Foundation Trust
	RTP	Surrey and Sussex Healthcare NHS Trust
	RXC	East Sussex Healthcare NHS Trust
	RXH	Brighton and Sussex University Hospitals NHS Trust
	RYR	Western Sussex Hospitals NHS Foundation Trust
Thames Valley	RHW	Royal Berkshire NHS Foundation Trust
	RTH	Oxford University Hospitals NHS Trust
	RXQ	Buckinghamshire Healthcare NHS Trust
Wessex	RBD	Dorset County Hospital NHS Foundation Trust
	RD3	Poole Hospital NHS Foundation Trust
	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
	R1F	Isle of Wight NHS Trust
	RHM	University Hospital Southampton NHS Foundation Trust
	RHU	Portsmouth Hospitals NHS Trust
	RN5	Hampshire Hospitals NHS Foundation Trust
West Midlands	RBK	Walsall Healthcare NHS Trust
	RRK	University Hospitals Birmingham NHS Foundation Trust
	RXK	Sandwell and West Birmingham Hospitals NHS Trust
	RJC	South Warwickshire NHS Foundation Trust
	RKB	University Hospitals Coventry and Warwickshire NHS Trust
	RLT	George Eliot Hospital NHS Trust
	RLQ	Wye Valley NHS Trust
	RWP	Worcestershire Acute Hospitals NHS Trust
	RJE	University Hospitals of North Midlands NHS Trust
	RL4	The Royal Wolverhampton NHS Trust
	RNA	The Dudley Group NHS Foundation Trust
	RXW	Shrewsbury and Telford Hospital NHS Trust
West Yorkshire and Harrogate	RAE	Bradford Teaching Hospitals NHS Foundation Trust
	RCF	Airedale NHS Foundation Trust
	RR8	Leeds Teaching Hospitals NHS Trust
	RWY	Calderdale and Huddersfield NHS Foundation Trust
	RXF	Mid Yorkshire Hospitals NHS Trust
North Wales	7A1	Betsi Cadwaladr University Health Board
South Wales	7A2	Hywel Dda University Health Board
	7A4	Cardiff and Vale University Health Board
	7A5	Cwm Taf Morgannwg University Health Board
	7A6	Aneurin Bevan University Health Board
Swansea Bay	7A3	Swansea Bay University Health Board

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Glossary

Adjuvant treatment – An additional therapy (e.g. chemotherapy or radiotherapy) provided to improve the effectiveness of the primary treatment (e.g. surgery). This may aim to reduce the chance of local recurrence of the cancer or to improve the patient's overall chance of survival.

Ablation – a palliative technique (performed by laser or argon beam coagulation) that aims to reduce symptoms by destroying the surface of the tumour, thereby shrinking it in size.

Adenocarcinoma – Tend to occur in the lower third of the oesophagus or stomach in glandular cells that make and release fluids.

AUGIS – Association of Upper GI Surgeons

Brachytherapy – This is a type of radiotherapy in which a radiation source is placed inside a person's oesophagus, next to the area requiring treatment.

BSG – British Society of Gastroenterology

CARMS – The Clinical Audit and Registries Management Service Support Unit of NHS Digital manages a number of national clinical audits in the areas of cancer, diabetes and heart disease. It is one of the key stakeholders leading the Audit.

Chemotherapy – Drug therapy used to treat cancer. It may be used alone, or in conjunction with other types of treatment (e.g. surgery or radiotherapy).

CEU – The Clinical Effectiveness Unit is an academic collaboration between The Royal College of Surgeons of England and the London School of Hygiene and Tropical Medicine, and undertakes national surgical audit and research. It is one of the key stakeholders leading the Audit.

CT scan – (Computer Tomography) an imaging modality that uses X-ray radiation to build up a 3-dimensional image of the body. It is used to detect distant abnormalities (such as metastases) but has a limited resolution, so is less useful for detecting smaller abnormalities (such as in lymph nodes).

Curative care – This is where the aim of the treatment is to cure the patient of the disease. It is not possible to do this in many patients with OG cancer and is dependent on how far the disease has spread and the patient's general health and physical condition.

Dilatation – a procedure that involves inflating balloon or passing a bougie or dilator after inserting an endoscope into the oesophagus to increase the size of the opening through which food or liquids can pass.

Dysphagia – A symptom where the patient experiences difficulty swallowing. They often complain that the food sticks in their throat. It is the commonest presenting symptom of oesophageal cancer.

Endoscopy – An investigation whereby a telescopic camera is used to examine the inside of the digestive tract. It can be used to guide treatments such as stents (see below).

Endoscopic mucosal resection – A procedure to remove abnormal tissue from the digestive tract using a telescopic camera to guide instruments. This procedure can be used to treat high grade dysplasia of the oesophagus or early cancers.

Endoscopic palliative therapies – These are treatments that aim to relieve symptoms, such as vomiting or swallowing difficulties, by using a telescopic camera to guide instruments that can relieve the blockage. Examples include stents, dilatation, laser therapy and brachytherapy.

Endoscopic ultrasound (EUS) – An investigation that uses an ultrasound probe on the end of a telescope. It is used to determine how deep into the surrounding tissues a cancer has invaded and to what extent it has spread to local lymph nodes.

