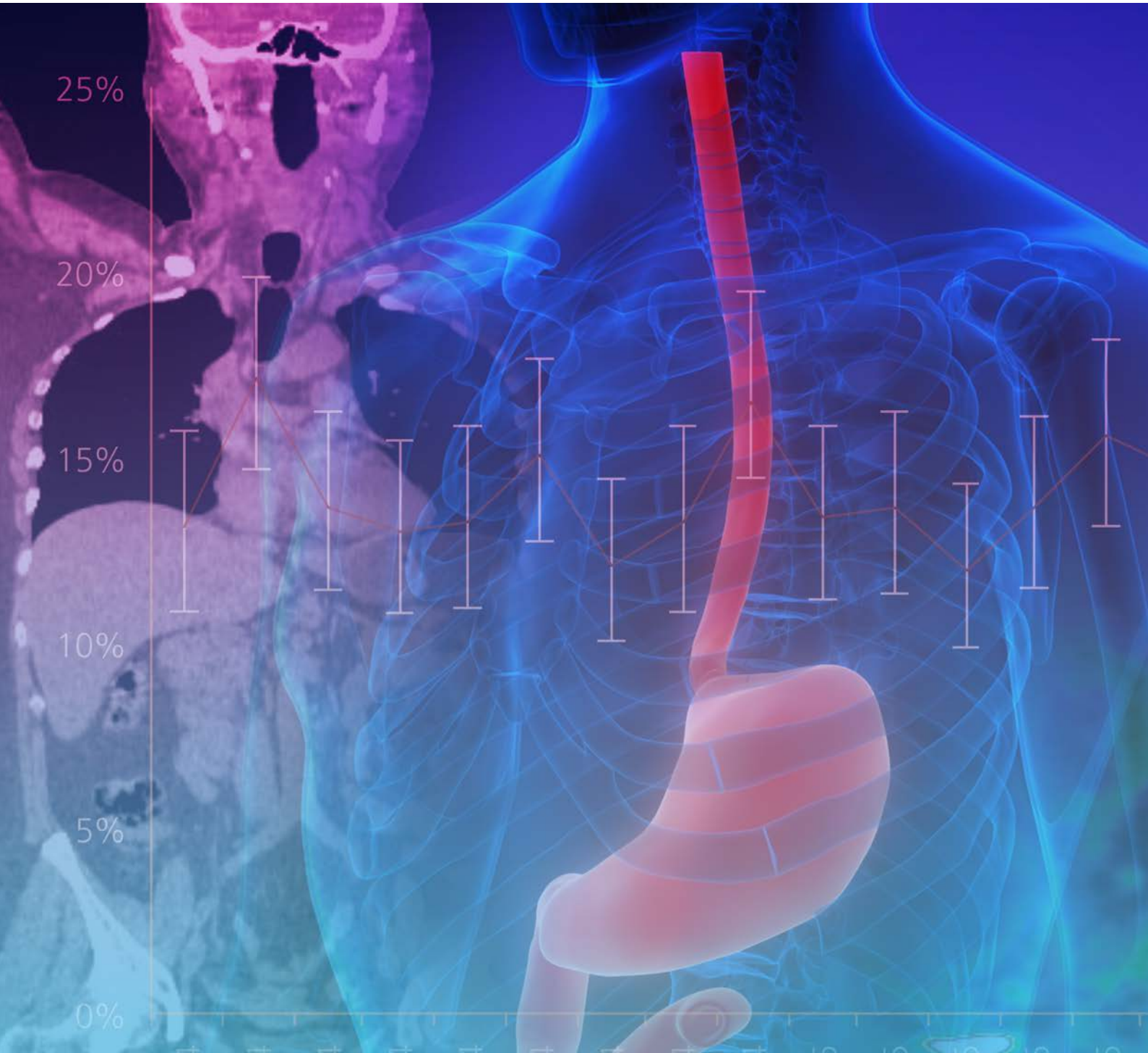
National Oesophago-Gastric Cancer Audit 2017



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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, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP hosts the contract to manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP). Its purpose is to engage clinicians across England and Wales in systematic evaluation of their clinical practice against standards and to support and encourage improvement in the quality of treatment and care. The programme comprises more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions.

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The RCS analysed the data and wrote the content of the 2017 Annual Report.

The Association of Upper GI Surgeons is the speciality society that represents upper gastrointestinal surgeons. It is one of the key partners leading the Audit.

The British Society of Gastroenterology is the speciality society of gastroenterologists. It is one of the key partners leading the Audit.

The Royal College of Radiologists is the speciality society of radiologists. It is one of the key partners leading the Audit.

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National Oesophago-Gastric Cancer Audit 2017

An audit of the care received by people with Oesophago-Gastric Cancer in England and Wales
2017 Annual Report

Contents

Acknowledgements

The National Oesophago-Gastric Cancer Audit (NOGCA) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). 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, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP hosts the contract to manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP). Its purpose is to engage clinicians across England and Wales in systematic evaluation of their clinical practice against standards and to support and encourage improvement in the quality of treatment and care. The programme comprises more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions.

We would like to acknowledge the support of the many hospitals that participated in this Audit and thank them for the considerable time that their staff devoted to collecting and submitting the data.

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- The members of the Clinical Reference Group and Project Board
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Foreword

This 2017 Annual Report from the National Oesophago-Gastric Cancer Audit provides us with the most up-to-date information on the care and outcomes of patients diagnosed with OG cancer or oesophageal high grade dysplasia. The report reflects an enormous amount of hard work and it is a credit to everyone involved – NHS trusts, Welsh local health boards, NHS Digital and the Clinical Effectiveness Unit at the Royal College of Surgeons of England. Its continuing success has only been possible due to the tremendous effort of all involved.

The Audit findings show that clinicians are generally providing a high quality of care for patients. There has been an increasing uptake of definitive chemoradiotherapy among patients with oesophageal squamous cell carcinoma, and a greater use of combined therapies (surgery, radiotherapy and chemotherapy), demonstrating services are responding to our greater understanding of what is best practice.

Surgical teams across England & Wales are to be congratulated on their low mortality rates for such major surgery. We should not, however, be complacent and the drive to reduce complication rates and post-operative hospital stays must continue. We have clearly demonstrated the benefits of high-volume centres for surgery and the same principle could now be extended to endoscopic therapy.

The new information about chemotherapy regimens for patients having non-curative treatment is particularly welcome. Wide variations in chemotherapy and radiotherapy regimens are difficult to understand and warrant further investigation. Another issue for reflection is the time it takes from diagnosis to the start of treatment. For some patients, this is taking longer than desirable and local services should examine what might be contributing to the delays.

This is, however, a report full of positive stories and we should celebrate the progress that has been made in the last decade. Of course, the value of the annual report depends upon the completeness of the data submitted by participating hospitals. Clinical ownership and oversight of the data are crucial.

The Audit has been a pioneer of using linked datasets. This is to be applauded as it enables the Audit to describe more fully the quality of care and outcomes for patients in England and Wales and minimises the burden of data collection for staff. We can foresee this approach delivering more useful information for patients and clinicians, and we remain excited about the potential of the Audit for the years to come.

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Executive Summary

Background to the Audit

Around 13,000 people are diagnosed with oesophago-gastric (OG) cancer each year within England and Wales. It is the fifth most common type of cancer, and patients are often diagnosed with more advanced disease compared with other cancers. As a result, prognosis is relatively poor, with only 15% of oesophageal cancer patients and 19% of gastric cancer patients surviving 5 years after diagnosis.

The 2017 Annual Report is the sixth report published by National Oesophago-Gastric Cancer Audit (NOGCA) since it was re-established in 2011 to investigate the quality of care received by patients with OG cancer. Its long term goals are to provide information that enables NHS cancer services to benchmark their performance and to identify areas where aspects of care could be improved. The Audit is run by the Clinical Association of Upper Gastrointestinal Surgeons of Great Britain & Ireland (AUGIS), Royal College of Radiologists (RCR), British Society of Gastroenterologists (BSG), NHS Digital and the Clinical Effectiveness Unit of the Royal College of Surgeons of England.

The Audit is commissioned by the Health Quality Improvement Partnership (HQIP), and funded by NHS England and the Welsh Government. The delivery of the Audit is overseen by a Project Board. A Clinical Reference Group (CRG), whose members represent professional medical associations and patient organisations, provides advice to the Audit team on the clinical direction of the Audit, the interpretation of its findings and how these can be disseminated effectively.

This executive summary is intended for multidisciplinary clinical teams, patients, caregivers, senior hospital managers / medical directors and commissioners. A glossary explaining terms used in the summary can be found at the end of the report.

What the Audit measures

NOGCA collects prospective data on adult patients diagnosed in England and Wales with either invasive epithelial cancer of the oesophagus, gastro-oesophageal junction (GOJ) or stomach, or high grade dysplasia (HGD) of the oesophagus. In this report, we describe the care received by patients diagnosed between 1 April 2014 and 31 March 2016 and their outcomes.

Results are presented at a national level, at regional level (using the Cancer Alliance areas for England) and at individual NHS trust / local health board level.
The information is primarily published to support the quality improvement activities in hospitals providing OG cancer care as well as the commissioners of cancer services. The results will also be used to guide Care Quality Commission (CQC) inspections.

In addition to this report, the Audit publishes information on surgical outcomes at the level of a consultant within the English NHS trusts. The information is published on the AUGIS and NHS Choices (MyNHS) websites.

- AUGIS website (http://www.augis.org/outcomes-data-2017/)
- MyNHS website (https://www.nhs.uk/Service-Search/performance/search)

High grade dysplasia of the oesophagus

Guidance on the management of patients with HGD was published by the BSG in 2014. These include clinical standards on the initial diagnosis of HGD, treatment planning and recommend that patients should be considered for endoscopic therapy in preference to either oesophagectomy or endoscopic surveillance.

The Audit received information on 732 patients diagnosed with HGD between April 2014 and March 2016. Within this period, performance against key standards was as follows:

- 327 patients (48.6%) had a repeat biopsy that confirmed the initial diagnosis of HGD.
- 626 patients (86.0%) were discussed at an upper GI MDT meeting

Overall, 72.8% of patients had endoscopic treatment, 3.1% had a surgical resection and 24.1% underwent surveillance alone. Of the 400 patients who had an endoscopic resection, the outcome of the procedure was known for 339 cases (84.8%). In addition, for 120 patients (30.4%), the diagnosis was upgraded to intramucosal or submucosal cancer once the removed tissue had been examined by a pathologist.

That a high proportion of HGD patients having endoscopic treatments were found to have early disease cancer raises questions about whether these cancers were also being detected among HGD patients on surveillance. By linking the NOGCA dataset with routine hospital data, we were able to examine what treatments were received by patients recorded in NOGCA as on surveillance within a year of their HGD diagnosis. The Audit found that these patients tended to have a regular series of endoscopic procedures, and that about one third of these patients were also diagnosed with cancer. That early cancer is commonly identified around the time of a HGD diagnosis lends support for the BSG recommendation about endoscopic resection being the preferred first-choice treatment.

The BSG guideline also recommends that the management of HGD is undertaken in NHS organisations treating 15 or more cases each year. Only 6 of 115 NHS providers (5.2%) treated this number of patients in every year of data collection, and at 91 providers (79.1%) the average number of patients treated was less than 5 cases per year.

Participation by NHS acute trusts and case ascertainment

English NHS trusts submitted clinical information for 19,900 patients (80.3% of the 24,782 estimated total). Data on 1,342 patients treated in Welsh hospitals (80.9% of estimated total) was supplied centrally from the NHS Wales cancer information system (CANISC).

The Audit data was linked to information on the date of death from the Office for National Statistics (ONS) to obtain information on outcomes. The Audit data was also linked to Hospital Episode Statistics (HES), the English chemotherapy (SACT) and radiotherapy dataset (RTDS) to gather additional information on patient management.

Routes to diagnosis

A patient can be diagnosed with OG cancer after referral to secondary care via three main routes: following a visit to a general practitioner, after an emergency admission, or a referral by another hospital consultant from a non-emergency setting. Patients diagnosed as a result of an emergency admission are less likely to be managed with curative intent, and there has been a national "Be Clear on Cancer" initiative (run in early 2015) to raise the public awareness of OG cancer and to improve the diagnosis process (https://campaignresources.phe.gov.uk/resources/campaigns/16-be-clear-on-cancer/overview).

Among patients diagnosed between April 2014 and March 2016, we found that the proportion of patients diagnosed after an emergency admission was 13.7%, a fall from the 15.3% reported by the Audit in 2010. There was still significant variation across the Cancer Alliances in the proportion of patients diagnosed after an emergency admission, which suggests that there is room for improvement.

Times from diagnosis to treatment

Over the past decade, NHS cancer services have focused on reducing the time between a patient experiencing symptoms and initial treatment. Several national cancer waiting time targets have been introduced, but these may not always capture the total time from diagnosis to the start of treatment. We examined the range of times to treatment for patients who start different types of therapy: curative surgery, neoadjuvant therapy, palliative oncology and palliative endoscopic/radiologic therapy.

There were limited differences across the regions in England and Wales in the range of waiting times for each type of treatment. But it was clear that, within each region, some patients could be waiting at least 100 days to begin their treatment. The waits were greatest for patients having surgery only. Their median waiting time was 65 days (interquartile range: 25 to 140 days) and within eight regions, 23% of patients waited at least 100 days for surgery from their date of diagnosis.

Staging and treatment planning

All patients with a new diagnosis of OG cancer are recommended to have a staging CT scan to investigate the extent to which the disease has spread. Overall, 88.5% of OG cancer patients diagnosed between April 2014 and March 2016 were reported to have a CT scan, and, although those that did not have a scan were more likely to be older and / or more frail, the proportion was still only 91% among younger, fit patients. The use of endoscopic ultrasound and staging laparotomy for staging the disease was also lower than expected. NHS trusts / local health boards should explore the use of staging investigations, and the submission of data about these investigations where their use is reported to be low.

Overall, 38.7% of patients had a curative treatment plan. This proportion varied across the various tumour sites, being highest for tumours located in the lower oesophagus or the gastro-oesophageal junction (43.2%). The proportion of patients with stomach tumours having planned curative surgery was 33.2%. The proportion of patients managed with curative intent varied across Cancer Alliances and Welsh regions, ranging from 28% to 52%.

Among patients having non-curative treatment, the most common planned therapy was palliative oncology, with 6,353 patients (50.4%) planned to received chemotherapy / radiotherapy, although there is some variation of planned modality by tumour site. There was also variation in the type of planned treatment across the geographical regions of England and Wales, with the proportion of patients having planned oncology ranging from 41% to 67% across the regions.

Definitive chemoradiotherapy

Evidence from randomised clinical trials suggests that definitive chemoradiotherapy is equivalent to surgery with respect to survival for patients with some types of oesophageal cancers. The results from the Audit suggest services are responding to this evidence with increasing use of definitive chemoradiotherapy. Patients who have definitive oncology are, on average, older and more frail than those who have curative surgery but there is greater variation among patients within these two groups and between them. This suggests that patient preference might be as important as clinical factors in deciding on which therapy to have.

The limited size of clinical trials means that estimates of survival have not been provided for different stages of disease. We provide some indicative figures which will hopefully be a useful guide to what patients with specific stages of disease might expect if selecting definitive chemoradiotherapy.

Curative Surgery

For the two-year audit period, data were submitted on 2,989 curative oesophagectomies and 1750 curative gastrectomies. There has been increasing use of minimally invasive surgical techniques during the last decade, and 41% of oesophagectomies and 16% of gastrectomies were performed using a minimally invasive (either full or hybrid) approach.

All NHS trusts / local health boards in England and Wales achieved similar outcomes after curative surgery, and the overall rates of mortality continue to improve. The 90-day postoperative mortality rate for oesophagectomy and gastrectomy was 3.3% (95 % CI 2.7-4.0) and 3.1% (95 % CI 2.3-4.1), respectively. Surgical complications remained fairly common, with 36.4% of patients suffering a complication after oesophagectomy and 21.7% suffering one after gastrectomy.

We have added some additional surgical indicators to augment the information of postoperative mortality, which cover the number of lymph nodes excised and examined for cancer cells, and the proportion of patients for whom there was cancer at the end of the removed specimen (a positive resection margin).

Early exploration of these indicators has highlighted a lack of standardisation within England and Wales in both the preparation of the surgical specimen after oesophagectomy and gastrectomy, and in the pathological preparation / examination of it. Achieving a common approach to preparation and examination needs to be addressed within the surgical and pathology community.

Non-curative treatments

Two thirds of patients with OG cancer were managed with palliative intent. For these patients, the care focuses on symptom control (e.g. relief of dysphagia) and improving quality of life.

Their most common treatment modality was palliative oncology. However, there was significant variation in the choice of palliative treatment across the regions in England and Wales.

There were 2,327 patients that had a stent insertion, and most of which were for oesophageal and junctional tumours. Stents were successfully deployed in 98% without immediate complications, and around 45% stents were placed under combined endoscopic and fluoroscopic guidance. The guidance approach varied widely across regions, however. 57% patients survived more than 3 months after stent insertion, and therefore could have been candidates for a treatment aiming to treat their cancer such as brachytherapy. This was rarely used, however.

The English NOGCA data was linked to both the English radiotherapy (RTDS) dataset and the chemotherapy (SACT) dataset for patients diagnosed between 1 April 2014 and 31 March 2016. This enabled the Audit to examine the consistency of prescribed chemotherapy and radiotherapy regimens. In both cases, there was considerable variation in the treatments used within Cancer Alliances. In particular, 64% of patients were prescribed a radiotherapy regimen recommended by the Royal College of Radiologists (RCR). (Data on radiotherapy and chemotherapy is not collected in Wales in the same way as England and hence it was not possible to ascertain these figures for Welsh patients).

Key themes and pathway to improvement

Patients diagnosed with OG cancer or HGD can follow various different pathways of care. Some patients have complex pathways that reflect them receiving a combination of different therapies. Other patients have a far simpler pathway, perhaps best reflected by patients who are not candidates for curative therapy and have best supportive care.

OG cancer services are performing well with regard to various aspects of care. As we noted last year, the risks associated with curative surgery have improved over the years. There has also been a large increase in the use of definitive chemotherapy among patients with oesophageal squamous cell carcinoma, and a rise in the use of combined therapies (surgery and oncology), both of which are consistent with recommended practice.

This year's report does highlight various areas for review. The first area for review is the time it takes from diagnosis to the start of first treatment. This encapsulates three distinct aspects of care – the organisation of staging, the planning of care, and the scheduling of treatment. For many patients, moving through these stages occurs relatively rapidly. The results in chapter 5 demonstrated that the process can take longer than desirable in some patients and for all types of treatment modality. The sources of these times to the start of treatment require investigation by local services.

This investigation can also encompass a specific review on why the proportion of patients who were reported to have undergone a staging CT scan is lower than expected. The accurate staging of patients after diagnosis is important to ensure that appropriate treatment options are considered by multidisciplinary teams.

A second area for review relates to the regimens used for palliative oncology. This year's report contains more robust information about the radiotherapy doses used for non-curative therapy than reported in previous reports and also contains (for the first time) information about chemotherapy regimens for patients having non-curative treatment. In both cases, we found variations in the patterns of treatments used for patients across regions. There may be justifiable reasons for this, not least reflecting patient preferences. However, the sizes of the regions are sufficient large for individual preferences to average out and it is possible that characteristics of service delivery are contributing to the observed variation.

Finally, we draw attention to the results for patients with oesophageal HGD. In particular, we note that, although most patients with oesophageal HGD had endoscopic treatment, in line with BSG recommendations, a quarter of patients were reported to NOGCA as being placed on surveillance. Among those patients having endoscopic treatment, one third were found to have malignant tumours in the resected tissue, which posed the question "were some patients on surveillance likely to have early cancers that were not being treated?" The exploration of HES records alongside the NOGCA data suggests that a similar proportion of patients labelled as being on surveillance in NOGCA also had cancer but that, because they were having regular endoscopy, these cancers were being diagnosed and treated. This is reassuring but it raises the question about whether the patients should have had endoscopic treatment immediately. We therefore recommend that those organisations with a high proportion of patients not receiving active treatment should review their care pathways. Where there is a lack of local expertise or limited access to endoscopic therapy, English NHS trusts should consider referring patients to specialist OG cancer centres.

Future of the Audit

The National Oesophago-Gastric Cancer Audit will be re-commissioned in 2018, together with the current National Bowel Cancer Audit, as the three-year National Gastrointestinal Cancer Audit Programme. The new programme will reflect a change in how the two current Audits are managed and delivered. However, it is expected that the new programme will continue to have distinct work streams for bowel and OG cancer, and an audit with a distinct identity will continue to publish information for health care professionals and patients on the delivery of care to patients with OG cancer.

Recommendations

In each annual report, we seek to highlight key areas for OG cancer services (and other NHS organisations) to review with the aim of identifying ways to improve patient experience and outcomes.

Multidisciplinary teams (MDTs)

Multidisciplinary teams should review the results for their organisation to ensure care is consistent with the recommendations in national clinical guidance on patients with oesophago-gastric cancer and high grade dysplasia of the oesophagus.

For patients with high grade dysplasia:

1. It is important that NHS trusts / local health boards have clear protocols in place to ensure all cases of HGD are referred to the Upper GI MDT.

2. Pathologist should use the new SNOMED CT code for Barrett's oesophagus with high grade dysplasia ("1082761000119106") to aid identification of these patients.

3. MDT lists should be reviewed on an annual basis to ensure all cases of HGD are reported to the NOGCA in order to maximise case ascertainment. Guidance on which patients to include as HGD cases and which as OG cases is available on the NOGCA website.

4. MDTs should prospectively monitor their management of patients with HGD. If an MDT only has a few cases of HGD each year, it is important that these cases are referred to / discussed with their local specialist centre to ensure the patient has all treatment options made available to them.

5. MDTs should ensure that all patients with HGD are referred for potential endoscopic therapy to a local specialist centre, given the BSG recommendation that all such patients should be considered for this treatment.

For patients diagnosed with OG cancer, we recommend:

1. Case ascertainment of OG cancer patients within England has stabilised at around 80% (Chapter 3). While MDTs are commended for their effort in submitting data for this group of patients, steps should be taken to identify the missing 20% of patients to ensure their details are submitted in the future.

2. A significant proportion of cases of OG cancer are diagnosed after an emergency admission. It is important that NHS trusts/NHS Local Health Boards monitor these rates and take steps at a local level to identify possible reasons where levels are high (we suggest overall rates above 15% could warrant investigation).

3. NHS trusts / local health boards, GPs and CCGs should coordinate efforts to address delays in the patient pathway, to avoid patients having to wait longer than necessary to start treatment (we suggest providers aim to avoid delays beyond 31 days from the time of diagnosis to initial treatment unless it is for clinical reasons).

4. NHS organisations monitor their use of staging investigations and investigate reasons for low use. Where this is due to poor reporting, mechanisms should be put in place to improve reporting in future to ensure this information is captured (e.g. at the time of MDT meetings).

5. There is variation in the planned use of non-curative treatment modalities among patients unsuitable for treatment with curative intent. MDTs should review the way in which patients are offered non-curative treatment options and examine whether more patients would benefit from active treatment.

6. Cancer centres performing curative surgery should regularly monitor the number of lymph nodes resected and proportion of patients with positive resection margins (Chapter 9). In particular, centres should examine whether the management of specimens can become more standardised.

7. There was variation across Cancer Alliances in the choice of palliative chemotherapy and radiotherapy regimens. Providers should keep their current regimens under review. In particular, the use of palliative radiotherapy regimens should be reviewed against the new guidance published by the Royal College of Radiologists.

Medical Directors of NHS trusts/ local health boards

Medical Directors should review the results for their organisation. Where areas of poor performance have been identified, it is important that these findings are discussed with their medical teams in order to identify options for improving services in future. This might involve examining whether sufficient resources are available for MDTs to provide high quality care as well as to collect and submit the data requested by the Audit.

Cancer Alliances / commissioners and local health boards

There is variation between NHS providers in the provision of various elements of care along the care pathway. Alliances and commissioners (in England) and the Welsh Cancer regions should review the results in this report for organisations within their regions, and work with NHS providers to develop strategies for addressing any areas of variation in their region.

1. Alliances / Welsh regions should ensure that patients with HGD are consistently referred to a specialist centre which has experience in managing HGD.

2. Alliances / Welsh regions should know the proportion of cases of OG cancer managed with curative intent and develop strategies to improve this figure. This may involve working across hospitals and with general practitioners to develop strategies to reduce the proportion of patients diagnosed after an emergency admission.

The aim of the Audit is to evaluate the quality of care received by patients with oesophago-gastric (OG) cancer or high grade dysplasia of the oesophagus and produce information that enables NHS services in England and Wales to identify where patient care can be improved.

High grade dysplasia of the oesophagus

Patients have a change in the cells where the oesophagus joins the stomach which increases their risk of developing cancer.

For 732 patients diagnosed between April 2014 and March 2016, the Audit found:

85% **of patients had their initial diagnosis confirmed by a second pathologist.**

86% **of patients were discussed by a multidisciplinary team of clinicians.**

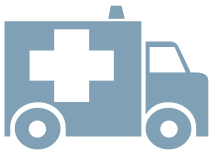
73% **of patients had endoscopic treatment to remove the high grade dysplasia.**

30% **of these patients were found to have small cancer tumours in the removed part of the oesophagus.**

Patients with oesophago-gastric cancer

Three-quarters of cancers were in the oesophagus or where the oesophagus meets the stomach. One quarter of cancers were in the stomach.

For 21,242 patients diagnosed between April 2014 and March 2016, the Audit found:



14% of patients were diagnosed after being admitted to hospital as an emergency. Patients diagnosed after an emergency admission tend to have more advanced disease.

89% of patients had a CT scan to investigate the spread of the cancer. All patients are recommended to have this investigation.

39% of patients had cancer and were fit enough to have treatments that could cure the disease. Most of these patients had either surgery or surgery with chemotherapy.

Among patients for whom curative treatments were not an option, **50%** were planned to have either chemotherapy or radiotherapy. Some areas within England and Wales had more patients having these planned therapies than others (lowest: 41%; highest 67%).

NHS hospitals in England and Wales achieved similar outcomes for patients having curative surgery, and outcomes continue to improve. Over **96%** of patients having this major operation are alive 90 days after the surgery.

64% of patients were prescribed a recommended dose of radiotherapy when it was used to control the symptoms of the cancer and improve the quality of life for patients. There was variation across regions of England and Wales in the dose of radiotherapy given to patients.

1. Introduction

The National Oesophago-Gastric Cancer Audit (NOGCA) was established to investigate whether the care of patients with oesophago-gastric (OG) cancer is consistent with recommended practice and to identify areas where improvements could be made in future. In addition, the Audit evaluates the care received by patients with a new diagnosis of oesophageal high grade dysplasia (HGD) because there is a risk of progression to oesophageal cancer if HGD is left untreated.

The Audit measures the quality of care received by patients with oesophago-gastric cancer and HGD within NHS services in England and Wales. It is designed to evaluate the care pathway followed by patients once they have been diagnosed with either condition, and to answer questions related to:

- the pathway of care that patients took to diagnosis
- whether clinical (pre-treatment) staging is performed to the standards specified in national clinical guidelines
- whether decisions about planned treatments are supported by the necessary clinical data (staging, patient fitness, etc)
- access to curative modalities for suitable patients, such as neoadjuvant chemotherapy prior to surgical resection
- the use of oncological and endoscopic/radiological palliative services
- outcomes of care for patients receiving curative and palliative therapies.

The Audit is run by the Association of Upper Gastrointestinal Surgeons of Great Britain & Ireland (AUGIS), Royal College of Radiologists (RCR), British Society of Gastroenterologists (BSG), NHS Digital and the Clinical Effectiveness Unit of the Royal College of Surgeons of England. It is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and is one of five national cancer audits currently being undertaken in England and Wales. The delivery of the Audit is overseen by a Project Board whose role is to ensure the Audit 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 (CRG), which is formed of members representing professional medical associations as well as the Oesophageal Patient Organisation (see Annex 1 for further details).

Various clinical guidelines support clinicians in the management of oesophageal and gastric cancer, and HGD. These guidelines are used by the Audit to determine which aspects of care to examine, and as sources of the standards of care that services should be delivering. The principal UK guidelines for OG cancer and HGD are:

- The clinical guideline published by Association of Upper Gastrointestinal Surgeons of Great Britain & Ireland, British Society of Gastroenterologists, and the British Association of Surgical Oncology [Allum et al 2011]
- The Scottish Intercollegiate Guideline Network (SIGN) guideline on the management of oesophageal and gastric cancer [SIGN 2006]
- The British Society of Gastroenterology guidelines on the diagnosis and management of Barrett's oesophagus [BSG/Fitzgerald et al 2014]
- The National Institute for Health and Clinical Excellence (NICE) has provided additional guidance on specific aspects of care, notably:
    - Referral Guidelines for Suspected Cancer, and the Management of Dyspepsia in Adults in Primary Care.
    - Guidance on the use of interventional procedures, such as endoscopic submucosal dissection of oesophageal tumours

New guidance on the management of oesophageal and gastric cancer from the NICE will be published in January 2018. Going forward, the Audit will use this guideline as a source of clinical standards against which to evaluate the provision of care.

Key indicators used to assess the care of patients with HGD (source: BSG guidelines)		
Domain	**Standard**	**Indicator**
Referral & diagnosis	All patients with a diagnosis of HGD should have the diagnosis confirmed by a second pathologist	% of patients whose diagnosis was confirmed on a second biopsy
Treatment planning	All patients with HGD for whom therapy is considered should be discussed at a specialist OG cancer MDT	% discussed at MDT
	Endoscopic treatment is preferred over oesophagectomy or endoscopic surveillance	% patients who received active treatment vs surveillance alone
	Endoscopic treatment should be performed in high volume tertiary referral centres	Number of cases of HGD treated at each English NHS Trust

Key indicators used to assess the care of patients with OG cancer (source: AUGIS/BSG/BASO guidelines unless otherwise stated)		
Domain	**Standard**	**Indicator**
Referral & diagnosis	GPs should be encouraged to refer patients as early as possible	% patients diagnosed after an emergency admission
Treatment planning	All patients with OG cancer should have CT performed as an initial staging investigation	% patients reported to have had a staging CT performed
		% curative treatment plan
	Chemoradiotherapy or chemoradiotherapy plus surgery are considered equally effective for the curative management of mid/lower oesophageal squamous cell cancers	% oesophageal squamous cell cancers managed curatively with definitive oncology vs surgery
Curative surgery	Overall hospital mortality for oesophageal resections should be <10%	30 and 90 postoperative mortality rates
	Patients should have ≥15 lymph nodes excised at the time of a curative OG resection	% patients who had ≥15 lymph nodes excised at the time of a curative OG resection
Palliative therapy	Doses of palliative radiotherapy given for oesophageal cancer should follow national guidelines (RCR guideline)	% patients following RCR recommended radiotherapy dose

1.1 Aim of the 2017 Annual Report

The aim of this report is to give an overall picture of the care provided by NHS services to adult patients with OG cancer or oesophageal HGD. Cancer patients were eligible for inclusion 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 endocrine tumours or gastro-intestinal stromal tumours (GISTs) were not included in the Audit due to the different behaviour and management of these tumours. In relation to both oesophageal HGD and OG cancer, the report focuses on the experience and outcomes of patients diagnosed between 1 April 2014 and 31 March 2016.

The report is primarily aimed at clinicians working within hospital cancer units. Nonetheless, the information contained in the report on patterns of care is relevant to other health care professionals, commissioners, regulators as well as patients and the public who are interested in knowing how OG cancer services are delivered within the NHS.

The methods used to produce the results in this report are described in Annex 2.

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. In the period up to 2012, services were organised into Cancer Networks, with each containing one or more cancer centres that provide curative surgical treatment and specialist radiology, oncology and palliative services to all patients living in the area. Diagnostic services and non-specialist palliative services continued to be provided by individual NHS trusts (units) within the cancer network areas. The English Cancer Networks were replaced in 2013 with Strategic Clinical Networks, and we have been publishing regional results at this level for the last few years. For Wales, we have been publishing results for two regional cancer networks. These existed until 2016, after which the Welsh cancer networks were merged into a single network with responsibility for implementing the new Welsh cancer strategy.

In this report, we have changed our approach to reporting regional results. For England, we have adopted the regional structures created by the new Cancer Alliance and the National Cancer Vanguards [NHS England 2016]. The Cancer Alliances and Vanguard regions will be responsible for organising services across the whole pathways of care for local populations, with the aim of reducing variation in the treatment for all people with cancer across the country. For Wales, we have adopted an approach that recognises the three strong regional relationships between services, defining areas labelled as: Abertawe Bro Morgannwg (ABMU), Betsi Cadwaladr (North Wales) and South Wales Cardiff region.

The geographical boundaries of the 19 English Cancer Alliances / Vanguard regions are as shown in Figure 1.1. A list of these regions is provided in Annex 3.

Figure 1.1
Location of NHS surgical cancer centres and regional boundaries as at September 2017 (Key for NHS trust codes overleaf).

