CAS-SOP #4.6
Linking treatment tables – chemotherapy, tumour resections and radiotherapy

Version 4.6
About Public Health England

Public Health England exists to protect and improve the nation’s health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

This report has been produced as part of the Cancer Research UK (CRUK) – Public Health England (PHE) partnership.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

For queries relating to this document, please contact: NCRASenquiries@phe.gov.uk

© Crown copyright 2021
You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, please visit OGL or email psi@nationalarchives.gsi.gov.uk. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Published: October 2017
Corrected: February 2018
Updated: May 2018
Corrected: July 2018
Updated: June 2019
Updated: April 2021
PHE publications
gateway number: 2017508

PHE supports the UN
Sustainable Development Goals
# Contents

Introduction 4  
Method 6  
Appendix 1: Code changes compared to SOP version 4.5 14  
Appendix 2: Summary of tumour sites & timeframe rules 16  
Appendix 3: Site-specific summary of tumour resection rules 18  
Appendix 4: Example code 39  
Appendix 5: Datasets used 78  
Appendix 6: Sensitivity analysis – impact of tumour resection code update 79  
Appendix 7: Sensitivity analysis – impact of timeframe update 80
Introduction

This Standard Operating Procedure (SOP) (v4.6) updates the previous version (v4.5), incorporating ICD10 codes, resection procedure codes and treatment time frames specific to 5X tumour sites. The affected tumour sites are Brain (benign endocrine), Brain (non-malignant brain), Melanoma, Non-Melanoma Skin Cancer (NMSC): Basal Cell Carcinoma (BCC), NMSC: cutaneous Squamous Cell Carcinoma (cSCC), NMSC: other. It also updates the previous SOP to include tumours diagnosed in 2017 and 2018. The changes to the code are summarised in Appendix 1 of this document. Additional ICD10 codes are included in Appendix 2. Updated resection procedure codes are provided in Appendix 3.

The purpose of this SOP is to describe the method of linking treatment tables to the cancer registration data in the Cancer Analysis System (CAS). This allows basic treatment flags to be created; recording whether there was chemotherapy, tumour resection, or radiotherapy recorded following cancer diagnosis. This method was used for recent NCRAS publications of treatment work including the workbook ‘Chemotherapy, Radiotherapy and Tumour Resections in England, 2013 – 2015’ (available here).

The cancer sites included are the 31 sites which have pre-defined lists of relevant tumour resection procedures. All other sites are grouped under either ‘other malignant’ or ‘other non-malignant’ tumours. The term ‘tumour resection’ (previously termed ‘major resection’ in other outputs) is used to describe surgical attempts to remove the primary tumour. This SOP replaces the previous method used to count tumour resections (available here).

Cancer site and treatment-specific timeframes have been adopted to strike a balance between including as many treatments as possible carried out as part of the patient’s first course of treatment for that tumour, while minimising the inclusion of treatments for recurrent tumours.

This SOP is to be used where the analyst wishes to extract data on treatments among cancer sites listed in Appendix 2. The cancer sites with a tumour resection flag have been chosen because they are solid tumours (so are potentially resectable); are commonly diagnosed; and input from a site-specific clinician was available. Expansion of this list to include more cancer sites, where resection is a treatment choice, will be considered for future NCRAS work. Chemotherapy and radiotherapy data was available for all cancer sites. This SOP exists to set a standard that can be followed to produce uniform and replicable results and, in particular, for external requests for treatment data received via the Office for Data Release (ODR). Certain specific uses may require a
different approach and should be discussed with the lead of the therapeutics functional
team.
The specific procedure codes used to select tumour resections are listed in Appendix 3.
The SQL script which accompanies this SOP is in Appendix 4. The SQL code produces
tumour-level data with 3 treatment flags (chemotherapy [CT], tumour resection [SG] and
radiotherapy [RT]), with 0 as no treatment and 1 where treatment is present.
Method

Cohort definition

Cancer registry data from AT_TUMOUR_ENGLAND is used as the base to identify the cohort of patients. All patients diagnosed with malignant cancer in England in 2013-2018 were included. This version additionally includes benign neoplasm or neoplasms of the brain, melanoma, and non-melanoma skin cancer of uncertain behaviour. Males with gynaecological cancer and females with prostate cancer were excluded. Death certificate only registrations are included (1.2% of the cohort).

Overall approach to identify treatments

The datasets used to collate tumour resection data are AT_TREATMENT_ENGLAND (CAS 2102 snapshot onwards can be used), SACT (Systemic Anti-Cancer Therapy), RTDS (RadioTherapy DataSet), and inpatient (Admitted Patient Care (APC)) HES (Hospital Episode Statistics). The AT_TREATMENT_ENGLAND table is linked at tumour level, based on registration staff linking tumours to recorded treatments. Appendix 5 details the datasets and Snapshots used in this update.

The scope of this SOP is tumours diagnosed from 2013 onwards as it is known that the data quality in AT_TREATMENT_ENGLAND and SACT is lower before this point. However, treatment flags for select groups (e.g. childhood cancers) may be fairly complete in AT_TREATMENT_ENGLAND for earlier years. Cancer Waiting Times (CWT) data is not currently used. This decision was made following an assessment of the coverage of the datasets, and as ≥98% of radiotherapy and ≥94% of chemotherapy were captured by registry, SACT and RTDS in the period October 2012 to March 2013 (with the data completeness believed to be increasing since) it did not justify the complication of including CWT data.

For patients with one tumour diagnosed in 2013-2018, and those patients with multiple tumours diagnosed more than eighteen months apart, data from both the tumour linked table (AT_TREATMENT_ENGLAND) and the patient linked tables (SACT, RTDS and HES) is used. However, for patients with two or more tumours diagnosed within eighteen months of each other, only data from the tumour-linked table (i.e., AT_TREATMENT_ENGLAND) is used. This is because for the patient linked tables, the precise tumour that a treatment relates to is not identified, only the person. The current scope of this SOP is to define a working methodology for counting treatments in the absence of tumour level linked data, but this may be modified as and when further tumour-linked treatment data becomes available.
Tumours which received the same treatment more than once are only counted once.
Early stage tumour resections

Previous resections work relied upon lists of procedure codes (OPCS-4 codes) which would be used to remove the primary tumour (available here). These lists were defined in consultation with experienced clinicians. Lack of data on stage at diagnosis at the time of definition meant that the lists were conservative, and each code would apply across all tumours of that particular site regardless of stage. Now that high quality stage at diagnosis data is available for most sites, the list of OPCS-4 procedure codes used to define tumour resections has been adapted to include tumour resections for early stage tumours. Site-specific clinicians were consulted for the 31 sites included in the original major resection list, and stage-specific rules have now been incorporated for relevant sites (cervical, colon, rectum, bladder, liver, oesophageal and stomach cancers).

In addition to the existing tumour resection list, the following procedures were identified as tumour resections in early stage disease only:

<table>
<thead>
<tr>
<th>Site</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical</td>
<td>Cone biopsies for FIGO stage 1a tumours, and also those with stage 1b &amp; 1b1 disease if the patient also had a lymphadenectomy</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>Endoscopic resections and endoscopic biopsy procedures for TNM stage 1 tumours</td>
</tr>
<tr>
<td>Bladder</td>
<td>Endoscopic resections, destructions, and cauterisation of lesion of bladder (TURBT) and other specified endoscopic extirpation of lesion of bladder for T1 (non-muscle invasive) tumours</td>
</tr>
<tr>
<td>Liver</td>
<td>Percutaneous radiofrequency and microwave ablation of lesion of liver for TNM stage 1 tumours</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>Fibreoptic endoscopic resection of lesions of upper gastrointestinal tract and oesophagus for TNM stage 1a tumours</td>
</tr>
<tr>
<td>Stomach</td>
<td>Fibreoptic endoscopic resection of lesion of upper gastrointestinal tract and oesophagus for TNM stage 1a tumours</td>
</tr>
</tbody>
</table>

In addition, after clinical review certain OPCS-4 codes were added to or removed from the previous list for all stages of disease. For more information, see Appendix 3.
Appendix 6 for a sensitivity analysis showing the impact of adding stage-specific tumour resections.
Timeframe

European Network of Cancer Registries (ENCR) rules state that date of diagnosis is recorded as the date of most recent pathological confirmation. This means that date of diagnosis can be shortly after a surgical resection. To avoid excluding relevant data, treatments in the one month (-31 days inclusive) prior to diagnosis were included in the analysis.

A data-driven approach with additional input from site-specialist clinicians was used to decide a site- and modality- specific post-diagnosis timeframe. The timeframe was chosen to be long enough to capture as many treatments as possible as part of the patient’s primary course of treatment, while also minimising the inclusion of treatments for recurrence. This SOP counts treatments between one month before, to up to eighteen months after diagnosis, with the exact timeframe depending on the site and treatment type. For patients who received each treatment for each cancer, the number of days after diagnosis at which 95% of these patients received the treatment was identified. This was rounded up to the nearest three month interval, and this timeframe cut off was applied. Post-diagnosis timeframes were therefore 6, 9, 12, 15 or 18 months. The timeframes were based on 2013 and 2014 data only, because of the length of follow-up data required.

For example, of the pancreatic tumours diagnosed in 2013-14 which received a tumour resection within two years of diagnosis, 95% had their resection within 226 days. Therefore for all pancreatic cancers diagnosed in 2013-2016, a post-diagnosis tumour resection timeframe of 274 days (9 months) was applied. Exceptions to the data driven approach were made for particular treatments for certain cancer sites under recommendation from clinicians. For these sites, clinicians decided the timeframe using a combination of their own experience and the data. See Appendix 2 for details, and Appendix 7 for a sensitivity analysis showing the impact of changing the timeframes.

Relative to other tumour sites, treatment data quality for non-melanoma skin cancers (NMSC) (BCC, cSCC and other NMSC tumours) is poor, with only ~75% of tumours registered according to the UKIACR method (counting only the first ever registered tumour for BCC and cSCC cancers and counting all instances of other NMSC tumours, see CAS SOP Counting non-melanoma skin cancers C44) having treatment data. A data-driven approach failed to identify 95% of chemotherapy and radiotherapy treatments within an appropriate timeframe. Clinician input was therefore used to decide suitable timeframes for treatment periods, with the view that quantifying the current state of treatment data can be used as a base to improve overall data quality. These figures should therefore be considered provisional and are expected to be incomplete.
SQL rules used to identify treatments

In order to match the output from CancerStats, the cascade_inci_flag (from the registry AT_TUMOUR_ENGLAND base table) must equal 1 (refer to the standard operating procedure “CAS-SOP #1: Counting Cancer Cases” for further information on this, available on request to NCRAS). This SOP applies to CAS 1612 onwards, as it uses the newly categorised treatments implemented in December 2016.

Chemotherapy

A tumour is recorded as treated with chemotherapy if:

- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with chemotherapy (event is either ‘Cytotoxic Chemotherapy’ (code = 02) or ‘CT - Other’ (code = CTX) or ‘Chemoradiotherapy’ (code = 04) or ‘radioisotope therapy (including radiiodine)’ (code = 19) or ‘Immunotherapy’ (code = 15))
- and the event date (EVENTDATE) occurred in the relevant timeframe (see Appendix 2)

OR

- there is a record in SACT (excluding those null or classified as 'Hormones' or 'Not chemo' or 'Zoledronic acid' or 'Pamidronate' or 'Denosumab')
- and the start date of the regimen (START_DATE_OF_REGIMEN) occurred in the relevant timeframe
- and the patient had no other tumours diagnosed in the 18 months before or after that tumour’s diagnosis date

SACT is linked to cancer registration where NHS numbers are a perfect match. Regimen mappings are based on both those directly confirmed by trusts, and those assigned by the SACT team (for example where trusts haven’t addressed unmapped regimens).

Tumour resections

A tumour is recorded as treated by resection if:

- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery (event is '01a', '01b', or '01z')
- and the OPCS4_CODE is in the tumour resection list
  - or the OPCS4_CODE is identified as a tumour resection in early stage tumours for that specific cancer site (see Appendix 3)
- and the operation date (OPERTN) occurred in the relevant timeframe (see Appendix 2)

OR
• there is an inpatient HES episode with a tumour resection OPCS-4 code in one of the operation fields
  o or one of the operation fields contains an OPCS-4 code identified as a tumour resection in early stage tumours for that specific cancer site (see Appendix 3)
• and the operation date (OPERTN) occurred in the relevant timeframe
• and the patient had no other tumours diagnosed in the 18 months before or after that tumour's diagnosis date

HES is linked to the cancer registration using a matching algorithm taking into account NHS number, date of birth, sex and postcode at diagnosis (details available on request to NCRAS).

Radiotherapy

A tumour is recorded as treated with radiotherapy if:

• there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with radiotherapy (event is either ‘RT - Teletherapy’ (code = 05) or ‘chemoradiotherapy’ (code = 04) or ‘radiosurgery’ (code = 22) or 'RT - Other/ NK' (code = RTX))
  • and the event date (EVENTDATE) occurred in the relevant timeframe (see Appendix 2)
OR
• there is a record in RTDS (excluding those classed as Brachytherapy, i.e., with RTTREATMENTMODALITY='06')
  • and the appointment date (APPTDATE) occurred in the relevant timeframe
  • and the patient had no other tumours diagnosed in the 18 months before or after that tumour’s diagnosis date

RTDS is linked to the cancer registration using a matching algorithm taking into account NHS number, date of birth, sex and postcode at diagnosis (details available on request to NCRAS). Brachytherapy was excluded from the definition of radiotherapy because further investigation into its completeness is needed first. Radiotherapy figures are likely to be an underestimate as there is underreporting of teletherapy in both RTDS datasets, and data may be incomplete for selected NHS Trusts.

From 1 April 2016, PHE took over full responsibility for RTDS, allowing greater integration of the management, collection, quality assurance and analysis of radiotherapy data alongside the other major national cancer data sets in its charge. For patients whose follow up period for radiotherapy extended past April 2016, the RTDS.AT_PRESCRIPTIONS dataset in CAS1902 was used.
Results breakdowns

Results are broken down by 31 tumour sites; the ICD-10 codes used to define these can be found in Appendix 2.