Gastric – An adjective used to describe something that is related to or involves the stomach, e.g. gastric cancer is another way of saying stomach cancer.

Gastrectomy – A surgical procedure to remove either a section (a partial gastrectomy) or all (a total gastrectomy) of the stomach. In a total gastrectomy, the oesophagus is connected to the small intestine.

HES – Hospital Episode Statistics is a database which contains data on all in-patients treated within NHS trusts in England. This includes details of admissions, diagnoses and those treatments undergone.

High-grade dysplasia of the oesophagus – Precancerous changes in the cells of the oesophagus, which are often associated with Barrett's oesophagus.

ICD10 – International Statistical Classification of Diseases and Related Health Problems 10th Revision

Laparoscopy – This is often called "keyhole surgery" and involves inserting a small camera into the belly through a small cut, so as to either guide the operation or to look at the surface of the abdominal organs and so accurately stage the disease.

Lymph nodes – Lymph nodes are small oval bits of tissue that form part of the immune system. They are distributed throughout the body and are usually the first place to which cancers spread.

Metastases – Metastases are deposits of cancer that occur when the cancer has spread from the place in which it started to other parts of the body. These are commonly called secondary cancers, and is known as metastatic disease.

MDT – The multi-disciplinary team is a group of professionals from diverse specialties that works to optimise diagnosis and treatment throughout the patient pathway.

Minimally invasive surgery – A procedure performed through the skin or anatomical opening using a laparoscopic instrument rather than through an opening. Full minimally invasive oesophagectomies involve thoracoscopy for the chest-phase of the operation and laparoscopy for the abdominal phase.

Neo-adjuvant chemotherapy – Chemotherapy given before another treatment, usually surgery. This is usually given to reduce the size, grade or stage of the cancer and therefore improve the effectiveness of the surgery performed.

Neoplasm – A neoplasm or tumour is an abnormal mass of tissue that results when cells divide more than they should or do not die. Neoplasms may be benign (not cancerous), or malignant (cancerous).

NHS Digital – A special health authority that provides facts and figures to help the NHS and social services run effectively. The Clinical Audit and Registries Management Service (CARMS) is one of its key components.

NICE – The National Institute for Health and Care Excellence is an independent organisation responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health.

Oesophagus – The portion of the digestive tract that carries food from the bottom of the throat to the top of the stomach. It is also known as the gullet or the foodpipe.

Oesophagectomy – The surgical removal of all or part of the oesophagus. The procedure can be performed by opening the thorax (a trans-thoracic oesophagectomy) or through openings in the neck and abdomen (a trans-hiatal oesophagectomy)

Oncology – The branch of medicine which deals with the non-surgical treatment of cancer, such as chemotherapy and radiotherapy.

Open-and-shut procedure – A planned procedure to remove a tumour was found to be infeasible after the initial surgical incision was made. The incision was therefore closed without the surgery proceeding further.

Pathology – The branch of medicine that deals with tissue specimens under a microscope to determine the type of disease and how far a cancer has spread within the specimen (i.e. whether a tumour has spread to the edges of the specimen or lymph nodes).

Palliative care – Palliative care (also called non-curative care) is the care given to patients whose disease cannot be cured. It aims to improve quality of life rather than extend survival and concentrates on relieving physical and psychological distress.

PEDW – Patient Episode Database for Wales (PEDW) is an administrative database that contains data on all in-patients treated within NHS hospitals in Wales.

PET – An imaging technique that detects cancer spread or metastases by looking at how fast radioactive sugar molecules are used by different parts of the body. Cancer cells use sugar at a very high rate so show up brightly on this test.

Radiology – The branch of medicine that involves the use of imaging techniques (such as X-rays, CT Scans and PET scans) to diagnose and stage clinical problems.

Radiotherapy – A treatment that uses radiation to kill tumour cells and so shrink the tumour. In most cases, it is a palliative treatment but it can be used together with surgery or chemotherapy in a small number of patients as part of an attempt at cure.

RCS – The Royal College of Surgeons of England is an independent professional body committed to enabling surgeons to achieve and maintain the highest standards of surgical practice and patient care. As part of this it supports audit and the evaluation of clinical effectiveness for surgery.

Squamous cell carcinoma – A tumour that is located in the cells lining the oesophagus and tends to occur in the upper or middle of the oesophagus.

Stage – The extent to which the primary tumour has spread; the higher the stage, the more extensive the disease.

Staging – The process by which the stage (or extent of spread) of the tumour is determined through the use of various investigations.

Stent – A device used to alleviate swallowing difficulties or vomiting in patients with incurable OG cancer. It is a collapsible tube that expands and relieves the blockage when inserted into the affected area.

Surgical resection – An operation whose aim is to completely remove the tumour

TNM – A system to describe the size and spread of cancer: T describes the size of the tumour, N describes any spread of cancer to lymph nodes, and M describes metastasis (spread of cancer to other parts of the body).

Two-week wait referral – This is a referral mechanism used by General Practitioners (GPs) when they suspect the patient may have cancer.

Ultrasound – An imaging modality that uses high frequency sound waves to create an image of tissues or organs in the body.