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Surgical Centres

Code	Name	Code	Name
7A1	Betsi Cadwaladr University Local Health Board		
7A3	Abertawe Bro Morgannwg University Local Health Board	**RN3**	Great Western Hospitals NHS Foundation Trust
7A4	Cardiff & Vale University Local Health Board	**RPY**	The Royal Marsden NHS Foundation Trust
7A5	Cwm Taf University Local Health Board	**RQ6**	Royal Liverpool and Broadgreen University Hospitals NHS Trust
		RQ8	Mid Essex Hospital Services NHS Trust
RA2	Royal Surrey County Hospital NHS Foundation Trust	**RR1**	Heart of England NHS Foundation Trust
RA7	University Hospitals Bristol NHS Foundation Trust	**RR8**	Leeds Teaching Hospitals NHS Trust
RAE	Bradford Teaching Hospitals NHS Foundation Trust	**RRK**	University Hospitals Birmingham NHS Foundation Trust
RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	**RRV**	University College London Hospitals NHS Foundation Trust
REM	Aintree University Hospital NHS Foundation Trust	**RTD**	The Newcastle Upon Tyne Hospitals NHS Foundation Trust
RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	**RTE**	Gloucestershire Hospitals NHS Foundation Trust
RGT	Cambridge University Hospitals NHS Foundation Trust	**RTG**	Derby Hospitals NHS Foundation Trust
RHM	University Hospital Southampton NHS Foundation Trust	**RTH**	Oxford University Hospitals NHS Trust
RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	**RTR**	South Tees Hospitals NHS Foundation Trust
RHU	Portsmouth Hospitals NHS Trust	**RW3**	Central Manchester University Hospitals NHS Foundation Trust
RJ1	Guy's and St Thomas' NHS Foundation Trust	**RWA**	Hull and East Yorkshire Hospitals NHS Trust
RJE	University Hospitals of North Midlands NHS Trust	**RWE**	University Hospitals of Leicester NHS Trust
RK9	Plymouth Hospitals NHS Trust	**RWG**	West Hertfordshire Hospitals NHS Trust
RKB	University Hospitals Coventry and Warwickshire NHS Trust	**RX1**	Nottingham University Hospitals NHS Trust
RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	**RXH**	Brighton and Sussex University Hospitals NHS Trust
RM2	University Hospital of South Manchester NHS Foundation Trust	**RXN**	Lancashire Teaching Hospitals NHS Foundation Trust
RM3	Salford Royal NHS Foundation Trust	**RYJ**	Imperial College Healthcare NHS Trust

Cancer Alliances & Welsh regions

Code	Name	Code	Name
Cheshire	Cheshire and Merseyside	**SE Lon**	South East London
E Mids	East Midlands	**S Yorks**	South Yorkshire, Bassetlaw, North Derbyshire
E Engl	East of England	**Surrey**	Surrey and Sussex
Manc	Greater Manchester	**Thames**	Thames Valley
Humber	Humber, Coast and Vale	**Wessex**	Wessex
Kent	Kent and Medway	**W Lon**	West London
Lancs	Lancashire and South Cumbria	**W Mids**	West Midlands
NCE Lon	North Central and East London	**W Yorks**	West Yorkshire
N East	North East and Cumbria	**ABMU**	Abertawe Bro Morgannwg
Penns	Peninsula	**N Wales**	North Wales Cancer Centre: Betsi Cadwaladr
Soms	Somerset, Wiltshire, Avon & Gloucestershire	**S Wales**	South Wales Cancer Centre: Cardiff & Vale, Cwm Taf, Hywel Dda, Aneurin Bevan

1.3 Other sources of information produced by the Audit

As well as producing these annual reports, the Audit publishes information on the www.nogca.org.uk website for all NHS trusts / local health boards in England and Wales with OG cancer services. In addition, as part of NHS England's "Everyone Counts: Planning for Patients 2013/4" initiative, the Audit has published outcome information for curative surgical procedures by individual consultants currently working at the organisation.
This information can be found on the:

- AUGIS website (http://www.augis.org/outcomes-data-2017/)
- 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 CQC intelligence team to create a dashboard to support CQC inspections.

A number of peer-review publications produced by members of the Audit team have also appeared in the last year. These include:

- Chadwick G, Varagunam M, Brand, C, Riley SA, Maynard N, Crosby T, Michalowski J; Cromwell DA. Coding of Barrett's oesophagus with high-grade dysplasia in national administrative databases: a population-based cohort study. BMJ Open 2017; 7(6):e014281; DOI: 10.1136/bmjopen-2016-014281; Open Access
- Chadwick G, Groene O, Taylor A, Riley S, Hardwick RH, Crosby T, Greenaway K, Cromwell DA. Management of Barrett's high-grade dysplasia: initial results from a population-based national audit. Gastrointest Endosc 2016; 83(4):736-42.e1; DOI: 10.1016/j.gie.2015.08.020
- Chadwick G; Riley S, Hardwick RH, Crosby T, Hoare J, Hanna G, Greenaway K, Varagunam M, Cromwell DA, Groene, O. Population-based cohort study of the management and survival of patients with early-stage oesophageal adenocarcinoma in England. Br J Surg 2016; 103(5): 544-52;. DOI: 10.1002/bjs.10116
- Fischer C, Lingsma H, Hardwick R, Cromwell DA, Steyerberg E, Groene O. Risk adjustment models for short-term outcomes after surgical resection for oesophagogastric cancer. Br J Surg 2016; 103(1):105-16; DOI: 10.1002/bjs.9968

Abstracts of papers presented at 2016 conferences can be found in the following journals:

Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland, 19th Scientific Meeting (September 2016)

- Chadwick G, Varagunam M, Brand C, Maynard N, Crosby T, Riley S, Cromwell D. Long term survival of Oesophageal Squamous cell cancers in England and Wales. Br J Surg 2016; 103: 11
- Chadwick G, Varagunam M, Brand C, Maynard N, Crosby T, Riley S, Cromwell D. Changing patterns of management and outcomes for early Oesophageal Adenocarcinomas in England and Wales. Br J Surg 2016; 103: 60
- Chadwick G, Varagunam M, Brand C, Maynard N, Crosby T, Riley S, Cromwell D. Patterns of management for Oesophageal Squamous cell cancers in England and Wales. Br J Surg 2016; 103: 17

International Population Data Linkage Conference (August 2016)

- Brand C, Varagunam M, Chadwick G, Cromwell D. Evaluating the care received by patients with oesophago-gastric (OG) cancer: the richer picture provided by linked datasets. International Journal for Population Data Science 2017; 1(1).

British Society of Gastroenterology, Annual General Meeting (June 2016)

- Varagunam M, Cromwell D. PWE-140 Relationship between social deprivation and the care pathway of oesophago-gastric (OG) cancer patients. Gut 2016; 65 (Suppl 1), A207-A207
- Chadwick G, Cromwell D. PWE-074 Variation in the management of Barrett's High Grade Dysplasia in England. GUT 2016; 65 (Suppl 1), A174-A175
- Chadwick G, Cromwell D. Is there nationwide variation in the proportion of palliative oesophago-gastric cancer patients dying in hospital? GUT 2016; 65 (Suppl 1), A288-A289.

1.4 Future of the Audit

The National OG Cancer Audit will be re-commissioned in 2018, together with the current National Bowel Cancer Audit, as the three-year National Gastrointestinal Cancer (Oesophago-gastric and Bowel) Audit Programme.

The new programme will reflect a change in how the two current Audits are managed and delivered. However, it is expected that the new programme will continue to have a distinct work stream for OG cancer patients and publish information for health care professionals and patients on the delivery of care and outcomes under a recognisable name.

2. Management of HGD patients in England

2.1 Introduction

In a small proportion of patients with Barrett's oesophagus, the cells become increasingly abnormal, a condition called dysplasia. The most severe form of dysplasia, known as high grade dysplasia (HGD), is a recognised risk factor for oesophageal cancer [Rastogi et al 2008]. This report provides an update of figures reported in the previous two years and it sheds additional light on the longer term care pathways of HGD patients, especially those who were placed on surveillance.

The British Society of Gastroenterology have made the following recommendations regarding the management of patients with HGD within NHS services [BSG/Fitzgerald et al 2014]:

- Systematic biopsies should be taken every 2cm from the segment of Barrett's oesophagus at endoscopy, as well as of any visible nodules. It is important to ensure this rigorous biopsy regimen is followed in order to optimise the detection of dysplasia.
- Once a diagnosis of HGD is made, this should be confirmed by at least one other specialist gastrointestinal pathologist. This is because grading the degree of dysplasia can be subjective, and studies have shown that a significant proportion of patients progress to cancer among those whose diagnosis was confirmed by two pathologists.
- All patients with a diagnosis of HGD should be discussed at a specialist multi-disciplinary team meeting (MDT), prior to treatment. This is to ensure the patient is considered for the most appropriate treatment option.

Key indicators used to assess the care of patients with HGD (source: BSG 2014 guideline)

Domain	Standard	Indicator
Referral & diagnosis	All patients with a diagnosis of HGD should have the diagnosis confirmed by a second pathologist	% of patients whose diagnosis was confirmed on a second biopsy
Treatment planning	All patients with HGD for whom therapy is considered should be discussed at a specialist OG cancer MDT	% discussed at MDT
	Endoscopic treatment is preferred over oesophagectomy or endoscopic surveillance	% patients who received active treatment vs surveillance alone
	Endoscopic treatment should be performed in high volume tertiary referral centres	Number of cases of HGD treated at each trust

2.2 Participation in HGD component and patient characteristics

The Audit has been collecting data on patients with a new diagnosis of oesophageal HGD since April 2012 and, to date, information on 1,655 patients have been submitted. This represents one of the largest datasets of its kind in the world. The information on HGD has been uploaded by English NHS trusts using the Audit data collection system. As data on Welsh patients is collected in a different way (via CANISC), it has not been possible to collect information on Welsh HGD patients so far.

The characteristics of patients diagnosed with HGD are described in Table 2.1. The majority of HGD patients are male and the condition typically occurs in people aged 65 or older. About 40% of patients had at least one comorbidity reported, most frequently cardiovascular disease.

Roughly half of patients come through to secondary services after experiencing symptoms and being referred by a medical practitioner; the other half are diagnosed while being on surveillance.

Table 2.1
Characteristics of patients diagnosed with HGD by year of diagnosis in England

	2012-14	2014-16	Total
Number of patients	923	732	1,655
Male, n (%)	667 (72.4)	565 (77.2)	1,232 (74.5)
Median (IQR) age in years	72 (65-79)	70 (64-79)	71 (64-79)
Any comorbidity		256 (40.2)	
Source of referral, n (%)			
Symptomatic	458 (54.1)	342 (50.5)	800 (52.5)
Surveillance	388 (45.9)	335 (49.5)	723 (47.5)
Missing	77	55	132

NB: Data on comorbidities has only been available since April 2014.

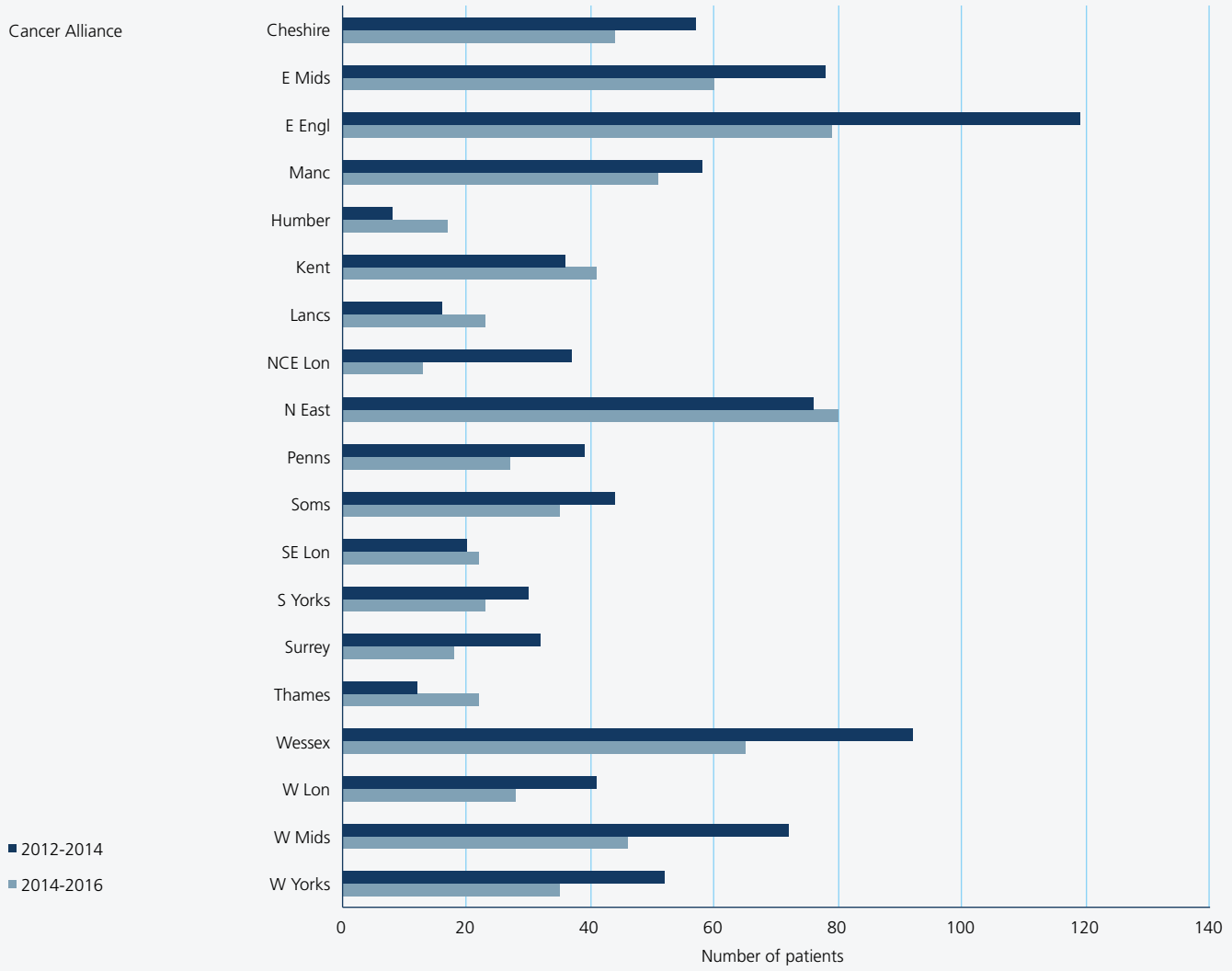
The number of records on HGD cases submitted to the Audit has fluctuated over time:

- Among patients diagnosed between April 2012 and March 2014, the Audit received data on 923 cases
- Among patients diagnosed between April 2014 and March 2016, the Audit received data on 732 cases.

The decline in cases reported to the Audit over the last two years is likely to reflect a drop in case ascertainment rather than a change in the underlying incidence of the disease. Unfortunately, it is not possible to estimate the case ascertainment for the HGD component of the Audit because there is no ICD-10 code specific to the diagnosis of HGD that hospitals can use to identify these patients in their hospital IT systems or within Hospital Episode Statistics (HES) (see Chadwick et al [2017] for more information). Moreover, there is no other national data collection that captures these cases.

Figure 2.1 shows the number of HGD patients diagnosed over the past four years by Cancer Alliance. As the Cancer Alliances do not cover populations of equal size, it is unsurprising that there are differences in the total numbers submitted, but it highlights that the year-on-year changes were observed in 13 of the 19 regions. The drop in the number within some Alliances is a cause for concern because it is unlikely to be a true reflection of the underlying disease incidence.

Figure 2.1
Number of patients diagnosed with HGD by English Cancer Alliance, grouped into two-year periods by date of diagnosis.



Key: Total based on 1,648 patients. Figure excludes 7 patients who were either diagnosed in private hospitals, diagnosed in Wales but treated in England, or where the diagnosing organisation is unknown

2.3 Diagnosis and treatment planning

Establishing a definitive diagnosis of HGD is not straight forward. The severity of the dysplasia can vary over time, and the identification of HGD within a pathology specimen retains an element of subjectivity. Consequently, the BSG guideline [2014] recommends that an initial diagnosis of HGD is confirmed by a second pathologist. Among patients diagnosed between April 2012 and Match 2016, 734 patients (46.1%) had a repeat biopsy that confirmed the diagnosis of HGD.

The data items on which patients had their initial diagnosis confirmed by a second pathologist changed from 1 April 2014, and a question was added on the use of quadratic biopsy. In the period since April 2014, 539 patients (85%) had their initial diagnosis confirmed by a second pathologist, while among those who had a second biopsy, 290 patients (88%) had the this result confirmed by a second pathologist. 263 patients (71%) had a quadratic biopsy.

The endoscopic findings at the time of diagnosis are also summarised in Table 2.2. In summary:

- the median length of Barrett's segments (when reported) was 4 cm (IQR 2-7)
- 56% of patients were reported to have nodular disease, while 40% had flat mucosa
- 34% of patients had a multifocal lesion.

Table 2.2
Diagnostic details of HGD patients, in England

	2012-2014	2014-2016	Total
Was there a repeat biopsy confirming the diagnosis?	407 (44.2)	327 (48.6)	734 (46.1)
Repeat biopsy detail missing	3	59	62
Length of Barrett's segment			
Circumferential length recorded, n (%)	279 (30.2)	262 (35.8)	541 (32.7)
Median (IQR) of length, cm	4 (2-7)	3 (2-6)	4 (2-7)
Endoscopic appearance, n (%)			
Nodular lesion	293 (56.5)	219 (55.3)	512 (56.0)
Flat mucosa	204 (39.3)	163 (41.2)	367 (40.1)
Depressed lesion	22 (4.2)	14 (3.5)	36 (3.9)
Missing	404	336	740
Examination of pathology specimen, n (%)			
Multifocal lesion	165 (36.2)	112 (32.1)	277 (34.4)
Unifocal lesion	291 (63.8)	237 (67.9)	528 (65.6)
Missing	467	383	850

2.4 Treatment modality

The BSG guideline recommends that a newly diagnosed case is discussed at an Upper GI MDT meeting to ensure that the most appropriate treatment is selected. Between April 2012 and March 2016, this has been the case for 86% of patients.

For many years, oesophagectomy was the only treatment option available for patients with HGD. This was associated with significant morbidity and mortality, and patients were frequently recommended to have their condition monitored on surveillance programmes as a way to manage the risk of progression to cancer. Over the last ten years, less invasive endoscopic treatments have been developed, such as endoscopic mucosal resection, and now endoscopic treatment is recommended as the first line treatment for HGD in preference to either surgery or surveillance alone [BSG/Fitzgerald et al 2014].

Endoscopic therapies now account for nearly three quarters of the selected therapies for HGD patients (Table 2.3), an increase in use from the 65% of patients reported between 2012 and 2014 ($p<0.01$). Oesophagectomy was used for only 3.1% of patients in 2014-16. Despite clinical guidance emphasising active treatment, a quarter of patients were reported to receive no active treatment or were placed on a surveillance regime. We only have timing information on planned surveillance for few patients (n=50). Of those, 56% have a planned procedure within three months, another 30% within six months.

Table 2.3
Treatment modality for HGD patients, in England

	2012-2014	2014-2016	Total
Case discussed at MDT meeting, n (%)	743 (86.8)	626 (86.0)	1369 (86.3)
Treatment modality, n (%)			
Endoscopic treatment	570 (65.3)	501 (72.8)	1071 (68.6)
Endoscopic mucosal resection (EMR)	387 (67.5)	379 (75.7)	766 (71.5)
Radiofrequency ablation (RFA)	139 (24.4)	96 (19.2)	235 (21.9)
Endoscopic submucosal dissection (ESD)	27 (4.7)	21 (4.2)	48 (4.5)
Argon Plasma coagulation (APC)	11 (1.9)	3 (0.6)	14 (1.3)
Other	6 (1.1)	2 (0.4)	8 (0.7)
Curative surgical resection	50 (5.7)	21 (3.1)	71 (4.6)
Surveillance or no active treatment	253 (29.0)	166 (24.1)	419 (26.8)
Reason for surveillance / no active treatment, n (%)			
Patient choice	-	33 (44.6)	-
Patient unfit for endoscopic or surgical treatment	-	40 (54.1)	-
Lack of access to endoscopic therapy or surgery	-	1 (1.4)	-
Missing	-	92	-

As in previous reports, we combined the two response categories "surveillance" and "no active treatment". We note that these two options have changed relative positions over the four years: surveillance has declined from 24% to 10% and "no active treatment" risen from 3% to 14%. In terms of the reasons for a lack of active treatment (collected from April 2014), patients' lack of fitness for treatment was reported slightly more frequently than patients' choice. Both of these responses leave open the possibility that the decision to not treat actively was only temporary, as both fitness and personal preferences can change.

The BSG guideline [2014] recommends that the management of HGD is limited to NHS trusts treating 15 or more cases each year. In the 2016 Annual Report, we highlighted that few NHS trusts treated this number of HGD patients per year. The position has not changed.

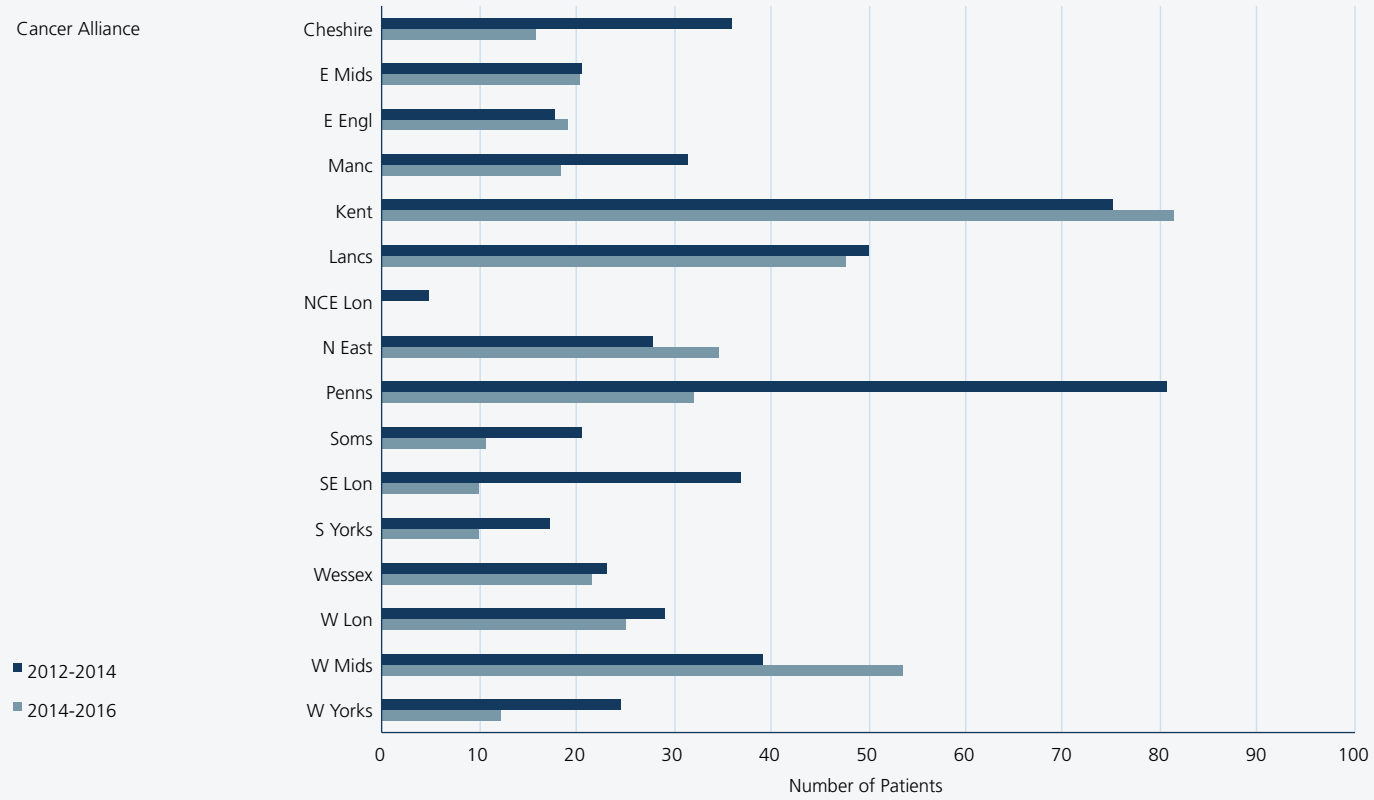
Among the 115 NHS trusts that had responsibility for the treatment of patients with HGD, only two organisations (1.7%) treated (and reported) this number of patients in every year of data collection. In terms of all NHS trusts:

- At 87 trusts (75.7%), the average number of patients treated was less than five cases per year
- 12 trusts (10.4%) treated the equivalent of ten or more cases per year.

As mentioned before, we are unsure of the case ascertainment of HGD cases. Annex 4 splits raw figures and selected process indicators (if there were 10 cases or more) into diagnoses and treatment plans, and it is apparent that some larger treatment centres have emerged.

Figure 2.2 shows the share of patients not receiving active treatment in 2012-2014 and 2014-2016. The two time periods were chosen in order to have sufficient numbers of cases. There is pronounced regional variation. There is also a positive pattern of declining rates in more than half of the Cancer Alliances. The apparent increases in Alliances "West Midlands" and "North East and Cumbria" may be a reason for concern, especially as these are also some of the higher volume Alliances.

Figure 2.2
Proportion of HGD patients with a treatment modality of surveillance / no active treatment by English Cancer Alliance and time period (2012-14 vs. 2014-16)



Results shown by Cancer Alliance where treatment planning took place
Humber, Surrey and Thames omitted due to small numbers (<10) in one or both of the time periods

Table 2.4 helps to put Figure 2.2 into context. NHS trusts in Cancer Alliance "Kent and Medway" tend to send patients for treatment into neighbouring alliances and the high rates of surveillance in this alliance probably reflect this fact. Cancer Alliance "North Central and North East London" tended to treat large numbers of patients diagnosed elsewhere.

Table 2.4
Comparison of number of HGD patients diagnoses within a Cancer Alliance and the Alliance in which treatment plans were made

Cancer Alliance	HGD cases diagnosed 2012-2016	HGD treatment plans 2012-2016
Cheshire and Merseyside	101	85
East Midlands	138	139
East of England	198	181
Greater Manchester	109	112
Humber, Coast and Vale	25	16
Kent and Medway	**77**	**35**
Lancashire and South Cumbria	39	36
North Central and East London	**50**	**108**
North East and Cumbria	156	157
Peninsula	66	66
Somerset, Wiltshire, Avon & Gloucestershire	79	69
South East London	42	63
South Yorkshire, Bassetlaw, North Derbyshire	53	52
Surrey and Sussex	50	33
Thames Valley	34	34
Wessex	157	178
West London	69	62
West Midlands	118	116
West Yorkshire	87	96
Total	1,648	1,638*

* Trust of treatment plan is missing for 10 patients

2.5 Short-term outcomes after EMR/ESD

Approximately two thirds of EMR / ESD procedures result in a complete excision, and there has been relatively little variation over the audit period (Table 2.5). In the majority of cases, the subsequent pathology examination has confirmed the original diagnosis of HGD. Nonetheless, about one third of patients had their diagnosis upgraded to intramucosal or submucosal cancer.

After incomplete excision:

- 50% have further (repeat) endoscopic treatment (more likely ablation instead of EMR/ESD),
- 18% are referred for oesophagectomy,
- 18% are put on surveillance, and
- 13% are reported to receive no further surveillance or treatment.

Small numbers preclude us from exploring the relationship between EMR/ESD pathology outcomes and further treatment intentions after incomplete excisions in much detail, but it is clear that referral for oesophagectomy is more likely if the diagnosis was upgraded to intramucosal or submucosal cancer.

Table 2.5
Outcome of EMR/ESD for patients with HGD

Outcome, n (%)	2012-2014	2014-2016	Total
Complete excision	259 (66.8)	228 (67.3)	487 (67.0)
Histological diagnosis upgraded to intramucosal or submucosal cancer	129 (33.2)	120 (30.4)	249 (31.8)
No evidence of HGD or cancer found in resected specimen	48 (12.3)	51 (12.9)	99 (12.6)
Missing	26	61	87

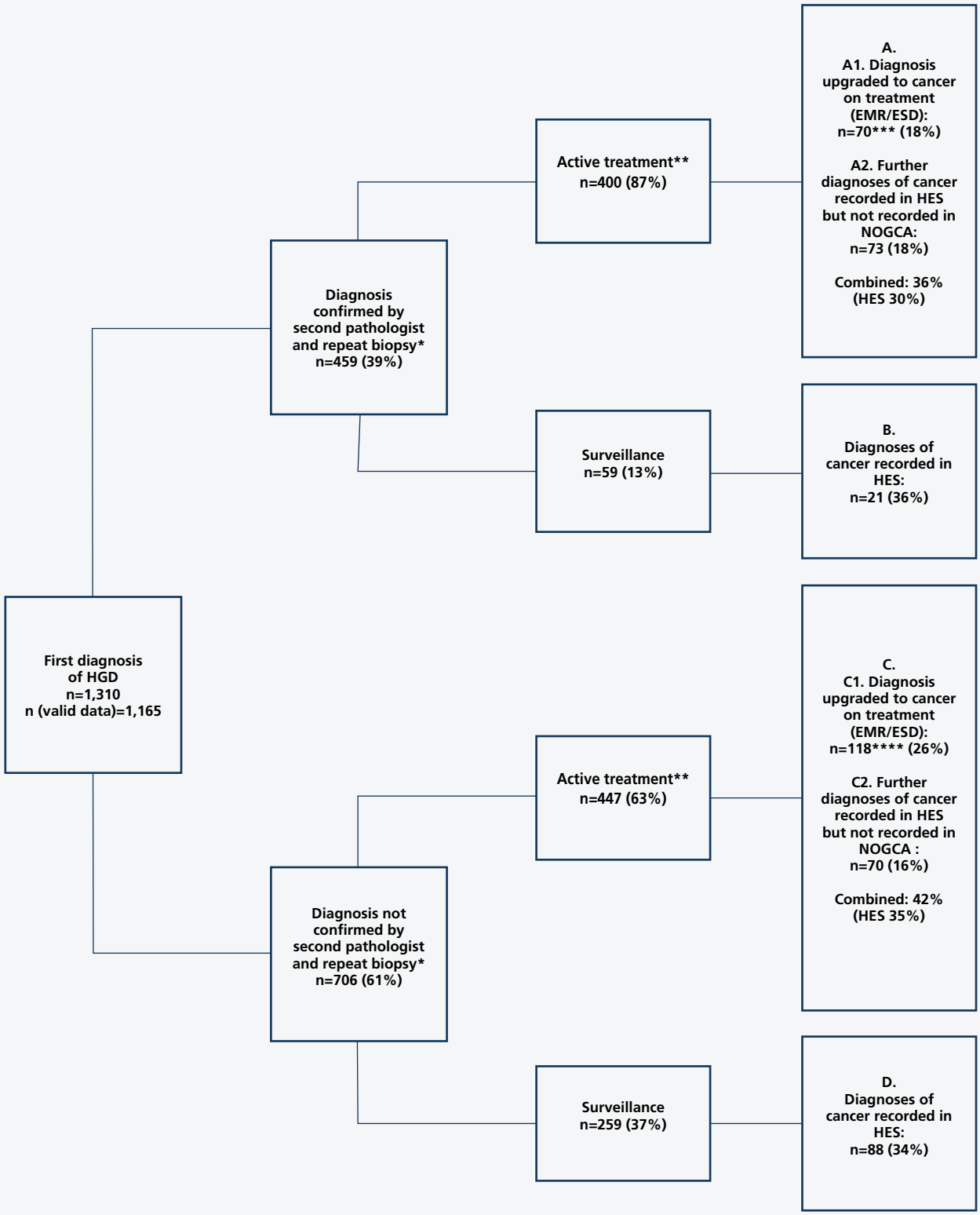
2.6 Outcomes among HGD patients placed on surveillance

An interesting finding from the Audit data is that nearly a third of HGD patients treated with EMR or ESD had their diagnosis changed to one of cancer upon the completion of their initial treatment. It seems reasonable to suspect that a similar proportion of patients placed on surveillance might also have lesions that might have proven to contain intramucosal or submucosal cancers upon treatment. We therefore linked the Audit HGD dataset to the corresponding records from the routine hospital database Hospital Episode Statistics (HES) to examine whether patients placed on surveillance were admitted with a diagnosis of OG cancer within a short-period of time after the HGD was diagnosed.

After linking the records of patients with HGD to their corresponding HES records, we then examined the series of hospital admissions as described within HES to determine if any contained a diagnosis of cancer and when that diagnosis first appeared. We limited the cancer diagnoses to ICD10 codes: C15x, C16.0, C16.9. We also identified the sequence of relevant endoscopic diagnostic and therapeutic procedures around the time of the HGD diagnosis recorded in the Audit. Patients were followed up in Hospital Episode Statistics for one year.

We divided the HGD patients into four analysis groups based on the degree of certainty associated with the HGD diagnosis (as shown in Figure 2.3). Among those with a high degree of diagnostic certainty, 88% of patients received active treatment following diagnosis, which is in accordance with BSG recommendations. Among patients with a degree of uncertainty in their diagnosis, 63% were actively treated.

Figure 2.3:
HGD pathways and associations with cancer diagnoses in Hospital Episode Statistics – diagnoses before, at and after HGD biopsy (April 2012-March 2015; HES follow-up until 31 March 2016), in England



* Second pathologist confirming original biopsy plus repeat biopsy taken. NB: prior to April 2014 the 2nd pathologist data item may refer to the first or a second biopsy (unspecified on proforma), while after April 2014 it only refers to the first biopsy. A small number of patients may be misclassified as a result.
** Any active treatment including surgical resection
*** 47 (67%) have a HES record of cancer
**** 85 (72%) have a HES record of cancer

The category boxes in Figure 2.3 (labelled A. – D.) show the basic outcomes in terms of percentages of patients eventually diagnosed with cancer within the relevant time frame (1 April 2012 to 31 March 2016). Several points become apparent:

- Among patients identified in NOGCA as having received an upgraded cancer diagnosis, there is reasonable agreement with the data in HES. Approximately, 70% of NOGCA HGD patients with an upgrade to cancer had a corresponding cancer diagnosis in HES (Groups A1 and C1).

- There were HGD patients in NOGCA who were not upgraded to cancer after their treatment but for whom a cancer diagnosis was recorded in HES (groups A2 and C2).

- Among NOGCA HGD patients who were placed on surveillance, the HES data contained a similar proportion of records containing a cancer diagnosis (groups B and D).

Table 2.6 contains some summary statistics for the groups shown above. Most diagnoses of cancer occur within the 100 days of the diagnosis of HGD. The median time for patients whose HGD diagnosis in NOGCA was rated as more uncertain (groups C and D) was three to four weeks shorter than for patients in groups A and B. Inspection of the HES data demonstrated that these patients had slightly fewer diagnostic procedures recorded on average (the time between two endoscopic procedures typically being around one month).

It is noteworthy that the timing of the cancer diagnosis derived from HES was not always after the HGD date of diagnosis in NOGCA.

- Between 5% and 27% of patients had a first cancer diagnosis that coincided with the HGD biopsy date. This is particularly evident in groups C and D, which are characterised by less systematic diagnostic work.

- Across all groups, between 9% and 23% of patients had a cancer diagnosis in HES that was slightly before the recorded HGD biopsy date. Further inspection of the HES records revealed that these patients generally had a history of prior endoscopic procedures. The reasons for this are not clear. It is possible that NOGCA received an incorrect date of HGD diagnosis. Another explanation is that the prior cancer diagnoses may reflect coding uncertainties in HES due to the absence of a specific ICD-10 code for HGD [Chadwick et al 2017].