Stage breakdowns in the data release use TNM staging, except for gynaecological cancers which use FIGO staging. For cervical cancers, only FIGO staging was used. For ovarian, uterine and vulval cancers, TNM stage was used where FIGO stage was unknown. Figo substages were collated into FIGO stages 1, 2, 3, 4, and unknown. To remain consistent with published stage data, Breast tumours (C50) with Paget’s disease were excluded. The final recorded stage of a tumour is derived by the registration service using all information available up to 3 months after diagnosis. For this reason, the tumour stage shown in this data may be different to the stage originally available to the clinician when deciding a course of treatment, as it may have been subsequently updated following removal of the tumour and pathology results.

The patient’s age group was based on the age of the patient when they were diagnosed with the tumour.

The patient’s income deprivation quintile was allocated by linking the patient’s postcode to their 2011 ONS census Lower Super Output Area (LSOA). This was then linked to the Ministry of Housing, Communities & Local Government 2015 income deprivation quintile for that LSOA.

The patient’s Charlson comorbidity score was derived from Hospital Episodes Statistics (HES) and Cancer Registry data combined, and looks back at the time period between 27 months to 3 months before the patient’s cancer diagnosis.

The patient’s Cancer Alliance was allocated based on their Cancer Alliance of residence at point of diagnosis, not the location(s) where they were treated.
Appendix 1: Code changes in SOP version 4.6 compared to 4.5

Changes have been made to the extraction code in SOP version 4.6 since SOP version 4.5 was published for 2013-2016 diagnoses. These are noted below. Only non-superficial changes are noted; i.e. changes that could potentially impact the results.

Timeframe lookup table

The timeframe lookup table was updated to include timeframes for brain (benign endocrine), brain (non-malignant brain) skin (melanoma), skin (non-melanoma skin cancer (NMSC)), and other non-malignant neoplasms (see Appendix 2).

Tumour cohort table

- Brain has been redefined into “malignant brain” (C70-C72) and “non-benign endocrine” (C75Brain, D44Brain) in accordance with the Get Data Out programme. Additional morphology codes have been used to define non-benign endocrine codes (D44) as opposed to “Other” (non-brain) D code tumours in the tumour_cohort table. The 3 digit ICD10 code is defined as “D44Brain” and “D44Other”, depending on the morphology of the tumour.

- Non-malignant brain and benign endocrine have been added as tumour sites. Morphology codes have been used to define non-malignant brain (D32Brain, D33Brain, D42Brain, D43Brain) and benign endocrine (D35Brain) tumours as opposed to “Other” (non-brain) D code tumours in the tumour_cohort table, in accordance with the Get Data Out programme. The 3 digit ICD10 codes are defined as D32Other, D33Other, D35Other, D42Other, D43Other, and D32Brain, D33Brain, D35Brain, D42Brain, D43Brain, respectively, depending on the morphology of the tumour.

- Melanoma skin cancer has been defined as tumours with ICD10 code “C43”.

- Non-melanoma skin cancers (NMSC) have been defined as either basal cell carcinoma (NMSC_BCC), cutaneous squamous-cell carcinoma (NMSC_cSCC) and other non-melanoma skin cancers (NMSC_OTHER). Morphology codes have been used to define NMSC tumour type as either “C44BCC”, “C44CSCC” or “C44OTHER”. Following UKIACR method of counting only the first ever registered tumour for BCC and cSCC cancers, and counting all instances of other NMSC tumours.

- Non-malignant tumours not already defined for e.g. brain codes are defined as ‘Other Malignant’ and are defined by morphology codes.

- The Snapshot used for AT_TUMOUR_ENGLAND and AT_TREATMENT_ENGLAND was updated to 2102.

- Trust codes are now available to show which trust a treatment was delivered in.
Chemotherapy flag

- The Snapshot used for AT_TREATMENT_ENGLAND was updated to 2102.

Tumour resection flag

- Specific resection codes and the site specific timeframes were added or updated for Bladder, Kidney, and Testes (see appendices 2 and 3).

Radiotherapy flag

- The Snapshots used for AT_TREATMENT_ENGLAND and for the RTDS dataset post April 2016 were updated to 2102.
### Appendix 2: Summary of tumour sites & timeframe rules

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>ICD10 codes</th>
<th>Chemotherapy</th>
<th>Tumour resections</th>
<th>Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder</td>
<td>C67</td>
<td>365 (12)</td>
<td>274 (9)</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Brain: Benign endocrine</td>
<td>D35.2-D35.4</td>
<td>547 (18)</td>
<td>365 (12)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>Brain: Malignant brain,</td>
<td>C70-72</td>
<td>547 (18)</td>
<td>183 (6)</td>
<td>365 (12)</td>
</tr>
<tr>
<td>Brain: Non-benign endocrine</td>
<td>C75.1-C75.3 D44.3-D44.5</td>
<td>547 (18)</td>
<td>183 (6)</td>
<td>365 (12)</td>
</tr>
<tr>
<td>Brain: Non-malignant brain</td>
<td>D32-D33, D42-D44.5</td>
<td>547 (18)</td>
<td>365 (12)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>Breast</td>
<td>C50</td>
<td>365 (12)*</td>
<td>365 (12)*</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Cervical</td>
<td>C53</td>
<td>274 (9)*</td>
<td>274 (9)*</td>
<td>274 (9)*</td>
</tr>
<tr>
<td>Colorectal: Colon</td>
<td>C18-19</td>
<td>365 (12)*</td>
<td>183 (6)*</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Colorectal: Rectum</td>
<td>C20</td>
<td>365 (12)*</td>
<td>365 (12)*</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Hypopharynx</td>
<td>C12, C13</td>
<td>183 (6)</td>
<td>365 (12)</td>
<td>183 (6)</td>
</tr>
<tr>
<td>Larynx</td>
<td>C32</td>
<td>365 (12)</td>
<td>456 (15)</td>
<td>183 (6)</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>C02, C03, C04, C06</td>
<td>456 (15)</td>
<td>183 (6)</td>
<td>456 (15)</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>C01, C09, C10</td>
<td>183 (6)</td>
<td>365 (12)</td>
<td>183 (6)</td>
</tr>
<tr>
<td>Other head and neck</td>
<td>C05, C11, C14, C30, C31</td>
<td>365 (12)</td>
<td>456 (15)</td>
<td>274 (9)</td>
</tr>
<tr>
<td>Salivary glands</td>
<td>C07, C08</td>
<td>547 (18)</td>
<td>183 (6)</td>
<td>274 (9)</td>
</tr>
<tr>
<td>Kidney</td>
<td>C64-C66, C68</td>
<td>365 (12)*</td>
<td>183 (6)</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Liver</td>
<td>C22</td>
<td>456 (15)</td>
<td>365 (12)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>SCLC</td>
<td>C33-C34 with ICD-O-2 morphology in list 8041, 8042, 8043, 8044, 8045</td>
<td>183 (6)*</td>
<td>183 (6)*</td>
<td>183 (6)*</td>
</tr>
<tr>
<td>NSCLC</td>
<td>C33-C34 with ICD-O-2 morphology not in list 8041, 8042, 8043, 8044, 8045</td>
<td>183 (6)*</td>
<td>183 (6)*</td>
<td>183 (6)*</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>C15</td>
<td>183 (6)</td>
<td>274 (9)</td>
<td>274 (9)*</td>
</tr>
<tr>
<td>Ovary</td>
<td>C56-C57, C48 (females, excluding ICD-O-2 8693, 8800-8806, 8963, 8990, 8991, 9040-9044, 8810-8921, 9120-9373, 9490, 9500, 9530-9582), D39.1</td>
<td>274 (9)*</td>
<td>274 (9)*</td>
<td>274 (9)*</td>
</tr>
<tr>
<td>Pancreas</td>
<td>C25</td>
<td>183 (6)</td>
<td>274 (9)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>Prostate</td>
<td>C61</td>
<td>365 (12)*</td>
<td>456 (15)</td>
<td>365 (12)*</td>
</tr>
<tr>
<td>Skin: Melanoma</td>
<td>C43</td>
<td>456 (15)</td>
<td>183 (6)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>Skin: NMSC BCC</td>
<td>C44 with ICD-O-2 morphology in list 8090, 8091, 8092, 8093, 8094, 8095, 8097</td>
<td>547 (18)</td>
<td>365 (12)</td>
<td>547 (18)</td>
</tr>
<tr>
<td>Skin: NMSC cSCC</td>
<td>C44 with ICD-O-2 morphology in list 8050, 8051, 8052, 8054, 8070, 8071, 8072, 8073, 8074, 8075, 8076</td>
<td>456 (15)</td>
<td>183 (6)</td>
<td>547 (18)</td>
</tr>
</tbody>
</table>
The following ICD 10 codes and post-diagnostic treatment time periods were used for the cancer sites presented in this workbook. The time periods were identified using a data driven approach detailed in CAS-SOP #4.4, with exceptions(*) made for particular treatments for certain cancer sites under recommendation from clinicians. These timeframes were chosen by clinicians using their own experience and the data. [^Updated in this version]

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>ICD-10 Codes</th>
<th>Time Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin: NMSC rare[^]</td>
<td>C44 with ICD-O-2 morphology not in list 8050, 8051, 8052, 8054, 8070, 8071, 8072, 8073, 8074, 8075, 8076, 8077, 8078, 8082, 8083, 8084, 8085, 8086, 8090, 8091, 8092, 8093, 8094, 8095, 8097</td>
<td>456 (15) 183 (6) 547 (18)</td>
</tr>
<tr>
<td>Stomach</td>
<td>C16</td>
<td>183 (6) 274 (9) 274 (9)*</td>
</tr>
<tr>
<td>Testis</td>
<td>C62, D29.2</td>
<td>274 (9) 183 (6) 547(18)</td>
</tr>
<tr>
<td>Uterine</td>
<td>C54-C55</td>
<td>274 (9)* 274 (9)* 274 (9)*</td>
</tr>
<tr>
<td>Vulva</td>
<td>C51</td>
<td>274 (9)* 274 (9)* 274 (9)*</td>
</tr>
<tr>
<td>Other malignant neoplasms</td>
<td>C00, C17, C21, C23-C24, C26, C37-C42, C45-C48, non-ovarian C48, C49, C52, C58-C60, C63, C69, C75.0, C75.4-C97</td>
<td>456 (15) N/A 547 (18)</td>
</tr>
<tr>
<td>Other non-malignant neoplasms[^]</td>
<td>D00, D02, D05, D09-D10, D12, D14, D17, D19-D24, D26, D28, D30, D31, D34, D35.0-D35.1, D35.5-D35.9, D37-D38, D41, D44.0-D44.2, D44.6-D44.9, D45-D47</td>
<td>456 (15) 183 (6) 547 (18)</td>
</tr>
</tbody>
</table>
## Appendix 3: Site-specific summary of tumour resection rules

<table>
<thead>
<tr>
<th>OPCS-4 code</th>
<th>Procedure name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder (C67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M421</td>
<td>Endoscopic resection of lesion of bladder</td>
<td>Non muscle invasive (T1) tumours only</td>
</tr>
<tr>
<td>M422</td>
<td>Endoscopic cauterisation of lesion of bladder</td>
<td>Non muscle invasive (T1) tumours only</td>
</tr>
<tr>
<td>M423</td>
<td>Endoscopic destruction of lesion of bladder NEC</td>
<td>Non muscle invasive (T1) tumours only</td>
</tr>
<tr>
<td>M428</td>
<td>Other specified endoscopic extirpation of lesion of bladder</td>
<td>Non muscle invasive (T1) tumours only</td>
</tr>
<tr>
<td>M429</td>
<td>Unspecified endoscopic extirpation of lesion of bladder</td>
<td>Non muscle invasive (T1) tumours only</td>
</tr>
<tr>
<td>M341</td>
<td>Cystoprostatectomy</td>
<td></td>
</tr>
<tr>
<td>M342</td>
<td>Cystourethrectomy</td>
<td></td>
</tr>
<tr>
<td>M343</td>
<td>Cystectomy NEC</td>
<td></td>
</tr>
<tr>
<td>M344</td>
<td>Simple cystectomy</td>
<td></td>
</tr>
<tr>
<td>M348</td>
<td>Other specified total excision of bladder</td>
<td></td>
</tr>
<tr>
<td>M349</td>
<td>Unspecified total excision of bladder</td>
<td></td>
</tr>
<tr>
<td>M359</td>
<td>Unspecified partial excision of bladder</td>
<td></td>
</tr>
<tr>
<td>X142</td>
<td>Anterior exenteration of pelvis</td>
<td></td>
</tr>
<tr>
<td>Brain (C70-C72, C75.1-C75.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A011</td>
<td>Hemispherectomy</td>
<td></td>
</tr>
<tr>
<td>A012</td>
<td>Total lobectomy of brain</td>
<td></td>
</tr>
<tr>
<td>A013</td>
<td>Partial lobectomy of brain</td>
<td></td>
</tr>
<tr>
<td>A018</td>
<td>Other specified major excision of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A019</td>
<td>Unspecified major excision of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A021</td>
<td>Excision of lesion of tissue of frontal lobe of brain</td>
<td></td>
</tr>
<tr>
<td>A022</td>
<td>Excision of lesion of tissue of temporal lobe of brain</td>
<td></td>
</tr>
<tr>
<td>A023</td>
<td>Excision of lesion of tissue of parietal lobe of brain</td>
<td></td>
</tr>
<tr>
<td>A024</td>
<td>Excision of lesion of tissue of occipital lobe of brain</td>
<td></td>
</tr>
<tr>
<td>A025</td>
<td>Excision of lesion of cerebellum</td>
<td></td>
</tr>
<tr>
<td>A026</td>
<td>Excision of lesion of tissue of brain stem</td>
<td></td>
</tr>
<tr>
<td>A028</td>
<td>Other specified excision of lesion of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A029</td>
<td>Unspecified excision of lesion of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A068</td>
<td>Other specified other excision of lesion of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A069</td>
<td>Unspecified other excision of lesion of tissue of brain</td>
<td></td>
</tr>
<tr>
<td>A171</td>
<td>Endoscopic extirpation of lesion of ventricle of brain</td>
<td></td>
</tr>
<tr>
<td>A291</td>
<td>Excision of lesion of optic nerve (II)</td>
<td></td>
</tr>
<tr>
<td>A292</td>
<td>Excision of lesion of oculomotor nerve (III)</td>
<td></td>
</tr>
<tr>
<td>A293</td>
<td>Excision of lesion of trigeminal nerve (V)</td>
<td></td>
</tr>
<tr>
<td>A294</td>
<td>Excision of lesion of facial nerve (VII)</td>
<td></td>
</tr>
<tr>
<td>A295</td>
<td>Excision of lesion of acoustic nerve (VIII)</td>
<td></td>
</tr>
</tbody>
</table>
Excision of lesion of glossopharyngeal nerve (IX)
Excision of lesion of vagus nerve (X)
Unspecified excision of lesion of cranial nerve
Extirpation of lesion of meninges of cortex of brain
Extirpation of lesion of meninges of sphenoidal ridge of cranium
Extirpation of lesion of meninges of subfrontal region of brain
Extirpation of lesion of meninges of parasagittal region of brain
Extirpation of lesion of falx cerebri
Extirpation of lesion of tentorium cerebelli
Other specified excision of lesion of meninges of brain
Unspecified extirpation of lesion of meninges of brain
Extirpation of lesion of meninges of skull base
Extirpation of lesion of meninges of skull clivus
Other specified other extirpation of lesion of meninges of brain
Unspecified other extirpation of lesion of meninges of brain
Chordectomy of spinal cord
Extirpation of lesion of spinal cord NEC
Excision of lesion of intradural intramedullary spinal cord NEC
Excision of lesion of extradural spinal cord
Excision of lesion of intradural extramedullary spinal cord
Other specified partial extirpation of spinal cord
Unspecified partial extirpation of spinal cord
Extirpation of lesion of meninges of spinal cord
Extirpation of lesion of psinal nerve root
Other specified excision of peripheral nerve
Excision of lesion of peripheral nerve
Trans-sphenoidal hypophysectomy
Trans-septal hypophysectomy
Transcranial hypophysectomy
Other specified excision of pituitary gland
Unspecified excision of pituitary gland
Excision of lesion of pituitary gland
Excision of pineal gland
Other specified operations on pineal gland
Excision of lesion of orbit
Extirpation of lesion of cranium
Excision of lesion of infratemporal fossa
Primary laminectomy excision of cervical intervertebral disc
Primary anterolateral excision of thoracic intervertebral disc NEC
Other specified primary excision of thoracic intervertebral disc
### CAS-SOP #4: Linking treatment tables