Table 2.6
Descriptive statistics of analysis groups shown in Figure 2.3

Analysis group	A1	A2	B	C1	C2	D
Patients in group	47	73	21	85	70	88
Median time from HGD biopsy to cancer diagnosis in HES (days)	79	86	80	48	56	57.5
Type of endoscopic procedure recorded against cancer diagnosis in HES						
No procedure recorded	8.5%	27.4%	28.6%	9.4%	17.1%	40.9%
Diagnostic endoscopy	40.4%	50.7%	66.7%	49.4%	55.7%	53.4%
Therapeutic endoscopy	51.1%	21.9%	4.8%	41.2%	27.1%	5.7%

Table 2.6 also shows that, within HES, the endoscopic procedure associated with the first occurrence of the cancer diagnosis could be coded as either therapeutic or diagnostic procedures. It is not clear whether this highlights the use of inappropriate OPCS codes in HES or reflects the complexity of the care pathway that cannot be captured by the NOGCA HGD dataset. Figure 2.5 illustrates this complexity by comparing the records available within both the NOGCA and HES datasets for a typical HGD patient from group A2.

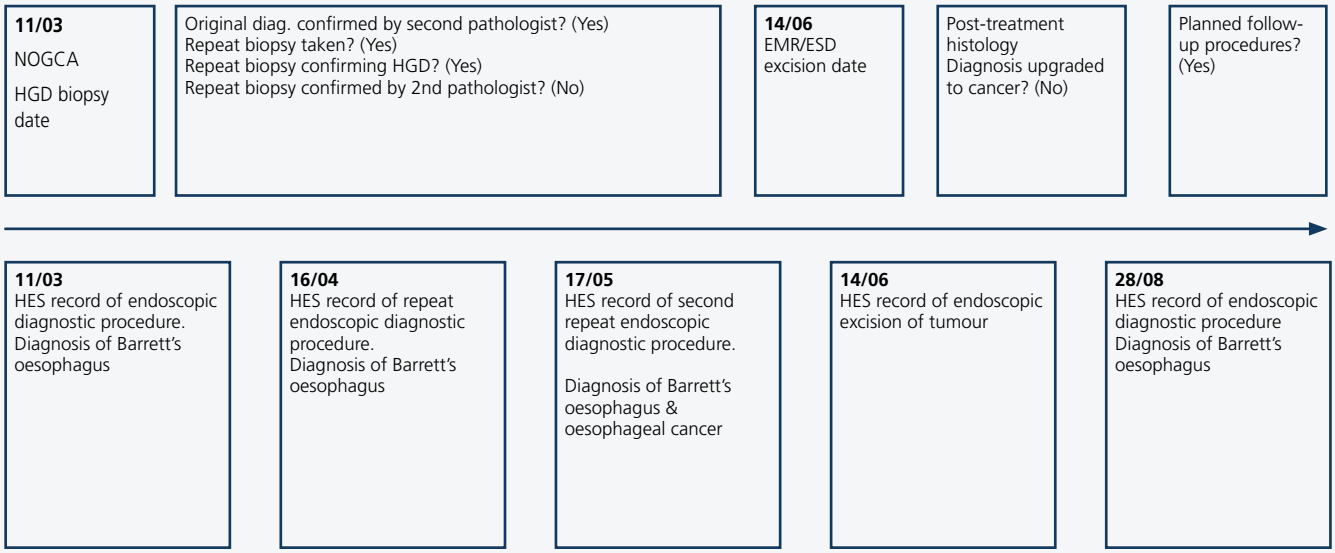
- The time from biopsy to EMR/ESD is comparable to the median time in the sample of 72 days (IQR 45-110).

- The longitudinal HES records reveal a total of five relevant endoscopic procedures.

- The NOGCA dataset captures a snapshot of activity and only explicitly identifies two of those procedures.

The additional endoscopic procedures reveal the potential for patients to have their cancer diagnosis made just prior to the endoscopic excision, during one of the repeat biopsies.

Figure 2.5
Comparison of a "typical" patient's clinical pathway as represented in NOGCA and HES (Group A2)



Patients in all other groups exhibited care pathways of similar degrees of complexity. And importantly, for patients recorded as being on surveillance (groups B & D), active treatment followed quickly after a cancer diagnosis.

In summary, the aim of this analysis was to examine whether patients initially put on surveillance / no active treatment but whose lesion might have progressed to cancer were being identified for treatment. When we linked the NOGCA HGD records to HES, we found very little difference in the proportion of HGD patients who had a diagnosis of cancer within the HES database across the four categories of patients. This suggests that patients who were placed on surveillance are being reviewed sufficiently regularly to identify malignant tumours identified. Nonetheless, the high observed incidence of cancer among these HGD patients supports the BSG recommendation for active treatment as the preferred option after diagnosis when clinically feasible.

We recognise that the limitations of HES data means the results of this analysis need to be interpreted cautiously. Further work in this area would be beneficial. First, the results suggest a small number of cancer diagnoses among HGD patients are not recorded in HES. Second, that a cancer diagnosis can appear in HES when no such diagnosis was recorded in the relevant NOGCA HGD follow-up dataset suggests the Audit may underestimate the true proportion of concurrent cancers. The reasons for these discrepancies should be explored.

Key Findings

The proportion of patients with oesophageal HGD who are not actively treated has been declining since April 2012 in most English Cancer Alliances. However, it is concerning to see that there are regions where this trend has not occurred and that these tend to be relatively high volume regions. The reasons for this need to be explored at a local level.

We note that patients with confirmed diagnoses of HGD (by a second pathologist and/or repeat biopsies) are more likely to be selected for active treatment and this highlights the importance of following BSG recommendations on diagnostic standards.

We continue to see a decline in the number of HGD patients reported to the Audit and this is disappointing because the NOGCA HGD dataset is a unique resource and could inform the further development of guidelines on the management of HGD. Furthermore, the incompleteness of data submitted for non-mandatory HGD data items limits the potential insights that the Audit can provide for improving clinical decision making. Both shortcomings can only be investigated and rectified at the local level by ensuring processes are in place to submit all eligible patients and provide complete data.

Recommendations for HGD

- It is important that NHS trusts have clear protocols in place to ensure all cases of HGD are referred to the Upper GI MDT.

- Pathologist to use the new SNOMED CT code for Barrett's oesophagus with high grade dysplasia ("1082761000119106") to aid identification of these patients

- MDT lists should be reviewed on an annual basis to ensure all cases of HGD are reported to the NOGCA in order to maximise the case ascertainment of the Audit. Guidance on which patients to include as HGD cases and which as OG cases is available on the NOGCA website.

- MDTs should prospectively monitor their management of patients with HGD. If they only deal with a few cases of HGD each year, it is important that they consider referral of these cases to their local specialist centre to ensure the patient has all treatment options made available to them.

- MDTs should ensure that all patients with HGD are referred for potential endoscopic therapy to a local specialist centre, given the BSG recommendation that all such patients should be considered for this treatment.

3. Participation in the OG cancer prospective audit

3.1 Audit inclusion criteria

The 2017 Audit Report is primarily based on information collected on patients with oesophageal-gastric (OG) cancer in England and Wales between 1 April 2014 and 31 March 2016. We expand this time period to April 2013 and March 2016 in certain sections of the report in order to increase the sample size and make the results more robust.

Cancer patients were eligible for inclusion in the prospective 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 endocrine tumours or gastro-intestinal stromal tumours (GISTs) were not included in the Audit due to the different behaviour and management of these tumours.

Patients were included in the Audit if they were diagnosed or treated in an NHS hospital in England or Wales. A small number of treatments received by patients in independent hospitals were reported to the Audit but, since the management of patients with OG cancer takes place in the context of an NHS MDT meeting irrespective of whether they were diagnosed in the public or private sector, the majority of patients in the Audit had received treatment in the NHS only.

3.2 Data submission and case ascertainment

The NHS trusts / local health boards were given three submission deadlines in the process of data collection.

- After the first submission deadline, organisations were encouraged to review their data using the "data quality" reports in the online data collection tool.
- After the second submission deadline, an extract of the Audit data was taken which became the extract on which the Audit report was based. This dataset was linked to the Office for National Statistics (ONS) as well as the other national datasets. In addition, to support the clinical outcome programme (COP), data quality reports were produced and sent to NHS trusts / local health boards in relation to surgical practice and outcomes.
- After the review period, a third and final data extract was taken. This was used to produce the results for the COP publication. To be consistent with this publication, the results on curative surgery in the report were derived from the extract taken after the third submission deadline.

The estimated case ascertainment for the audit period is summarised in Table 3.1. In England, case ascertainment was estimated to be 80.3%, a slight increase from the 78.3% estimated for the previous audit period (2013-2015). The case ascertainment of surgical records in England was 95.7% and reflects the influence of the COP process.

For Wales, the estimated case ascertainment for 2014-2016 was 80.9% for tumour records and 89.3% for surgical records.

It is not possible to quantify the completeness of submission for the oncological records and endoscopic/palliative records because we do not have a reliable denominator.

Case ascertainment by NHS organisation for England and Wales is given in Annex 5.

Table 3.1
Number of data forms submitted to the Audit between April 2014 and March 2016 in England and Wales

	England	Wales
Number of tumour records	19,900	1,342
Case ascertainment (tumour records)	80.3%	80.9%
Number of surgical records	4,655	251
Case ascertainment (surgical records)	95.7%	89.3%
Number of pathology records	4,191	203
Number of oncology records		
Curative	5,038	207
Non-curative	7,069	221
Number of endoscopic / radiological palliation records	2,737	220

We derived the case ascertainment for all diagnosed patients in England as well as all patients having curative surgery by comparing the number of patients with tumour records in the Audit dataset with the number of patients identified within the Hospital Episode Statistics (HES) database over the audit period. The HES database collects information on all patients admitted to NHS hospitals in England and contains sufficient clinical details to identify patients diagnosed with oesophageal (C15) and gastric cancer (C16). However, it does not enable us to limit this group to only epithelial tumours. Consequently, the overall case ascertainment will be a slight underestimate.

We changed the method of deriving case ascertainment for Wales this year so that it was equivalent to the process used for England. Specifically, we used the Welsh hospital administrative database (called the Patient Episode Database for Wales or PEDW) to calculate the expected number of Welsh patients diagnosed during the audit period. PEDW is the equivalent of HES.

Data on Welsh patients are uploaded into the NOGCA Clinical Audit Platform (CAP) data collection system from the Cancer Network Information System Cymru (CaNISC), an online information system that provides information for health professionals on all cancer patients in Wales. Although this could theoretically lead to 100% case ascertainment for Wales, this was not achieved in practice because patient records can be rejected from the CAP system if the records were missing mandatory information.

3.3 Completeness of submitted surgical records

Annex 6 shows the data quality of the data items used to derive the surgical indicators published by the Audit as part of the COP initiative. The data quality information was derived from the data extract taken after the third submission deadline and which was used to calculate the 2017 COP surgical indicators.

Key findings

It is encouraging that staff in busy NHS hospitals are continuing to improve the quality of data provided to the Audit. We value their commitment. Case ascertainment for patients diagnosed with OG cancer have surpassed the 80% mark for both England and Wales.

There is still room for improvement. In particular, the additional indicators on the outcomes of curative surgery introduced this year rely on information in the pathology records. It is important that Cancer Centres ensure they return all pathology records associated with patients undergoing curative surgery.

4. Patients with OG cancer

4.1 Overview of the treatment of OG cancer

Clinical guidelines recommend that general practitioners (GPs) make an urgent referral for suspected OG cancer if patients are over 55 years and present with 'alarm symptoms' (e.g., weight loss, vomiting, difficulty swallowing). However one-sixth of patients are still diagnosed after an emergency admission and it is generally accepted that improving the diagnostic process is an important route to increasing survival rates. One of the challenges of this is that many of the signs and symptoms of OG cancer are non-specific and are present in large numbers of individuals without cancer. Public Health England ran its 'Be Clear on Cancer' Campaign in early 2015 to raise public awareness of OG cancers (https://campaignresources.phe.gov.uk/resources/campaigns/16-be-clear-on-cancer/overview), and is one of various national initiatives aimed at improving early diagnosis rates.

Establishing the options for treatment requires patients to have a number of investigations and so determine the stage of the disease. Standard investigations currently include computed tomography (CT) scan, endoscopic ultrasound and staging laparoscopy. Positron emission tomography (PET) is also increasingly used to identify patients suitable for curative treatment. Poor staging procedures can lead to curative treatments being attempted inappropriately.

Surgery is the mainstay of curative treatment for patients with localised disease. It is often combined with preoperative (neoadjuvant) cycles of chemotherapy and radiotherapy. A recent development has been the use of chemo-radiotherapy without surgery as a treatment option.

This is now an accepted standard of care for patients with localised squamous cell carcinoma, and can also be considered for patients with adenocarcinoma not suitable for surgical resection (but this is restricted to particular types of oesophageal tumours). Curative surgery for OG cancer is a major undertaking, and is only suitable for patients who are relatively fit. Because of this, and because many patients are diagnosed with advanced disease, only around 30% of patients are candidates for a curative treatment pathway.

Patients who are not eligible for curative therapy may be treated with a range of palliative treatments. Oncological therapies (chemotherapy, radiotherapy or a combination of the two) are increasingly used, with the aim of extending life. Endoscopic / radiological therapies (e.g. stenting) are principally used for symptom control.

4.2 Patient characteristics

As described in chapter 3, this report describes patient diagnosed with OG cancer between 1 April 2014 and 31 March 2016. The audit cohort contained 19,900 patients diagnosed in England and 1,342 patients in Wales.

The characteristics of the cohort were similar to previous years, with approximately three quarters of the tumours in the oesophagus or gastric-oesophageal junction (GOJ) and one-quarter in the stomach (Table 4.1). Around two-thirds of the oesophageal tumours were located in the lower section and just over half of the stomach tumours were located in the body of the stomach. When compared to the distribution of tumour sites in the first NOGCA [Palser et al 2010], there seems to be a slight increase in tumours in oesophageal tumours (51.1% v 56.2%) and small decrease in stomach tumours (30.7% v 26.6%).

Table 4.1
Distribution of OG cancer tumours across the various sites in England and Wales

Site	No. of patients (%)	Sub-site	No. of patients (%)
Oesophagus	11,946 (56.2)	Upper third	975 (8.2)
		Middle third	2,804 (23.5)
		Lower third	8,167 (68.4)
G-O junction	3,642 (17.1)	Siewert I	1,331 (36.5)
		Siewert II	1,327 (36.4)
		Siewert III	984 (27.0)
Stomach	5,654 (26.6)	Fundus	637 (12.8)
		Body	3,269 (57.8)
		Antrum	1,076 (19.0)
		Pylorus	672 (11.9)
Total			**21,242**

Tumours of the G-O junction are described using the 3 category Siewert classification [Siewert et al 1996]:

I. Adenocarcinoma of the distal oesophagus, the centre of which is within 2-5cm proximal to the anatomical cardia. It may infiltrate the gastro-oesophageal junction from above.
II. True junctional adenocarcinoma, the centre of which is within 2cm above or below of the anatomical cardia.
III. Subcardial gastric adenocarcinoma the centre of which is within the 5cm distal to the anatomical cardia. It may infiltrate the gastro-oesophageal junction from below.

The majority of OG cancers are diagnosed in older people, with the average age at diagnosis ranging from 70 to 76 years across the different tumour sites (Table 4.2). Among oesophageal SCC patients, around half the cases were male. However, among the other tumour sites, there was a larger proportion of men among the patients with OG cancer. In particular, there were four times as many men than women among patients with a lower oesophageal or Siewert I adenocarcinoma. The reasons for this difference in the incidence of OG cancer among men and women is not currently understood. A greater proportion of patients with stomach tumours had worse performance status and more comorbidities.

Table 4.2 Summary of patient characteristics by type of tumour in England and Wales

	Oes SCC	Oes upper/ mid ACA	Oes lower/ SI ACA	GOJ SII / SIII ACA	Stomach
Number of patients (%)	4341 (20.4)	1380 (6.5)	7556 (35.6)	2311 (10.9)	5654 (26.6)
Ratio Female: male	1:0.95	1:2.5	1:4	1:3.2	1:1.8
Median age (years) Male	70	72	70	71	75
Median age (years) Female	74	76	74	72	76
Performance status ≥3 (%)	14	15	11	12	17
*Comorbidities (%)					
0/1 comorbidities	84.2	85.9	82.0	82.8	81.6
2/3 comorbidities	15.2	13.2	17.0	16.6	17.8
4 or more comorbidities	0.6	1.0	1.1	0.7	0.6

Key: Oes – oesophageal, SCC – squamous cell carcinoma, ACA – adenocarcinoma
*Comorbidities are reported for patients diagnosed from 1 April 2015 to 31 March 2016 as this data item was made mandatory in this year and hence has improved data quality

5. Patterns of care at diagnosis

5.1 Route to diagnosis

Patients can be diagnosed with oesophago-gastric cancer after following a number of different pathways. These include: referral from a general practitioner (GP), diagnosis after an emergency admission, following referral by another hospital consultant from a non-emergency setting, or as a result of a surveillance gastroscopy. The NOGCA previously reported that patients diagnosed as a result of an emergency admission were significantly less likely to be considered for curative therapy [Palser et al 2009].

Key indicators used to assess the care of patients with OG cancer (source: AUGIS/BSG/BASO guideline [Allum et al 2011] unless otherwise stated)

Domain	Standard	Indicator
Referral & diagnosis	GPs should be encourage to refer patients as early as possible	% patients diagnosed after an emergency admission

Audit findings

The principal routes to diagnosis are described in Table 5.1. The majority of patients were diagnosed after a GP referral. The remaining patients were typically diagnosed either (1) after a referral by another hospital consultant or (2) after an emergency admission. The proportion of patients coming through the emergency route was 13.7% in the 2014-2016 cohort, which was similar to the proportion reported last year (13.7%). Patients who were diagnosed after an emergency diagnosis were, on average, older and had a worse performance status. A greater proportion of patients with gastric cancer were also diagnosed in this way.

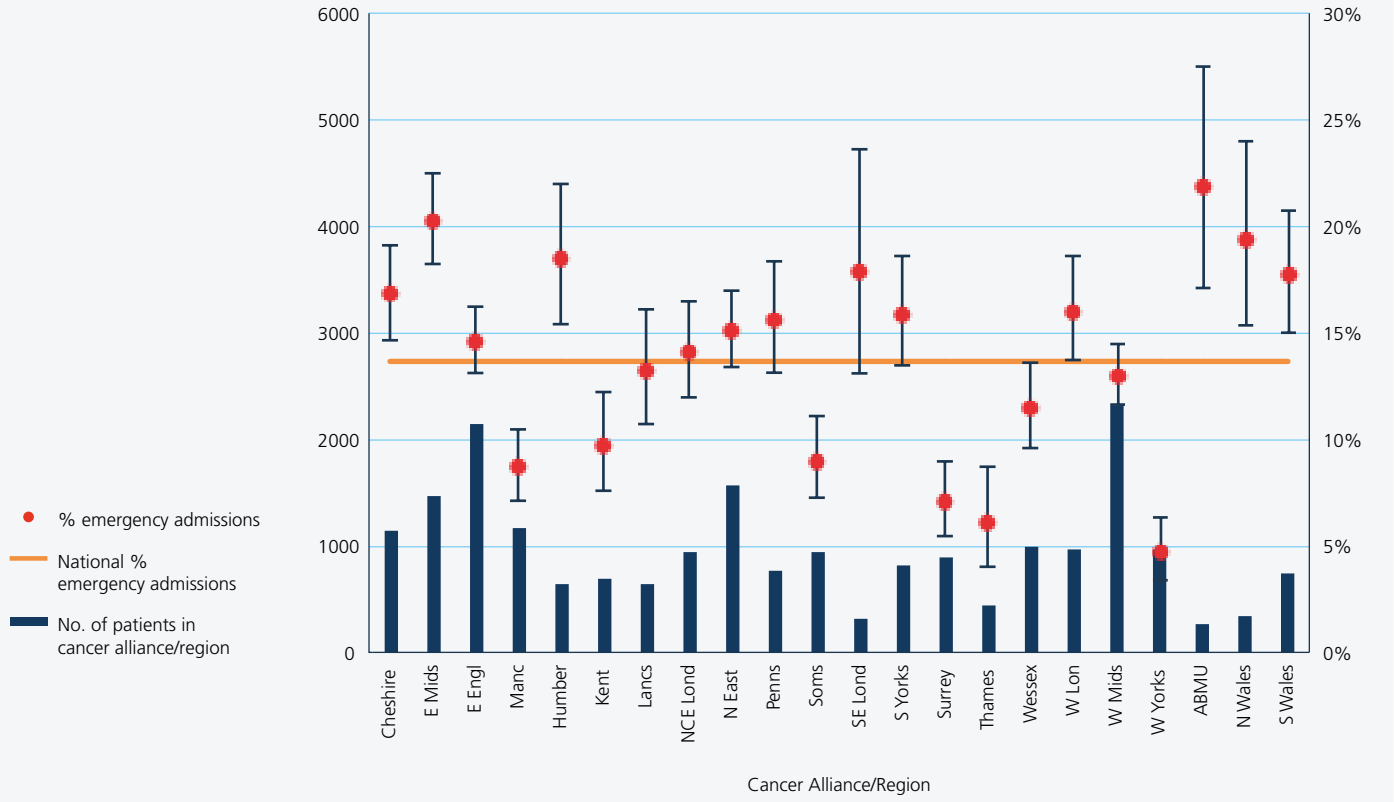
It is important that local services try to reduce the proportion of patients diagnosed after an emergency admission. Patients diagnosed via this route are less likely to be managed with curative intent which stems from the fact that a greater proportion of these patients are diagnosed with advanced disease.

Table 5.1
Route to diagnosis among OG cancer patients in England and Wales

Route to diagnosis	No. of patients	%
GP referral	13,315	65.2
Emergency admission	2,786	13.7
Other hospital consultant	4,039	19.8
Open access endoscopy	159	0.8
Barrett's surveillance	99	0.5
Total	20,398	
Missing	844	

There was significant variation across the Cancer Alliances in the proportion of patients diagnosed after an emergency admission (see Annex 7 for figures). The variation in rates across Cancer Alliances suggests that there is room for improvement.

Figure 5.1
Proportion of patients diagnosed after an emergency admission between April 2014 and March 2016 by Cancer Alliance in England and region in Wales.



Key: Proportions shown as dots with 95% confidence intervals. The orange line shows the overall average. The bars show the volume within a region.

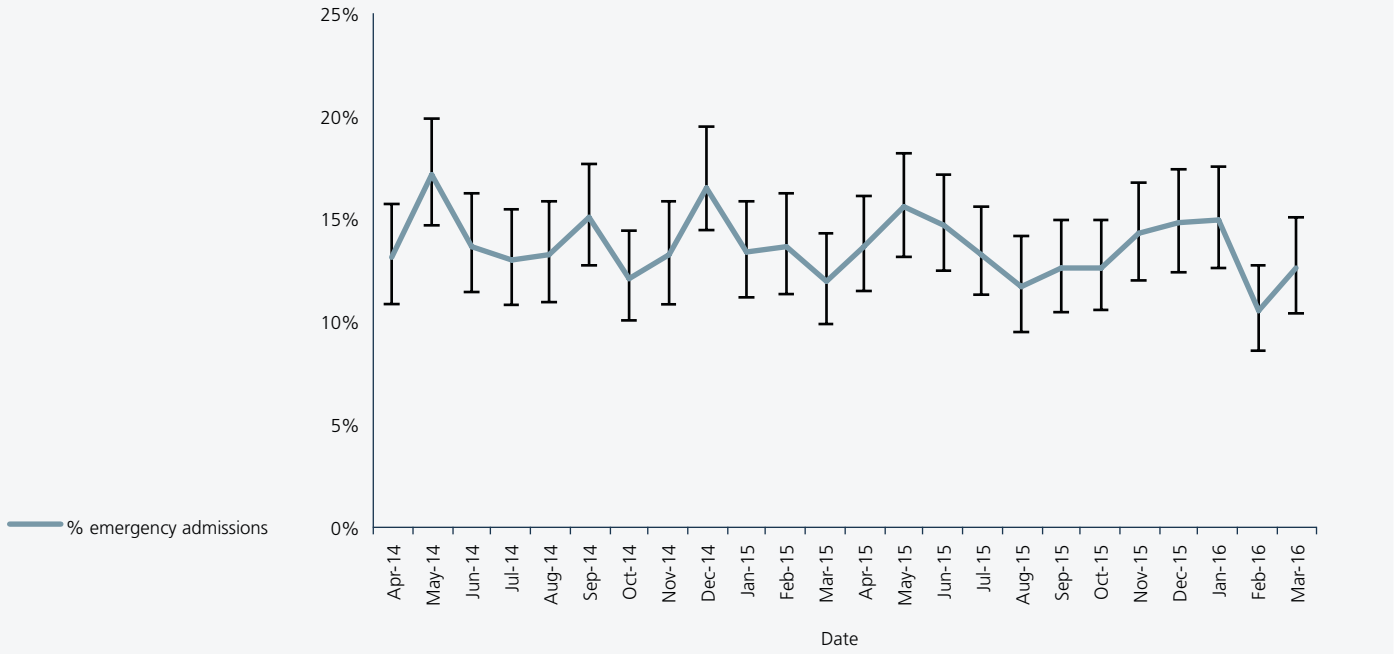
The first national oesophago-gastric cancer 'Be clear on cancer' campaign was run from 26 January to 22 February 2015 as an initiative to improve the awareness of OG cancer among the public [Cancer Research UK 2015]. The campaign was aimed at men and women aged 50 years and over, and focused on two symptoms of oesophageal and stomach cancers:

- Heartburn most days for 3 weeks or more
- Food sticking when you swallow.

The campaign included television and radio adverts, posters and coverage in national newspapers.

Figure 5.2 shows the proportion of patients diagnosed after an emergency admission from April 2014 to March 2016. This is a short period of time over which to investigate what effect the campaign might have had. The time-series does not show any noticeable change in its level or direction around the time of the initiative, which suggests its impact was limited at a national level. Further work might reveal a more nuanced set of results within regions.

Figure 5.2
Proportion of patients diagnosed after an emergency admission within England and Wales, by month, between April 2014 and March 2016. Timing of campaign was 26 January to 22 February 2015.



Key: Monthly estimates shown with 95% confidence intervals

5.2 Time from diagnosis to treatment

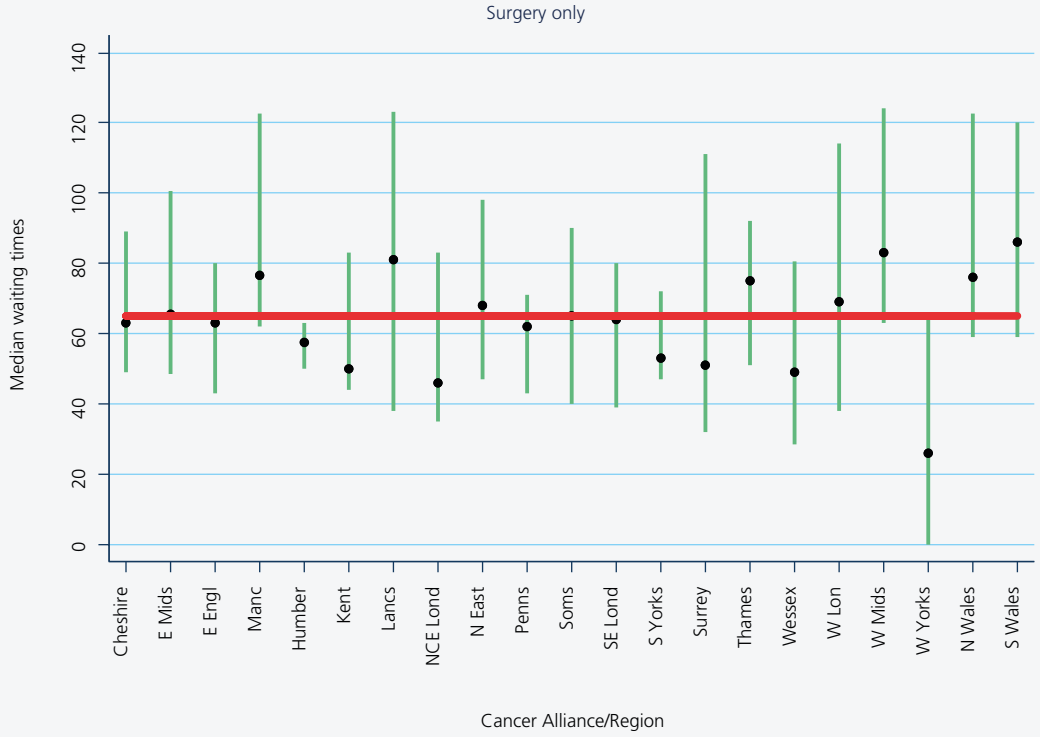
Cancer waiting times (CWT) recommend that all cancer patients should be treated within 31 days of decision to treat (DTT). The DTT is usually defined as the date the patient agrees to a treatment plan for their cancer, and NHS cancer services are expected to treat 96% of patients within the 31 day period (operational standard). The majority of trusts meet this target [NHS England 2016]. However, this standard only captures a portion of the time that elapses after a patient has received their diagnosis. Consequently, we examined whether the time to treatment from the date of diagnosis varied between the Cancer Alliances / Welsh regions for the common treatment modalities. This included the time period:

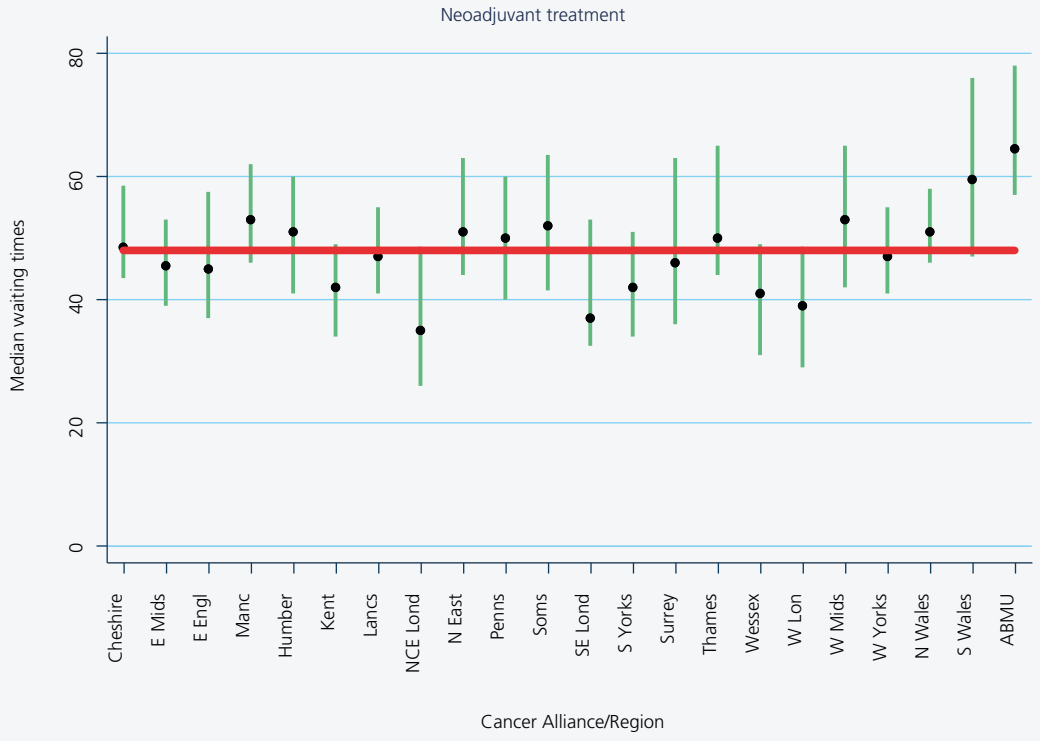
- from diagnosis to the MDT meeting, which covered the staging process
- the MDT meeting to the decision to start treatment
- from the DTT date to the start of treatment.

Figure 5.3 (A and B) describe the distribution of waiting times within regions for patients having curative treatments: respectively, surgery only or surgery with neoadjuvant treatment. Treatment modality was defined according to their treatment record and the values for Cancer Alliances / Welsh regions are shown if more than 10 cases had the specific type of therapy.

There is least variation across the regions in the times from diagnosis to treatment among patients having neoadjuvant therapy as their first treatment. In the majority of regions, 75% of patients have started treatment within 60 days of their diagnosis date. In contrast, the range of waiting times within regions and across regions is much greater for patients having surgery only. Within 8 regions, 23% of patients waited at least 100 days for surgery from their date of diagnosis. Overall, the median (25th & 75th percentiles) waiting time was 65 days (25,140) for patients who had surgery only and 48 days (29,73) for patients who had neoadjuvant treatment.

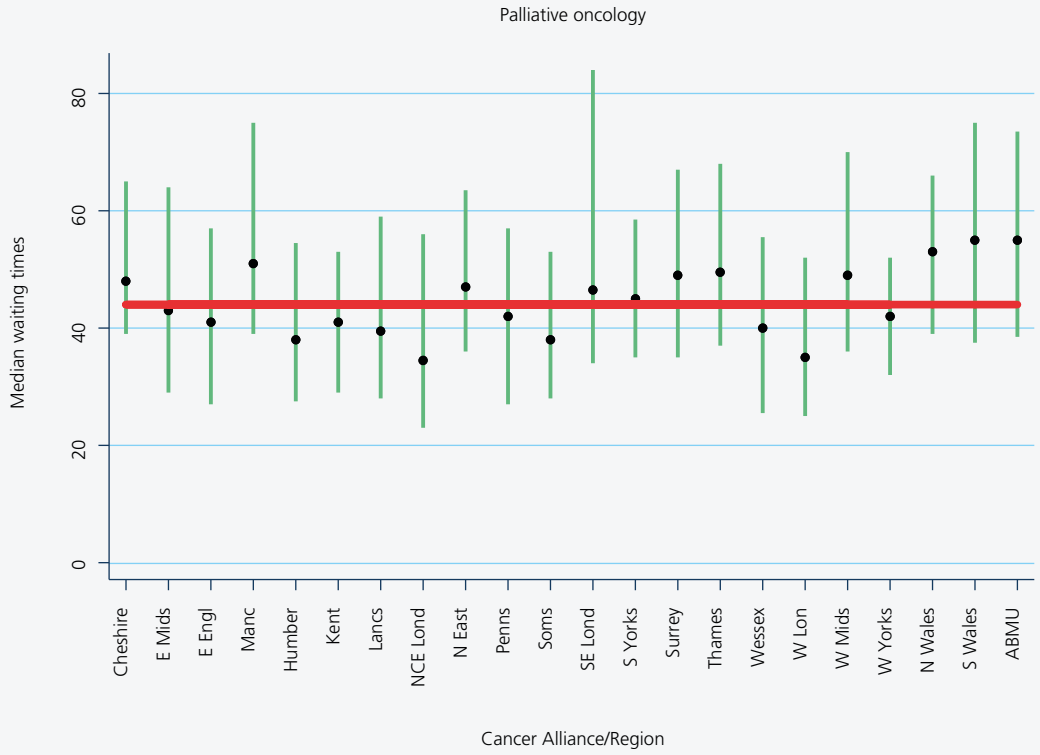
Figure 5.3a
Waiting times for patients having curative treatments by Cancer Alliance in England and region in Wales.

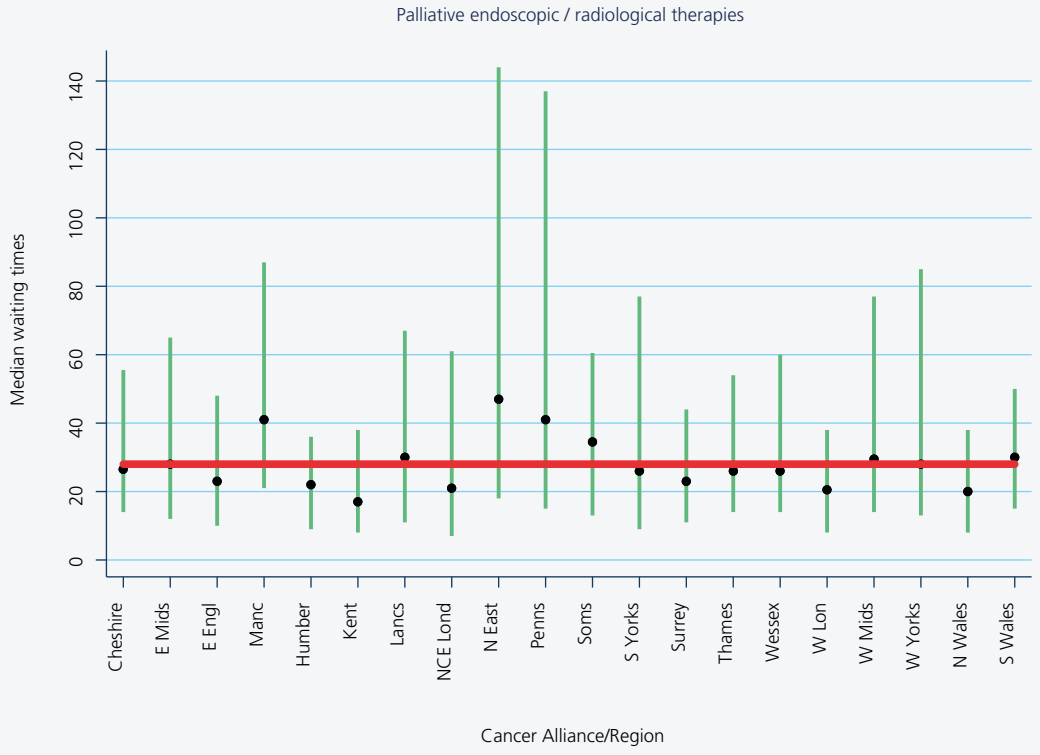




Key: The graph shows the median as a black dot and 25th, 75th percentile as the ends of the green line. The red line shows the overall median. Regions are only shown if there was data on more than 10 cases.

Figure 5.3b
Waiting times for patients having palliative treatment by Cancer Alliance in England and region in Wales.





Key; The graph shows the median as a black dot and 25th, 75th percentile as the ends of the green line. The red line shows the overall median. Regions are only shown if there was data on more than 10 cases.

The pattern of waiting times for patients who had palliative oncology was similar to those patients having oncological treatment before surgery, and the regions had broadly similar distributions of waiting times. The pattern for palliative endoscopic / radiological therapies was slightly different from the other modalities. Many patients had short waiting times, with the median wait being between 20 and 30 days for most regions. There were, however, a couple of Cancer Alliances with long waiting times among a quarter of patients. It is unclear what factors might be causing this. The differences in waiting times could arise at various points along the care pathway, with patients having to wait because of specific staging investigations to be performed, delays in getting access to treatment, and/or delays in the administrative pathways.

Perspective on results from Dr Tom Crosby

(Consultant Clinical Oncologist, Velindre Cancer Centre, Cardiff)

The report reveals that there is large variation across regions in England and Wales in the times patients experience from diagnosis to treatment for both curative and palliative treatments. It is vital that hospitals value performance measures which reflect the actual patient experience, such as access to staging investigations and knowledge of which will drive improved system performance. In particular, the range of waiting times when patients have surgery alone needs to be explored further both nationally and locally. That 23% of patients are waiting more than 8 weeks for treatment is a concern because patients may be symptomatic, deteriorate nutritionally and, over time, may become less well suited for the planned therapies.

Key findings

There is still significant regional variation in the proportion of patients being diagnosed after an emergency admission. Local services with a high proportion should investigate possible reasons for this because patients diagnosed after an emergency admission are significantly less likely to be managed with curative intent than those diagnosed through any other referral route.

We also found variation in waiting times from diagnosis to treatment for both particular curative and palliative modalities. There was limited variation among patients requiring oncological treatments but the range of waiting times raises some concerns. Around 23% of patients waited more than 8 weeks to begin treatment which is comparatively long compared with the typical time taken for diagnosis. The majority of patients who had endoscopic / radiological palliative therapies were also treated quickly, on average. This may be a reflection of the fact that these patients require rapid intervention to ameliorate symptoms and improve quality of life.

We recommend that:

- General Practitioners and CCGs should work together to promote early referrals and reduce the proportion of patient diagnosed after an emergency admission
- NHS trusts / local health boards, GPs and CCGs should coordinate efforts to address delays in the patient pathway, to avoid patients having to wait longer than necessary to start treatment.

6. Staging investigations

Once a diagnosis of oesophago-gastric (OG) cancer is made, patients will undergo appropriate staging investigations to determine the extent of the disease and whether it is potentially amenable to curative therapy.

In the 2016 Annual Report, we reported a concerning downward trend in the reporting staging investigations. All patients diagnosed with OG cancer are recommended to have an initial CT scan to assess the spread of disease and look for evidence of metastatic disease. If the patient is suitable for curative treatment and the cancer is localised, further staging investigations are done to determine the location and stage of cancer. The Audit collects information on whether an initial CT scan was performed and, if the patient is amenable to curative treatment, information is collected on the use of endoscopic ultrasound (EUS), staging laparoscopy, PET/PET-CT scan and other staging investigations.

The UK guidelines for the management of oesophageal and gastric cancer [Allum et al 2011] recommend the following staging investigations:

- CT scan of chest/abdomen and pelvis to provide an initial assessment, and look for evidence of metastatic spread.
- Endoscopic resection, if there is evidence of T1 disease or nodular high grade dysplasia to assess the depth of tumour invasion.
- Endoscopic ultrasound (EUS) for oesophageal, gastro-oesophageal junction (GOJ) and selected gastric cancers to provide more accurate assessment of T-stage and look for evidence of local nodal involvement. The addition of fine-needle aspiration may further improve the diagnostic accuracy.
- Positron emission tomography (PET)-CT to assess for evidence of more distant nodal disease.
- Laparoscopy for all gastric cancers and selected lower oesophageal and GOJ tumours. This allows direct visualisation for low volume hepatic and peritoneal metastases, and assessment of the degree of local spread.

It is important that the staging investigations are recorded accurately in the Audit. Accurate information on staging can give us information on adherence to clinical guidelines and the variation in staging investigations performed in England and Wales.

Audit findings

The quality of the data on staging investigations submitted to the Audit varied across the various NHS organisations. To avoid the data from hospitals with poor levels of data submission adversely affecting the results, we excluded those organisations which had disproportionately low proportion of CT scans (less than 50% of patients) and those that reported no patients with a curative treatment intent having either an EUS (oesophageal tumours) or laparoscopy (gastric tumours).

Overall, 88.5% of OG cancer patients diagnosed between April 2014 and March 2016 had a CT scan. Patients who did not have a CT scan were more likely to have been older and / or had a worse performance status (Table 6.1).

Table 6.1
Proportion of patients who were reported to have had a CT scan, by age at diagnosis and performance status

	Performance status					
Age group (Years)	0	1	2	3	4	Total
Under 60	91%	90%	89%	87%	78%	90%
61-70	89%	90%	91%	88%	85%	89%
71-80	88%	90%	89%	82%	75%	87%
80 or over	75%	86%	77%	75%	60%	76%
Total	90%	89%	89%	84%	77%	

Amongst the patients with curative treatment intent, only 49.4% of patients had EUS and 48.3% patients had laparoscopy (Table 6.2). The reporting of these staging investigations has fallen compared with results from earlier Audit reports. This is unlikely to reflect a systematic change in clinical practice, and it is more likely to reflect poor reporting of staging investigations.

Differences between organisations in the reporting of CT staging are described in Annex 8.

Table 6.2
Reporting of staging investigations since the first audit in England and Wales

Investigation	2010 Annual Report (First audit)	2013 Annual Report	2017 Annual Report
CT scan	90%	91.0%	88.5%
EUS	58%	62.0%	49.4%
Laparoscopy	48%	57.0%	48.3%

Key findings

UK guidelines recommend that all patients with a new diagnosis of OG cancer have a staging CT scan. NHS trusts / local health boards should explore the use of staging investigations, and the submission of data about these investigations where their use is reported to be low. This may involve better coordination between MDT team members and data mangers in the NHS trust / local health board so that complete information is submitted to the Audit.

7. Treatment planning

Whether a patient's cancer is amenable to therapy with curative intent depends upon the site and extent of the disease. The principal curative treatment option for patients is surgery (either alone or in combination with chemotherapy) but this places considerable strain on patients and whether they can tolerate it depends upon the presence of comorbidities, their degree of frailty and other factors such as nutritional status. Patient preferences will also influence the decision. Palliative (non-curative) treatment aims to reduce the impact of symptoms and improve the quality of life for patients. Therapeutic options include endoscopic stenting, palliative oncology, palliative surgery, and best supportive care.

The treatment options for all patients are discussed at the upper gastro-intestinal (GI) multi-disciplinary team (MDT) meeting. These meetings typically involve a gastroenterologist, a surgeon, a pathologist and a radiologist. Recommendations for treatment in current guidelines are summarised in the box below [Allum et al 2011].

Early oesophageal and gastric cancers

- Endoscopic mucosal resection or submucosal dissection may be considered if the tumour is limited to the mucosa or most superficial layer of the submucosa, and there is no evidence of local or distant spread.

Oesophageal SCC:

- 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 Siewert II and III cancers.

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.

Audit findings

Overall, 8,217 (38.7%) of the 21,242 patients were recorded as having a curative treatment intent. This is similar to the 37.6% reported in the 2016 Annual Report. Patients with oesophageal lower/S1 and junctional S11/S111 tumours are more likely to be treated with curative intent (Table 7.1).

Table 7.1
Treatment intent by type of tumour in England and Wales

	Oesophageal SCC	Oesophageal ACA Mid / upper	Oesophageal ACA Lower/ SI	G-O junction SII/SIII	Stomach
Curative	1,612 (37.1)	463 (33.6)	3265 (43.2)	998 (43.2)	1879 (33.2)
Non-curative (palliative)	2,279 (62.9)	917 (66.5)	4291 (56.8)	1313 (56.8)	3775 (66.8)
Total	4,341	1,380	7,556	2,311	5,654

Clinical trials have demonstrated the survival advantage of peri-operative chemotherapy and preoperative chemoradiotherapy for locally advanced tumours [Allum et al 2011]. Last year, we reported on the increase in the use of peri-operative chemotherapy since the first National OG Cancer Audit examined the care received by patients diagnosed between 2007 and 2009 [Palser et al 2010]. The use of peri-operative chemotherapy remains high for patients with stage 2/3 disease, with a slight increase in the use of chemotherapy among patients with Siewart II/III junctional tumours (Table 7.2).

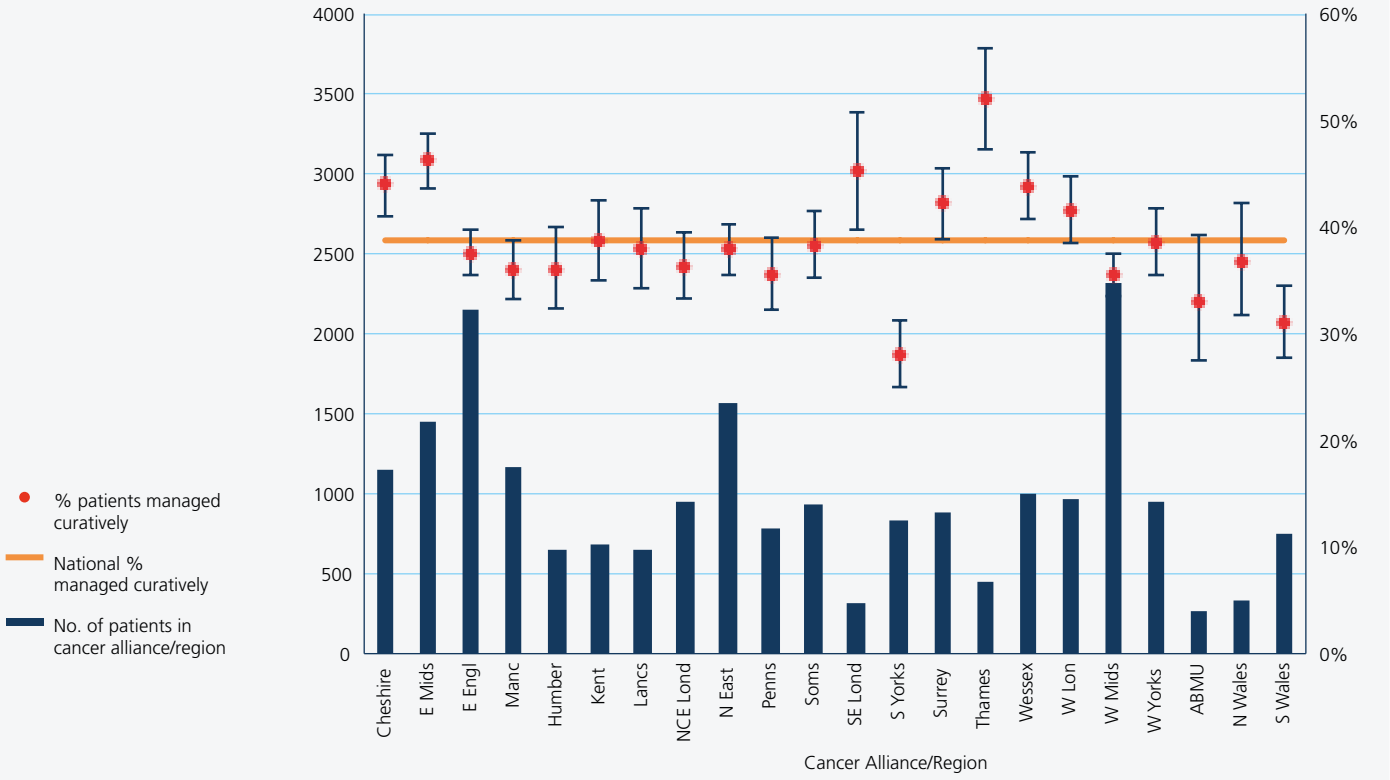
Table 7.2
Patients with stage 2/3 disease who are planned to have either curative surgery alone or surgery combined with peri-operative chemotherapy in England and Wales

	2013-15		2014-2016	
Tumour site	**Surgery alone**	**Surgery + peri-operative chemotherapy**	**Surgery alone**	**Surgery + peri-operative chemotherapy**
Upper / mid oesophagus	22%	78%	21%	78%
Lower oesophagus / Siewart I	14%	86%	13%	87%
Siewart II/III (G-O Junction)	11%	89%	8%	92%

The (unadjusted) proportion of patients who had curative treatments across Cancer Alliances and Welsh regions is shown in Figure 7.1. Factors such as case mix and personal choice may influence these differences, but it is also important to consider the impact of local policies and differences in infrastructure.

There is lack of information around the reasons why patients decline curative treatment. We have made the data item on this topic mandatory for patients diagnosed after 1 April 2015. Looking at the data collected on 6,567 patients diagnosed between April 2015 and March 2016, there were 256 patients (4%) who declined curative treatment. Hence, the small proportion of patients who declined treatment is unlikely to play a major role in the variation in curative treatment across Cancer Alliances and Welsh regions.

Figure 7.1
Proportion of OG cancer patients managed with curative treatment plans, by Cancer Alliance for England and regions in Wales.



Key: Proportions shown as dots with 95% confidence intervals. The orange line shows the overall average. The bars show the volume within a region.

7.1 Choice of non-curative treatment modality

Non-curative (palliative) treatment options aim to both control patient symptoms and improve the quality of life for patients. In the period between 2014 and 2016, the most common planned palliative modality was palliative oncology, corresponding to 50.4% of all patients (6,353/12,600), although there is some variation of planned modality by cancer site (Table 7.3). The proportion of patients with gastric cancer managed with best supportive care (48%) was significantly higher than for oesophageal and GOJ tumours.

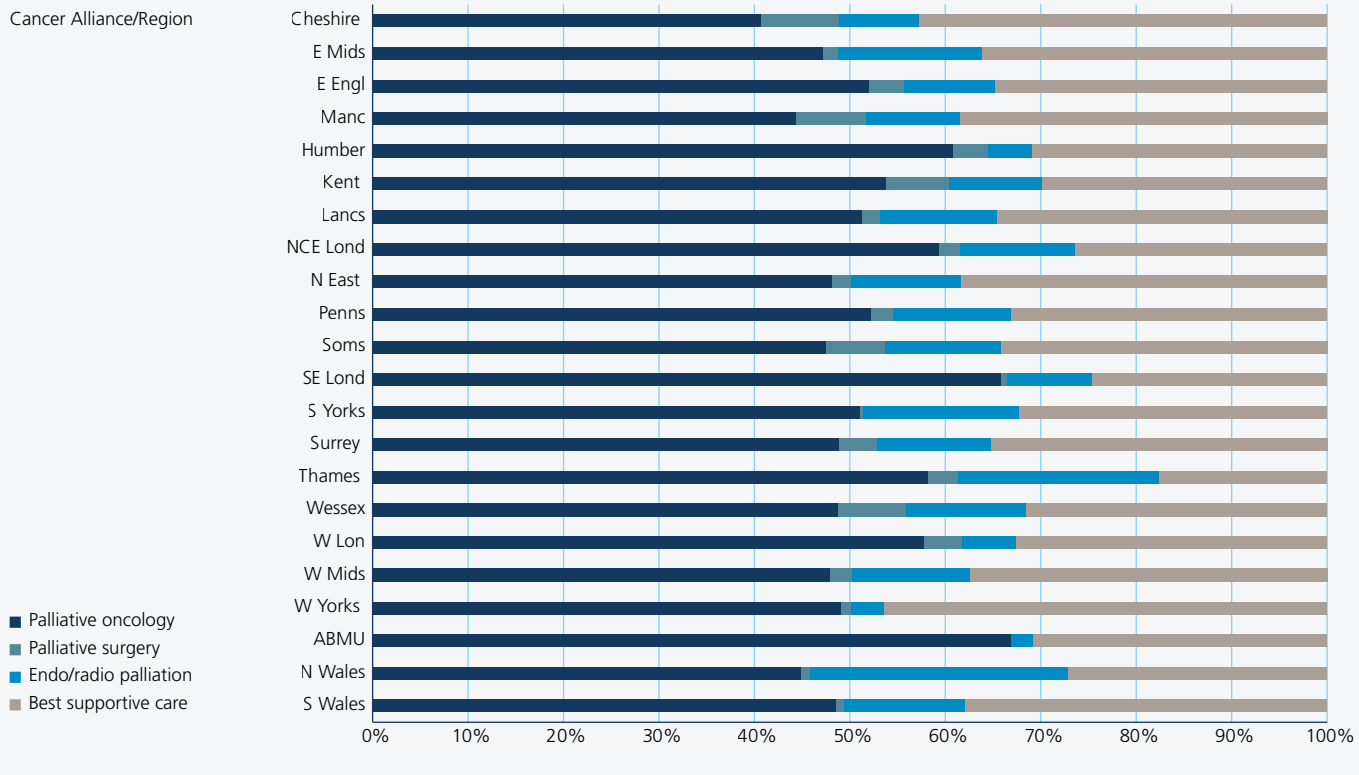
The proportion of patients planned to receive palliative oncology was lower among patients of greater age and of worse performance status.

Table 7.3
Planned non-curative treatment modality by cancer type for patients diagnosed between April 2014 and March 2016.

	Oes SCC		Upper/Mid oes ACA		Lower oes / SI ACA		GOJ SII / SIII ACA		Stomach	
	N	%	N	%	N	%	N	%	N	%
Palliative oncology	1,366	52	420	48	2,240	54	704	56	1,623	44
Palliative surgery	95	4	33	4	147	4	29	2	121	3
Endoscopic/radiological palliative therapy	419	16	141	16	552	13	127	10	180	5
Best supportive care	756	29	282	32	1,192	29	399	32	1,774	48
Total	2,636	100	876	100	4,131	100	1,259	100	3,698	100
Missing	93		41		160		54		77	

There was variation in the choice of palliative modality across the geographical regions of England and Wales, with some Cancer Alliances actively treating patients with oncology more than others. For example, in Humber, Coast and Vale, 60.8% (95% CI 55.3%, 66.1%) of patients had oncology as their planned modality. In contrast, in Somerset, Wiltshire, Avon & Gloucestershire, this modality was selected for 47.5% (95% CI 43.3, 51.7) patients.

Figure 7.2
Selected non-curative treatment modality by English Cancer Alliance and Welsh region



Key findings

The proportion of patients who are candidates for curative treatments remains around 39%. There is some differences is this proportion by tumour site, with tumours around the lower oesophagus and G-O junction more likely to have a curative treatment intent. Although there is some regional variation, the majority of Cancer Alliances/ Welsh regions have a proportion of patients treated curatively clustered around the national average. As noted in the previous chapter, the route to diagnosis is strongly associated with treatment intent, and efforts to improve the proportion eligible for curative treatment should be focused in the pathway to care.

Palliative oncology remains the most common non-curative palliative modality. There is some variation in the patterns of planned palliative modality across the regions, and those with comparatively high rates of best supportive care should examine whether more patients would benefit from active treatment.

8. Use of definitive chemo-radiotherapy and outcomes

The use of definitive chemoradiotherapy has increased since the first National OG Cancer Audit [Palser et al 2010], possibly in response to guidelines being revised to more strongly recommend this practice (see recommendations below). A Cochrane systematic review on this topic concluded that chemoradiotherapy appears to be at least equivalent to surgery in terms of short-term and long-term survival in patients with oesophageal SCC among patients who were fit for surgery and were responsive to chemoradiotherapy [Best et al 2016]. Nonetheless, the review noted that the clinical trials were of low quality evidence.

In this chapter, we report on the use of definitive chemoradiatherapy and the patterns of survival among patients diagnosed with oesophageal SCC. The analysis used a dataset that includes patients diagnosed between April 2013 and March 2016 to increase the sample size, and the robustness of the results. The cohort for analysis was based on the site of tumour, and the planned mode of treatment, with patients grouped into those who had surgery (on its own or in combination with neoadjuvant /adjuvant therapy) and those who had definitive chemoradiotherapy.

Current curative treatment plan recommendations for oesophageal tumours [Allum et al 2011]

Oesophageal SCC:

- 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 Siewert II and III cancers.

Audit findings

Table 8.1 describes the characteristics of the patients who undergo the two types of treatment. On average, there are small differences between the groups; patients who had definitive oncology were slightly older, were less likely to be of performance status 0/1, and a greater proportion had at least one comorbidity. This is to be expected because, for some patients, the definitive chemoradiotherapy option may have been selected because the patient was too frail to have surgical treatment. Nonetheless, there is a greater diversity of patients within each group than between them, which suggests many patients would have been candidates for either treatment.

Table 8.1
Patient characteristics for patients with oesophageal SCC and a planned modality of surgical or non-surgical curative treatment, diagnosed between April 2013 and March 2016 in England and Wales

	Surgery / Surgery + oncology	Definitive oncology
Age (years), median (IQR)	67 (60, 73)	70 (63, 76)
Performance status 0/1 (%)	848 (87.2)	822 (83.1)
% with any comorbidity	347 (35.7)	372 (37.6)
% TNM 0/1	138 (14.1)	124 (12.5)
% missing TNM	116	98

The long-term patterns of survival among patients who have definitive chemotherapy or surgery are summarised in Figure 8.1. These show the Kaplan-Meier survival curves for the two treatment options for patients with different stages of disease over approximately two years of follow-up. The graphs reveal progressively worse outcomes among the patients with the most severe disease, differences that remain after adjusting for age at diagnosis, gender, performance status and comorbidities (see Table 8.2). For both modalities, the hazard ratio for patients with stage 2 disease was approximately twice that of patients with stage 0/1 disease. The hazard ratio for patients with stage 3/4 disease was approximately three times that of patients with stage 0/1 for both modalities.

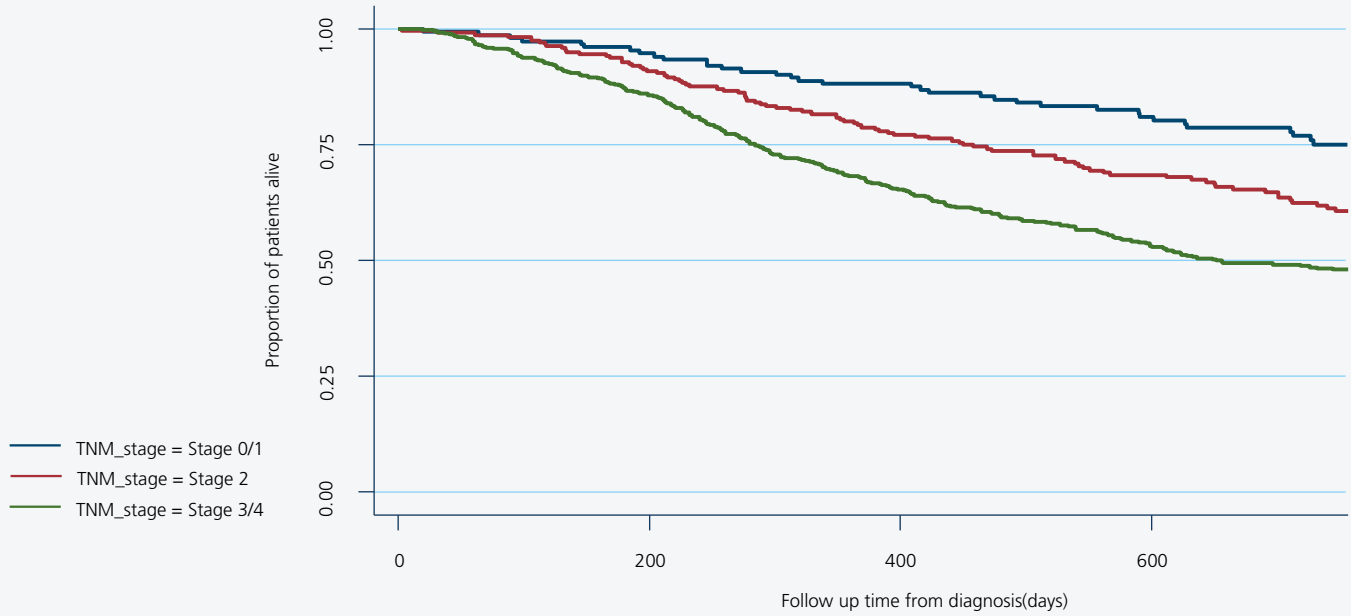
NOGCA is not designed to evaluate the comparative effectiveness of different treatments and so we caution against using these results to infer that one treatment is better than the other. However, we note that patterns of survival observed in NHS services are consistent with the results from the clinical trials [Best et al 2016]. The relative difference in survival between the two modalities after adjusting for age at diagnosis, gender, performance status comorbidities and TNM stage was small; the hazard ratio of definitive oncology compared to surgery (+/-oncology) was 1.03 (95% CI 0.90,1.19; p-value = 0.7).

Table 8.2
Survival differences between patients who had surgery+/-oncology or definitive chemotherapy for squamous cell carcinoma patients stratified by overall TNM stage after adjusting for patient characteristics.

Disease stage	Hazard ratio (95% CI)	
	Surgery / Surgery & oncology	Definitive chemoradiotherapy
0/1	1	1
2	1.69 (1.17, 2.43)	1.98 (1.37, 2.86)
3/4	2.64 (1.86, 3.76)	2.70 (1.88, 3.90)

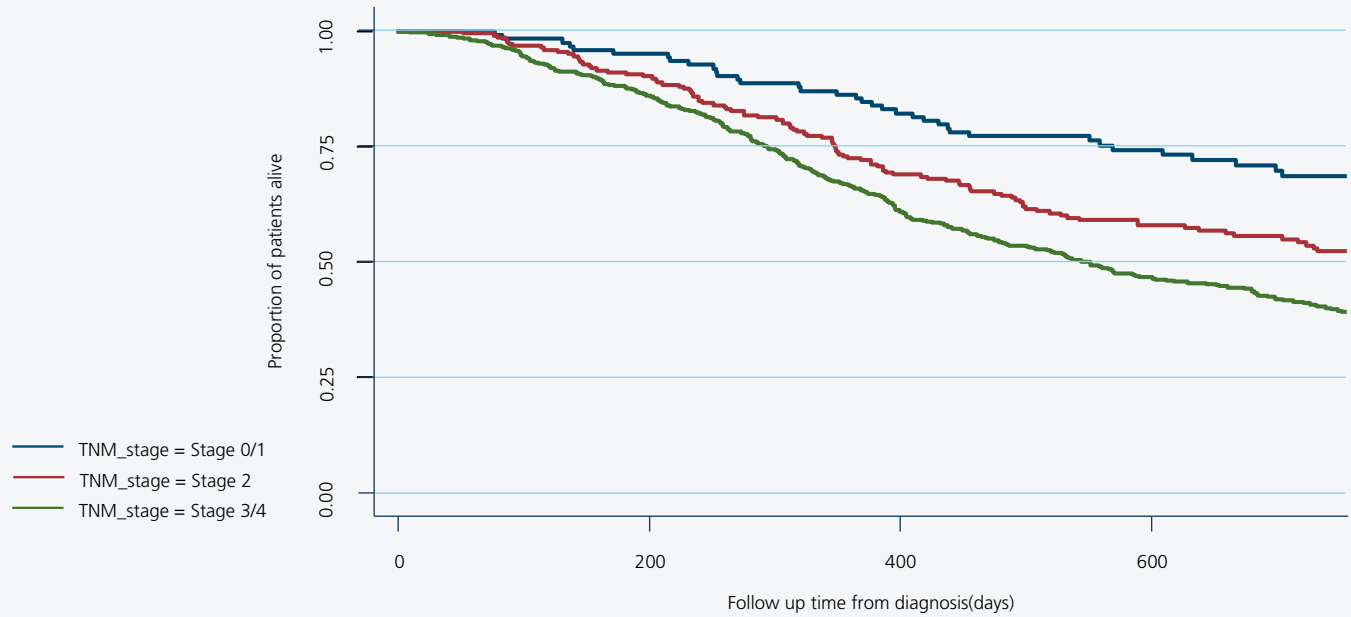
Figure 8.1
Unadjusted survival of patients diagnosed between April 2013 and March 2016 in England and Wales stratified by TNM stage and mode of treatment

Surgery with / without neoadjuvant therapy



No. of patients at risk				
Stage 0 / 1	152	144	134	106
Stage 2	240	218	185	136
Stage 3 / 4	506	433	330	218

Definitive chemoradiotherapy



No. of patients at risk				
Stage 0 / 1	124	118	102	70
Stage 2	222	203	155	105
Stage 3 / 4	541	465	331	200

Key findings

The Audit has found that definitive chemoradiotherapy is being received by more patients in England and Wales. The evidence from the few randomised clinical trials suggest that definitive chemoradiotherapy is equivalent to surgery with respect to survival for patients with oesophageal SCC [Crosby et al 2013; Best et al 2016]. However, these clinical trials were performed on relatively fit patients and may not reflect outcomes of patients that can be achieved in normal clinical practice, where patients are of a more varied case mix.

These results lend some support to the perception that patients who have definitive oncology are, on average, older and more frail than those who have curative surgery. But, the differences between the two groups of patients are not as large as might be expected. There is greater variation between patients within each group. This suggests that patient preference might be as important as clinical factors in deciding on which therapy to have.

The limited size of clinical trials means that estimates of survival have not been provided for different stages of disease. The analysis of outcomes from these population-based audit data will hopefully provide some indication of what patients with specific stages of disease might expect if selecting definitive chemoradiotherapy.

9. Curative surgery

The majority of OG cancer patients suitable for curative treatment received surgery. Over time, the types of surgical procedures performed and the surgical approach used has changed, with an increasing use of minimally invasive surgical techniques. In this chapter, we describe the patterns of curative surgery and the short-term outcomes.

A total of 4,906 surgical records were submitted for patients diagnosed between April 2014 and March 2016, with 4,739 patients (96.6%) recorded as having curative intent: The type of surgery these patients had is described in Table 9.1:

- For patients having an oesophagectomy, the procedure was typically performed using the transthoracic approach (left thoraco-abdominal 9.6%, 2-phase 83.8%, 3-phase 6.7%)
- For stomach tumours, patients typically had either total or distal gastrectomy.

The proportion of open-and-shut/ bypass cases had reduced significantly since the first audit cycle (patients diagnosed between 2007 and 2009). In the current audit period, there were only 177 of these procedures - 3.7% (95%CI 3.2%, 4.3%). The majority of these were associated with stomach tumours. The proportion of patients with oesophageal tumours that had an open-and-shut procedure was less than 1%.

Table 9.1
Type of curative surgical procedures performed in patients diagnosed from April 2014 to March 2016, in England and Wales

	No. of operations	% (within procedure)
Oesophagectomy		
Transthoracic approach	2,851	95.4%
Transhiatal approach	127	4.2%
Thoractomy (open and shut)	11	0.4%
Gastrectomy		
Total gastrectomy	666	38.1%
Distal gastrectomy	701	40.1%
Other	217	12.4%
Laparotomy (open and shut)	148	8.5%
Bypass procedures	18	1.0%
Total	**4,739**	

An increasing number of surgical procedures were performed using minimally invasive (MI) techniques. These 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.