#### Thoracic Spine (V300-V359)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V319</td>
<td>Unspecified primary excision of thoracic intervertebral disc</td>
</tr>
<tr>
<td>V331</td>
<td>Primary laminectomy excision of lumbar intervertebral disc</td>
</tr>
<tr>
<td>V339</td>
<td>Unspecified primary excision of lumbar intervertebral disc</td>
</tr>
<tr>
<td>V351</td>
<td>Primary excision of intervertebral disc NEC</td>
</tr>
<tr>
<td>V431</td>
<td>Excision of lesion of cervical vertebra</td>
</tr>
<tr>
<td>V432</td>
<td>Excision of lesion of thoracic vertebra</td>
</tr>
<tr>
<td>V433</td>
<td>Excision of lesion of lumbar vertebra</td>
</tr>
<tr>
<td>V438</td>
<td>Other specified extirpaiton of lesion of spine</td>
</tr>
<tr>
<td>V439</td>
<td>Unspecified extirpation of lesion of spine</td>
</tr>
</tbody>
</table>

#### Breast (C50)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B271</td>
<td>Total mastectomy and excision of both pectoral muscles and part of chest wall</td>
</tr>
<tr>
<td>B272</td>
<td>Total mastectomy and excision of both pectoral muscles NEC</td>
</tr>
<tr>
<td>B273</td>
<td>Total mastectomy and excision of pectoralis minor muscle</td>
</tr>
<tr>
<td>B274</td>
<td>Total mastectomy NEC</td>
</tr>
<tr>
<td>B275</td>
<td>Subcutaneous mastectomy</td>
</tr>
<tr>
<td>B276</td>
<td>Skin sparing mastectomy</td>
</tr>
<tr>
<td>B278</td>
<td>Other specified total excision of breast</td>
</tr>
<tr>
<td>B279</td>
<td>Unspecified total excision of breast</td>
</tr>
<tr>
<td>B281</td>
<td>Quadrantectomy of breast</td>
</tr>
<tr>
<td>B282</td>
<td>Partial excision of breast NEC</td>
</tr>
<tr>
<td>B283</td>
<td>Excision of lesion of breast NEC</td>
</tr>
<tr>
<td>B284</td>
<td>Re-excision of breast margins</td>
</tr>
<tr>
<td>B285</td>
<td>Wire guided partial excision of breast</td>
</tr>
<tr>
<td>B286</td>
<td>Excision of accessory breast tissue</td>
</tr>
<tr>
<td>B287</td>
<td>Wire guided excision of lesion of breast</td>
</tr>
<tr>
<td>B288</td>
<td>Other specified other excision of breast</td>
</tr>
<tr>
<td>B289</td>
<td>Unspecified other excision of breast</td>
</tr>
<tr>
<td>B341</td>
<td>Subareolar excision of mammary duct</td>
</tr>
<tr>
<td>B342</td>
<td>Excision of lesion of mammary duct</td>
</tr>
<tr>
<td>B343</td>
<td>Excision of lesion of mammary duct</td>
</tr>
<tr>
<td>B352</td>
<td>Excision of nipple</td>
</tr>
<tr>
<td>B353</td>
<td>Exirpation of lesion of nipple</td>
</tr>
<tr>
<td>B374</td>
<td>Capsulectomy of breast</td>
</tr>
<tr>
<td>B401</td>
<td>Interstitial laser destruction of lesion of breast</td>
</tr>
<tr>
<td>B408</td>
<td>Other specified destruction of lesion of breast</td>
</tr>
<tr>
<td>B409</td>
<td>Unspecified destruction of lesion of breast</td>
</tr>
</tbody>
</table>

#### Cervical (C53)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P172</td>
<td>Partial colpectomy</td>
</tr>
<tr>
<td>Q011</td>
<td>Amputation of cervix uteri</td>
</tr>
<tr>
<td>Q013</td>
<td>Excision of lesion of cervix uteri</td>
</tr>
<tr>
<td>Q018</td>
<td>Other specified excision of cervix uteri</td>
</tr>
<tr>
<td>Q071</td>
<td>Abdominal hysterocolpectomy and excision of perouterine tissue</td>
</tr>
</tbody>
</table>

---

20
### CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q072</td>
<td>Abdominal hysterectomy and excision of periuterine tissue NEC</td>
</tr>
<tr>
<td>Q073</td>
<td>Abdominal hysterocolpectomy NEC</td>
</tr>
<tr>
<td>Q074</td>
<td>Total abdominal hysterectomy NEC</td>
</tr>
<tr>
<td>Q078</td>
<td>Other specified abdominal excision of uterus</td>
</tr>
<tr>
<td>Q079</td>
<td>Unspecified abdominal excision of uterus</td>
</tr>
<tr>
<td>Q081</td>
<td>Vaginal hysterocolpectomy and excision of periuterine tissue</td>
</tr>
<tr>
<td>Q082</td>
<td>Vaginal hysterectomy and excision of periuterine tissue NEC</td>
</tr>
<tr>
<td>Q083</td>
<td>Vaginal hysterocolpectomy NEC</td>
</tr>
<tr>
<td>Q088</td>
<td>Other specified vaginal excision of uterus</td>
</tr>
<tr>
<td>Q089</td>
<td>Unspecified vaginal excision of uterus</td>
</tr>
<tr>
<td>X141</td>
<td>Total exenteration of pelvis</td>
</tr>
<tr>
<td>X142</td>
<td>Anterior exenteration of pelvis</td>
</tr>
<tr>
<td>X143</td>
<td>Posterior exenteration of pelvis</td>
</tr>
<tr>
<td>X148</td>
<td>Other specified clearance of pelvis</td>
</tr>
<tr>
<td>X149</td>
<td>Unspecified clearance of pelvis</td>
</tr>
<tr>
<td>Q014</td>
<td>Large loop excision of transformation zone</td>
</tr>
<tr>
<td>Q031</td>
<td>Knife cone biopsy of cervix uteri</td>
</tr>
<tr>
<td>Q032</td>
<td>Laser cone biopsy of cervix uteri</td>
</tr>
<tr>
<td>Q033</td>
<td>Cone biopsy of cervix uteri NEC</td>
</tr>
<tr>
<td>T856</td>
<td>Block dissection of pelvic lymph nodes</td>
</tr>
<tr>
<td>T859</td>
<td>Unspecified block dissection of lymph nodes</td>
</tr>
<tr>
<td>T865</td>
<td>Sampling of mediastinal lymph nodes</td>
</tr>
</tbody>
</table>

**Colon and rectum (C18, C19 and C20)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H041</td>
<td>Panproctocolectomy and ileostomy</td>
</tr>
<tr>
<td>H042</td>
<td>Panproctocolectomy and anastomosis of ileum to anus and creation of pouch HFQ</td>
</tr>
<tr>
<td>H043</td>
<td>Panproctocolectomy and anastomosis of ileum to anus NEC</td>
</tr>
<tr>
<td>H048</td>
<td>Other specified total excision of colon and rectum</td>
</tr>
<tr>
<td>H049</td>
<td>Unspecified total excision of colon and rectum</td>
</tr>
<tr>
<td>H051</td>
<td>Total colectomy and anastomosis of ileum to rectum</td>
</tr>
<tr>
<td>H052</td>
<td>Total colectomy and ileostomy and creation of rectal fistula HFQ</td>
</tr>
<tr>
<td>H053</td>
<td>Total colectomy and ileostomy NEC</td>
</tr>
<tr>
<td>H058</td>
<td>Other specified total excision of colon</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>H059</td>
<td>Unspecified total excision of colon</td>
</tr>
<tr>
<td>H061</td>
<td>Extended right hemicolecotomy and end to end anastomosis</td>
</tr>
<tr>
<td>H062</td>
<td>Extended right hemicolecotomy and anastomosis of ileum to colon</td>
</tr>
<tr>
<td>H063</td>
<td>Extended right hemicolecotomy and anastomosis NEC</td>
</tr>
<tr>
<td>H064</td>
<td>Extended right hemicolecotomy and ileostomy HFQ</td>
</tr>
<tr>
<td>H065</td>
<td>Extended right hemicolecotomy and end to side anastomosis</td>
</tr>
<tr>
<td>H068</td>
<td>Other specified extended excision of right hemicolon</td>
</tr>
<tr>
<td>H069</td>
<td>Unspecified extended excision of right hemicolon</td>
</tr>
<tr>
<td>H071</td>
<td>Right hemicolecotomy and end to end anastomosis of ileum to colon</td>
</tr>
<tr>
<td>H072</td>
<td>Right hemicolecotomy and side to side anastomosis of ileum to transverse colon</td>
</tr>
<tr>
<td>H073</td>
<td>Right hemicolecotomy and anastomosis NEC</td>
</tr>
<tr>
<td>H074</td>
<td>Right hemicolecotomy and ileostomy HFQ</td>
</tr>
<tr>
<td>H075</td>
<td>Right hemicolecotomy and end to side anastomosis</td>
</tr>
<tr>
<td>H078</td>
<td>Other specified other excision of right hemicolon</td>
</tr>
<tr>
<td>H079</td>
<td>Unspecified other excision of right hemicolon</td>
</tr>
<tr>
<td>H081</td>
<td>Transverse colectomy and end to end anastomosis</td>
</tr>
<tr>
<td>H082</td>
<td>Transverse colectomy and anastomosis of ileum to colon</td>
</tr>
<tr>
<td>H083</td>
<td>Transverse colectomy and anastomosis NEC</td>
</tr>
<tr>
<td>H084</td>
<td>Transverse colectomy and ileostomy HFQ</td>
</tr>
<tr>
<td>H085</td>
<td>Transverse colectomy and exteriorisation of bowel NEC</td>
</tr>
<tr>
<td>H088</td>
<td>Other specified excision of transverse colon</td>
</tr>
<tr>
<td>H089</td>
<td>Unspecified excision of transverse colon</td>
</tr>
<tr>
<td>H091</td>
<td>Left hemicolecotomy and end to end anastomosis of colon to rectum</td>
</tr>
<tr>
<td>H092</td>
<td>Left hemicolecotomy and end to end anastomosis of colon to colon</td>
</tr>
<tr>
<td>H093</td>
<td>Left hemicolecotomy and anastomosis NEC</td>
</tr>
<tr>
<td>H094</td>
<td>Left hemicolecotomy and ileostomy HFQ</td>
</tr>
<tr>
<td>H095</td>
<td>Left hemicolecotomy and exteriorisation of bowel NEC</td>
</tr>
<tr>
<td>H098</td>
<td>Other specified excision of left hemicolon</td>
</tr>
<tr>
<td>H099</td>
<td>Unspecified excision of left hemicolon</td>
</tr>
<tr>
<td>H101</td>
<td>Sigmoid colectomy and end to end anastomosis of ileum to rectum</td>
</tr>
<tr>
<td>H102</td>
<td>Sigmoid colectomy and anastomosis of colon to rectum</td>
</tr>
<tr>
<td>H103</td>
<td>Sigmoid colectomy and anastomosis NEC</td>
</tr>
<tr>
<td>H104</td>
<td>Sigmoid colectomy and ileostomy HFQ</td>
</tr>
<tr>
<td>H105</td>
<td>Sigmoid colectomy and exteriorisation of bowel NEC</td>
</tr>
<tr>
<td>H106</td>
<td>Sigmoid colectomy and end to side anastomosis</td>
</tr>
<tr>
<td>H108</td>
<td>Other specified excision of sigmoid colon</td>
</tr>
<tr>
<td>H109</td>
<td>Unspecified excision of sigmoid colon</td>
</tr>
<tr>
<td>H111</td>
<td>Colectomy and end to end anastomosis of colon to colon NEC</td>
</tr>
</tbody>
</table>
H112  Colectomy and side to side anastomosis of ileum
to colon NEC
H113  Colectomy and anastomosis NEC
H114  Colectomy and ileostomy NEC
H115  Colectomy and exteriorisation of bowel NEC
H118  Other specified other excision of colon
H119  Unspecified other excision of colon
H291  Subtotal excision of colon and rectum and creation
of colonic pouch and anastomosis of colon to anus
H292  Subtotal excision of colon and rectum and creation
of colonic pouch NEC
H293  Subtotal excision of colon and creation of colonic
pouch and anastomosis of colon to rectum
H294  Subtotal excision of colon and creation of colonic
pouch NEC
H298  Other specified subtotal excision of colon
H299  Unspecified subtotal excision of colon
H322  Hartmann procedure (rectosigmoidectomy)
H331  Abdominoperineal excision of rectum and end
colostomy
H332  Proctectomy and anastomosis of colon to anus
H333  Anterior resection of rectum and anastomosis of
colon to rectum using staples
H334  Anterior resection of rectum and anastomosis NEC
H335  Rectosigmoidectomy and closure of rectal stump
and exteriorisation of bowel
H336  Anterior resection of rectum and exteriorisation of
bowel
H337  Perineal resection of rectum HFQ
H338  Other specified excision of rectum
H339  Unspecified excision of rectum
H404  Trans-sphincteric anastomosis of colon to anus
H408  Other specified operations on rectum through anal
sphincter
H409  Unspecified operations on rectum through anal
sphincter
X141  Total exenteration of pelvis
X142  Anterior exenteration of pelvis
X143  Posterior exenteration of pelvis
X148  Other specified clearance of pelvis
X149  Unspecified clearance of pelvis
H122  Excision of lesion of colon NEC  Stage 1 only
H181  Open colonoscopy  Stage 1 only
H191  Open biopsy of lesion of colon  Stage 1 only
H201  Fibreoptic endoscopic snare resection of lesion of
colon  Stage 1 only
H202  Fibreoptic endoscopic cauterisation of lesion of
colon  Stage 1 only
H204  Fibreoptic endoscopic destruction of lesion of
colon NEC  Stage 1 only
H205  Fibreoptic endoscopic submucosal resection of
lesion of colon  Stage 1 only
H206  Fibreoptic endoscopic resection of lesion of colon
NEC  Stage 1 only
H208 | Other specified endoscopic extirpation of lesion of colon | Stage 1 only
H209 | Unspecified endoscopic extirpation of lesion of colon | Stage 1 only
H221 | Diagnostic fibreoptic endoscopic examination of colon and biopsy of lesion of colon | Stage 1 only
H229 | Unspecified diagnostic endoscopic examination of colon | Stage 1 only
H231 | Endoscopic snare resection of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H232 | Endoscopic cauterisation of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H235 | Endoscopic submucosal resection of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H236 | Endoscopic resection of lesion of lower bowel using fibreoptic sigmoidoscope NEC | Stage 1 only
H238 | Other specified endoscopic extirpation of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H239 | Unspecified endoscopic extirpation of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H248 | Other specified other therapeutic endoscopic operations on lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H251 | Diagnostic endoscopic examination of lower bowel and biopsy of lesion of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H259 | Unspecified diagnostic endoscopic examination of lower bowel using fibreoptic sigmoidoscope | Stage 1 only
H261 | Endoscopic snare resection of lesion of sigmoid colon using rigid sigmoidoscope | Stage 1 only
H281 | Diagnostic endoscopic examination of sigmoid colon and biopsy of lesion of sigmoid colon using rigid sigmoidoscope | Stage 1 only
H341 | Open excision of lesion of rectum | Stage 1 only
H402 | Trans-sphincteric excision of lesion of rectum | Stage 1 only
H412 | Peranal excision of lesion of rectum | Stage 1 only
H418 | Other specified other operations on rectum through anus | Stage 1 only
H419 | Unspecified other operations on rectum through anus | Stage 1 only
H561 | Biopsy of lesion of anus | Stage 1 only
H024 | Incidental appendicectomy | C18.1 (appendix tumours) only
H019 | Unspecified emergency excision of appendix | C18.1 (appendix tumours) only
H011 | Emergency excision of abnormal appendix and drainage HFQ | C18.1 (appendix tumours) only