Fully minimally invasive oesophagectomies involve thoracoscopy for the chest-phase of the operation and laparoscopy for the abdominal phase. However, oesophagectomies can be performed using minimally invasive techniques for only the abdominal or chest phase. These are commonly referred to as hybrid operations.

The proportion (CI) of patients who had MI oesophagectomy was 40.8% (95% CI 39.0%, 42.7%) overall, of which three-quarters were hybrid procedures (Table 9.2).

The proportion of patients who had MI gastrectomy was much lower. Among 1,561 gastrectomies in which surgical approach was known, only 264 procedures (16.3%; 95% CI 14.4-18.2%) were performed using a MI technique.

Table 9.2
Use of minimally invasive surgical techniques during oesophagectomy operations performed on patients diagnosed from April 2014 to March 2016 in England and Wales

Oesophagectomy	Left thoraco abdominal	3-phase (Ivor Lewis)	2-phase (McKeown)
Open	234	1,259	73
Hybrid (includes converted)	36	776	45
Fully minimally invasive (includes converted)	0	221	46
Total	270	2,256	164
Proportion of MI (full/hybrid)	13.3	44.2	55.5
Proportion of hybrid MI	100.0	77.8	49.5
Data incomplete	2	132	27

9.1 Short-term outcomes of curative surgery

The outcomes of curative surgery have improved progressively since the first Audit [Palser et al 2010] with postoperative mortality rates decreasing significantly (Table 9.3). The time that patients spend in hospital after the operation has also fallen by an average of 2 days.

Table 9.3
Outcomes after curative surgery for patients diagnosed from April 2014 to March 2016 in England and Wales, compared for results from the first National OG Cancer Audit.

	Oesophagectomy		Gastrectomy	
	2007-2009	2014-2016	2007-2009	2014-2016
In hospital mortality (95% CI)	4.5 (3.7,5.5)	2.1 (1.6,2.7)	6.0(4.8,7.4)	2.0 (1.3,2.8)
30-day mortality (95%CI)	3.8 (3.1,4.7)	1.9 (1.5,2.5)	4.5 (3.4,5.7)	1.5 (1.0,2.2)
90-day mortality (95% CI)	5.7 (4.8,6.8)	3.3 (2.7,4.0)	6.9 (5.6,8.3)	3.1 (2.3,4.1)
Length of stay (days) Median (IQR)	14 (11,21)	12 (9,18)	11 (8,17)	9 (8,13)

The 30-day and 90-day postoperative mortality rates among the NHS trust / local health board levels are shown in Figure 9.1 using funnel plots. The organisational figures were based on 3-years of data to increase the number of cases on which they were derived, and were adjusted for differences in the distribution of age, sex, performance status, comorbidities, TNM stage, ASA grade and site of tumour. The funnel plots suggest that the underlying postoperative mortality rate at each NHS organisation is the same and each are performing to the same standard.

Since 2013, NOGCA has published information as part of the Clinical Outcome Programme (COP) on 30- and 90-day postoperative mortality rates, together with length of stay figures, for NHS trusts and consultants in England. This year, we will be reporting additional indicators at NHS organisational level to support local quality improvement.

The new indicators are:

1. Proportion of patients with 15 or more lymph nodes removed and examined (both oesophagectomies and gastrectomies)

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)

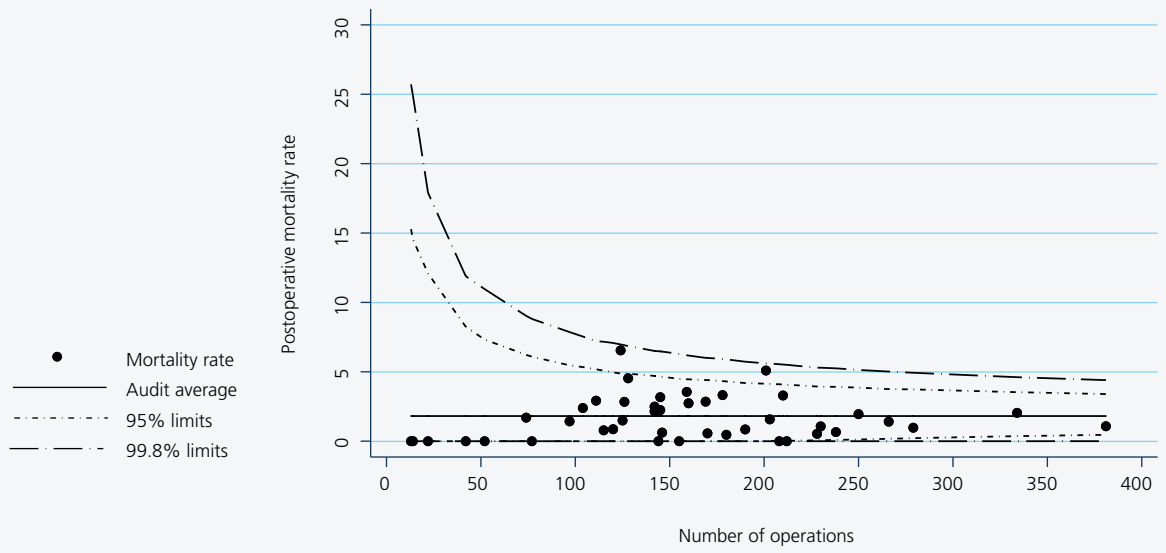
The surgical margin indicators were adjusted for overall postoperative stage and history of neoadjuvant therapy.

The additional indicators were selected on the basis of the recommendations in the AUGIS 2016 Provision of Services document [AUGIS 2016]. The figures for each NHS trust introduced in the 2016 Annual Report were considered to be preliminary due to the lack of a formal review of data completeness / quality. This year, data quality reports were sent to NHS trusts so that they had an opportunity to complete missing data and to amend any errors that might have occurred during data entry. It became apparent from our communication with the NHS trusts during the data quality exercise that there is variation in surgical practices and the interpretation of pathology specimens. In particular, there is a lack of standardisation within England and Wales in both the preparation of the surgical specimen after oesophagectomy and gastrectomy, and in the pathological preparation / examination of the surgical specimen. These variations clearly affect the lymph node yields and rates of positive margins that are reported (see Figure 9.2). It is therefore essential that the published figures are interpreted with caution. The figures show that some NHS trusts will have higher than average rates of positive margins or lower lymph node yields but, because one of the causes of the variation between NHS trusts will be the lack of standardisation, we will not initially be classifying NHS trusts with unusually high / low rates as outliers.

We expect the presentation of these new indicators will help to drive the standardisation of these surgical practices, and lead to an improvement in the quality of data collected. This will then support the development of these measures in the future as robust indicators of quality of surgery (and pathological examination). Figures are presented in Annex 9.

Figure 9.1
Funnel plots of adjusted 30- and 90-day postoperative mortality for patients diagnosed between April 2013 and March 2016 in England and Wales.

Adjusted 30-day mortality rates



Adjusted 90-day mortality rates

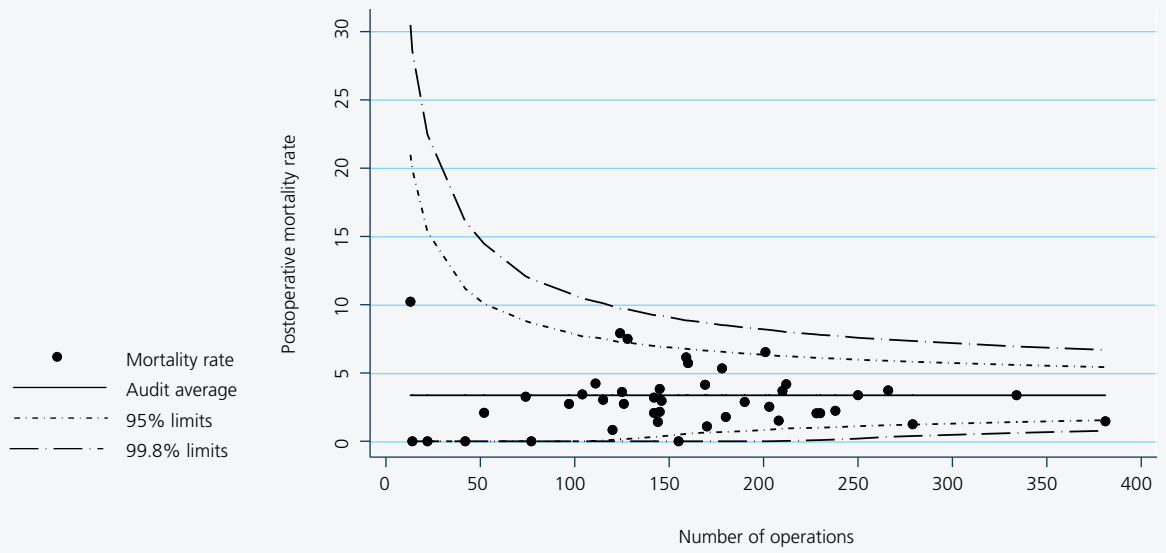
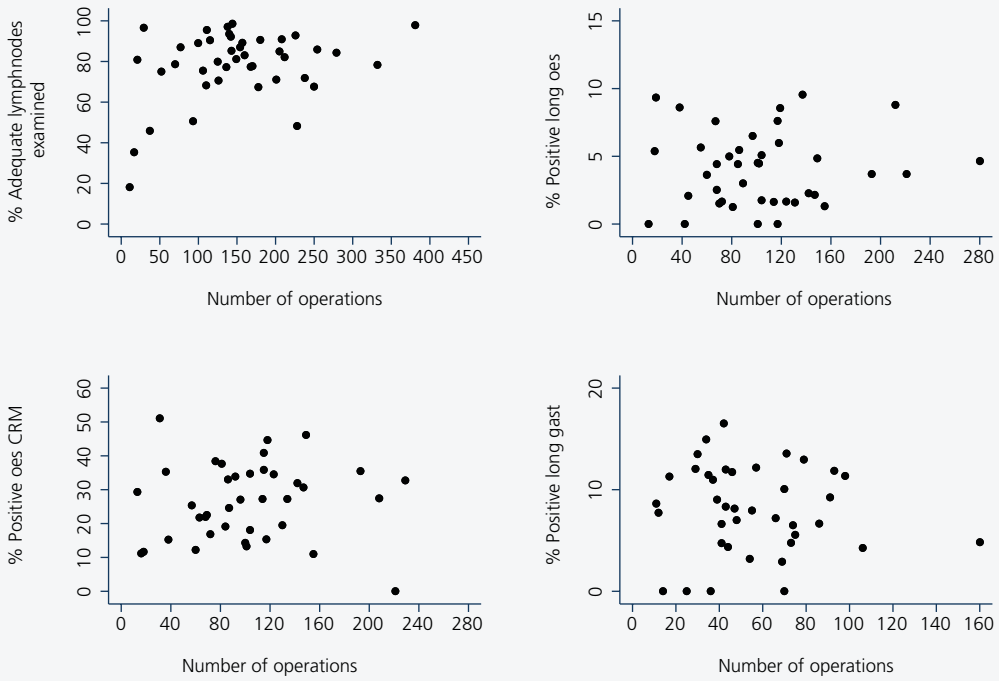


Figure 9.2
Graphs showing the values for the four new surgical indicators by NHS organisation by the volume of activity.



KEY: Four indicators are:
1. Proportion of patients with 15 or more lymph nodes examined (both procedures) -unadjusted
2. proportion of patients with positive longitudinal margins (oesophagectomy) - adjusted for overall TNM , history of neoadjuvant treatment
3. proportion of patients with positive circumferential margins (oesophagectomy) - adjusted for overall TNM, history of neo-adjuvant treatment
4. proportion of patients with positive longitudinal margins (gastrectomy) - adjusted for overall TNM, history of neo-adjuvant treatment

Each dot represents an NHS organisation

Patients undergoing surgery may experience complications, and the Audit records information on this. Information on complications among patients diagnosed in Wales has only been available recently, and so the figures reported here for the period April 2014 to March 2016 do not include patients from Wales. We last reported on complications in the 2015 NOGCA Annual Report and since then the data item on complications has been made mandatory, which would have resulted in better reporting. We advise against comparing these findings with the results in previous annual reports.

Table 9.3
Overall rates of postoperative in-hospital complications for patients with OG cancer in England from April 2014 to March 2016

	Oesophagectomy		Gastrectomy	
	Rate (%)	95% CI	Rate (%)	95% CI
Any complication	36.4	34.6-38.2	21.7	19.7-23.9
Anastomatic leak	6.3	5.5-7.3	3.0	2.2-4.0
Chyle leak	3.8	3.1-4.5	0.3	0.1-0.8
Cardiac complication	5.3	4.5-6.2	2.8	2.0-3.7
Wound infection	2.8	2.3-3.5	2.3	1.6-3.2
Respiratory	16.9	15.5-18.3	8.7	7.3-10.3
Unplanned surgery	10.2	9.1-11.5	6.5	5.2-8.0

Overall, patients having a gastrectomy had more specific complications compared to the patients who had oesophagectomies. The most common complication for oesophagectomy and gastrectomy was respiratory (which included infection, pulmonary effusion, pulmonary embolism and acute respiratory distress syndrome), which affected 16.9% and 8.7% of patients, respectively.

Perspective on the surgical results from Mr Nick Maynard

(Consultant Upper GI Surgeon, Oxford University Hospitals NHS Foundation Trust)

We expect cancer centres will welcome the organisational information on surgical margins and lymph node yields following oesophagectomy and gastrectomy. There is a clear correlation between positive surgical margins and patient outcomes, and rate of positive margins is now increasingly accepted as a marker of surgical quality. The link between lymph node yield and outcome is less clear, but radical lymph node dissections for oesophagectomy (2 field lymph node dissection) and gastrectomy (D2 lymph node dissection) are widely accepted as surgical standards of care in the United Kingdom. The AUGIS 2016 Provision of Services document includes surgical margins and lymph node yields as outcome standards for both oesophagectomy and gastrectomy. Factors other than surgery will affect the likelihood of a positive margin and influence the number of lymph nodes (for example, neoadjuvant therapy and quality of pathological examination), and data will of course be interpreted cautiously. The quality of the data we collect will improve, and we expect in due course that these measures will provide robust indicators of quality of surgery.

Key findings

All NHS trusts / local health boards in England and Wales have similar outcomes after curative surgery, and the overall rates of mortality continue to improve. To augment these results, we have added some additional surgical indicators on the number of lymph nodes examined and the rate of positive resection margins. Early exploration of these indicators has highlighted a lack of standardisation within England and Wales in both the preparation of the surgical specimen after oesophagectomy and gastrectomy, and in the pathological preparation / examination of the surgical specimen. This is something that needs to be addressed within the surgical and pathology community.

There is also a lack of standardisation in definition of surgical complications, which means that it is difficult to interpret difference in complication rates across NHS organisations. To address this issue, the Audit plans to incorporate the recently published standardised list of complications written by the International Esophagectomy Complications Consensus Group (ECCG) [Low et al 2015].

10. Non-curative OG cancer treatment patterns and outcomes

Two thirds of patients with OG cancer were managed with non-curative treatment intent after their diagnosis. Non-curative intent is frequently referred to simply as palliative intent and the Audit's data manual and proforma also reflect this practice. The traditional aims of palliative therapy are symptom control (e.g. relief of pain or difficulty swallowing), improving quality of life and lengthening the duration of survival. Patients on a non-curative care pathway have various treatment options available to them – e.g. palliative chemotherapy or endoscopic/radiological therapy – but whether or not a patient receives a particular therapy will depend upon their condition and preference [Allum et al 2011]. Nonetheless, a common management approach remains "best supportive care" which is characterised by no active treatment beyond the immediate relief of symptoms.

Palliative Treatment Options:

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 treat dysphagia with few side effects, but benefit is comparatively slow to achieve compared to stenting.

Brachytherapy can be used to treat dysphagia with few adverse effects, and should be considered if life expectancy is more than 3 months.

Endoscopic /radiological therapy

- Stenting provides rapid relief of dysphagia in a one-stage procedure; useful if life expectancy short.
- Laser therapy and argon plasma coagulation (APC) can both be used to relieve dysphagia due to tumours of oesophagus and GOJ and are particularly useful for treating tumour ingrowth above and below a stent. However, both techniques require multiple sessions and can be poorly tolerated.

As has been noted in the treatment planning chapter, 12,600 patients were unable to benefit from curative treatment and thus followed a non-curative pathway or were planned not to receive any active treatment (best supportive care). The most frequently reported reason for a non-curative pathway was advanced disease stage (68%) followed by significant comorbidities or poor performance status (37%).

As noted earlier, the most common non-curative treatment modality was palliative oncology (chemotherapy and/or radiotherapy) (50%), but the selection of the planned treatment modality was dependent upon the tumour location. For instance, three times as many patients with oesophageal tumours had endoscopic/ radiological palliation (typically used to relief the symptoms of dysphagia – difficulty swallowing) than patients with stomach tumours (16% vs. 5%). In addition, a much higher proportion of patients with stomach tumours received "best supportive care" than patients with oesophageal tumours (48% vs. 29%).

10.1 Endoscopic/radiological palliative therapy

Table 10.1 provides a more detailed look at the various endoscopic and radiological non-curative procedures recorded by the Audit. Stenting was the single most frequently conducted procedure to relieve patients of their symptoms. It was reported for 72% of patients receiving endoscopic / radiological palliation and it was also reported together with 38% of palliative oncology treatments and 7% of patients on best supportive care. The absolute numbers of other procedures were relatively small. It is of note that brachytherapy was only used in three of the 19 English Cancer Alliances, a situation that has not changed since the 2013 Annual Report.

Table 10.1
Number of endoscopic/radiological non-curative therapeutic procedures by OG cancer site (first recorded procedure in NOGCA), in England and Wales (patients diagnosed between April 2014 and March 2016)

Procedure	Oesophageal SCC	Oes ACA Upper/Mid	Oes ACA Lower/SI	SII /SIII ACA	Stomach	All sites
Stent Insertion	692	197	1,011	198	229	2,327
Laser Ablation	<5	5	14	<5	<5	25
Brachytherapy	18	<5	5	<5	<5	31
Dilatation	25	<5	30	<5	<5	63
Other	7	9	7	<5	13	39

SCC=squamous cell carcinoma; ACA=adenocarcinoma; SI, SII, SIII= Siewert I, II, III.
Other includes Gastrostomy and Argon plasma coagulation
Excludes non-curative therapeutic procedures applied to patients who (initially) followed a curative pathway: 305 stents, 84 dilatations.

Table 10.2 describes the type of stent and the method of stent placement. Both stent type and placement procedure were unknown in 40%, which includes all Welsh patients. Metal covered stents dominated clinical practice overall, especially for patients with oesophageal cancer, while uncovered metal stents were slightly more frequently used in patients with stomach cancer.

There has been some debate among clinicians on the best method of stent placement. In this audit period, the combination of endoscopic and fluoroscopic guidance was the most likely option in patients suffering from all types of tumours (44%). Nevertheless, single endoscopic or fluoroscopic guided insertion were still used relatively frequently (32% and 24%, respectively). Figure 10.1 highlights there was a high degree of regional variation. In three Cancer Alliances, most stents were placed with the combination technique; in contrast, two Cancer Alliances relied overwhelmingly on fluoroscopic guidance alone. The data used in this figure, as well as that used in all other figures showing regional variation in this chapter, are presented in Annex 10. Where appropriate, the figures are also presented as Cancer Alliance maps in Annex 11.

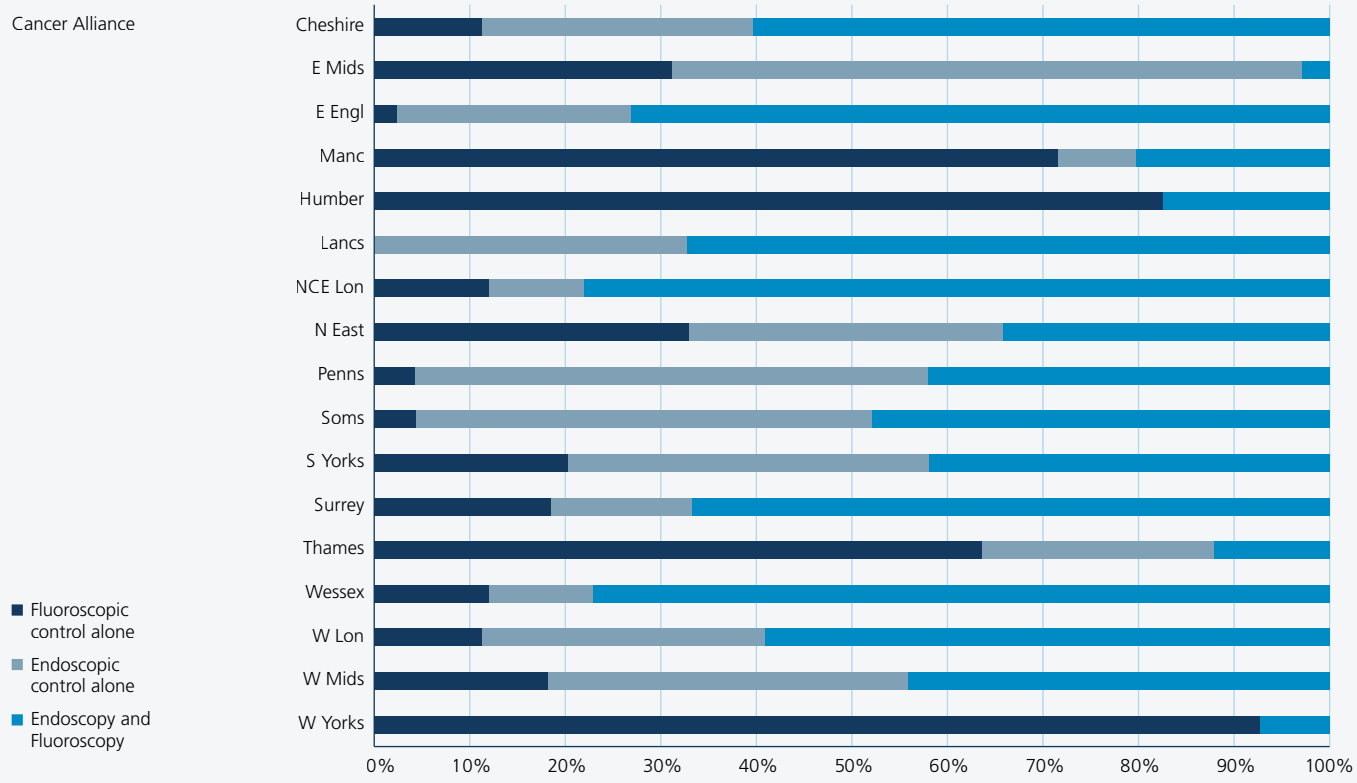
The median time between diagnosis and stent insertion was approximately 24 days (IQR 10-50). Almost 98% of palliative stenting procedures were without immediate complications. Among the cases in which complications were reported, postoperative strictures were reported in 19 cases, perforations in 6 cases and haemorrhage occurred in 5 cases. Overall, 59% of patients who had a stent survived for longer than three months, a similar figure to the 57% reported in 2013 [Chadwick et al 2013]. Short-term survival was not related to type of stent or method of stent placement after controlling for tumour site, clinical stage and the patient's age.

Table 10.2
Characteristics of stent procedure by OG cancer site (first recorded procedure in NOGCA), in England (patients diagnosed between April 2014 and March 2016)

	Oesophageal SCC	Oes ACA Upper/Mid	Oes ACA Lower/SI	SII/SIII ACA	Stomach	All sites
Stent type, (%)						
Plastic	1.8	0.8	1.6	3.5	1.5	1.7
Metal: Covered	82.7	81.5	75.3	75.9	63.0	76.9
Metal: Uncovered	6.5	8.9	10.7	7.8	25.9	10.4
Metal: Anti-reflux	5.4	8.1	8.6	8.6	4.4	7.2
Biodegradable	1.4	0.0	1.8	1.7	1.5	1.5
Other	2.2	0.8	2.1	2.6	3.7	2.2
n (type known)	446	124	684	116	135	1,505
Method of placement, (%)						
Fluoroscopic control alone	25.2	31.5	21.6	24.6	25.2	24.0
Endoscopic control alone	30.2	30.8	33.1	32.7	30.2	31.7
Endoscopy and Fluoroscopy	44.7	37.7	45.4	42.7	44.6	44.2
n (method known)	441	130	699	110	139	1,519

Details of procedures were not provided by Welsh local health boards

Figure 10.1
Distribution of methods of stent placement, by Cancer Alliance in England (patients diagnosed between April 2014 and March 2016)



Two alliances with fewer than 20 procedures omitted

10.2 Palliative oncology

There were 6,340 patients whose initial treatment plan was palliative oncology. Among these, 5,606 patients (88%) had the model of oncology (chemotherapy, radiotherapy) recorded. Palliative chemotherapy alone was the most common treatment (70.2%), with palliative radiotherapy (24.2%) also used relatively frequently. The choice of oncology modality varied across tumour sites (Table 10.3). Chemotherapy alone was used for four-fifths of stomach tumours and Siewert II/III tumours. In comparison, the use of chemotherapy and radiotherapy was more evenly split for oesophageal squamous cell carcinomas (SCC).

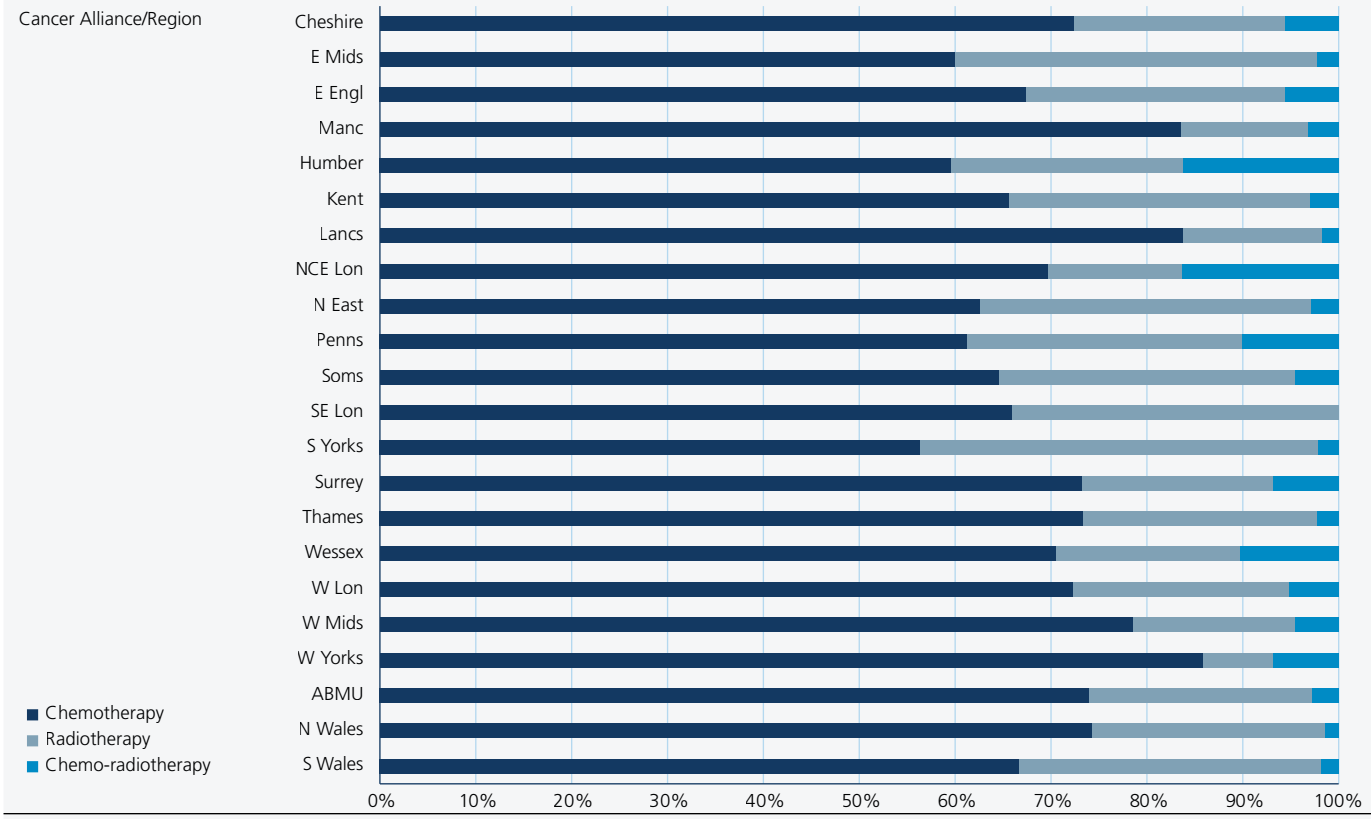
As with other aspects of treatment reported in this chapter, there is a fair degree of regional variation (Figure 10.2). The combination of chemo- and radiotherapy, in particular, was rarely used in eight of the 19 English Cancer Alliances and equally rarely in the three Welsh regions.

Table 10.3
Planned palliative oncology treatment modality (first oncological treatment) according to tumour site, in England and Wales (patients diagnosed between April 2014 and March 2016)

	Oesophageal SCC	Oes ACA Upper/ Mid	Oes ACA Lower/SI	SII/SIII ACA	Stomach	All sites
Treatment modality, n (%)						
Chemotherapy	641 (53.0)	229 (61.2)	1,581 (73.3)	506 (77.6)	979 (80.8)	3,936 (70.2)
Radiotherapy	426 (35.2)	116 (31.0)	479 (22.2)	123 (18.9)	215 (17.7)	1,359 (24.2)
Chemo-radiotherapy	143 (11.8)	29 (7.8)	98 (4.5)	23 (3.5)	18 (1.5)	311 (5.6)
Total	1,210	374	2,158	652	1,212	5,606

SCC=squamous cell carcinoma; ACA=adenocarcinoma; SI, SII, SIII= Siewert I, II, III.

Figure 10.2
Proportion of non-curative patients who were planned to receive each treatment modality (first oncological treatment), by Cancer Alliance in England and region in Wales (patients diagnosed April 2014 – March 2016)



Two alliances with fewer than 20 procedures omitted

The records of Audit patients were linked to data from the National Radiotherapy Dataset (RTDS) and (for the first time) data from the Systemic Anti-Cancer Therapy dataset (SACT). These two datasets are managed by the National Cancer Registration and Analysis Service (NCRAS) and capture information on patients that receive oncological therapy in England. Data on radiotherapy and chemotherapy are not collected in Wales in the same way as England, and so the results in this section only relate to patients treated in England. The two datasets were linked to the Audit records of patients diagnosed between April 2014 and March 2016 (SACT treatment records being available until summer 2016 and RTDS records until spring 2016).

The aim of this section is to highlight the distributions of typical regimens used as first treatments and to explore regional variations. Both RTDS and SACT data were used after the following selection conditions were applied to the linked dataset:

- The patient had a first oncology record in NOGCA that was reported to be an actual application of either chemotherapy or radiotherapy with non-curative intent (this excludes combined therapies and those patients with an initial non-curative treatment plan but who then had neoadjuvant or adjuvant procedures recorded first).
- A SACT or RTDS record could be linked with close temporal proximity to the recorded first oncological record in NOGCA (this excludes treatment episodes that were recorded in SACT or RTDS before or after the relevant record in NOGCA).
- The SACT and RTDS records were restricted to the first recorded treatment cycle that fulfilled above criteria.

Within the NOGCA dataset, 3,587 patients had a first oncology record with non-curative treatment intent and chemotherapy only treatment modality. Of those, 2,446 (68%) had a matching SACT record for a first cycle within +/- 14 days of the recorded date.

Eleven drug regimens (Table 10.4) accounted for approx. 90% of administered first cycles. The combination chemotherapy EOX (epirubicin, oxaliplatin and capecitabine) was the most commonly used regimen in non-curative OG cancer patients and this has demonstrated effectiveness as a first-line chemotherapy, although a high proportion of patients may experience toxicity side-effects.

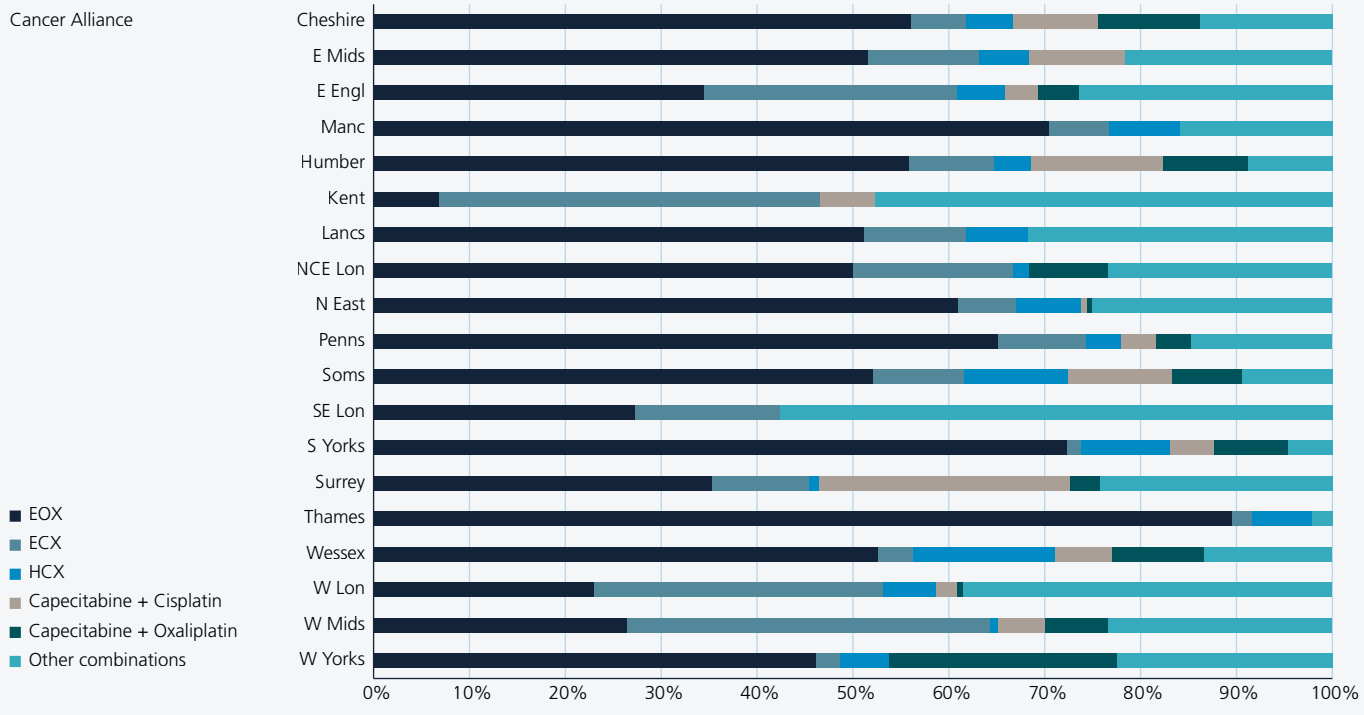
As with all previous aspects of palliative care reported in this chapter, there is pronounced regional variation (Figure 10.3). In two of the 19 English Cancer Alliances, drug combinations other than the top five shown in Table 10.4 are used in approx. 50% of first cycle applications.