Head and neck (C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C30, C31, C32)

E191 | Total pharyngectomy
E192 | Partial pharyngectomy
E214 | Plastic repair of pharynx NEC
E231 | Open excision of lesion of pharynx
E242 | Endoscopic extirpation of lesion of pharynx NEC
E291 | Total laryngectomy
E292 | Partial horizontal laryngectomy
E293 | Partial vertical laryngectomy
CAS-SOP #4: Linking treatment tables

E294  Partial laryngectomy NEC
E295  Laryngofissure and chordectomy of vocal chord
E296  Laryngectomy NEC
E299  Unspecified excision of larynx
E301  Excision of lesion of larynx using thyotomy as approach
E341  Microtherapeutic endoscopic extirpation of lesion of larynx using laser
E342  Microtherapeutic endoscopic resection of lesion of larynx NEC
E343  Microtherapeutic endoscopic destruction of lesion of larynx NEC
E352  Endoscopic resection of lesion of pharynx NEC
E414  Tracheo-oesophageal puncture with insertion of speech prothesis
F011  Excision of vermilion border of lip and advancement of mucosa of lip
F018  Other specified partial excision of lip
F021  Excision of lesion of lip
F042  Reconstruction of lip using skin flap
F202  Excision of lesion of gingiva
F221  Total glossectomy
F222  Partial glossectomy
F231  Excision of lesion of tongue
F281  Excision of lesion of palate
F301  Plastic repair of palate using flap of palate
F303  Plastic repair of palate using flap of tongue
F304  Plastic repair of palate using graft of skin
F305  Plastic repair of palate using flap of mucosa
F324  Operations on uvula NEC
F328  Other specified other operations on palate
F341  Bilateral dissection tonsillectomy
F349  Unspecified excision of tonsil
F381  Excision of lesion of floor of mouth
F382  Excision of lesion of mouth NEC
F391  Reconstruction of mouth using flap NEC
F392  Reconstruction of mouth using graft NEC
F441  Total excision of parotid gland
F442  Partial excision of parotid gland
F443  Excision of parotid gland NEC
F444  Excision of submandibular gland
F451  Excision of lesion of parotid gland
G021  Total oesophagectomy and anastomosis of pharynx to stomach
G032  Partial oesophagectomy and interposition of microvascularly attached jejunum
S171  Distant myocutaneous subcutaneous pedicle flap to head or neck
S208  Other specified other distant flap of skin
S248  Other specified local flap of skin and muscle

Tonsil tumours (C09) only
CAS-SOP #4: Linking treatment tables

S288 Other specified flap of mucosa
S353 Split autograft of skin to head or neck NEC
T851 Block dissection of cervical lymph nodes
V061 Medial maxillectomy
V068 Other specified excision of maxilla
V069 Unspecified excision of maxilla
V141 Hemimandibulectomy
V142 Extensive excision of mandible NEC
V143 Partial excision of mandible NEC
V144 Excision of lesion of mandible
V149 Unspecified excision of mandible
V168 Other specified division of mandible
V191 Reconstruction of mandible
Y051 Total excision of organ NOC
Y092 Harvest of radial artery flap of skin and fascia
Y598 Other specified harvest of flap of skin and fascia
Y612 Harvest of flap of skin and pectoralis major muscle
Y631 Harvest of flap of latissimus dorsi muscle NEC
Y638 Other specified harvest of flap of muscle of trunk
Y662 Harvest of bone from rib

Kidney (C64-C66, C68)

M021 Nephrectomy and excision of perirenal tissue
M022 Nephroureterectomy NEC
M023 Bilateral nephrectomy
M024 Excision of half of horseshoe kidney
M025 Nephrectomy NEC
M028 Other specified total excision of kidney
M029 Unspecified total excision of kidney
M038 Other specified partial excision of kidney
M039 Unspecified partial excision of kidney
M042 Open excision of lesion of kidney NEC
M104 Endoscopic cryoablative of lesion of kidney
M137 Percutaneous radiofrequency ablation of lesion of kidney
M181 Total ureterectomy
M182 Excision of segment of ureter
M183 Secondary ureterectomy
M252 Open excision of lesion of ureter NEC
M291 Endoscopic extirpation of lesion of ureter

Liver (C22)

J011 Orthotopic transplantation of liver NEC
J015 Orthotopic transplantation of whole liver

Tumours of ureter (C66) & pelvis (C65) only
### CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J019</td>
<td>Unspecified transplantation of liver</td>
</tr>
<tr>
<td>J021</td>
<td>Right hemihepatectomy NEC</td>
</tr>
<tr>
<td>J022</td>
<td>Left hemihepatectomy NEC</td>
</tr>
<tr>
<td>J023</td>
<td>Resection of segment of liver</td>
</tr>
<tr>
<td>J024</td>
<td>Wedge excision of liver</td>
</tr>
<tr>
<td>J026</td>
<td>Extended right hemihepatectomy</td>
</tr>
<tr>
<td>J027</td>
<td>Extended left hemihepatectomy</td>
</tr>
<tr>
<td>J028</td>
<td>Other specified partial excision of liver</td>
</tr>
<tr>
<td>J029</td>
<td>Unspecified partial excision of liver</td>
</tr>
<tr>
<td>J031</td>
<td>Excision of lesion of liver NEC</td>
</tr>
<tr>
<td>J032</td>
<td>Open wedge biopsy of lesion of liver</td>
</tr>
<tr>
<td>J101</td>
<td>Percutaneous transluminal embolisation of hepatic artery</td>
</tr>
<tr>
<td>J124</td>
<td>Percutaneous radiofrequency ablation of lesion of liver</td>
</tr>
<tr>
<td>J127</td>
<td>Percutaneous microwave ablation of lesion of liver</td>
</tr>
</tbody>
</table>

#### Small cell lung cancer (SCLC) and Non small cell lung cancer (NSCLC) (C33-C34)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E391</td>
<td>Open excision of lesion of trachea</td>
</tr>
<tr>
<td>E398</td>
<td>Other specified partial excision of trachea</td>
</tr>
<tr>
<td>E399</td>
<td>Unspecified partial excision of trachea</td>
</tr>
<tr>
<td>E441</td>
<td>Excision of carina</td>
</tr>
<tr>
<td>E461</td>
<td>Sleeve resection of bronchus and anastomosis HFQ</td>
</tr>
<tr>
<td>E541</td>
<td>Total pneumonectomy</td>
</tr>
<tr>
<td>E542</td>
<td>Bilobectomy of lung</td>
</tr>
<tr>
<td>E543</td>
<td>Lobectomy of lung</td>
</tr>
<tr>
<td>E544</td>
<td>Excision of segment of lung</td>
</tr>
<tr>
<td>E545</td>
<td>Partial lobectomy of lung NEC</td>
</tr>
<tr>
<td>E548</td>
<td>Other specified excision of lung</td>
</tr>
<tr>
<td>E549</td>
<td>Unspecified excision of lung</td>
</tr>
<tr>
<td>E552</td>
<td>Open excision of lesion of lung</td>
</tr>
<tr>
<td>E554</td>
<td>Open destruction of lesion of lung NEC</td>
</tr>
<tr>
<td>E559</td>
<td>Unspecified open extirpation of lesion of lung</td>
</tr>
<tr>
<td>T013</td>
<td>Excision of lesion of chest wall</td>
</tr>
<tr>
<td>T023</td>
<td>Insertion of prosthesis into chest wall NEC</td>
</tr>
</tbody>
</table>

#### Oesophagus (C15)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G011</td>
<td>Oesophagogastrectomy and anastomosis of oesophagus to stomach</td>
</tr>
<tr>
<td>G013</td>
<td>Oesophagogastrectomy and anastomosis of oesophagus to jejunumNEC</td>
</tr>
<tr>
<td>G018</td>
<td>Other specified excision of oesophagus and stomach</td>
</tr>
<tr>
<td>G019</td>
<td>Unspecified excision of oesophagus and stomach</td>
</tr>
<tr>
<td>G021</td>
<td>Total oesophagectomy and anastomosis of pharynx to stomach</td>
</tr>
<tr>
<td>G022</td>
<td>Total oesophagectomy and interposition of microvascularily attached jejunum</td>
</tr>
</tbody>
</table>
### Ovarian (C56-C57, and selected C48 tumours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H331</td>
<td>Abdominoperineal excision of rectum and end colostomy</td>
</tr>
<tr>
<td>H332</td>
<td>Proctectomy and anastomosis of colon to anus</td>
</tr>
<tr>
<td>H333</td>
<td>Anterior resection of rectum and anastomosis of colon to rectum using staples</td>
</tr>
<tr>
<td>H334</td>
<td>Anterior resection of rectum and anastomosis NEC</td>
</tr>
<tr>
<td>H335</td>
<td>Rectosigmoidectomy and closure of rectal stump and exteriorisation of bowel</td>
</tr>
<tr>
<td>H336</td>
<td>Anterior resection of rectum and exteriorisation of bowel</td>
</tr>
<tr>
<td>H337</td>
<td>Perineal resection of rectum HFQ</td>
</tr>
<tr>
<td>H338</td>
<td>Other specified excision of rectum</td>
</tr>
<tr>
<td>H339</td>
<td>Unspecified excision of rectum</td>
</tr>
<tr>
<td>Q071</td>
<td>Abdominal hysterocolpectomy and excision of periuterine tissue</td>
</tr>
<tr>
<td>Q072</td>
<td>Abdominal hysterectomy and excision of periuterine tissue NEC</td>
</tr>
<tr>
<td>Q073</td>
<td>Abdominal hysterocolpectomy NEC</td>
</tr>
<tr>
<td>Q074</td>
<td>Total abdominal hysterectomy NEC</td>
</tr>
</tbody>
</table>
CAS-SOP #4: Linking treatment tables

Q075  Subtotal abdominal hysterectomy
Q078  Other specified abdominal excision of uterus
Q079  Unspecified abdominal excision of uterus
Q081  Vaginal hysterocolpectomy and excision of periuterine tissue
Q082  Vaginal hysterectomy and excision of periuterine tissue NEC
Q083  Vaginal hysterocolpectomy NEC
Q088  Other specified vaginal excision of uterus
Q089  Unspecified vaginal excision of uterus
Q221  Bilateral salpingoophorectomy
Q223  Bilateral oophorectomy NEC
Q231  Unilateral salpingoophorectomy NEC
Q232  Salpingoophorectomy of remaining solitary fallopian tube and ovary
Q235  Unilateral oophorectomy NEC
Q236  Oophorectomy of remaining solitary ovary NEC
Q241  Salpingoophorectomy NEC
Q243  Oophorectomy NEC
Q438  Other specified partial excision of ovary
Q439  Unspecified partial excision of ovary
Q473  Open biopsy of lesion of ovary
Q478  Other specified other open operations on ovary
Q491  Endoscopic extirpation of lesion of ovary NEC
T331  Open excision of lesion of peritoneum
T332  Open destruction of lesion of peritoneum
T338  Other specified open extirpation of lesion of peritoneum
T339  Unspecified open extirpation of lesion of peritoneum
T361  Omentectomy
T362  Excision of lesion of omentum
X141  Total exenteration of pelvis
X142  Anterior exenteration of pelvis
X143  Posterior exenteration of pelvis
X148  Other specified clearance of pelvis
X149  Unspecified clearance of pelvis

Pancreas (C25)

J551  Total pancreatectomy and excision of surrounding tissue
J552  Total pancreatectomy NEC
J558  Other specified total excision of pancreas
J559  Unspecified total excision of pancreas
J561  Pancreaticoduodenectomy and excision of surrounding tissue
J562  Pancreaticoduodenectomy and resection of antrum of stomach
J563  Pancreaticoduodenectomy NEC
J568  Other specified excision of head of pancreas
J569  Unspecified excision of head of pancreas
J571  Subtotal pancreatectomy
J573  Left pancreatectomy NEC
J574  Excision of tail of pancreas and drainage of pancreatic duct
### Prostate (C61)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J575</td>
<td>Excision of tail of pancreas NEC</td>
</tr>
<tr>
<td>J578</td>
<td>Other specified other partial excision of pancreas</td>
</tr>
<tr>
<td>J579</td>
<td>Unspecified other partial excision of pancreas</td>
</tr>
<tr>
<td>J582</td>
<td>Excision of lesion of pancreas NEC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M341</td>
<td>Cystoprostatectomy</td>
</tr>
<tr>
<td>M611</td>
<td>Total excision of prostate and capsule of prostate</td>
</tr>
<tr>
<td>M614</td>
<td>Perineal prostatectomy</td>
</tr>
<tr>
<td>M618</td>
<td>Other specified open excision of prostate</td>
</tr>
<tr>
<td>M619</td>
<td>Unspecified open excision of prostate</td>
</tr>
<tr>
<td>M671</td>
<td>Endoscopic cryotherapy to lesion of prostate</td>
</tr>
<tr>
<td>M711</td>
<td>High intensity focused ultrasound of prostate</td>
</tr>
<tr>
<td>X141</td>
<td>Total exenteration of pelvis</td>
</tr>
</tbody>
</table>