Table 10.4
Most frequently used chemotherapy drugs and combinations (first palliative chemotherapy cycle in NOGCA & SACT) according to tumour site, in England (patients diagnosed April 2014 – March 2016)

Drug or drug combination (%)	Oes SCC	Oes ACA Upper/ Mid	Oes ACA Lower/ SI	SII/SIII ACA	Stomach	All sites
EOX	31.4	48.5	50.3	49.2	51.2	47.1
ECX	9.8	16.7	16.5	15.9	15.2	15.0
HCX	1.2	9.9	6.6	7.1	4.9	5.5
Capecitabine + cisplatin	17.1	3.0	3.4	3.1	2.1	5.3
Capecitabine + oxaliplatin	4.6	2.3	4.9	4.4	7.1	5.2
Capecitabine + carboplatin	4.4	5.3	2.9	2.7	4.7	3.7
Cisplatin + fluorouracil	9.5	0.0	0.8	1.0	0.6	2.2
Ecarbox	1.0	3.8	1.8	1.0	2.2	1.8
Carboplatin + etoposide	5.6	1.5	0.4	1.0	0.6	1.5
Oxaliplatin + MDG	1.0	0.8	1.3	1.4	1.6	1.3
ECF	1.2	0.8	1.3	1.0	1.1	1.2
Other combinations	13.2	7.6	9.8	12.2	8.7	10.2

Key: EOX epirubicin, oxaliplatin and capecitabine; ECX: epirubicin, cisplatin, capecitabine; HCX: herceptin cisplatin, capecitabine; ECF: epirubicin, cisplatin, fluorouracil
The analysis omitted 70 treatments that were part of clinical trials and 28 that did not have valid drugs.

Figure 10.3
Top 5 drugs and combinations used in first cycles for palliative chemotherapy, by Cancer Alliance in England (patients diagnosed between April 2014 and March 2016)



Key: EOX epirubicin, oxaliplatin and capecitabine; ECX: epirubicin, cisplatin, capecitabine; HCX: herceptin cisplatin, capecitabine

Radiotherapy is provided in the form of standardised radiation doses spread over a number of visits (referred to as fractions). The Royal College of Radiologists (RCR) recommends four evidence-based treatment regimens for non-curative treatment of oesophageal cancer [RCR 2017]. Radiotherapy is not a recommended treatment option for gastric cancer managed with non-curative intent and the figures shown below refer only to oesophageal tumours.

There were 1,322 patients in NOGCA that had a first oncology record with non-curative treatment intent for oesophageal cancer and radiotherapy only treatment modality. Of those, 932 (70%) had a matching RTDS record for completed radiotherapy within +/- 14 days of the recorded date. It should be noted that RTDS treatment details were only available until March 2016, i.e. the same month in which the last patients of this cohort were diagnosed.

Table 10.5 shows the distribution of radiotherapy doses and fractions prescribed as first palliative radiotherapy. Overall:

- 64% of patients followed a regimen recommended by the RCR and
- 59% of patients received the prescribed evidence based dose in the planned number of fractions. This is the same value that was reported for 2012-2013 RTDS data in last year's annual report.
- A further 13% of patients followed a commonly used regimen for palliative management, namely, a single 8Gy fraction. This is likely to be used for pain control of metastatic disease or to treat bleeding oesophageal lesions.

A total of nearly 22% of patients were apparently following a variety of non-evidenced based regimens. In most cases, patients completed these regimens, but less than a quarter of patients with non-evidence based regimens received an overall dose that was significantly less than the one prescribed.

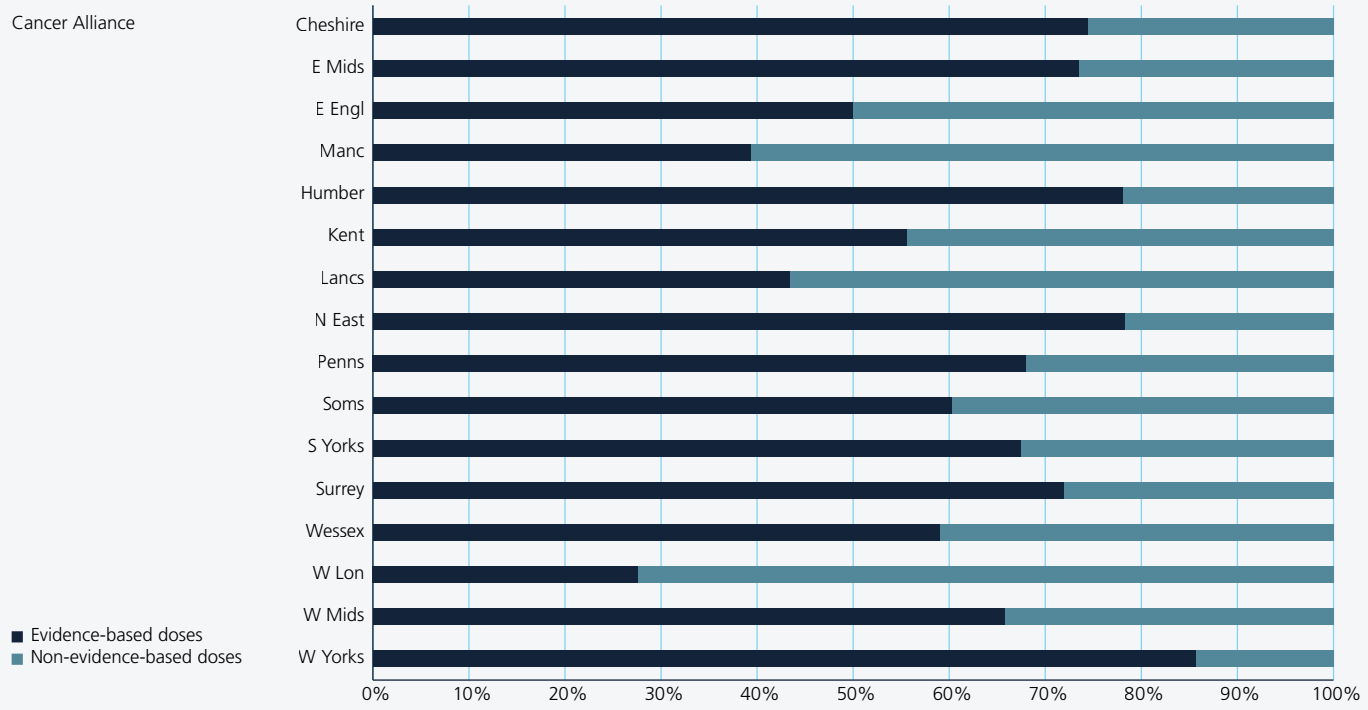
Again, there was pronounced regional variation in the proportion of evidence-based radiotherapy regimens being used (Figure 10.4).

Table 10.5
Prescribed radiotherapy doses and fractions administered for non-curative purposes in oesophageal cancer (first treatments April 2014 to March 2016), in England

	Dose (Gy)	Number of fractions	Number of patients	%
Non-curative evidence based doses				
Grade C	30	10	285	30.6
Grade D	20	5	301	32.3
Grade D	40	15	12	1.3
Grade C	35	15	0	0.0
Curative evidence based doses	55	20	13	1.4
Non-evidence-based doses	8	1	120	12.9
	27	6	37	4.0
	36	12	27	2.9
	20	4	15	1.6
	10	1	12	1.3
	50	25	9	1.0
	9	3	9	1.0
	8	2	5	0.5
Other non-evidence-based doses used in 5 or fewer patients			87	9.3
Total			**932**	

* 261 patients received the exact prescribed dose and number of fractions
** 275 patients received the exact prescribed dose and number of fractions

Figure 10.4
Evidence-based vs. non-evidence-based palliative radiotherapy doses, by Cancer Alliance in England (patients diagnosed between April 2014 and March 2016)



Cancer Alliances with fewer than 20 first radiotherapy treatments were omitted

Perspective from Professor Sam Ahmedzai

(Emeritus Professor of Palliative Medicine, The University of Sheffield)

The results in this year's NOGCA report on non-curative management of oesophago-gastric (OG) cancer engender a mixed response from me, as a supportive and palliative care physician. Cutting through the wealth of information, the important message emerging is that there were unacceptable levels of variation across England and sometimes Wales.

First, with respect to chemotherapy, we find a bewildering array of doublet and triplet regimens being used to differing extents across the country. It is hard to understand how such a mixture can exist, compared to the standardisation in some other solid tumours. The new guidance being prepared by NICE on management of OG cancer should reduce this.

Regional variation was also seen in the radiotherapy regimes, and it is surprising that nearly a quarter of radiotherapy schedules were non-evidence based. This perhaps reflects the ability of clinical oncologists to finely tailor the dosing for each patient, which may be a good thing.

The third type of non-curative management is endoscopic palliation. It is reassuring to see that the types of intervention used were largely appropriate, albeit with the persistently low usage of brachytherapy. I also feel that the variation in the method of stent placement (endoscopic or fluoroscopically guided) requires explanation.

Ultimately, all these non-curative therapies are important for patients whose expected survival is short. Unfortunately, the NOGCA results cannot tell us about the speed and duration of symptom relief after treatment, recovery and maintenance of nutritional intake and finally, the quality of dying that these interventions achieve. These aspects of care should not be forgotten by local services when thinking about their results.

Key findings

All aspects of non-curative treatment planning and clinical practice reveal pronounced regional variation at the level of English Cancer Alliances and – where available – Welsh regions. Some of this variation probably reflects the limited clinical evidence to support clinical decision making, and some variation is also likely to reflect patient preferences. However, we found that a significant proportion of patients were following radiotherapy treatment patterns for which there was no strong evidence and whether this is justified should be examined within Cancer Alliances.

The findings should stimulate local investigation and clinical debate on the reasons for the reported variations. It is likely that the existence of such pronounced variation in itself highlights the lack of evidence on how best to treat patients with non-curative treatment intent and therefore might point towards areas where further research could be especially fruitful.

Annexes

Annex 1: Organisation of the Audit

The project 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.

The project is overseen by a Project Board, which has senior representatives from the four participating organisations and the funding body.

Members of Clinical Reference Group		
Jan van der Meulen (chair)	Professor of Clinical Epidemiology	London School of Hygiene and Tropical Medicine
Mike Hallisey	Consultant Surgeon Birmingham	Association of Cancer Surgeons
David McKinlay	Programme Manager	Healthcare Quality Improvement Partnership (HQIP)
Bill Allum	Consultant Surgeon	Member of Specialised Cancer Surgery Commissioning Group
Nic Mapstone	Consultant Pathologist	Royal College of Pathologists
Hans-Ulrich Laasch	Consultant Radiologist	Royal College of Radiologists
Sam Ahmedzai	Emeritus Professor of Supportive Care Medicine	Palliative Care Representative
Nick Carroll	Consultant Radiologist and Endoscopist	UK EUS Users Group
Fiona Huddy	Specialist Dietician	British Dietetic Association Oncology Group
Richard Roope	RCGP/CRUK Clinical Lead for Cancer	Durham University
John Taylor	Patient representative	Oesophageal Patient Association
with members of the project team		

Members of Project Board	
Jan van der Meulen (chair)	London School of Hygiene and Tropical Medicine
Richard Hardwick	Association of Upper GI Surgeons (AUGIS)
Diana Tait	Royal College Radiologists (RCR)
Alison Roe	NHS Digital
David McKinlay	Healthcare Quality Improvement Partnership (HQIP)
Kirsten Windfuhr	Healthcare Quality Improvement Partnership (HQIP)
with members of the 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. This information was combined with other available datasets to provide a rich description of the care process and to minimise the burden of data collection on clinical staff.

Data collection

All NHS 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 http://www.nogca.org.uk.

Welsh data was 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.

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:

- Office for National Statistics (ONS) 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

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 to calculate Audit case ascertainment

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 (Abertawe Bro Morgannwg, 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, Alliance rates are plotted against the overall National rate, with Alliances ordered according to the number of patients on 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 (e.g. 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 30-day and 90-day mortality rates for patients who underwent curative surgery for each NHS trust. The rates were adjusted to take into account differences in the case mix of patients treated at each centre using a flexible parametric survival model. This model was used to estimate the risk of death for each individual having surgery, and these were then summed to calculate the predicted number of deaths for each NHS trust. The regression models included the following patient characteristics: age at diagnosis, gender, co-morbidities, performance status, overall stage of tumour, site of tumour and ASA grade.

We present the organisational postoperative mortality rates after curative surgery 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 Department of Health "Detection and Management of Outliers" policy, published in January 2011. This policy involves giving the organisation an opportunity to review their data to ensure it is 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 will also be informed.

The results of NHS trusts with a case volume of fewer 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 in England and Wales

Cancer Alliance/Vanguard 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
	REP	Liverpool Women's NHS Foundation Trust
	REN	The Clatterbridge Cancer Centre NHS Foundation Trust
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust
	RNQ	Kettering General Hospital NHS Foundation Trust
	RNS	Northampton General Hospital NHS Trust
	RTG	Derby Hospitals 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	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
	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
	RGN	Peterborough and Stamford Hospitals 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
	RQQ	Hinchingbrooke Health Care NHS Trust
	RAJ	Southend University Hospital NHS Foundation Trust
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust
	RDE	Colchester Hospital University NHS Foundation Trust
	RGQ	Ipswich Hospital NHS Trust
	RQ8	Mid Essex Hospital Services NHS Trust
Greater Manchester	RM2	University Hospital of South Manchester 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
	RW3	Central Manchester University Hospitals NHS Foundation Trust
	RW6	Pennine Acute Hospitals NHS Trust
	RWJ	Stockport NHS Foundation Trust
	RBV	The Christie NHS Foundation Trust
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust
	RWA	Hull and East Yorkshire Hospitals NHS Trust

Cancer Alliance/Vanguard 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
	RPC	Queen Victoria Hospital NHS Foundation 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 and North East London	RAL	Royal Free London NHS Foundation Trust
	RAP	North Middlesex University Hospital NHS Trust
	RKE	The Whittington Hospital NHS Trust
	RRV	University College London Hospitals NHS Foundation Trust
	R1H	Barts Health NHS Trust
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust
	RQX	Homerton University Hospital NHS Foundation Trust
North East and Cumbria	RE9	South Tyneside NHS Foundation Trust
	RLN	City Hospitals Sunderland NHS Foundation Trust
	RNL	North Cumbria University Hospitals NHS 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	Plymouth Hospitals 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
	RBA	Taunton and Somerset NHS Foundation Trust
	RD1	Royal United Hospitals Bath 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
South Yorkshire, Bassetlaw and North Derbyshire	RFF	Barnsley Hospital NHS Foundation Trust
	RFR	The Rotherham NHS Foundation Trust
	RFS	Chesterfield Royal Hospital NHS Foundation Trust
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust

Cancer Alliance/Vanguard or Welsh Region	NHS Trust/ Health Board code	NHS Trust/Health Board name
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
	RN3	Great Western Hospitals 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 London	R1K	London North West Healthcare NHS Trust
	RAS	The Hillingdon Hospitals NHS Foundation Trust
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust
	RT3	Royal Brompton and Harefield NHS Foundation Trust
	RPY	The Royal Marsden 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
West Midlands	RBK	Walsall Healthcare NHS Trust
	RR1	Heart of England NHS Foundation 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
	RJF	Burton Hospitals NHS Foundation Trust
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust
	RCD	Harrogate and District 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

Cancer Alliance/Vanguard or Welsh Region	NHS Trust/ Health Board code	NHS Trust/Health Board name
North Wales	7A1	Betsi Cadwaladr University Local Health Board
South Wales	7A2	Hywel Dda University Local Health Board
	7A4	Cardiff & Vale University Local Health Board
	7A5	Cwm Taf University Local Health Board
	7A6	Aneurin Bevan University Local Health Board
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board

Annex 4: Management of high grade dysplasia (HGD) by NHS Trusts (over 2012-2016, 4 years of data)

HGD Alliance figures														
Cancer Alliance	**N First diagnosis confirmed by second pathologist**	**% First diagnosis confirmed by second pathologist**	**N Quadratic biospy performed**	**% Quadratic biospy performed**	**N HGD plan discussed at MDT**	**% HGD plan discussed at MDT**	**N Treatment plan for active treatment**	**% Treatment plan for active treatment**	**N Surveil-lance/ no active treatment**	**% Surveil-lance/ no active treatment**	**N Curative surgical resection**	**% Curative surgical resection**	**N Endoscopic treatment**	**% Endoscopic treatment**
Cheshire and Merseyside	48	76.2%	10	43.5%	51	63.0%	57	74.0%	20	26%	4	5%	53	69%
East Midlands	125	96.2%	13	72.2%	128	94.1%	105	79.5%	27	20%	2	2%	103	78%
East of England	167	90.3%	44	86.3%	170	95.0%	138	81.7%	31	18%	2	1%	136	80%
Greater Manchester	70	90.9%	30	85.7%	102	91.1%	75	75.0%	25	25%	5	5%	70	70%
Humber, Coast and Vale	15	88.2%	8	53.3%	12	80.0%	12	75.0%	4	25%	1	6%	11	69%
Kent and Medway	47	79.7%	14	63.6%	27	90.0%	6	21.4%	22	79%	1	4%	5	18%
Lancashire and South Cumbria	29	80.6%	9	75.0%	26	74.3%	18	51.4%	17	49%	1	3%	17	49%
North Central and East London	33	75.0%	11	61.1%	88	82.2%	100	96.2%	4	4%	2	2%	98	94%
North East and Cumbria	121	89.0%	28	73.7%	139	93.9%	103	68.7%	47	31%	15	10%	88	59%
Peninsula	36	80.0%	6	50.0%	40	75.5%	24	39.3%	37	61%	3	5%	21	34%
Somerset, Wiltshire, Avon & Gloucestershire	61	84.7%	11	61.1%	48	69.6%	56	83.6%	11	16%	1	1%	55	82%
South East London	37	92.5%	12	80.0%	53	88.3%	48	81.4%	11	19%	1	2%	47	80%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	42	89.4%	11	78.6%	50	98.0%	42	85.7%	7	14%	2	4%	40	82%
Surrey and Sussex	34	82.9%	2	33.3%	28	90.3%	17	54.8%	14	45%	2	6%	15	48%
Thames Valley	28	87.5%	14	70.0%	23	71.9%	25	80.6%	6	19%	1	3%	24	77%
Wessex	78	87.6%	24	75.0%	138	81.7%	132	77.6%	38	22%	6	4%	126	74%
West London	56	91.8%	11	84.6%	56	94.9%	43	72.9%	16	27%	1	2%	42	71%
West Midlands	47	59.5%	17	60.7%	89	80.9%	62	55.4%	50	45%	9	8%	53	47%
West Yorkshire	44	57.9%	12	52.2%	86	92.5%	76	80.9%	18	19%	9	10%	67	71%

HGD trust figures are presented separately for number of diagnoses and number of treatment plans. Percentages of selected indicators are reported if at least 10 patients with valid data were submitted to the audit.

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
Cheshire and Merseyside	RBL	Wirral University Teaching Hospital NHS Foundation Trust	9			5		
	RBN	St Helens and Knowsley Hospitals NHS Trust	5			0		
	RBT	Mid Cheshire Hospitals NHS Foundation Trust	3			2		
	REM	Aintree University Hospital NHS Foundation Trust	9			13	92%	77%
	RJN	East Cheshire NHS Trust	3			4		
	RJR	Countess of Chester Hospital NHS Foundation Trust	6			6		
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	60	70%	20%	54	45%	78%
	RVY	Southport and Ormskirk Hospital NHS Trust	2			1		
	RWW	Warrington and Halton Hospitals NHS Foundation Trust	4			0		
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust	2			2		
	RNQ	Kettering General Hospital NHS Foundation Trust	5			0		
	RNS	Northampton General Hospital NHS Trust	5			3		
	RTG	Derby Hospitals NHS Foundation Trust	16	100%		14	93%	62%
	RWD	United Lincolnshire Hospitals NHS Trust	3			1		
	RWE	University Hospitals of Leicester NHS Trust	27	96%		34	91%	79%
	RX1	Nottingham University Hospitals NHS Trust	80	95%		85	98%	84%

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
East of England	RAJ	Southend University Hospital NHS Foundation Trust	7			3		
	RC1	Bedford Hospital NHS Trust	4			0		
	RC9	Luton and Dunstable University Hospital NHS Foundation Trust	6			5		
	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	9			4		
	RD8	Milton Keynes Hospital NHS Foundation Trust	12	58%		9		
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	13	92%		5		
	RDE	Colchester Hospital University NHS Foundation Trust	13	80%		6		
	RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	4			0		
	RGP	James Paget University Hospitals NHS Foundation Trust	8			7		
	RGQ	Ipswich Hospital NHS Trust	9			5		
	RGR	West Suffolk NHS Foundation Trust	7			3		
	RGT	Cambridge University Hospitals NHS Foundation Trust	53	98%	100%	73	99%	97%
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	16	100%		25	100%	100%
	RQ8	Mid Essex Hospital Services NHS Trust	4			19	95%	74%
	RQQ	Hinchingbrooke Health Care NHS Trust	9			1		
	RQW	The Princess Alexandra Hospital NHS Trust	4			0		
	RWG	West Hertfordshire Hospitals NHS Trust	14	77%		15	100%	100%
	RWH	East and North Hertfordshire NHS Trust	6			1		
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	2			2		
	RM3	Salford Royal NHS Foundation Trust	20	94%		40	98%	72%
	RMC	Bolton NHS Foundation Trust	2			2		
	RMP	Tameside and Glossop Integrated Care NHS Foundation Trust	1			0		
	RRF	Wrightington, Wigan and Leigh NHS Foundation Trust	15			9		
	RW3	Central Manchester University Hospitals NHS Foundation Trust	48	100%	86%	55	95%	84%
	RW6	Pennine Acute Hospitals NHS Trust	17	69%		4		
	RWJ	Stockport NHS Foundation Trust	4			0		
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust	10			1		
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust	5			3		
	RWA	Hull and East Yorkshire Hospitals NHS Trust	10			12	75%	92%

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
Kent and Medway	RN7	Dartford and Gravesham NHS Trust	14	100%		2		
	RPA	Medway NHS Foundation Trust	10			7		
	RVV	East Kent Hospitals University NHS Foundation Trust	27	57%	45%	15	83%	15%
	RWF	Maidstone and Tunbridge Wells NHS Trust	26	88%		11	91%	
Lancashire and South Cumbria	RTX	University Hospitals of Morecambe Bay NHS Foundation Trust	1			0		
	RXL	Blackpool Teaching Hospitals NHS Foundation Trust	7			6		
	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	9			10	100%	70%
	RXR	East Lancashire Hospitals NHS Trust	22	91%		20	75%	32%
North Central and East London	R1H	Barts Health NHS Trust	11	90%		7		
	RAL	Royal Free London NHS Foundation Trust	3			0		
	RAP	North Middlesex University Hospital NHS Trust	1			1		
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	7			1		
	RKE	The Whittington Hospital NHS Trust	2			0		
	RRV	University College London Hospitals NHS Foundation Trust	26	63%	58%	99	82%	98%
North East and Cumbria	RE9	South Tyneside NHS Foundation Trust	5			0		
	RLN	City Hospitals Sunderland NHS Foundation Trust	5			1		
	RNL	North Cumbria University Hospitals NHS Trust	16	93%		2		
	RR7	Gateshead Health NHS Foundation Trust	14	100%		0		
	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	45	98%	74%	108	95%	75%
	RTF	Northumbria Healthcare NHS Foundation Trust	16	79%		3		
	RTR	South Tees Hospitals NHS Foundation Trust	1			0		
	RVW	North Tees and Hartlepool NHS Foundation Trust	19	82%		5		
	RXP	County Durham and Darlington NHS Foundation Trust	22	77%	70%	11	100%	36%
Peninsula	RA9	Torbay and South Devon NHS Foundation Trust	6			5		
	RBZ	Northern Devon Healthcare NHS Trust	6			3		
	REF	Royal Cornwall Hospitals NHS Trust	19	71%		19	79%	21%
	RH8	Royal Devon and Exeter NHS Foundation Trust	15	100%	60%	15	87%	73%
	RK9	Plymouth Hospitals NHS Trust	20			24	36%	25%

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
Somerset, Wiltshire, Avon & Gloucestershire	RA3	Weston Area Health NHS Trust	4			2		
	RA4	Yeovil District Hospital NHS Foundation Trust	2			0		
	RA7	University Hospitals Bristol NHS Foundation Trust	15	93%		26	46%	92%
	RBA	Taunton and Somerset NHS Foundation Trust	4			2		
	RD1	Royal United Hospitals Bath NHS Foundation Trust	3			0		
	RNZ	Salisbury NHS Foundation Trust	15	100%		3		
	RTE	Gloucestershire Hospitals NHS Foundation Trust	35	81%		36	86%	86%
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	16	100%		63	88%	81%
	RJ2	Lewisham and Greenwich NHS Trust	12	92%		0		
	RJZ	King's College Hospital NHS Foundation Trust	14	85%		0		
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RFF	Barnsley Hospital NHS Foundation Trust	8			1		
	RFR	The Rotherham NHS Foundation Trust	5			2		
	RFS	Chesterfield Royal Hospital NHS Foundation Trust	6			1		
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	16	93%		41	98%	92%
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	18	80%		7		
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	2			2		
	RDU	Frimley Park Hospital NHS Foundation Trust	16	88%		15	100%	86%
	RTK	Ashford and St Peter's Hospitals NHS Foundation Trust	6			3		
	RTP	Surrey and Sussex Healthcare NHS Trust	14			27	89%	67%
	RXC	East Sussex Healthcare NHS Trust	7			6		
	RXH	Brighton and Sussex University Hospitals NHS Trust	3			3		
	RYR	Western Sussex Hospitals NHS Foundation Trust	16	85%		4		
Thames Valley	RHW	Royal Berkshire NHS Foundation Trust	7			1		
	RN3	Great Western Hospitals NHS Foundation Trust	7			0		
	RTH	Oxford University Hospitals NHS Trust	15	87%	75%	31	79%	80%
	RXQ	Buckinghamshire Healthcare NHS Trust	5			2		

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
Wessex	R1F	Isle of Wight NHS Trust	13	77%		5		
	RBD	Dorset County Hospital NHS Foundation Trust	3			2		
	RD3	Poole Hospital NHS Foundation Trust	2			0		
	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	27	85%		39	72%	79%
	RHM	University Hospital Southampton NHS Foundation Trust	38	97%	70%	54	85%	91%
	RHU	Portsmouth Hospitals NHS Trust	61			74	89%	76%
	RN5	Hampshire Hospitals NHS Foundation Trust	13			4		
West London	R1K	London North West Healthcare NHS Trust	6			3		
	RAS	The Hillingdon Hospitals NHS Foundation Trust	2			2		
	RAX	Kingston Hospital NHS Foundation Trust	4			0		
	RJ6	Croydon Health Services NHS Trust	6			3		
	RJ7	St George's Healthcare NHS Trust	4			2		
	RPY	The Royal Marsden NHS Foundation Trust	4			16	94%	93%
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust	13	92%		7		
	RVR	Epsom and St Helier University Hospitals NHS Trust	9			3		
	RYJ	Imperial College Healthcare NHS Trust	21	100%		26	96%	96%

HGD Trust Figures								
Cancer Alliance	**NHS Trust code**	**NHS Trust name**	**N diagnosed**	**% First diagnosis confirmed by second pathologist**	**% Quadratic biopsy performed**	**N treatment planning**	**% HGD plan discussed at MDT**	**% Treatment plan for active treatment**
West Midlands	RBK	Walsall Healthcare NHS Trust	2			0		
	RJC	South Warwickshire NHS Foundation Trust	5			0		
	RJE	University Hospitals of North Midlands NHS Trust	10			12	50%	40%
	RJF	Burton Hospitals NHS Foundation Trust	7			6		
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	8			15	100%	67%
	RL4	The Royal Wolverhampton NHS Trust	15	18%		13	75%	54%
	RLQ	Wye Valley NHS Trust	2			2		
	RLT	George Eliot Hospital NHS Trust	7			4		
	RNA	The Dudley Group NHS Foundation Trust	1			1		
	RR1	Heart of England NHS Foundation Trust	19	6%		19	89%	28%
	RRK	University Hospitals Birmingham NHS Foundation Trust	4			7		
	RWP	Worcestershire Acute Hospitals NHS Trust	24	92%		23	61%	43%
	RXK	Sandwell and West Birmingham Hospitals NHS Trust	8			8		
	RXW	Shrewsbury and Telford Hospital NHS Trust	6			6		
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	10			15	100%	73%
	RCD	Harrogate and District NHS Foundation Trust	7			0		
	RCF	Airedale NHS Foundation Trust	3			1		
	RR8	Leeds Teaching Hospitals NHS Trust	44	40%	50%	64	91%	86%
	RWY	Calderdale and Huddersfield NHS Foundation Trust	4			0		
	RXF	Mid Yorkshire Hospitals NHS Trust	19	100%		16	93%	71%

Annex 5: Levels of case ascertainment for English NHS Trusts and Welsh Health Boards (April 2014 – March 2016)

Estimates of the number of patients diagnosed in England and Wales with oesophago-gastric (OG) cancer are derived from the number of patients whose first record with OG cancer (ICD code: C15/C16) in HES / PEDW within the Audit period. HES / PEDW data do not provide a gold-standard for comparison, but can give an indication on major discrepancies between patients submitted in the audit and patients documented to receiving care for OG cancer. NHS trusts / local health boards submitting less than 10 cases in the 2 year period were excluded from the comparison.

Note: Three Trusts were not included in the annex, as they are tertiary treatment centres only

Key

Audit year
- ● >80%
- ■ 50-80%
- ▲ <50%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	Expected cases based on HES	Tumour records submitted	% Case ascertainment rate (grouped)
Cheshire and Merseyside	RBL	Wirral University Teaching Hospital NHS Foundation Trust	201 to 250	191	>90 ●
	RBN	St Helens and Knowsley Hospitals NHS Trust	151 to 200	146	71 to 80 ■
	RBT	Mid Cheshire Hospitals NHS Foundation Trust	101 to 150	113	81 to 90 ●
	REM	Aintree University Hospital NHS Foundation Trust	201 to 250	197	71 to 80 ■
	RJN	East Cheshire NHS Trust	51 to 100	86	>90 ●
	RJR	Countess of Chester Hospital NHS Foundation Trust	101 to 150	89	71 to 80 ■
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	251 to 300	210	81 to 90 ●
	RVY	Southport and Ormskirk Hospital NHS Trust	101 to 150	48	41 to 50 ▲
	RWW	Warrington and Halton Hospitals NHS Foundation Trust	101 to 150	64	51 to 60 ■
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust	151 to 200	162	>90 ●
	RNQ	Kettering General Hospital NHS Foundation Trust	101 to 150	116	>90 ●
	RNS	Northampton General Hospital NHS Trust	101 to 150	111	81 to 90 ●
	RTG	Derby Hospitals NHS Foundation Trust	301 to 350	265	81 to 90 ●
	RWD	United Lincolnshire Hospitals NHS Trust	251 to 300	128	41 to 50 ▲
	RWE	University Hospitals of Leicester NHS Trust	401 to 450	359	81 to 90 ●
	RX1	Nottingham University Hospitals NHS Trust	301 to 350	316	>90 ●
East of England	RAJ	Southend University Hospital NHS Foundation Trust	101 to 150	125	81 to 90 ●
	RC1	Bedford Hospital NHS Trust	51 to 100	102	>90 ●
	RC9	Luton and Dunstable University Hospital NHS Foundation Trust	101 to 150	123	>90 ●
	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	101 to 150	124	>90 ●
	RD8	Milton Keynes Hospital NHS Foundation Trust	51 to 100	66	81 to 90 ●
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	101 to 150	119	81 to 90 ●
	RDE	Colchester Hospital University NHS Foundation Trust	151 to 200	139	81 to 90 ●
	RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	101 to 150	113	81 to 90 ●
	RGP	James Paget University Hospitals NHS Foundation Trust	101 to 150	124	81 to 90 ●
	RGQ	Ipswich Hospital NHS Trust	101 to 150	144	>90 ●
	RGR	West Suffolk NHS Foundation Trust	51 to 100	110	>90 ●
	RGT	Cambridge University Hospitals NHS Foundation Trust	201 to 250	187	71 to 80 ■
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	301 to 350	274	81 to 90 ●
	RQ8	Mid Essex Hospital Services NHS Trust	201 to 250	75	0 to 40 ▲
	RQQ	Hinchingbrooke Health Care NHS Trust	51 to 100	61	>90 ●
	RQW	The Princess Alexandra Hospital NHS Trust	51 to 100	46	51 to 60 ■
	RWG	West Hertfordshire Hospitals NHS Trust	151 to 200	57	0 to 40 ▲
	RWH	East and North Hertfordshire NHS Trust	151 to 200	158	>90 ●

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	Expected cases based on HES	Tumour records submitted	% Case ascertainment rate (grouped)
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	101 to 150	111	71 to 80 ■
	RM3	Salford Royal NHS Foundation Trust	151 to 200	100	51 to 60 ■
	RMC	Bolton NHS Foundation Trust	101 to 150	134	>90 ●
	RMP	Tameside and Glossop Integrated Care NHS Foundation Trust	101 to 150	80	61 to 70 ■
	RRF	Wrightington, Wigan and Leigh NHS Foundation Trust	151 to 200	139	81 to 90 ●
	RW3	Central Manchester University Hospitals NHS Foundation Trust	151 to 200	189	>90 ●
	RW6	Pennine Acute Hospitals NHS Trust	301 to 350	296	>90 ●
	RWJ	Stockport NHS Foundation Trust	101 to 150	120	81 to 90 ●
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust	251 to 300	196	71 to 80 ■
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust	201 to 250	213	>90 ●
	RWA	Hull and East Yorkshire Hospitals NHS Trust	251 to 300	237	81 to 90 ●
Kent and Medway	RN7	Dartford and Gravesham NHS Trust	101 to 150	110	71 to 80 ■
	RPA	Medway NHS Foundation Trust	101 to 150	126	81 to 90 ●
	RVV	East Kent Hospitals University NHS Foundation Trust	301 to 350	247	71 to 80 ■
	RWF	Maidstone and Tunbridge Wells NHS Trust	201 to 250	203	81 to 90 ●
Lancashire and South Cumbria	RTX	University Hospitals of Morecambe Bay NHS Foundation Trust	151 to 200	92	51 to 60 ■
	RXL	Blackpool Teaching Hospitals NHS Foundation Trust	151 to 200	159	81 to 90 ●
	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	201 to 250	213	>90 ●
	RXR	East Lancashire Hospitals NHS Trust	201 to 250	186	81 to 90 ●
North Central and East London	R1H	Barts Health NHS Trust	251 to 300	205	71 to 80 ■
	RAL	Royal Free London NHS Foundation Trust	201 to 250	202	81 to 90 ●
	RAP	North Middlesex University Hospital NHS Trust	101 to 150	139	>90 ●
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	201 to 250	195	81 to 90 ●
	RKE	The Whittington Hospital NHS Trust	51 to 100	60	>90 ●
	RQX	Homerton University Hospital NHS Foundation Trust	51 to 100	52	71 to 80 ■
	RRV	University College London Hospitals NHS Foundation Trust	201 to 250	93	41 to 50 ▲
North East and Cumbria	RE9	South Tyneside NHS Foundation Trust	51 to 100	75	>90 ●
	RLN	City Hospitals Sunderland NHS Foundation Trust	151 to 200	142	>90 ●
	RNL	North Cumbria University Hospitals NHS Trust	151 to 200	138	71 to 80 ■
	RR7	Gateshead Health NHS Foundation Trust	101 to 150	115	>90 ●
	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	301 to 350	238	71 to 80 ■
	RTF	Northumbria Healthcare NHS Foundation Trust	201 to 250	209	>90 ●
	RTR	South Tees Hospitals NHS Foundation Trust	251 to 300	257	81 to 90 ●
	RVW	North Tees and Hartlepool NHS Foundation Trust	151 to 200	158	>90 ●
	RXP	County Durham and Darlington NHS Foundation Trust	201 to 250	235	>90 ●
Peninsula	RA9	Torbay and South Devon NHS Foundation Trust	101 to 150	112	81 to 90 ●
	RBZ	Northern Devon Healthcare NHS Trust	51 to 100	79	>90 ●
	REF	Royal Cornwall Hospitals NHS Trust	151 to 200	170	81 to 90 ●
	RH8	Royal Devon and Exeter NHS Foundation Trust	201 to 250	204	81 to 90 ●
	RK9	Plymouth Hospitals NHS Trust	251 to 300	212	81 to 90 ●
Somerset, Wiltshire, Avon & Gloucestershire	RA3	Weston Area Health NHS Trust	51 to 100	54	61 to 70 ■
	RA4	Yeovil District Hospital NHS Foundation Trust	51 to 100	58	81 to 90 ●
	RA7	University Hospitals Bristol NHS Foundation Trust	201 to 250	144	61 to 70 ■
	RBA	Taunton and Somerset NHS Foundation Trust	101 to 150	123	>90 ●
	RD1	Royal United Hospitals Bath NHS Foundation Trust	151 to 200	82	51 to 60 ■
	RNZ	Salisbury NHS Foundation Trust	51 to 100	91	>90 ●
	RTE	Gloucestershire Hospitals NHS Foundation Trust	301 to 350	253	71 to 80 ■
	RVJ	North Bristol NHS Trust	101 to 150	127	>90 ●

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	Expected cases based on HES	Tumour records submitted	% Case ascertainment rate (grouped)
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	251 to 300	56	0 to 40 ▲
	RJ2	Lewisham and Greenwich NHS Trust	151 to 200	112	71 to 80 ■
	RJZ	King's College Hospital NHS Foundation Trust	151 to 200	153	>90 ●
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RFF	Barnsley Hospital NHS Foundation Trust	101 to 150	121	>90 ●
	RFR	The Rotherham NHS Foundation Trust	101 to 150	88	81 to 90 ●
	RFS	Chesterfield Royal Hospital NHS Foundation Trust	151 to 200	152	>90 ●
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	351 to 400	257	61 to 70 ■
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	251 to 300	207	71 to 80 ■
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	151 to 200	84	51 to 60 ■
	RDU	Frimley Park Hospital NHS Foundation Trust	251 to 300	133	51 to 60 ■
	RTK	Ashford and St Peter's Hospitals NHS Foundation Trust	101 to 150	85	81 to 90 ●
	RTP	Surrey and Sussex Healthcare NHS Trust	101 to 150	104	>90 ●
	RXC	East Sussex Healthcare NHS Trust	151 to 200	173	81 to 90 ●
	RXH	Brighton and Sussex University Hospitals NHS Trust	151 to 200	103	61 to 70 ■
	RYR	Western Sussex Hospitals NHS Foundation Trust	201 to 250	201	>90 ●
Thames Valley	RHW	Royal Berkshire NHS Foundation Trust	151 to 200	23	0 to 40 ▲
	RN3	Great Western Hospitals NHS Foundation Trust	151 to 200	118	71 to 80 ■
	RTH	Oxford University Hospitals NHS Trust	251 to 300	194	61 to 70 ■
	RXQ	Buckinghamshire Healthcare NHS Trust	101 to 150	117	81 to 90 ●
Wessex	R1F	Isle of Wight NHS Trust	<50	68	>90 ●
	RBD	Dorset County Hospital NHS Foundation Trust	101 to 150	106	>90 ●
	RD3	Poole Hospital NHS Foundation Trust	101 to 150	96	81 to 90 ●
	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	151 to 200	166	81 to 90 ●
	RHM	University Hospital Southampton NHS Foundation Trust	201 to 250	179	81 to 90 ●
	RHU	Portsmouth Hospitals NHS Trust	301 to 350	239	71 to 80 ■
	RN5	Hampshire Hospitals NHS Foundation Trust	151 to 200	145	81 to 90 ●
West London	R1K	London North West Healthcare NHS Trust	101 to 150	167	>90 ●
	RAS	The Hillingdon Hospitals NHS Foundation Trust	51 to 100	63	>90 ●
	RAX	Kingston Hospital NHS Foundation Trust	51 to 100	95	>90 ●
	RJ6	Croydon Health Services NHS Trust	51 to 100	84	>90 ●
	RJ7	St George's Healthcare NHS Trust	101 to 150	118	>90 ●
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust	101 to 150	118	>90 ●
	RVR	Epsom and St Helier University Hospitals NHS Trust	101 to 150	120	>90 ●
	RYJ	Imperial College Healthcare NHS Trust	151 to 200	175	>90 ●
West Midlands	RBK	Walsall Healthcare NHS Trust	101 to 150	40	0 to 40 ▲
	RJC	South Warwickshire NHS Foundation Trust	51 to 100	60	61 to 70 ■
	RJE	University Hospitals of North Midlands NHS Trust	451 to 500	275	51 to 60 ■
	RJF	Burton Hospitals NHS Foundation Trust	101 to 150	123	>90 ●
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	251 to 300	165	61 to 70 ■
	RL4	The Royal Wolverhampton NHS Trust	201 to 250	179	71 to 80 ■
	RLQ	Wye Valley NHS Trust	<50	102	>90 ●
	RLT	George Eliot Hospital NHS Trust	51 to 100	75	71 to 80 ■
	RNA	The Dudley Group NHS Foundation Trust	201 to 250	191	>90 ●
	RR1	Heart of England NHS Foundation Trust	351 to 400	341	81 to 90 ●
	RRK	University Hospitals Birmingham NHS Foundation Trust	251 to 300	186	61 to 70 ■
	RWP	Worcestershire Acute Hospitals NHS Trust	251 to 300	260	>90 ●
	RXK	Sandwell and West Birmingham Hospitals NHS Trust	101 to 150	166	>90 ●
	RXW	Shrewsbury and Telford Hospital NHS Trust	201 to 250	146	61 to 70 ■

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	Expected cases based on HES	Tumour records submitted	% Case ascertainment rate (grouped)
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	151 to 200	167	>90 ●
	RCD	Harrogate and District NHS Foundation Trust	51 to 100	105	>90 ●
	RCF	Airedale NHS Foundation Trust	51 to 100	70	81 to 90 ●
	RR8	Leeds Teaching Hospitals NHS Trust	301 to 350	233	61 to 70 ■
	RWY	Calderdale and Huddersfield NHS Foundation Trust	151 to 200	149	71 to 80 ■
	RXF	Mid Yorkshire Hospitals NHS Trust	201 to 250	233	>90 ●
North Wales	7A1	Betsi Cadwaladr University Local Health Board	401 to 450	340	71 to 80 ■
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board	251 to 300	260	81 to 90 ●
South Wales	7A2	Hywel Dda University Local Health Board	201 to 250	185	71 to 80 ■
	7A4	Cardiff & Vale University Local Health Board	151 to 200	131	71 to 80 ■
	7A5	Cwm Taf University Local Health Board	151 to 200	187	>90 ●
	7A6	Aneurin Bevan University Local Health Board	251 to 300	239	81 to 90 ●

Annex 6: Data completeness for surgical and pathology records (April 2013 – March 2016)

Completeness of data entered by each NHS organisation for key fields needed to calculate the new indicators is given. The data was derived from the extract taken after the 3rd submission deadline for data collection.

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N oesophagectomy	N gastrectomy	Total cases	N pathology records returned	N with TNM complete	N with circum margin recorded as N/A	N complete adeq lymp	% complete adeq lymph	N complete oes long	% complete oes long	N complete oes circ	% complete oes circ	N complete gast long	% complete gast long
Cheshire and Merseyside	REM	Aintree University Hospital NHS Foundation Trust	78	42	120	100	100	1	100	83.3%	70	89.7%	69	88.5%	30	71.4%
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	90	56	146	136	134	0	136	93.2%	86	95.6%	86	95.6%	48	85.7%
East Midlands	RTG	Derby Hospitals NHS Foundation Trust	90	35	125	125	124	2	125	100.0%	89	98.9%	87	96.7%	35	100.0%
	RWE	University Hospitals of Leicester NHS Trust	124	54	178	178	178	1	178	100.0%	124	100.0%	123	99.2%	54	100.0%
	RX1	Nottingham University Hospitals NHS Trust	236	98	334	332	332	5	332	99.4%	280	118.6%	229	97.0%	98	100.0%
East of England	RGT	Cambridge University Hospitals NHS Foundation Trust	134	74	208	205	205	1	205	98.6%	131	97.8%	130	97.0%	74	100.0%
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	105	39	144	140	140	0	140	97.2%	101	96.2%	101	96.2%	39	100.0%
	RQ8	Mid Essex Hospital Services NHS Trust	147	43	190	29	29	0	29	15.3%	18	12.2%	18	12.2%	11	25.6%
	RWG	West Hertfordshire Hospitals NHS Trust	68	43	111	111	111	0	111	100.0%	68	100.0%	68	100.0%	43	100.0%
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	38	14	52	52	52	2	52	100.0%	38	100.0%	36	94.7%	14	100.0%
	RM3	Salford Royal NHS Foundation Trust	147	91	238	238	238	0	238	100.0%	147	100.0%	147	100.0%	91	100.0%
	RW3	Central Manchester University Hospitals NHS Foundation Trust	79	47	126	126	125	2	126	100.0%	78	98.7%	76	96.2%	47	100.0%
Humber, Coast and Vale	RWA	Hull and East Yorkshire Hospitals NHS Trust	81	47	128	110	109	0	110	85.9%	72	88.9%	72	88.9%	37	78.7%
Lancashire and South Cumbria	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	149	79	228	228	228	0	228	100.0%	149	100.0%	149	100.0%	79	100.0%
North Central and East London	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	50	27	77	70	70	44	70	90.9%	45	90.0%	1	2.0%	25	92.6%
	RRV	University College London Hospitals NHS Foundation Trust	97	73	170	170	170	1	170	100.0%	97	100.0%	96	99.0%	73	100.0%
North East and Cumbria	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	221	160	381	381	381	0	381	100.0%	N/A	N/A	221	100.0%	160	100.0%
	RTR	South Tees Hospitals NHS Foundation Trust	124	79	203	201	188	2	201	99.0%	117	94.4%	115	92.7%	71	89.9%
Peninsula	RK9	Plymouth Hospitals NHS Trust	221	45	266	254	254	4	254	95.5%	212	95.9%	208	94.1%	42	93.3%
Somerset, Wiltshire, Avon & Gloucestershire	RA7	University Hospitals Bristol NHS Foundation Trust	139	71	210	208	207	3	208	99.0%	137	98.6%	134	96.4%	70	98.6%
	RTE	Gloucestershire Hospitals NHS Foundation Trust	88	57	145	143	131	1	143	98.6%	85	96.6%	84	95.5%	46	80.7%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N oesophagectomy	N gastrectomy	Total cases	N pathology records returned	N with TNM complete	N with circum margin recorded as N/A	N complete adeq lymp	% complete adeq lymph	N complete oes long	% complete oes long	N complete oes circ	% complete oes circ	N complete gast long	% complete gast long
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	193	86	279	279	279	0	279	100.0%	193	100.0%	193	100.0%	86	100.0%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	143	107	250	250	248	0	250	100.0%	142	99.3%	142	99.3%	106	99.1%
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	101	44	145	144	144	1	144	99.3%	101	100.0%	100	99.0%	43	97.7%
	RXH	Brighton and Sussex University Hospitals NHS Trust	61	13	74	17	17	0	17	23.0%	9	14.8%	9	14.8%	8	61.5%
Thames Valley	RN3	Great Western Hospitals NHS Foundation Trust	11	3	14	6	6	0	6	42.9%	5	45.5%	5	45.5%	1	33.3%
	RTH	Oxford University Hospitals NHS Trust	158	72	230	226	224	0	226	98.3%	155	98.1%	155	98.1%	69	95.8%
Wessex	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	75	22	97	77	77	3	77	79.4%	60	80.0%	57	76.0%	17	77.3%
	RHM	University Hospital Southampton NHS Foundation Trust	119	36	155	154	153	0	154	99.4%	117	98.3%	117	98.3%	36	100.0%
	RHU	Portsmouth Hospitals NHS Trust	110	49	159	149	148	0	149	93.7%	104	94.5%	104	94.5%	44	89.8%
West London	RPY	The Royal Marsden NHS Foundation Trust	67	75	142	142	142	4	142	100.0%	67	100.0%	63	94.0%	75	100.0%
	RYJ	Imperial College Healthcare NHS Trust	70	72	142	138	138	8	138	97.2%	68	97.1%	60	85.7%	70	97.2%
West Midlands	RJE	University Hospitals of North Midlands NHS Trust	132	69	201	168	161	0	168	83.6%	104	78.8%	104	78.8%	57	82.6%
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	119	41	160	160	160	4	160	100.0%	119	100.0%	115	96.6%	41	100.0%
	RR1	Heart of England NHS Foundation Trust	81	34	115	115	115	0	115	100.0%	81	100.0%	81	100.0%	34	100.0%
	RRK	University Hospitals Birmingham NHS Foundation Trust	114	66	180	180	180	0	180	100.0%	114	100.0%	114	100.0%	66	100.0%
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	111	58	169	157	157	10	157	92.9%	102	91.9%	92	82.9%	55	94.8%
	RR8	Leeds Teaching Hospitals NHS Trust	119	93	212	212	211	0	212	100.0%	118	99.2%	118	99.2%	93	100.0%
N Wales	7A1	Betsi Cadwaladr University Local Health Board	74	50	124	106	96	18	106	85.5%	55	74.3%	38	51.4%	41	82.0%
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board	27	15	42	37	31	6	37	88.1%	19	70.4%	16	59.3%	12	80.0%
S Wales	7A4	Cardiff & Vale University Local Health Board	61	43	104	93	71	15	93	89.4%	42	68.9%	31	50.8%	29	67.4%
	7A5	Cwm Taf University Local Health Board	5	8	13	11	11	0	11	84.6%	4	80.0%	4	80.0%	7	87.5%

Annex 7: Emergency admission by English Cancer Alliances and Welsh Cancer Centres (April 2014 – March 2016)

The proportion of data reported as "unknown" for referral source and the adjusted referral rates were calculated for each NHS trust / local health board. Rates were derived from complete data and adjusted for age and gender.

NHS trusts / local health boards submitting fewer than 10 records in the two year period were excluded from comparison.

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N emergency admissions	% emergency admissions adjusted for age and sex	N unknown	% unknown
Cheshire and Merseyside	RBL	Wirral University Teaching Hospital NHS Foundation Trust	48	24.2%	0	0.0%
	RBN	St Helens and Knowsley Hospitals NHS Trust	31	22.2%	1	0.7%
	RBT	Mid Cheshire Hospitals NHS Foundation Trust	16	14.5%	4	3.5%
	REM	Aintree University Hospital NHS Foundation Trust	34	17.2%	2	1.0%
	RJN	East Cheshire NHS Trust	1	1.1%	0	0.0%
	RJR	Countess of Chester Hospital NHS Foundation Trust	11	12.6%	1	1.1%
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	33	18.2%	21	10.0%
	RVY	Southport and Ormskirk Hospital NHS Trust	2	3.9%	1	2.1%
	RWW	Warrington and Halton Hospitals NHS Foundation Trust	11	17.1%	1	1.6%
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust	39	24.4%	0	0.0%
	RNQ	Kettering General Hospital NHS Foundation Trust	20	17.2%	1	0.9%
	RNS	Northampton General Hospital NHS Trust	22	18.9%	0	0.0%
	RTG	Derby Hospitals NHS Foundation Trust	36	13.5%	2	0.8%
	RWD	United Lincolnshire Hospitals NHS Trust	25	21.3%	4	3.1%
	RWE	University Hospitals of Leicester NHS Trust	63	17.7%	1	0.3%
	RX1	Nottingham University Hospitals NHS Trust	88	27.7%	4	1.3%
East of England	RAJ	Southend University Hospital NHS Foundation Trust	32	26.4%	0	0.0%
	RC1	Bedford Hospital NHS Trust	15	15.9%	4	3.9%
	RC9	Luton and Dunstable University Hospital NHS Foundation Trust	17	16.1%	14	11.4%
	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	21	16.2%	0	0.0%
	RD8	Milton Keynes Hospital NHS Foundation Trust	3	5.0%	2	3.0%
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	19	16.7%	3	2.5%
	RDE	Colchester Hospital University NHS Foundation Trust	1	0.7%	0	0.0%
	RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	8	7.1%	2	1.8%
	RGP	James Paget University Hospitals NHS Foundation Trust	26	20.5%	0	0.0%
	RGQ	Ipswich Hospital NHS Trust	26	17.0%	0	0.0%
	RGR	West Suffolk NHS Foundation Trust	20	18.0%	0	0.0%
	RGT	Cambridge University Hospitals NHS Foundation Trust	21	15.3%	48	25.7%
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	60	21.2%	0	0.0%
	RQ8	Mid Essex Hospital Services NHS Trust	5	7.4%	0	0.0%
	RQQ	Hinchingbrooke Health Care NHS Trust	4	6.6%	0	0.0%
	RQW	The Princess Alexandra Hospital NHS Trust	4	8.4%	0	0.0%
	RWG	West Hertfordshire Hospitals NHS Trust	2	3.5%	0	0.0%
	RWH	East and North Hertfordshire NHS Trust	13	11.4%	43	27.2%
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	28	25.8%	0	0.0%
	RM3	Salford Royal NHS Foundation Trust	11	11.6%	1	1.0%
	RMC	Bolton NHS Foundation Trust	26	20.2%	3	2.2%
	RMP	Tameside and Glossop Integrated Care NHS Foundation Trust	1	1.2%	1	1.3%
	RRF	Wrightington, Wigan and Leigh NHS Foundation Trust	7	5.1%	0	0.0%
	RW3	Central Manchester University Hospitals NHS Foundation Trust	6	3.2%	0	0.0%
	RW6	Pennine Acute Hospitals NHS Trust	21	7.3%	0	0.0%
	RWJ	Stockport NHS Foundation Trust	1	0.8%	0	0.0%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N emergency admissions	% emergency admissions adjusted for age and sex	N unknown	% unknown
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust	23	18.9%	73	37.2%
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust	50	23.1%	0	0.0%
	RWA	Hull and East Yorkshire Hospitals NHS Trust	31	13.8%	12	5.1%
Kent and Medway	RN7	Dartford and Gravesham NHS Trust	19	18.2%	3	2.7%
	RPA	Medway NHS Foundation Trust	19	19.1%	19	15.1%
	RVV	East Kent Hospitals University NHS Foundation Trust	7	2.8%	7	2.8%
	RWF	Maidstone and Tunbridge Wells NHS Trust	18	9.4%	9	4.4%
Lancashire and South Cumbria	RTX	University Hospitals of Morecambe Bay NHS Foundation Trust	3	3.6%	7	7.6%
	RXL	Blackpool Teaching Hospitals NHS Foundation Trust	31	19.0%	0	0.0%
	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	18	9.1%	23	10.8%
	RXR	East Lancashire Hospitals NHS Trust	29	16.0%	0	0.0%
North Central and East London	R1H	Barts Health NHS Trust	46	24.4%	7	3.4%
	RAL	Royal Free London NHS Foundation Trust	14	7.0%	1	0.5%
	RAP	North Middlesex University Hospital NHS Trust	8	5.7%	0	0.0%
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	51	25.1%	1	0.5%
	RKE	The Whittington Hospital NHS Trust	12	21.2%	0	0.0%
	RQX	Homerton University Hospital NHS Foundation Trust	1	2.0%	0	0.0%
	RRV	University College London Hospitals NHS Foundation Trust	0	0.0%	0	0.0%
North East and Cumbria	RE9	South Tyneside NHS Foundation Trust	10	12.9%	0	0.0%
	RLN	City Hospitals Sunderland NHS Foundation Trust	6	4.4%	1	0.7%
	RNL	North Cumbria University Hospitals NHS Trust	15	11.1%	1	0.7%
	RR7	Gateshead Health NHS Foundation Trust	16	13.9%	0	0.0%
	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	40	16.8%	0	0.0%
	RTF	Northumbria Healthcare NHS Foundation Trust	49	23.2%	1	0.5%
	RTR	South Tees Hospitals NHS Foundation Trust	40	16.1%	4	1.6%
	RVW	North Tees and Hartlepool NHS Foundation Trust	25	15.5%	0	0.0%
	RXP	County Durham and Darlington NHS Foundation Trust	35	14.9%	1	0.4%
Peninsula	RA9	Torbay and South Devon NHS Foundation Trust	13	11.4%	0	0.0%
	RBZ	Northern Devon Healthcare NHS Trust	10	12.2%	0	0.0%
	REF	Royal Cornwall Hospitals NHS Trust	10	6.6%	14	8.2%
	RH8	Royal Devon and Exeter NHS Foundation Trust	43	20.5%	1	0.5%
	RK9	Plymouth Hospitals NHS Trust	43	20.2%	1	0.5%
Somerset, Wiltshire, Avon & Gloucestershire	RA3	Weston Area Health NHS Trust	6	11.0%	0	0.0%
	RA4	Yeovil District Hospital NHS Foundation Trust	2	3.4%	0	0.0%
	RA7	University Hospitals Bristol NHS Foundation Trust	6	4.3%	0	0.0%
	RBA	Taunton and Somerset NHS Foundation Trust	0	0.0%	0	0.0%
	RD1	Royal United Hospitals Bath NHS Foundation Trust	4	4.8%	0	0.0%
	RNZ	Salisbury NHS Foundation Trust	4	4.2%	0	0.0%
	RTE	Gloucestershire Hospitals NHS Foundation Trust	45	17.6%	1	0.4%
	RVJ	North Bristol NHS Trust	17	13.1%	0	0.0%
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	1	9.4%	44	78.6%
	RJ2	Lewisham and Greenwich NHS Trust	7	11.7%	51	45.5%
	RJZ	King's College Hospital NHS Foundation Trust	30	21.3%	8	5.2%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N emergency admissions	% emergency admissions adjusted for age and sex	N unknown	% unknown
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RFF	Barnsley Hospital NHS Foundation Trust	22	17.7%	0	0.0%
	RFR	The Rotherham NHS Foundation Trust	11	12.4%	0	0.0%
	RFS	Chesterfield Royal Hospital NHS Foundation Trust	38	24.2%	0	0.0%
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	34	13.5%	2	0.8%
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	24	12.1%	11	5.3%
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	6	7.5%	1	1.2%
	RDU	Frimley Park Hospital NHS Foundation Trust	3	2.5%	2	1.5%
	RTK	Ashford and St Peter's Hospitals NHS Foundation Trust	6	7.3%	4	4.7%
	RTP	Surrey and Sussex Healthcare NHS Trust	4	4.0%	3	2.9%
	RXC	East Sussex Healthcare NHS Trust	17	10.5%	13	7.5%
	RXH	Brighton and Sussex University Hospitals NHS Trust	3	3.2%	8	7.8%
	RYR	Western Sussex Hospitals NHS Foundation Trust	21	10.0%	0	0.0%
Thames Valley	RHW	Royal Berkshire NHS Foundation Trust	0	0.0%	3	13.0%
	RN3	Great Western Hospitals NHS Foundation Trust	16	14.2%	1	0.8%
	RTH	Oxford University Hospitals NHS Trust	7	3.7%	1	0.5%
	RXQ	Buckinghamshire Healthcare NHS Trust	4	3.4%	0	0.0%
Wessex	R1F	Isle of Wight NHS Trust	4	5.7%	0	0.0%
	RBD	Dorset County Hospital NHS Foundation Trust	12	11.2%	0	0.0%
	RD3	Poole Hospital NHS Foundation Trust	17	17.9%	5	5.2%
	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	31	18.9%	7	4.2%
	RHM	University Hospital Southampton NHS Foundation Trust	16	8.7%	0	0.0%
	RHU	Portsmouth Hospitals NHS Trust	31	12.9%	2	0.8%
	RN5	Hampshire Hospitals NHS Foundation Trust	2	1.5%	1	0.7%
West London	R1K	London North West Healthcare NHS Trust	0	0.0%	6	3.6%
	RAS	The Hillingdon Hospitals NHS Foundation Trust	13	19.7%	0	0.0%
	RAX	Kingston Hospital NHS Foundation Trust	19	22.9%	10	10.5%
	RJ6	Croydon Health Services NHS Trust	15	20.9%	6	7.1%
	RJ7	St George's Healthcare NHS Trust	32	27.4%	6	5.1%
	RPY	The Royal Marsden NHS Foundation Trust	1	9.8%	8	42.1%
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust	29	26.9%	4	3.4%
	RVR	Epsom and St Helier University Hospitals NHS Trust	17	15.0%	8	6.7%
	RYJ	Imperial College Healthcare NHS Trust	20	12.1%	1	0.6%
West Midlands	RBK	Walsall Healthcare NHS Trust	2	7.0%	9	22.5%
	RJC	South Warwickshire NHS Foundation Trust	2	3.8%	8	13.3%
	RJE	University Hospitals of North Midlands NHS Trust	40	14.5%	4	1.5%
	RJF	Burton Hospitals NHS Foundation Trust	13	12.6%	20	16.3%
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	23	14.8%	4	2.4%
	RL4	The Royal Wolverhampton NHS Trust	16	9.0%	1	0.6%
	RLQ	Wye Valley NHS Trust	14	13.2%	0	0.0%
	RLT	George Eliot Hospital NHS Trust	12	16.3%	0	0.0%
	RNA	The Dudley Group NHS Foundation Trust	10	5.1%	1	0.5%
	RR1	Heart of England NHS Foundation Trust	76	25.9%	47	13.8%
	RRK	University Hospitals Birmingham NHS Foundation Trust	10	5.6%	5	2.7%
	RWP	Worcestershire Acute Hospitals NHS Trust	40	15.5%	1	0.4%
	RXK	Sandwell and West Birmingham Hospitals NHS Trust	23	14.4%	14	8.4%
	RXW	Shrewsbury and Telford Hospital NHS Trust	4	3.0%	5	3.4%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N emergency admissions	% emergency admissions adjusted for age and sex	N unknown	% unknown
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	3	1.9%	5	3.0%
	RCD	Harrogate and District NHS Foundation Trust	16	17.1%	11	10.5%
	RCF	Airedale NHS Foundation Trust	1	1.6%	4	5.7%
	RR8	Leeds Teaching Hospitals NHS Trust	2	1.2%	57	24.5%
	RWY	Calderdale and Huddersfield NHS Foundation Trust	7	5.2%	17	11.4%
	RXF	Mid Yorkshire Hospitals NHS Trust	11	5.1%	14	6.0%
North Wales	7A1	Betsi Cadwaladr University Local Health Board	66	18.9%	0	0.0%
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board	57	21.4%	0	0.0%
South Wales	7A2	Hywel Dda University Local Health Board	28	16.8%	15	8.1%
	7A4	Cardiff & Vale University Local Health Board	27	21.4%	1	0.8%
	7A5	Cwm Taf University Local Health Board	40	21.9%	0	0.0%
	7A6	Aneurin Bevan University Local Health Board	31	14.1%	16	6.7%

Annex 8: Proportion of patients reported to have had an initial staging CT scan by NHS Trusts (April 2014 – March 2016)

NHS trusts / local health boards submitting records for fewer than 10 tumour records over the two year period were excluded from the comparison.