### Skin (C43, C44)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B279</td>
<td>Unspecified total excision of breast</td>
</tr>
<tr>
<td>B283</td>
<td>Excision of lesion of breast NEC</td>
</tr>
<tr>
<td>B284</td>
<td>Re-excision of breast margins</td>
</tr>
<tr>
<td>C011</td>
<td>Exenteration of orbit</td>
</tr>
<tr>
<td>C012</td>
<td>Enucleation of eye</td>
</tr>
<tr>
<td>C013</td>
<td>Evisceration of eye</td>
</tr>
<tr>
<td>C018</td>
<td>Other specified excision of eye</td>
</tr>
<tr>
<td>C019</td>
<td>Unspecified excision of eye</td>
</tr>
<tr>
<td>C021</td>
<td>Excision of lesion of orbit</td>
</tr>
<tr>
<td>C022</td>
<td>Destruction of lesion of orbit</td>
</tr>
<tr>
<td>C028</td>
<td>Other specified extirpation of lesion of orbit</td>
</tr>
<tr>
<td>C029</td>
<td>Unspecified extirpation of lesion of orbit</td>
</tr>
<tr>
<td>C101</td>
<td>Excision of lesion of eyebrow</td>
</tr>
<tr>
<td>C102</td>
<td>Hair bearing flap to eyebrow</td>
</tr>
<tr>
<td>C103</td>
<td>Hair bearing graft to eyebrow</td>
</tr>
<tr>
<td>C111</td>
<td>Excision of lesion of canthus</td>
</tr>
<tr>
<td>C115</td>
<td>Graft of skin to canthus</td>
</tr>
<tr>
<td>C121</td>
<td>Excision of lesion of eyelid NEC</td>
</tr>
<tr>
<td>C124</td>
<td>Curettage of lesion of eyelid</td>
</tr>
<tr>
<td>C126</td>
<td>Wedge excision of lesion of eyelid</td>
</tr>
<tr>
<td>C141</td>
<td>Flap of skin to eyelid</td>
</tr>
<tr>
<td>C142</td>
<td>Graft of skin to eyelid</td>
</tr>
<tr>
<td>C143</td>
<td>Graft of cartilage to eyelid</td>
</tr>
<tr>
<td>C144</td>
<td>Graft of skin and fat to eyelid</td>
</tr>
<tr>
<td>C145</td>
<td>Graft of fascia to eyelid</td>
</tr>
<tr>
<td>C148</td>
<td>Other specified reconstruction of eyelid</td>
</tr>
<tr>
<td>C149</td>
<td>Unspecified reconstruction of eyelid</td>
</tr>
<tr>
<td>C162</td>
<td>Lateral tarsorrhaphy</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>C164</td>
<td>Tarsorrhaphy NEC</td>
</tr>
<tr>
<td>C168</td>
<td>Other specified other plastic repair of eyelid</td>
</tr>
<tr>
<td>C178</td>
<td>Other specified other repair of eyelid</td>
</tr>
<tr>
<td>C179</td>
<td>Unspecified other repair of eyelid</td>
</tr>
<tr>
<td>D011</td>
<td>Total excision of external ear</td>
</tr>
<tr>
<td>D012</td>
<td>Partial excision of external ear</td>
</tr>
<tr>
<td>D013</td>
<td>Excision of preauricular abnormality</td>
</tr>
<tr>
<td>D018</td>
<td>Other specified excision of external ear</td>
</tr>
<tr>
<td>D019</td>
<td>Unspecified excision of external ear</td>
</tr>
<tr>
<td>D021</td>
<td>Excision of lesion of external ear</td>
</tr>
<tr>
<td>D028</td>
<td>Other specified extirpation of lesion of external ear</td>
</tr>
<tr>
<td>D031</td>
<td>Reconstruction of external ear using graft</td>
</tr>
<tr>
<td>D032</td>
<td>Reconstruction of external ear NEC</td>
</tr>
<tr>
<td>D064</td>
<td>Graft of skin to external ear</td>
</tr>
<tr>
<td>D065</td>
<td>Flap of skin to external ear</td>
</tr>
<tr>
<td>E011</td>
<td>Total excision of nose</td>
</tr>
<tr>
<td>E018</td>
<td>Other specified excision of nose</td>
</tr>
<tr>
<td>E019</td>
<td>Unspecified excision of nose</td>
</tr>
<tr>
<td>E021</td>
<td>Total reconstruction of nose</td>
</tr>
<tr>
<td>E022</td>
<td>Reconstruction of nose NEC</td>
</tr>
<tr>
<td>E023</td>
<td>Septorhinoplasty using implant</td>
</tr>
<tr>
<td>E024</td>
<td>Septorhinoplasty using graft</td>
</tr>
<tr>
<td>E025</td>
<td>Reduction rhinoplasty</td>
</tr>
<tr>
<td>E026</td>
<td>Rhinoplasty NEC</td>
</tr>
<tr>
<td>E027</td>
<td>Alar reconstruction with cartilage graft</td>
</tr>
<tr>
<td>E028</td>
<td>Other specified plastic operations on nose</td>
</tr>
<tr>
<td>E029</td>
<td>Unspecified plastic operations on nose</td>
</tr>
<tr>
<td>E037</td>
<td>Septal reconstruction with cartilage graft</td>
</tr>
<tr>
<td>E091</td>
<td>Excision of lesion of external nose</td>
</tr>
<tr>
<td>E094</td>
<td>Shave of skin of nose</td>
</tr>
<tr>
<td>F011</td>
<td>Excision of vermillion border of lip and advancement of mucosa of lip</td>
</tr>
<tr>
<td>F018</td>
<td>Other specified partial excision of lip</td>
</tr>
<tr>
<td>F019</td>
<td>Unspecified partial excision of lip</td>
</tr>
<tr>
<td>F021</td>
<td>Excision of lesion of lip</td>
</tr>
<tr>
<td>F029</td>
<td>Unspecified extirpation of lesion of lip</td>
</tr>
<tr>
<td>F041</td>
<td>Reconstruction of lip using tongue flap</td>
</tr>
<tr>
<td>F042</td>
<td>Reconstruction of lip using skin flap</td>
</tr>
<tr>
<td>F048</td>
<td>Other specified other reconstruction of lip</td>
</tr>
<tr>
<td>F049</td>
<td>Unspecified other reconstruction of lip</td>
</tr>
<tr>
<td>F441</td>
<td>Total excision of parotid gland</td>
</tr>
<tr>
<td>F442</td>
<td>Partial excision of parotid gland</td>
</tr>
<tr>
<td>F443</td>
<td>Excision of parotid gland NEC</td>
</tr>
<tr>
<td>F444</td>
<td>Excision of submandibular gland</td>
</tr>
<tr>
<td>F445</td>
<td>Excision of sublingual gland</td>
</tr>
<tr>
<td>F448</td>
<td>Other specified excision of salivary gland</td>
</tr>
<tr>
<td>F449</td>
<td>Unspecified excision of salivary gland</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>F451</td>
<td>Excision of lesion of parotid gland</td>
</tr>
<tr>
<td>F452</td>
<td>Excision of lesion of submandibular gland</td>
</tr>
<tr>
<td>N012</td>
<td>Excision of lesion of scrotum</td>
</tr>
<tr>
<td>N271</td>
<td>Excision of lesion of penis</td>
</tr>
<tr>
<td>P111</td>
<td>Excision of lesion of female perineum</td>
</tr>
<tr>
<td>S018</td>
<td>Other specified plastic excision of skin of head or neck</td>
</tr>
<tr>
<td>S019</td>
<td>Unspecified plastic excision of skin of head or neck</td>
</tr>
<tr>
<td>S028</td>
<td>Other specified plastic excision of skin of abdominal wall</td>
</tr>
<tr>
<td>S029</td>
<td>Unspecified plastic excision of skin of abdominal wall</td>
</tr>
<tr>
<td>S038</td>
<td>Other specified plastic excision of skin of other site</td>
</tr>
<tr>
<td>S039</td>
<td>Unspecified plastic excision of skin of other site</td>
</tr>
<tr>
<td>S041</td>
<td>Excision of sweat gland bearing skin of axilla</td>
</tr>
<tr>
<td>S042</td>
<td>Excision of sweat gland bearing skin of groin</td>
</tr>
<tr>
<td>S043</td>
<td>Excision of sweat gland bearing skin NEC</td>
</tr>
<tr>
<td>S048</td>
<td>Other specified other excision of skin</td>
</tr>
<tr>
<td>S049</td>
<td>Unspecified other excision of skin</td>
</tr>
<tr>
<td>S051</td>
<td>Microscopically controlled excision of lesion of skin of head or neck using fresh tissue technique</td>
</tr>
<tr>
<td>S052</td>
<td>Microscopically controlled excision of lesion of skin using fresh tissue technique NEC</td>
</tr>
<tr>
<td>S053</td>
<td>Microscopically controlled excision of lesion of skin of head or neck using chemosurgical technique</td>
</tr>
<tr>
<td>S054</td>
<td>Microscopically controlled excision of lesion of skin using chemosurgical technique NEC</td>
</tr>
<tr>
<td>S055</td>
<td>Microscopically controlled excision of lesion of skin of head or neck NEC</td>
</tr>
<tr>
<td>S058</td>
<td>Other specified microscopically controlled excision of lesion of skin</td>
</tr>
<tr>
<td>S059</td>
<td>Unspecified microscopically controlled excision of lesion of skin</td>
</tr>
<tr>
<td>S063</td>
<td>Shave excision of lesion of skin of head or neck</td>
</tr>
<tr>
<td>S064</td>
<td>Shave excision of lesion of skin NEC</td>
</tr>
<tr>
<td>S065</td>
<td>Excision of lesion of skin of head or neck NEC</td>
</tr>
<tr>
<td>S066</td>
<td>Re-excision of skin margins of head or neck</td>
</tr>
<tr>
<td>S067</td>
<td>Re-excision of skin margins NEC</td>
</tr>
<tr>
<td>S068</td>
<td>Other specified other excision of lesion of skin</td>
</tr>
<tr>
<td>S069</td>
<td>Unspecified other excision of lesion of skin</td>
</tr>
<tr>
<td>S081</td>
<td>Curettage and cauterisation of lesion of skin of head or neck BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S082</td>
<td>Curettage and cauterisation of lesion of skin NEC BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S083</td>
<td>Curettage of lesion of skin of head or neck BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S088</td>
<td>Other specified curettage of lesion of skin BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S089</td>
<td>Unspecified curettage of lesion of skin BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S143</td>
<td>Shaved deep ellipse biopsy of lesion of skin of head or neck BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S144</td>
<td>Shaved deep ellipse biopsy of lesion of skin NEC BCC and cSCC tumours only</td>
</tr>
<tr>
<td>S171</td>
<td>Distant myocutaneous subcutaneous pedicle flap to head or neck</td>
</tr>
<tr>
<td>S172</td>
<td>Distant myocutaneous subcutaneous pedicle flap NEC</td>
</tr>
</tbody>
</table>
CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S173</td>
<td>Distant myocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S174</td>
<td>Distant myocutaneous free flap to head or neck</td>
</tr>
<tr>
<td>S175</td>
<td>Distant myocutaneous free flap NEC</td>
</tr>
<tr>
<td>S178</td>
<td>Other specified distant flap of skin and muscle</td>
</tr>
<tr>
<td>S179</td>
<td>Unspecified distant flap of skin and muscle</td>
</tr>
<tr>
<td>S181</td>
<td>Distant fasciocutaneous subcutaneous pedicle flap to head or neck</td>
</tr>
<tr>
<td>S182</td>
<td>Distant fasciocutaneous subcutaneous pedicle flap NEC</td>
</tr>
<tr>
<td>S183</td>
<td>Distant fasciocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S184</td>
<td>Distant fasciocutaneous free flap to head or neck</td>
</tr>
<tr>
<td>S185</td>
<td>Distant fasciocutaneous free flap NEC</td>
</tr>
<tr>
<td>S188</td>
<td>Other specified distant flap of skin and fascia</td>
</tr>
<tr>
<td>S189</td>
<td>Unspecified distant flap of skin and fascia</td>
</tr>
<tr>
<td>S191</td>
<td>Distant tube pedicle flap of skin to head or neck</td>
</tr>
<tr>
<td>S192</td>
<td>Distant tube pedicle flap of skin NEC</td>
</tr>
<tr>
<td>S198</td>
<td>Other specified distant pedicle flap of skin</td>
</tr>
<tr>
<td>S199</td>
<td>Unspecified distant pedicle flap of skin</td>
</tr>
<tr>
<td>S201</td>
<td>Axial pattern distant flap of skin to head or neck</td>
</tr>
<tr>
<td>S202</td>
<td>Axial pattern distant flap of skin NEC</td>
</tr>
<tr>
<td>S203</td>
<td>Random pattern distant flap of skin to head or neck</td>
</tr>
<tr>
<td>S204</td>
<td>Random pattern distant flap of skin NEC</td>
</tr>
<tr>
<td>S205</td>
<td>Distant flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S206</td>
<td>Distant free flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S207</td>
<td>Distant free flap of skin NEC</td>
</tr>
<tr>
<td>S208</td>
<td>Other specified other distant flap of skin</td>
</tr>
<tr>
<td>S209</td>
<td>Unspecified other distant flap of skin</td>
</tr>
<tr>
<td>S211</td>
<td>Hair bearing flap of skin to scalp for male pattern baldness</td>
</tr>
<tr>
<td>S212</td>
<td>Hair bearing flap of skin to scalp NEC</td>
</tr>
<tr>
<td>S213</td>
<td>Hair bearing flap of skin to nasolabial area</td>
</tr>
<tr>
<td>S214</td>
<td>Hair bearing flap of skin to chin area</td>
</tr>
<tr>
<td>S218</td>
<td>Other specified hair bearing flap of skin</td>
</tr>
<tr>
<td>S219</td>
<td>Unspecified hair bearing flap of skin</td>
</tr>
<tr>
<td>S221</td>
<td>Neurovascular island sensory flap of skin to head or neck</td>
</tr>
<tr>
<td>S222</td>
<td>Neurovascular island sensory flap of skin NEC</td>
</tr>
<tr>
<td>S223</td>
<td>Local sensory flap of skin to head or neck</td>
</tr>
<tr>
<td>S224</td>
<td>Local sensory flap of skin NEC</td>
</tr>
<tr>
<td>S228</td>
<td>Other specified sensory flap of skin</td>
</tr>
<tr>
<td>S229</td>
<td>Unspecified sensory flap of skin</td>
</tr>
<tr>
<td>S231</td>
<td>Z plasty to head or neck</td>
</tr>
<tr>
<td>S232</td>
<td>Z plasty NEC</td>
</tr>
<tr>
<td>S233</td>
<td>W plasty to head or neck</td>
</tr>
<tr>
<td>S234</td>
<td>W plasty NEC</td>
</tr>
<tr>
<td>S238</td>
<td>Other specified flap operations to relax contracture of skin</td>
</tr>
<tr>
<td>S239</td>
<td>Unspecified flap operations to relax contracture of skin</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>S241</td>
<td>Local myocutaneous subcutaneous pedicle flap to head or neck</td>
</tr>
<tr>
<td>S242</td>
<td>Local myocutaneous subcutaneous pedicle flap NEC</td>
</tr>
<tr>
<td>S243</td>
<td>Local myocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S248</td>
<td>Other specified local flap of skin and muscle</td>
</tr>
<tr>
<td>S249</td>
<td>Unspecified local flap of skin and muscle</td>
</tr>
<tr>
<td>S251</td>
<td>Local fasciocutaneous subcutaneous pedicle flap to head or neck</td>
</tr>
<tr>
<td>S252</td>
<td>Local fasciocutaneous subcutaneous pedicle flap NEC</td>
</tr>
<tr>
<td>S253</td>
<td>Local fasciocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S258</td>
<td>Other specified local flap of skin and fascia</td>
</tr>
<tr>
<td>S259</td>
<td>Unspecified local flap of skin and fascia</td>
</tr>
<tr>
<td>S261</td>
<td>Axial pattern local subcutaneous pedicle flap of skin to head or neck</td>
</tr>
<tr>
<td>S262</td>
<td>Axial pattern local subcutaneous pedicle flap of skin NEC</td>
</tr>
<tr>
<td>S263</td>
<td>Random pattern local subcutaneous pedicle flap of skin to head or neck</td>
</tr>
<tr>
<td>S264</td>
<td>Random pattern local subcutaneous pedicle flap of skin NEC</td>
</tr>
<tr>
<td>S265</td>
<td>Local subcutaneous pedicle flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S268</td>
<td>Other specified local subcutaneous pedicle flap of skin</td>
</tr>
<tr>
<td>S269</td>
<td>Unspecified local subcutaneous pedicle flap of skin</td>
</tr>
<tr>
<td>S271</td>
<td>Axial pattern local flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S272</td>
<td>Axial pattern local flap of skin NEC</td>
</tr>
<tr>
<td>S273</td>
<td>Random pattern local flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S274</td>
<td>Random pattern local flap of skin NEC</td>
</tr>
<tr>
<td>S275</td>
<td>Local flap of skin to head or neck NEC</td>
</tr>
<tr>
<td>S278</td>
<td>Other specified other local flap of skin</td>
</tr>
<tr>
<td>S279</td>
<td>Unspecified other local flap of skin</td>
</tr>
<tr>
<td>S291</td>
<td>Distant osteocutaneous pedicle flap to head or neck</td>
</tr>
<tr>
<td>S292</td>
<td>Distant osteocutaneous pedicle flap NEC</td>
</tr>
<tr>
<td>S293</td>
<td>Distant osteocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S294</td>
<td>Distant osteocutaneous free flap to head or neck</td>
</tr>
<tr>
<td>S295</td>
<td>Distant osteocutaneous free flap NEC</td>
</tr>
<tr>
<td>S298</td>
<td>Other specified distant flap of skin and bone</td>
</tr>
<tr>
<td>S299</td>
<td>Unspecified distant flap of skin and bone</td>
</tr>
<tr>
<td>S302</td>
<td>Transfer of flap of skin to head or neck</td>
</tr>
<tr>
<td>S314</td>
<td>Final inset of flap of skin NEC</td>
</tr>
<tr>
<td>S321</td>
<td>Distant osteomusculocutaneous pedicle flap of head or neck</td>
</tr>
<tr>
<td>S322</td>
<td>Distant osteomusculocutaneous pedicle flap NEC</td>
</tr>
<tr>
<td>S323</td>
<td>Distant osteomusculocutaneous flap to head or neck NEC</td>
</tr>
<tr>
<td>S324</td>
<td>Distant osteomusculocutaneous free flap to head or neck</td>
</tr>
<tr>
<td>S325</td>
<td>Distant osteomusculocutaneous free flap NEC</td>
</tr>
</tbody>
</table>
### CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S328</td>
<td>Other specified distant flap of skin and multiple tissues</td>
</tr>
<tr>
<td>S329</td>
<td>Unspecified distant flap of skin and multiple tissues</td>
</tr>
<tr>
<td>S338</td>
<td>Other specified hair bearing graft of skin to scalp</td>
</tr>
<tr>
<td>S339</td>
<td>Unspecified hair bearing graft of skin to scalp</td>
</tr>
<tr>
<td>S348</td>
<td>Other specified hair bearing graft of skin to other site</td>
</tr>
<tr>
<td>S351</td>
<td>Meshed split autograft of skin to head or neck</td>
</tr>
<tr>
<td>S352</td>
<td>Meshed split autograft of skin NEC</td>
</tr>
<tr>
<td>S353</td>
<td>Split autograft of skin to head or neck NEC</td>
</tr>
<tr>
<td>S358</td>
<td>Other specified split autograft of skin</td>
</tr>
<tr>
<td>S359</td>
<td>Unspecified split autograft of skin</td>
</tr>
<tr>
<td>S361</td>
<td>Full thickness autograft of skin to head or neck</td>
</tr>
<tr>
<td>S362</td>
<td>Full thickness autograft of skin NEC</td>
</tr>
<tr>
<td>S363</td>
<td>Composite autograft of skin to head or neck</td>
</tr>
<tr>
<td>S364</td>
<td>Composite autograft of skin NEC</td>
</tr>
<tr>
<td>S365</td>
<td>Pinch graft of skin to head or neck</td>
</tr>
<tr>
<td>S366</td>
<td>Pinch graft of skin NEC</td>
</tr>
<tr>
<td>S368</td>
<td>Other specified other autograft of skin</td>
</tr>
<tr>
<td>S369</td>
<td>Unspecified other autograft of skin</td>
</tr>
<tr>
<td>S371</td>
<td>Allograft of skin to head or neck</td>
</tr>
<tr>
<td>S372</td>
<td>Allograft of skin NEC</td>
</tr>
<tr>
<td>S373</td>
<td>Xenograft of skin to head or neck</td>
</tr>
<tr>
<td>S374</td>
<td>Xenograft of skin NEC</td>
</tr>
<tr>
<td>S378</td>
<td>Other specified other graft of skin</td>
</tr>
<tr>
<td>S379</td>
<td>Unspecified other graft of skin</td>
</tr>
<tr>
<td>S391</td>
<td>Allograft of amniotic membrane to head or neck</td>
</tr>
<tr>
<td>S392</td>
<td>Allograft of amniotic membrane NEC</td>
</tr>
<tr>
<td>S398</td>
<td>Other specified graft of other tissue to skin</td>
</tr>
<tr>
<td>S399</td>
<td>Unspecified graft of other tissue to skin</td>
</tr>
<tr>
<td>S641</td>
<td>Excision of nail bed</td>
</tr>
<tr>
<td>T013</td>
<td>Excision of lesion of chest wall</td>
</tr>
<tr>
<td>T313</td>
<td>Excision of lesion of anterior abdominal wall NEC</td>
</tr>
<tr>
<td>T851</td>
<td>Block dissection of cervical lymph nodes</td>
</tr>
<tr>
<td>T852</td>
<td>Block dissection of axillary lymph nodes</td>
</tr>
<tr>
<td>T853</td>
<td>Block dissection of mediastinal lymph nodes</td>
</tr>
<tr>
<td>T854</td>
<td>Block dissection of para-aortic lymph nodes</td>
</tr>
<tr>
<td>T855</td>
<td>Block dissection of inguinal lymph nodes</td>
</tr>
<tr>
<td>T856</td>
<td>Block dissection of pelvic lymph nodes</td>
</tr>
<tr>
<td>T858</td>
<td>Other specified block dissection of lymph nodes</td>
</tr>
<tr>
<td>T859</td>
<td>Unspecified block dissection of lymph nodes</td>
</tr>
<tr>
<td>T911</td>
<td>Biopsy of sentinel lymph node NEC</td>
</tr>
<tr>
<td>T962</td>
<td>Excision of lesion of soft tissue NEC</td>
</tr>
<tr>
<td>X071</td>
<td>Forequarter amputation</td>
</tr>
<tr>
<td>X072</td>
<td>Disarticulation of shoulder</td>
</tr>
<tr>
<td>X073</td>
<td>Amputation of arm above elbow</td>
</tr>
<tr>
<td>X074</td>
<td>Amputation of arm through elbow</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>X075</td>
<td>Amputation of arm through forearm</td>
</tr>
<tr>
<td>X078</td>
<td>Other specified amputation of arm</td>
</tr>
<tr>
<td>X079</td>
<td>Unspecified amputation of arm</td>
</tr>
<tr>
<td>X081</td>
<td>Amputation of hand at wrist</td>
</tr>
<tr>
<td>X082</td>
<td>Amputation of thumb</td>
</tr>
<tr>
<td>X083</td>
<td>Amputation of phalanx of finger</td>
</tr>
<tr>
<td>X084</td>
<td>Amputation of finger NEC</td>
</tr>
<tr>
<td>X088</td>
<td>Other specified amputation of hand</td>
</tr>
<tr>
<td>X089</td>
<td>Unspecified amputation of hand</td>
</tr>
<tr>
<td>X091</td>
<td>Hindquarter amputation</td>
</tr>
<tr>
<td>X092</td>
<td>Disarticulation of hip</td>
</tr>
<tr>
<td>X093</td>
<td>Amputation of leg above knee</td>
</tr>
<tr>
<td>X094</td>
<td>Amputation of leg through knee</td>
</tr>
<tr>
<td>X095</td>
<td>Amputation of leg below knee</td>
</tr>
<tr>
<td>X098</td>
<td>Other specified amputation of leg</td>
</tr>
<tr>
<td>X099</td>
<td>Unspecified amputation of leg</td>
</tr>
<tr>
<td>X101</td>
<td>Amputation of foot through ankle</td>
</tr>
<tr>
<td>X102</td>
<td>Disarticulation of tarsal bones</td>
</tr>
<tr>
<td>X103</td>
<td>Disarticulation of metatarsal bones</td>
</tr>
<tr>
<td>X104</td>
<td>Amputation through metatarsal bones</td>
</tr>
<tr>
<td>X108</td>
<td>Other specified amputation of foot</td>
</tr>
<tr>
<td>X109</td>
<td>Unspecified amputation of foot</td>
</tr>
<tr>
<td>X111</td>
<td>Amputation of great toe</td>
</tr>
<tr>
<td>X112</td>
<td>Amputation of phalanx of toe</td>
</tr>
<tr>
<td>X118</td>
<td>Other specified amputation of toe</td>
</tr>
<tr>
<td>X119</td>
<td>Unspecified amputation of toe</td>
</tr>
<tr>
<td>X121</td>
<td>Reamputation at higher level</td>
</tr>
<tr>
<td>X122</td>
<td>Excision of lesion of amputation stump</td>
</tr>
<tr>
<td>X123</td>
<td>Shortening of length of amputation stump</td>
</tr>
<tr>
<td>X124</td>
<td>Revision of coverage of amputation stump</td>
</tr>
<tr>
<td>X125</td>
<td>Drainage of amputation stump</td>
</tr>
<tr>
<td>X128</td>
<td>Other specified operations on amputation stump</td>
</tr>
<tr>
<td>X129</td>
<td>Unspecified operations on amputation stump</td>
</tr>
</tbody>
</table>