Key
● ≥90%
■ 80-89%
▲ <80%

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N with CT scan	% CT scan
Cheshire and Merseyside	RBL	Wirral University Teaching Hospital NHS Foundation Trust	173	90.6% ●
	RBN	St Helens and Knowsley Hospitals NHS Trust	87	59.6% ▲
	RBT	Mid Cheshire Hospitals NHS Foundation Trust	31	27.4% ▲
	REM	Aintree University Hospital NHS Foundation Trust	184	93.4% ●
	RJN	East Cheshire NHS Trust	66	76.7% ▲
	RJR	Countess of Chester Hospital NHS Foundation Trust	21	23.6% ▲
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	154	73.3% ▲
	RVY	Southport and Ormskirk Hospital NHS Trust	34	70.8% ▲
	RWW	Warrington and Halton Hospitals NHS Foundation Trust	51	79.7% ▲
East Midlands	RK5	Sherwood Forest Hospitals NHS Foundation Trust	162	100.0% ●
	RNQ	Kettering General Hospital NHS Foundation Trust	114	98.3% ●
	RNS	Northampton General Hospital NHS Trust	103	92.8% ●
	RTG	Derby Hospitals NHS Foundation Trust	262	98.9% ●
	RWD	United Lincolnshire Hospitals NHS Trust	114	89.1% ■
	RWE	University Hospitals of Leicester NHS Trust	344	95.8% ●
	RX1	Nottingham University Hospitals NHS Trust	303	95.9% ●
East of England	RAJ	Southend University Hospital NHS Foundation Trust	124	99.2% ●
	RC1	Bedford Hospital NHS Trust	42	41.2% ▲
	RC9	Luton and Dunstable University Hospital NHS Foundation Trust	117	95.1% ●
	RCX	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	108	87.1% ■
	RD8	Milton Keynes Hospital NHS Foundation Trust	23	34.8% ▲
	RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	118	99.2% ●
	RDE	Colchester Hospital University NHS Foundation Trust	103	74.1% ▲
	RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	106	93.8% ●
	RGP	James Paget University Hospitals NHS Foundation Trust	122	98.4% ●
	RGQ	Ipswich Hospital NHS Trust	132	91.7% ●
	RGR	West Suffolk NHS Foundation Trust	67	60.9% ▲
	RGT	Cambridge University Hospitals NHS Foundation Trust	144	77.0% ▲
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	248	90.5% ●
	RQ8	Mid Essex Hospital Services NHS Trust	71	94.7% ●
	RQQ	Hinchingbrooke Health Care NHS Trust	41	67.2% ▲
	RQW	The Princess Alexandra Hospital NHS Trust	46	100.0% ●
	RWG	West Hertfordshire Hospitals NHS Trust	56	98.2% ●
	RWH	East and North Hertfordshire NHS Trust	157	99.4% ●
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	111	100.0% ●
	RM3	Salford Royal NHS Foundation Trust	100	100.0% ●
	RMC	Bolton NHS Foundation Trust	119	88.8% ■
	RMP	Tameside and Glossop Integrated Care NHS Foundation Trust	70	87.5% ■
	RRF	Wrightington, Wigan and Leigh NHS Foundation Trust	119	85.6% ■
	RW3	Central Manchester University Hospitals NHS Foundation Trust	150	79.4% ▲
	RW6	Pennine Acute Hospitals NHS Trust	276	93.2% ●
	RWJ	Stockport NHS Foundation Trust	38	31.7% ▲
Humber, Coast and Vale	RCB	York Teaching Hospital NHS Foundation Trust	175	89.3% ■
	RJL	Northern Lincolnshire and Goole NHS Foundation Trust	113	53.1% ▲
	RWA	Hull and East Yorkshire Hospitals NHS Trust	230	97.0% ●
Kent and Medway	RN7	Dartford and Gravesham NHS Trust	109	99.1% ●
	RPA	Medway NHS Foundation Trust	123	97.6% ●
	RVV	East Kent Hospitals University NHS Foundation Trust	238	96.4% ●
	RWF	Maidstone and Tunbridge Wells NHS Trust	199	98.0% ●
Lancashire and South Cumbria	RTX	University Hospitals of Morecambe Bay NHS Foundation Trust	68	73.9% ▲
	RXL	Blackpool Teaching Hospitals NHS Foundation Trust	140	88.1% ■
	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	177	83.1% ■
	RXR	East Lancashire Hospitals NHS Trust	186	100.0% ●

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N with CT scan	% CT scan
North Central and East London	R1H	Barts Health NHS Trust	160	78.0% ▲
	RAL	Royal Free London NHS Foundation Trust	187	92.6% ●
	RAP	North Middlesex University Hospital NHS Trust	138	99.3% ●
	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	179	91.8% ●
	RKE	The Whittington Hospital NHS Trust	60	100.0% ●
	RQX	Homerton University Hospital NHS Foundation Trust	49	94.2% ●
	RRV	University College London Hospitals NHS Foundation Trust	93	100.0% ●
North East and Cumbria	RE9	South Tyneside NHS Foundation Trust	69	92.0% ●
	RLN	City Hospitals Sunderland NHS Foundation Trust	109	76.8% ▲
	RNL	North Cumbria University Hospitals NHS Trust	130	94.2% ●
	RR7	Gateshead Health NHS Foundation Trust	101	87.8% ■
	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	230	96.6% ●
	RTF	Northumbria Healthcare NHS Foundation Trust	205	98.1% ●
	RTR	South Tees Hospitals NHS Foundation Trust	138	53.7% ▲
	RVW	North Tees and Hartlepool NHS Foundation Trust	152	96.2% ●
	RXP	County Durham and Darlington NHS Foundation Trust	217	92.3% ●
Peninsula	RA9	Torbay and South Devon NHS Foundation Trust	105	93.8% ●
	RBZ	Northern Devon Healthcare NHS Trust	69	87.3% ■
	REF	Royal Cornwall Hospitals NHS Trust	133	78.2% ▲
	RH8	Royal Devon and Exeter NHS Foundation Trust	185	90.7% ●
	RK9	Plymouth Hospitals NHS Trust	184	86.8% ■
Somerset, Wiltshire, Avon & Gloucestershire	RA3	Weston Area Health NHS Trust	34	63.0% ▲
	RA4	Yeovil District Hospital NHS Foundation Trust	43	74.1% ▲
	RA7	University Hospitals Bristol NHS Foundation Trust	110	76.4% ▲
	RBA	Taunton and Somerset NHS Foundation Trust	97	78.9% ▲
	RD1	Royal United Hospitals Bath NHS Foundation Trust	72	87.8% ■
	RNZ	Salisbury NHS Foundation Trust	70	76.9% ▲
	RTE	Gloucestershire Hospitals NHS Foundation Trust	240	94.9% ●
	RVJ	North Bristol NHS Trust	83	65.4% ▲
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	56	100.0% ●
	RJ2	Lewisham and Greenwich NHS Trust	112	100.0% ●
	RJZ	King's College Hospital NHS Foundation Trust	153	100.0% ●
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RFF	Barnsley Hospital NHS Foundation Trust	114	94.2% ●
	RFR	The Rotherham NHS Foundation Trust	86	97.7% ●
	RFS	Chesterfield Royal Hospital NHS Foundation Trust	135	88.8% ■
	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	249	96.9% ●
	RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	203	98.1% ●
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	43	51.2% ▲
	RDU	Frimley Park Hospital NHS Foundation Trust	81	60.9% ▲
	RTK	Ashford and St Peter's Hospitals NHS Foundation Trust	39	45.9% ▲
	RTP	Surrey and Sussex Healthcare NHS Trust	58	55.8% ▲
	RXC	East Sussex Healthcare NHS Trust	108	62.4% ▲
	RXH	Brighton and Sussex University Hospitals NHS Trust	25	24.3% ▲
	RYR	Western Sussex Hospitals NHS Foundation Trust	183	91.0% ●
Thames Valley	RHW	Royal Berkshire NHS Foundation Trust	22	95.7% ●
	RN3	Great Western Hospitals NHS Foundation Trust	104	88.1% ■
	RTH	Oxford University Hospitals NHS Trust	191	98.5% ●
	RXQ	Buckinghamshire Healthcare NHS Trust	114	97.4% ●
Wessex	R1F	Isle of Wight NHS Trust	68	100.0% ●
	RBD	Dorset County Hospital NHS Foundation Trust	90	84.9% ■
	RD3	Poole Hospital NHS Foundation Trust	82	85.4% ■
	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	111	66.9% ▲
	RHM	University Hospital Southampton NHS Foundation Trust	176	98.3% ●
	RHU	Portsmouth Hospitals NHS Trust	228	95.4% ●
	RN5	Hampshire Hospitals NHS Foundation Trust	113	77.9% ▲

Cancer Alliance / Welsh Region	NHS Trust code	NHS Trust name	N with CT scan	% CT scan
West London	R1K	London North West Healthcare NHS Trust	151	90.4% ●
	RAS	The Hillingdon Hospitals NHS Foundation Trust	56	88.9% ■
	RAX	Kingston Hospital NHS Foundation Trust	93	97.9% ●
	RJ6	Croydon Health Services NHS Trust	83	98.8% ●
	RJ7	St George's Healthcare NHS Trust	114	96.6% ●
	RPY	The Royal Marsden NHS Foundation Trust	18	94.7% ●
	RQM	Chelsea and Westminster Hospital NHS Foundation Trust	118	100.0% ●
	RVR	Epsom and St Helier University Hospitals NHS Trust	114	95.0% ●
	RYJ	Imperial College Healthcare NHS Trust	162	92.6% ●
West Midlands	RBK	Walsall Healthcare NHS Trust	40	100.0% ●
	RJC	South Warwickshire NHS Foundation Trust	59	98.3% ●
	RJE	University Hospitals of North Midlands NHS Trust	136	49.5% ▲
	RJF	Burton Hospitals NHS Foundation Trust	121	98.4% ●
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	161	97.6% ●
	RL4	The Royal Wolverhampton NHS Trust	103	57.5% ▲
	RLQ	Wye Valley NHS Trust	101	99.0% ●
	RLT	George Eliot Hospital NHS Trust	73	97.3% ●
	RNA	The Dudley Group NHS Foundation Trust	71	37.2% ▲
	RR1	Heart of England NHS Foundation Trust	326	95.6% ●
	RRK	University Hospitals Birmingham NHS Foundation Trust	184	98.9% ●
	RWP	Worcestershire Acute Hospitals NHS Trust	248	95.4% ●
	RXK	Sandwell and West Birmingham Hospitals NHS Trust	108	65.1% ▲
	RXW	Shrewsbury and Telford Hospital NHS Trust	105	71.9% ▲
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	161	96.4% ●
	RCD	Harrogate and District NHS Foundation Trust	101	96.2% ●
	RCF	Airedale NHS Foundation Trust	67	95.7% ●
	RR8	Leeds Teaching Hospitals NHS Trust	151	64.8% ▲
	RWY	Calderdale and Huddersfield NHS Foundation Trust	145	97.3% ●
	RXF	Mid Yorkshire Hospitals NHS Trust	197	84.5% ■
North Wales	7A1	Betsi Cadwaladr University Local Health Board	311	91.5% ●
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board	253	97.3% ●
South Wales	7A2	Hywel Dda University Local Health Board	155	83.8% ■
	7A4	Cardiff & Vale University Local Health Board	123	93.9% ●
	7A5	Cwm Taf University Local Health Board	170	90.9% ●
	7A6	Aneurin Bevan University Local Health Board	210	87.9% ■

Annex 9: Comparative analysis of short term outcomes after curative surgery for NHS Trusts in England and Wales (April 2013 – March 2016)

Trusts submitting <10 cases for the relevant outcome or with >10 cases but with <50% complete cases in the 3 year period are not shown (N/A).

Cancer Alliance/ Welsh Region	NHS Trust code	NHS Trust name	N oesophagectomies	N gastrectomies	Total cases	30 day mortality rate	90 day mortality rate	Length of stay (days)	% adequate lymph nodes examined	% oes positive longitudinal margins	% oes positive circum margins	% gast positive longitudinal margins
Cheshire and Merseyside	REM	Aintree University Hospital NHS Foundation Trust	78	42	120	0.9%	0.9%	12	89.0%	1.5%	22.7%	13.5%
	RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	90	56	146	0.6%	3.0%	13	77.2%	5.4%	33.2%	7.2%
East Midlands	RTG	Derby Hospitals NHS Foundation Trust	90	35	125	1.5%	3.7%	11	80.0%	3.0%	24.7%	11.4%
	RWE	University Hospitals of Leicester NHS Trust	124	54	178	3.3%	5.3%	15	67.4%	1.7%	34.5%	3.1%
	RX1	Nottingham University Hospitals NHS Trust	236	98	334	2.0%	3.4%	11	78.3%	4.6%	32.8%	11.3%
East of England	RGT	Cambridge University Hospitals NHS Foundation Trust	134	74	208	0.0%	1.5%	10	84.9%	1.6%	19.6%	6.4%
	RM1	Norfolk and Norwich University Hospitals NHS Foundation Trust	105	39	144	0.0%	1.4%	7	93.6%	0.0%	13.3%	9.0%
	RQ8	Mid Essex Hospital Services NHS Trust	147	43	190	0.8%	2.9%	10	N/A	N/A	N/A	N/A
	RWG	West Hertfordshire Hospitals NHS Trust	68	43	111	2.9%	4.3%	12	95.5%	2.5%	22.0%	8.3%
Greater Manchester	RM2	University Hospital of South Manchester NHS Foundation Trust	38	14	52	0.0%	2.0%	13	75.0%	8.6%	35.4%	0.0%
	RM3	Salford Royal NHS Foundation Trust	147	91	238	0.6%	2.2%	13	71.8%	2.2%	30.8%	9.1%
	RW3	Central Manchester University Hospitals NHS Foundation Trust	79	47	126	2.9%	2.8%	14	70.6%	4.9%	38.7%	8.2%
Humber, Coast and Vale	RWA	Hull and East Yorkshire Hospitals NHS Trust	81	47	128	4.4%	7.4%	12	68.2%	1.7%	17.0%	11.2%
Lancashire and South Cumbria	RXN	Lancashire Teaching Hospitals NHS Foundation Trust	149	79	228	0.5%	2.1%	12	48.2%	4.8%	46.3%	13.0%
North Central and East London	RF4	Barking, Havering and Redbridge University Hospitals NHS Trust	50	27	77	0.0%	0.0%	9.5	78.6%	2.1%	N/A	0.0%
	RRV	University College London Hospitals NHS Foundation Trust	97	73	170	0.6%	1.1%	14	77.6%	6.5%	27.2%	4.7%
North East and Cumbria	RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	221	160	381	1.1%	1.5%	10.5	97.9%	3.7%	N/A	4.8%
	RTR	South Tees Hospitals NHS Foundation Trust	124	79	203	1.6%	2.6%	12	71.1%	7.6%	36.0%	13.6%
Peninsula	RK9	Plymouth Hospitals NHS Trust	221	45	266	1.4%	3.7%	10	85.8%	8.8%	27.6%	16.6%
Somerset, Wiltshire, Avon & Gloucestershire	RA7	University Hospitals Bristol NHS Foundation Trust	139	71	210	3.3%	3.7%	11	90.9%	9.5%	27.4%	10.0%
	RTE	Gloucestershire Hospitals NHS Foundation Trust	88	57	145	3.1%	3.8%	11	85.3%	4.4%	19.1%	11.9%
South East London	RJ1	Guy's and St Thomas' NHS Foundation Trust	193	86	279	1.0%	1.2%	10	84.2%	3.7%	35.5%	6.5%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	143	107	250	1.9%	3.4%	10	67.6%	2.3%	32.0%	4.3%
Surrey and Sussex	RA2	Royal Surrey County Hospital NHS Foundation Trust	101	44	145	2.3%	2.2%	12	98.6%	4.5%	14.4%	12.0%
	RXH	Brighton and Sussex University Hospitals NHS Trust	61	13	74	1.7%	3.3%	10	N/A	N/A	N/A	N/A
Thames Valley	RN3	Great Western Hospitals NHS Foundation Trust	11	3	14	0.0%	0.0%	12.5	N/A	N/A	N/A	N/A
	RTH	Oxford University Hospitals NHS Trust	158	72	230	1.0%	2.0%	10	92.9%	1.3%	11.0%	2.9%
Wessex	RDZ	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	75	22	97	1.4%	2.8%	12	87.0%	3.6%	25.6%	11.5%
	RHM	University Hospital Southampton NHS Foundation Trust	119	36	155	0.0%	0.0%	9	87.0%	0.0%	15.4%	0.0%
	RHU	Portsmouth Hospitals NHS Trust	110	49	159	3.4%	6.0%	12	81.2%	1.8%	18.1%	4.3%
West London	RPY	The Royal Marsden NHS Foundation Trust	67	75	142	2.2%	2.1%	11	92.3%	7.6%	21.7%	5.4%
	RYJ	Imperial College Healthcare NHS Trust	70	72	142	2.5%	3.2%	11	97.1%	4.4%	12.3%	0.0%

Cancer Alliance/ Welsh Region	NHS Trust code	NHS Trust name	N oesophagec-tomies	N gastrecto-mies	Total cases	30 day mortality rate	90 day mortality rate	Length of stay (days)	% adequate lymph nodes examined	% oes positive longi-tudinal margins	% oes positive circum margins	% gast positive longitudi-nal margins
West Midlands	RJE	University Hospitals of North Midlands NHS Trust	132	69	201	5.2%	6.7%	11	77.4%	5.0%	34.8%	12.2%
	RKB	University Hospitals Coventry and Warwickshire NHS Trust	119	41	160	2.7%	5.7%	9	83.1%	8.6%	41.0%	4.6%
	RR1	Heart of England NHS Foundation Trust	81	34	115	0.8%	3.1%	14	90.4%	1.3%	37.7%	14.9%
	RRK	University Hospitals Birmingham NHS Foundation Trust	114	66	180	0.5%	1.8%	13	90.6%	1.6%	27.3%	7.2%
West Yorkshire	RAE	Bradford Teaching Hospitals NHS Foundation Trust	111	58	169	2.9%	4.2%	15	89.2%	4.5%	33.9%	7.9%
	RR8	Leeds Teaching Hospitals NHS Trust	119	93	212	0.0%	4.2%	12	82.1%	6.0%	44.8%	11.9%
North Wales	7A1	Betsi Cadwaladr University Local Health Board	74	50	124	6.5%	7.9%	9	75.5%	5.7%	15.2%	6.6%
ABMU	7A3	Abertawe Bro Morgannwg University Local Health Board	27	15	42	0.0%	0.0%	13	45.9%	9.3%	11.2%	7.7%
South Wales	7A4	Cardiff & Vale University Local Health Board	61	43	104	2.4%	3.4%	12	50.5%	0.0%	51.1%	12.0%
	7A5	Cwm Taf University Local Health Board	5	8	13	0.0%	10.2%	15	18.2%	N/A	N/A	N/A

Annex 10: Regional variation in non-curative cancer treatments in England and Wales (April 2014 – March 2016)

Method of stent placement						
Cancer Alliance	**N Fluoroscopic guidance**	**% Fluoroscopic guidance**	**N Endoscopic guidance**	**% Endoscopic guidance**	**N Fluoroscopic and endoscopic combined**	**% Fluoroscopic and endoscopic combined**
Cheshire and Merseyside	6	11.3%	15	28.3%	32	60.4%
East Midlands	44	31.2%	93	66.0%	4	2.8%
East of England	5	2.4%	51	24.5%	152	73.1%
Greater Manchester	106	71.6%	12	8.1%	30	20.3%
Humber, Coast and Vale	19	82.6%	0	0.0%	4	17.4%
Lancashire and South Cumbria	0	0.0%	18	32.7%	37	67.3%
North Central and East London	6	12.0%	5	10.0%	39	78.0%
North East and Cumbria	27	32.9%	27	32.9%	28	34.2%
Peninsula	3	4.4%	37	53.6%	29	42.0%
Somerset, Wiltshire, Avon & Gloucestershire	4	4.4%	44	47.8%	44	47.8%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	34	20.4%	63	37.7%	70	41.9%
Surrey and Sussex	5	18.5%	4	14.8%	18	66.7%
Thames Valley	21	63.6%	8	24.2%	4	12.1%
Wessex	10	12.1%	9	10.8%	64	77.1%
West London	5	11.4%	13	29.6%	26	59.1%
West Midlands	31	18.2%	64	37.7%	75	44.1%
West Yorkshire	38	92.7%	0	0.0%	3	7.3%

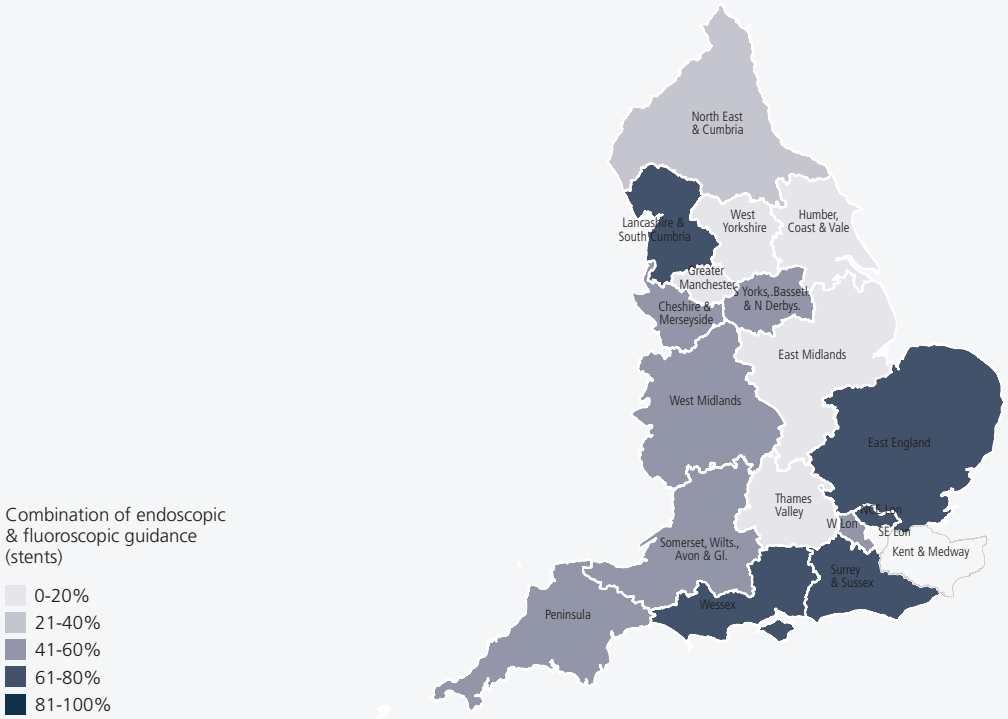
Palliative oncology						
Cancer Alliance / Welsh Region	**N Palliative chemotherapy**	**% Palliative chemotherapy**	**N Palliative radiotherapy**	**% Palliative radiotherapy**	**N Palliative chemo- and radiotherapy combined**	**% Palliative chemo- and radiotherapy combined**
Cheshire and Merseyside	221	72.5%	67	22.0%	17	5.6%
East Midlands	189	60.0%	119	37.8%	7	2.2%
East of England	374	67.4%	150	27.0%	31	5.6%
Greater Manchester	239	83.6%	38	13.3%	9	3.2%
Humber, Coast and Vale	140	59.6%	57	24.3%	38	16.2%
Kent and Medway	109	65.7%	52	31.3%	5	3.0%
Lancashire and South Cumbria	192	83.8%	33	14.4%	4	1.8%
North Central and East London	124	69.7%	25	14.0%	29	16.3%
North East and Cumbria	305	62.6%	168	34.5%	14	2.9%
Peninsula	158	61.2%	74	28.7%	26	10.1%
Somerset, Wiltshire, Avon & Gloucestershire	186	64.6%	89	30.9%	13	4.5%
South East London	29	65.9%	15	34.1%	0	0.0%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	80	56.3%	59	41.6%	3	2.1%
Surrey and Sussex	216	73.2%	59	20.0%	20	6.8%
Thames Valley	66	73.3%	22	24.4%	2	2.2%
Wessex	213	70.5%	58	19.2%	31	10.3%
West London	209	72.3%	65	22.5%	15	5.2%
West Midlands	415	78.6%	89	16.9%	24	4.6%
West Yorkshire	200	85.8%	17	7.3%	16	6.9%
ABMU	54	74.0%	17	23.3%	2	2.7%
North Wales	55	74.3%	18	24.3%	1	1.4%
South Wales	144	66.7%	68	31.5%	4	1.9%

Top 5 chemotherapy drugs												
Cancer Alliance	**N EOX**	**% EOX**	**N ECX**	**% ECX**	**N HCX**	**% HCX**	**N CAPECITABINE + CISPLATIN**	**% CAPECITABINE + CISPLATIN**	**N CAPECITABINE + OXALIPLATIN**	**% CAPECITABINE + OXALIPLATIN**	**N Other combinations**	**% Other combinations**
Cheshire and Merseyside	69	56.1%	7	5.7%	6	4.9%	11	8.9%	13	10.6%	17	13.8%
East Midlands	98	51.6%	22	11.6%	10	5.3%	19	10.0%	0	0.0%	41	21.6%
East of England	90	34.5%	69	26.4%	13	5.0%	9	3.4%	11	4.2%	69	26.4%
Greater Manchester	124	70.5%	11	6.3%	13	7.4%	0	0.0%	0	0.0%	28	15.9%
Humber, Coast and Vale	57	55.9%	9	8.8%	4	3.9%	14	13.7%	9	8.8%	9	8.8%
Kent and Medway	6	6.8%	35	39.8%	0	0.0%	5	5.7%	0	0.0%	42	47.7%
Lancashire and South Cumbria	63	51.2%	13	10.6%	8	6.5%	0	0.0%	0	0.0%	39	31.7%
North Central and East London	30	50.0%	10	16.7%	1	1.7%	0	0.0%	5	8.3%	14	23.3%
North East and Cumbria	100	61.0%	10	6.1%	11	6.7%	1	0.6%	1	0.6%	41	25.0%
Peninsula	71	65.1%	10	9.2%	4	3.7%	4	3.7%	4	3.7%	16	14.7%
Somerset, Wiltshire, Avon & Gloucestershire	72	52.2%	13	9.4%	15	10.9%	15	10.9%	10	7.2%	13	9.4%
South East London	9	27.3%	5	15.2%	0	0.0%	0	0.0%	0	0.0%	19	57.6%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	47	72.3%	1	1.5%	6	9.2%	3	4.6%	5	7.7%	3	4.6%
Surrey and Sussex	35	35.4%	10	10.1%	1	1.0%	26	26.3%	3	3.0%	24	24.2%
Thames Valley	43	89.6%	1	2.1%	3	6.3%	0	0.0%	0	0.0%	1	2.1%
Wessex	71	52.6%	5	3.7%	20	14.8%	8	5.9%	13	9.6%	18	13.3%
West London	33	23.1%	43	30.1%	8	5.6%	3	2.1%	1	0.7%	55	38.5%
West Midlands	60	26.4%	86	37.9%	2	0.9%	11	4.8%	15	6.6%	53	23.3%
West Yorkshire	72	46.2%	4	2.6%	8	5.1%	0	0.0%	37	23.7%	35	22.4%

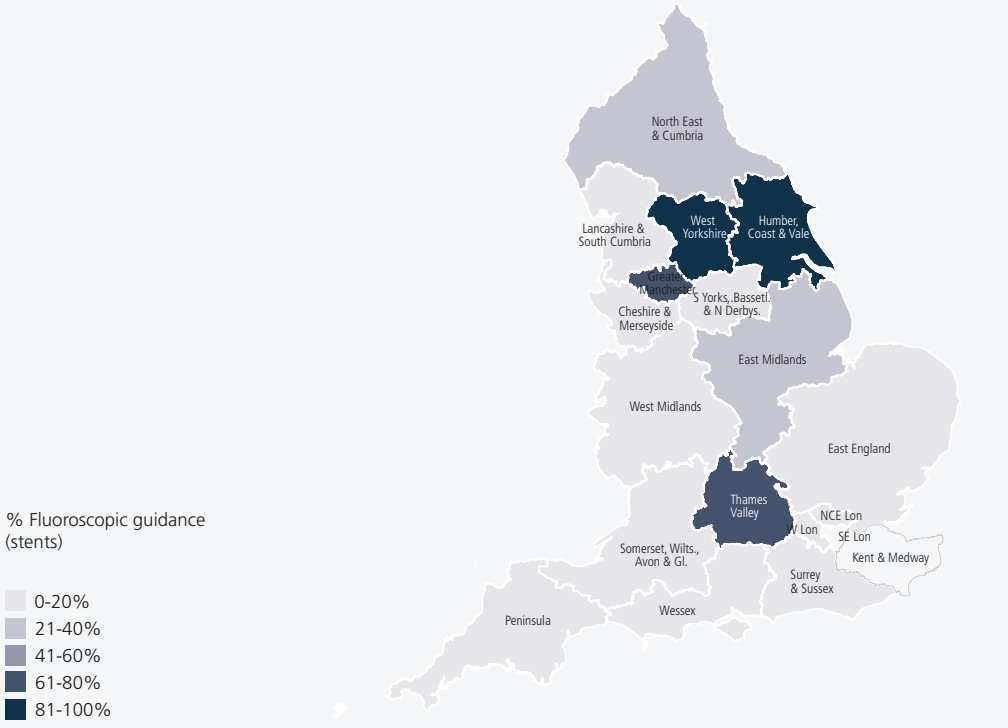
Evidence-based radiotherapy		
Cancer Alliance	**N** **Prescribed evidence-based non-curative radiotherapy dose and fraction**	**%** **Prescribed evidence-based non-curative radiotherapy dose and fraction**
Cheshire and Merseyside	47	74.5%
East Midlands	121	73.6%
East of England	106	50.0%
Greater Manchester	33	39.4%
Humber, Coast and Vale	32	78.1%
Kent and Medway	27	55.6%
Lancashire and South Cumbria	23	43.5%
North East and Cumbria	115	78.3%
Peninsula	75	68.0%
Somerset, Wiltshire, Avon & Gloucestershire	78	60.3%
South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	40	67.5%
Surrey and Sussex	25	72.0%
Wessex	61	59.0%
West London	29	27.6%
West Midlands	38	65.8%
West Yorkshire	42	85.7%

Annex 11: Regional variation (geography) in non-curative cancer treatments in England (April 2014 – March 2016)

Annex 11
Method of Stent Placement

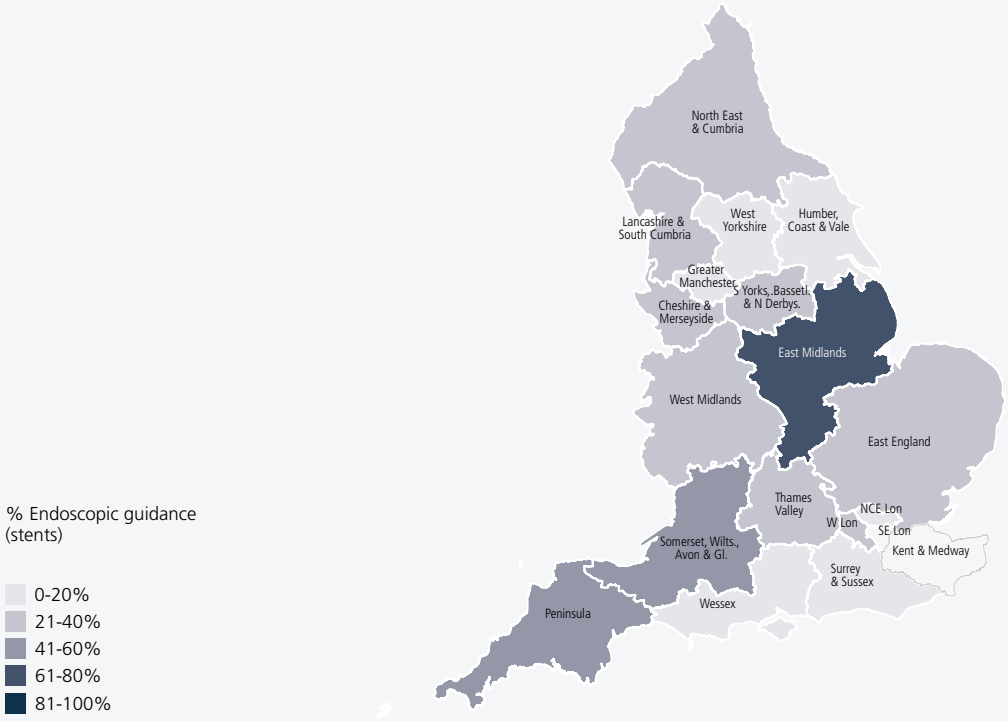


Annex 11
Method of Stent Placement



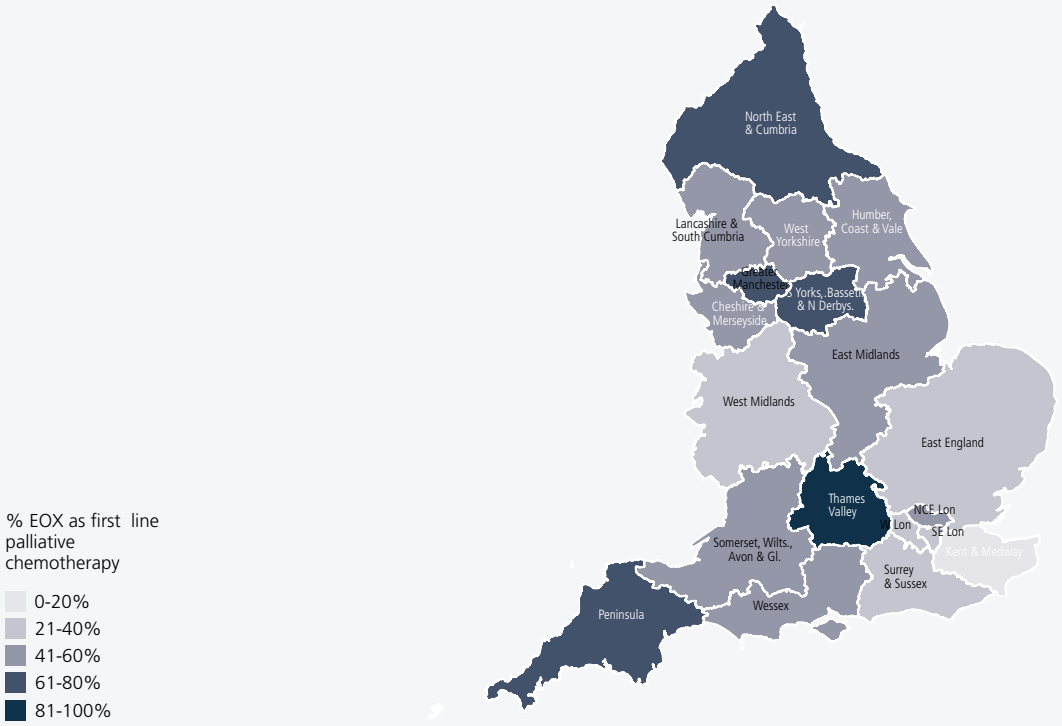
NB: Areas shown in white have been omitted

Annex 11
Method of Stent Placement

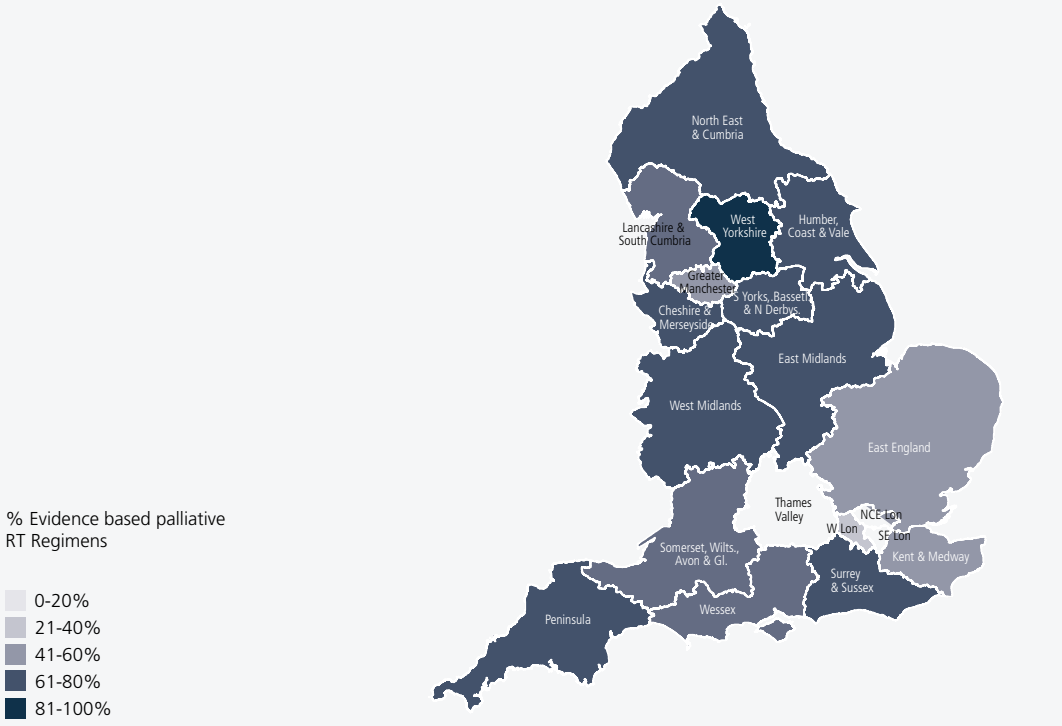


NB: Areas shown in white have been omitted

Annex 11
Palliative chemotherapy (EOX)



Annex 11
Palliative radiotherapy (evidence based regimens)



NB: Areas shown in white have been omitted

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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 Gastroenterologists

BASO – British Association of Surgical Oncology

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).

CRG – The audit's Clinical Reference Group is comprised of representatives of the key stakeholders in oesophago-gastric cancer care. They advise the Project Team on particular aspects of the project and provide input from the wider clinical and patient community.

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 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 Barratt'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. Disease in which this has occurred 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. Oesophagectomies using minimally invasive techniques for only the abdominal or chest phase are commonly referred to as hybrid operations.

NCEPOD – National Confidential Enquiry into Patient Outcome and Death. NCEPOD is an independent, government-funded body whose remit is to examine medical and surgical care, often by undertaking confidential surveys and research.

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 when they should. Neoplasms may be benign (not cancerous), or malignant (cancerous).

NHS Digital – is 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 of Health and Clinical 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.

ONS – The Office for National Statistics (ONS) is the government department responsible for collecting and publishing official statistics about the UK's society and economy. This includes cancer registration data.

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 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.

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.

PEDW – Patient Episode Database for Wales (PEDW) is an administrative database which contains data on all in-patients treated within NHS hospitals in Wales. This includes details of admissions, diagnoses and those treatments undergone.

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.

SNOMED (Systematized Nomenclature of Medicine) is a standardized set of clinical terms used by clinicians and other health care providers when recording clinical information in electronic medical records / clinical databases.

Squamous cell carcinoma is 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 is inserted into the area of narrowing (under either endoscopic or radiological control) that then expands and relieves the blockage.

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

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.