**Stomach (C16)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G011</td>
<td>Oesophagogastrectomy and anastomosis of oesophagus to stomach</td>
</tr>
<tr>
<td>G012</td>
<td>Oesophagogastrectomy and anastomosis of oesophagus to transposed jejunum</td>
</tr>
<tr>
<td>G013</td>
<td>Oesophagogastrectomy and anastomosis of oesophagus to jejunum NEC</td>
</tr>
<tr>
<td>G039</td>
<td>Unspecified partial excision of oesophagus</td>
</tr>
<tr>
<td>G271</td>
<td>Total gastrectomy and excision of surrounding tissue</td>
</tr>
<tr>
<td>G272</td>
<td>Total gastrectomy and anastomosis of oesophagus to duodenum</td>
</tr>
<tr>
<td>G273</td>
<td>Total gastrectomy and interposition of jejunum</td>
</tr>
<tr>
<td>G274</td>
<td>Total gastrectomy and anastomosis of oesophagus to transposed jejunum</td>
</tr>
</tbody>
</table>
### CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G275</td>
<td>Total gastrectomy and anastomosis of oesophagus to jejunum NEC</td>
</tr>
<tr>
<td>G278</td>
<td>Other specified total excision of stomach</td>
</tr>
<tr>
<td>G279</td>
<td>Unspecified total excision of stomach</td>
</tr>
<tr>
<td>G281</td>
<td>Partial gastrectomy and anastomosis of stomach to duodenum</td>
</tr>
<tr>
<td>G282</td>
<td>Partial gastrectomy and anastomosis of stomach to transposed jejunum</td>
</tr>
<tr>
<td>G283</td>
<td>Partial gastrectomy and anastomosis of stomach to jejunum NEC</td>
</tr>
<tr>
<td>G288</td>
<td>Other specified partial excision of stomach</td>
</tr>
<tr>
<td>G289</td>
<td>Unspecified partial excision of stomach</td>
</tr>
<tr>
<td>G421</td>
<td>Fibreoptic endoscopic submucosal resection of lesion of upper gastrointestinal tract Stage 1a disease only</td>
</tr>
<tr>
<td>G146</td>
<td>Fibreoptic endoscopic submucosal resection of lesion of oesophagus Stage 1a disease only</td>
</tr>
<tr>
<td>G449</td>
<td>Unspecified other therapeutic fibreoptic endoscopic operations on upper gastrointestinal tract Stage 1a disease only</td>
</tr>
</tbody>
</table>

**Testis (C62, D292)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N051</td>
<td>Bilateral Subcapsular Orchidectomy</td>
</tr>
<tr>
<td>N052</td>
<td>Bilateral Orchidectomy NEC, Ablation Of Testes</td>
</tr>
<tr>
<td>N053</td>
<td>Bilateral Inguinal Orchidectomy</td>
</tr>
<tr>
<td>N061</td>
<td>Subcapsular Orchidectomy NEC</td>
</tr>
<tr>
<td>N063</td>
<td>Orchidectomy NEC</td>
</tr>
<tr>
<td>N066</td>
<td>Inguinal Orchidectomy NEC</td>
</tr>
<tr>
<td>N068</td>
<td>Other Specified Other Excision Of Testis</td>
</tr>
<tr>
<td>N069</td>
<td>Unspecified Other Excision Of Testis</td>
</tr>
<tr>
<td>N072</td>
<td>Destruction Of Lesion Of Testis</td>
</tr>
<tr>
<td>N078</td>
<td>Other Specified Extirpation Of Lesion Of Testis</td>
</tr>
<tr>
<td>N079</td>
<td>Unspecified Extirpation Of Lesion Of Testis</td>
</tr>
<tr>
<td>X163</td>
<td>Excision Of Gonad From Abdomen</td>
</tr>
<tr>
<td>X164</td>
<td>Excision Of Gonad From Pelvis</td>
</tr>
<tr>
<td>X165</td>
<td>Excision Of Gonad From Inguinal Canal</td>
</tr>
<tr>
<td>X166</td>
<td>Excision Of Gonad Nec</td>
</tr>
</tbody>
</table>

**Uterine (C54-C55)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q071</td>
<td>Abdominal hysterocolpectomy and excision of periuterine tissue</td>
</tr>
<tr>
<td>Q072</td>
<td>Abdominal hysterectomy and excision of periuterine tissue NEC</td>
</tr>
<tr>
<td>Q073</td>
<td>Abdominal hysterocolpectomy NEC</td>
</tr>
<tr>
<td>Q074</td>
<td>Total abdominal hysterectomy NEC</td>
</tr>
<tr>
<td>Q075</td>
<td>Subtotal abdominal hysterectomy</td>
</tr>
<tr>
<td>Q078</td>
<td>Other specified abdominal excision of uterus</td>
</tr>
<tr>
<td>Q079</td>
<td>Unspecified abdominal excision of uterus</td>
</tr>
<tr>
<td>Q081</td>
<td>Vaginal hysterocolpectomy and excision of periuterine tissue</td>
</tr>
<tr>
<td>Q082</td>
<td>Vaginal hysterectomy and excision of periuterine tissue NEC</td>
</tr>
<tr>
<td>Q083</td>
<td>Vaginal hysterocolpectomy NEC</td>
</tr>
<tr>
<td>Q088</td>
<td>Other specified vaginal excision of uterus</td>
</tr>
<tr>
<td>Q089</td>
<td>Unspecified vaginal excision of uterus</td>
</tr>
<tr>
<td>Q093</td>
<td>Open excision of lesion of uterus NEC</td>
</tr>
<tr>
<td>Q161</td>
<td>Vaginal excision of lesion of uterus</td>
</tr>
</tbody>
</table>
### CAS-SOP #4: Linking treatment tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q221</td>
<td>Bilateral salpingoophorectomy</td>
</tr>
<tr>
<td>Q222</td>
<td>Bilateral salpingectomy NEC</td>
</tr>
<tr>
<td>Q223</td>
<td>Bilateral oophorectomy NEC</td>
</tr>
<tr>
<td>Q228</td>
<td>Other specified bilateral excision of adnexa of uterus</td>
</tr>
<tr>
<td>Q229</td>
<td>Unspecified bilateral excision of adnexa of uterus</td>
</tr>
<tr>
<td>Q231</td>
<td>Unilateral salpingoophorectomy NEC</td>
</tr>
<tr>
<td>Q232</td>
<td>Salpingoophorectomy of remaining solitary fallopian tube and ovary</td>
</tr>
<tr>
<td>Q235</td>
<td>Unilateral oophorectomy NEC</td>
</tr>
<tr>
<td>Q236</td>
<td>Oophorectomy of remaining solitary ovary NEC</td>
</tr>
<tr>
<td>Q238</td>
<td>Other specified unilateral excision of adnexa of uterus</td>
</tr>
<tr>
<td>Q239</td>
<td>Unspecified unilateral excision of adnexa of uterus</td>
</tr>
<tr>
<td>Q521</td>
<td>Excision of lesion of broad ligament of uterus</td>
</tr>
<tr>
<td>X141</td>
<td>Total exenteration of pelvis</td>
</tr>
<tr>
<td>X142</td>
<td>Anterior exenteration of pelvis</td>
</tr>
<tr>
<td>X143</td>
<td>Posterior exenteration of pelvis</td>
</tr>
<tr>
<td>X148</td>
<td>Other specified clearance of pelvis</td>
</tr>
<tr>
<td>X149</td>
<td>Unspecified clearance of pelvis</td>
</tr>
</tbody>
</table>

#### Vulva (C51)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P011</td>
<td>Clitoridectomy</td>
</tr>
<tr>
<td>P033</td>
<td>Excision of lesion of Bartholin gland</td>
</tr>
<tr>
<td>P051</td>
<td>Total excision of vulva</td>
</tr>
<tr>
<td>P052</td>
<td>Partial excision of vulva</td>
</tr>
<tr>
<td>P054</td>
<td>Excision of lesion of vulva NEC</td>
</tr>
<tr>
<td>P058</td>
<td>Other specified excision of vulva</td>
</tr>
<tr>
<td>P059</td>
<td>Unspecified excision of vulva</td>
</tr>
<tr>
<td>P111</td>
<td>Excision of lesion of female perineum</td>
</tr>
</tbody>
</table>
Appendix 4: Example code

--The code presented below was used to generate the AV2018.AV_TREATMENT_1318_4P6 table and should be used to identify treatments for cancers diagnosed in 2013-2018.

--There are also minor corrections to the code, so it supersedes the code published in both SOP version 4.2 for 2013-2014 diagnoses, 4.4 for 2013-2015 diagnoses (shared via NCRAS website), and 4.5 for 2013-2016 diagnoses.

-------------------------------------User notes:-------------------
-- This is the SQL to generate treatment flags (resection, chemo, radio) for 2013-18 diagnoses, including demographic & geographies breakdown
--It creates an extract to be used both in the unadjusted treatment rates workbook.

--It uses these tables in casref01:
--analysislouisereynolds.opcs4resection_lookup_13_16@casref01
--analysislouisereynolds.timeoutframe_lookup_13_18@casref01

--1. Set your connection to casref01
--2. Create each table in turn in the SQL, starting with your cohort of interest.
--If limiting the cohort, do this in the first table (tr_tumour_cohort_d)
--3. Then the last table brings all the previous ones together into your final export.
--4. After you run each new table, you need to index it and create database stats - this optimises performance.
--This is included throughout using the create index and execute commands
--You only need to create the database stats if you are creating and using that table the same day (otherwise they are automatically generated overnight)
--You will need to change analysislouisereynolds to your username
--If, after creating and indexing the tables, you need to rerun any, it may be more efficient to truncate the table than drop and create it again, e.g.:
--Truncate table tr_tumour_cohort;
--insert into tr_tumour_cohort_d (That's not correct but I'll fix it in the final version)
--5. Alternatively you can use the final table we have already created here:
--***analysislouisereynolds.av_treatment_table_1318_4p6@casref01***
--6. If analysing in stata, you can use the code below to collapse the data down so it's not identifiable (example below groups by stage, cancer type & diagnosis year)
--collapse (count) tumourid, by (cancergroup stage_group rt_flag ct_flag SG_flag diagnosisyear)

------------------------------------------------------------------------------
------ CREATE TUMOUR COHORT TABLE ------------------------------------------
------------------------------------------------------------------------------
CREATE TABLE tr_tumo AS

-- Non-melanoma (C44) skin cancers need to be selected separately to the rest of the tumour cohort. The cohorts will then be unioned together.
WITH tr_nmsc_cohort AS

(SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, figo, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear, dedup_flag, site_icd10_o2_3char, ctry_code, statusofregistration
FROM

(SELECT avt.tumourid, avt.patientid, avt.nhsnumber, avt.diagnosisdatebest, avt.site_icd10_o2, avt.figo, avt.sex, avt.ethnicity, avt.morph_icd10_o2, avt.fiveyearageband, avt.age, avt.diagnosisyear, avt.dedup_flag, avt.site_icd10_o2_3char, avt.ctry_code, avt.statusofregistration

-- Adds NMSC cancer type to tumour_code
, CASE WHEN avt.morph_icd10_o2 IN ('8050', '8051', '8052', '8054', '8070', '8071', '8072', '8073', '8074', '8075', '8076', '8077', '8078', '8082', '8083', '8084', '8085', '8086') THEN 'C44CSCC'
WHEN avt.morph_icd10_o2 IN ('8090', '8091', '8092', '8093', '8094', '8095', '8097') THEN 'C44BCC'
ELSE 'C44OTHER' END AS tumour_code,

-- This join flags any tumours diagnosed in 2013-18 that belong to a patient who had another tumour in the 18 months before or after that diagnosis
--(so that later, patient level datasets (HES, SACT, RTDS) are only used for patients with 1 tumour)
-- Tumour_flag = 1; the tumour belonged to a patient who had another tumour within 18 months

CASE WHEN ABS(avt.diagnosisdatebest-avt2.diagnosisdatebest)<548 THEN 1 ELSE 0 END AS tumour_flag

-- In the process of joining AVT2 to AVT to identify multiple tumours, duplicate rows are generated
-- The difference between diagnosis date for tumours in AVT and AVT2 ranks multiple tumours where more than one exists and drops all but the closest tumour to the original tumour.
-- Where RK = 1; this is the tumour record to keep

,RANK() OVER (PARTITION BY avt.tumourid ORDER BY ABS(avt.diagnosisdatebest-avt2.diagnosisdatebest) ASC, avt2.tumourid) AS rk

FROM av2018.at_tumour_england@casref01 avt

-- Multiple tumours join:
-- For tumours diagnosed from 2013-2018, identify any other tumour IDs that occurred between 2011-2019
-- A second copy of the tumour cohort (AVT2) is joined to the original tumour cohort of 2013-18 diagnoses (AVT)
-- Records from AVT2 are only joined if the patient ID is the same but the tumour ID is different
LEFT JOIN av2018.at_tumour_england@casref01 AVT2 ON avt.patientid=avt2.patientid
AND NOT(avt.tumourid=avt2.tumourid)
AND avt2.site_icd10_o2_3char NOT IN ('D01','D03','D04','D06','D07','D11','D13','D15','D16','D18','D25','D27','D36','D40','D48')
AND avt2.diagnosisyear BETWEEN 2011 AND 2020
--Define cohort of interest here
WHERE avt.site_icd10_o2_3char='C44'
AND avt.ctry_code='E'
AND avt.statusofregistration='F'
AND avt.dedup_flag=1
AND avt.age between 0 and 200
and avt.sex in (1,2)
)
WHERE rk=1),
c44_cohort AS
(

--select first ever BCC per patient all time only
SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear
FROM (SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear, RANK() OVER (PARTITION BY patientid ORDER BY diagnosisdatebest asc, tumourid) AS rank_nmsc
FROM tr_nmsc_cohort
WHERE tumour_code = 'C44BCC'
AND ctry_code = 'E'
AND site_icd10_o2_3char = 'C44'
AND statusofregistration = 'F'
AND dedup_flag = '1'
AND age BETWEEN 0 AND 200
AND sex IN (1,2)
WHERE rank_nmsc = '1'
AND (diagnosisyear>2012 AND diagnosisyear<2019)
)
UNION

--select first ever cSCC per patient all time only
SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear
FROM (SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear,
RANK() OVER (PARTITION BY patientid ORDER BY diagnosisdatebest asc, tumourid) AS rank_nmsc
FROM tr_nmsc_cohort
WHERE tumour_code = 'C44CSCC'
AND ctry_code = 'E'
AND site_icd10_o2_3char = 'C44'
AND statusofregistration = 'F'
AND dedup_flag = '1'
AND age BETWEEN 0 AND 200
AND sex IN (1,2)
WHERE rank_nmsc = '1'
AND (diagnosisyear>2012 AND diagnosisyear<2019)
UNION

SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, sex, ethnicity, morph_icd10_o2, fiveyearageband, age, diagnosisyear
FROM tr_nmsc_cohort
WHERE site_icd10_o2_3char = 'C44'
AND morph_icd10_o2 NOT IN ('8050', '8051', '8052', '8054', '8070', '8071', '8072', '8073', '8074', '8075', '8076', '8077', '8078', '8082', '8083', '8084', '8085', '8086', '8090', '8091', '8092', '8093', '8094', '8095', '8097')
AND (diagnosisyear>2012 AND diagnosisyear<2019)
AND ctry_code = 'E'
AND site_icd10_o2_3char = 'C44'
AND statusofregistration = 'F'
AND dedup_flag = '1'
AND age BETWEEN 0 AND 200
AND sex IN (1,2)
)

-- Create tumour cohort for all other (non C44 NMSC) tumours
SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, figo, sex, ethnicity, morph_icd10_o2, fiveyearageband, age
FROM (SELECT avt.tumourid, avt.patientid, avt.nhsnumber, avt.diagnosisdatebest, avt.site_icd10_o2, avt.figo, avt.sex, avt.ethnicity, avt.morph_icd10_o2, avt.fiveyearageband, avt.age
FROM avt
WHERE tumour_code != 'C44CSCC'
)
CAS-SOP #4: Linking treatment tables

--Create amended tumour_code variable to differentiate between ovarian and non-ovarian C48 tumours, changes also for brain and testes.

CASE
WHEN avt.site_icd10_o2_3char IN ('C48')
AND (avt.morph_icd10_o2 NOT IN (8693, 8800, 8801, 8802, 8803, 8804, 8805, 8806, 8963, 8990, 8991, 9040, 9041, 9042, 9043, 9044, 8810, 9490, 9500))
AND (avt.morph_icd10_o2 NOT BETWEEN 8811 AND 8921)
AND (avt.morph_icd10_o2 NOT BETWEEN 9120 AND 9373)
AND (avt.morph_icd10_o2 NOT BETWEEN 9530 AND 9582)
AND avt.sex=2)
THEN 'C48OVARY'
WHEN avt.site_icd10_o2_3char IN ('C48') THEN 'C48OTHER'
WHEN avt.site_icd10_o2 IN ('D391') THEN 'D39OVARY'
WHEN avt.site_icd10_o2_3char = 'D39' AND avt.site_icd10_o2 NOT IN ('D391') THEN 'D39OTHER'
WHEN avt.site_icd10_o2 IN ('D292') THEN 'D29TESTES'
WHEN avt.site_icd10_o2_3char = 'D29' AND avt.site_icd10_o2 NOT IN ('D292') THEN 'D29OTHER'
WHEN avt.site_icd10_o2 IN ('C751','C752','C753') THEN 'C75BRAIN'
WHEN avt.site_icd10_o2_3char = 'C75' AND avt.site_icd10_o2 NOT IN ('C751','C752','C753') THEN 'C75OTHER'
WHEN avt.site_icd10_o2 IN ('D320','D321','D329') THEN 'D32BRAIN'
WHEN avt.site_icd10_o2 IN ('D330','D331','D332','D333','D334','D337','D339') THEN 'D33BRAIN'
WHEN avt.site_icd10_o2 IN ('D352','D353','D354') THEN 'D35BRAIN'
WHEN avt.site_icd10_o2 IN ('D420','D421','D429') THEN 'D42BRAIN'
WHEN avt.site_icd10_o2 IN ('D430','D431','D432','D433','D434','D437','D439') THEN 'D43BRAIN'
WHEN avt.site_icd10_o2 IN ('D443','D444','D445') THEN 'D44BRAIN'
ELSE avt.site_icd10_o2_3char
END AS tumour_code,

-- This join flags any tumours diagnosed in 2013-18 that belong to a patient who had another tumour in the 18 months before or after that diagnosis

--(so that later, patient level datasets (hes, sact, rtds) are only used for patients with 1 tumour)
-- Tumour_flag = 1; the tumour belonged to a patient who had another tumour within 18 months

CASE WHEN ABS(avt.diagnosisdatebest-avt2.diagnosisdatebest)<548 THEN 1 ELSE 0 END AS tumour_flag

-- In the process of joining AVT2 to AVT to identify multiple tumours, duplicate rows are generated
-- The difference between diagnosis date for tumours in AVT AND AVT2 ranks multiple tumours where more than one exists AND drops all but the closest tumour to the original tumour.
-- Where rk = 1; this is the tumour record to keep
-- Multiple tumours join:
-- For tumours diagnosed from 2013-2018, identify any other tumour IDs that occurred between 2011-2020
-- A second copy of the tumour cohort (AVT2) is joined to the original tumour cohort of 2013-18 diagnoses (AVT)
-- Records from AVT2 are only joined if the patient ID is the same but the tumour ID is different

LEFT JOIN av2018.at_tumour_england@casref01 AVT2 ON avt.patientid=avt2.patientid
AND NOT(avt.tumourid=avt2.tumourid)
AND av2.cascade_inci_flag = 1
AND NOT(avt2.site_icd10_o2_3char='C44')
AND av2.site_icd10_o2_3char NOT IN ('D01', 'D03', 'D04', 'D06', 'D07', 'D11', 'D13', 'D15', 'D16', 'D18', 'D25', 'D27', 'D36', 'D40', 'D48')
AND avt2.diagnosisyear BETWEEN 2011 AND 2020

WHERE avt.cascade_inci_flag = 1
AND NOT(avt.site_icd10_o2_3char='C44')
AND avt.site_icd10_o2_3char NOT IN ('D01', 'D03', 'D04', 'D06', 'D07', 'D11', 'D13', 'D15', 'D16', 'D18', 'D25', 'D27', 'D36', 'D40', 'D48')
AND avt.diagnosisyear BETWEEN 2013 AND 2018

-- Removes duplicate tumour rows that had been added to identify patients with multiple tumours
)WHERE rk=1

-- Combine the C44 and non-C44 cohorts together into a single tumour cohort
UNION ALL

SELECT tumourid, patientid, nhsnumber, diagnosisdatebest, tumour_code, site_icd10_o2, tumour_flag, NULL AS figo, sex, ethnicity, morph_icd10_o2, fiveyearageband, age
FROM c44_cohort
;

-- Create table indexes for tumour cohort table

CREATE UNIQUE INDEX analysislouisereynolds.tr_tumcohort_tumourid_uq ON
analysislouisereynolds.tr_tumour_cohort(tumourid) NOLOGGING TABLESPACE analysisdata_IX;
CREATE INDEX analysislouisereynolds.tr_tumcohort_patientid_ix ON
analysislouisereynolds.tr_tumour_cohort(patientid) NOLOGGING TABLESPACE analysisdata_IX;
CREATE INDEX analysislouisereynolds.tr_tumcohort_nhsnumber_ix ON
analysislouisereynolds.tr_tumour_cohort ( nhsnumber ) NOLOGGING TABLESPACE analysisdata_IX;
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_tumour_cohort')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_tumcohort_tumourid_uq')

------------------------------------------------------------------------------
-----------------------------
CREATE SURGERY FLAG TABLES - ALL SITES-----------------------------
---------------------------------------------------------------------
--1)---------------- ALL SITES - SURGERY FROM AT_TREATMENT_ENGLAND -----------------------------------------
-- Create a surgery flag for the tumour if:
-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery
-- (event is '01a', '01b', or '01z')
-- and the opcs4_code is in the tumour resection list
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)

CREATE TABLE tr_av_sg AS(
SELECT DISTINCT tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS avsg_flag
, eventdate AS avsg_date
, avsg_trust_code
FROM (
SELECT tumourid, datediff, rk , eventdate, avsg_trust_code
FROM (SELECT tc.tumourid, (avtreat.eventdate - tc.diagnosisdatebest) AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk
, avtreat.eventdate
, avtreat.trust_code AS avsg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate - tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
INNER JOIN analysislouisereynolds.opcs4resection_lookup_13_18@casref01 opcs ON
opcs.tumouricdsite3code = tc.tumour_code AND TRIM(opcs.opcsresectioncode) = avtreat.opcs4_code ) WHERE rk=1 ));

--2)----------------- ALL SITES - SURGERY FROM HES -------------------
CAS-SOP #4: Linking treatment tables

-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the operation date (opertn) occurred in the relevant timeframe create table

CREATE TABLE tr_hes_sg AS
SELECT DISTINCT
  tumourid,
  CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS hessg_flag
, opdate AS hessg_date
, hessg_trust_code
FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code
FROM (SELECT tc.tumourid, ho.opdate - tc.diag
  , diagnose_time
, hessg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate-tc.diagnose_time BETWEEN -31 AND tim.resect_time
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN analysislouisereynolds.opcs4resection_lookup_13_18@casref01 opcs ON opcs.tumouricdsite3code = tc.tumour_code AND TRIM(opcs.opcsresectioncode) = ho.opertn
)
WHERE rk=1)
);

------------------------------------------------------------------------------
CREATE SURGERY FLAG TABLES - STAGE SPECIFIC RESECTIONS-----------------
------------------------------------------------------------------------------

--3)----------- LIVER C22 - AT_TREATMENT_ENGLAND ---------------
-- Create a surgery flag for the tumour if:
-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery (event is '01a', '01b', or '01z')
-- and the opcs4_code is a percutaneous radiofrequency AND microwave ablation of lesion of liver (see SOP Appendices for list of opcs4 codes)
CREATE TABLE tr_av_liver as (
    SELECT DISTINCT
        tumourid,
        CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS liver_avtreat,
        eventdate AS avsg_date,
        avsg_trust_code
    FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
            FROM (SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
                RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
                avtreat.eventdate,
                avtreat.trust_code AS avsg_trust_code
            FROM tr_tumour_cohort tc
            INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
            INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
            AND eventcode IN ('01a', '01b', '01z') AND (avtreat.eventdate - tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
            AND avtreat.opcs4_code IN ('J124', 'J127') AND tc.tumour_code IN ('C22'))
        WHERE rk=1));

CREATE TABLE tr_hes_liver AS(
    SELECT DISTINCT
        tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS liver_hes
, opdate AS hessg_date
, hessg_trust_code
FROM (Select tumourid, datediff, rk, opdate, hessg_trust_code FROM (Select tumourid, datediff, rk, opdate, hessg_trust_code FROM (Select tumourid, datediff, rk, opdate, hessg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsitecode = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
AND ho.opertn IN ('J124','J127') AND tc.tumour_code IN ('C22'))
WHERE rk=1));

--5)----------- OESOPHAGUS C15 - AT_TREATMENT_ENGLAND -----------

CREATE TABLE tr_av_oesoph AS(
SELECT DISTINCT
  tumourid,
  CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS oesoph_avtreat
  , eventdate AS avsg_date
  , avsg_trust_code
FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM ( SELECT tc.tumourid, avtreat.eventdate-tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk, avtreat.eventdate, avtreat.trust_code AS avsg_trust_code FROM tr_tumour_cohort tc INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time) AND avtreat.opcs4_code IN ('G421','G431','G146','G171','G438') AND tc.tumour_code IN ('C15')) WHERE rk=1));

--6)------------------ OESOPHAGUS C15 - HES ------------------

-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is a fibreoptic endoscopic resection of lesions of upper gastrointestinal tract AND oesophagus (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is TNM stage 1a (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)
-- and the patient only had one tumour in the time period of interest (this is also incorporated in the final table)

CREATE TABLE tr_hes_oesoph AS(
SELECT DISTINCT tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS oesoph_hes
, opdate AS hessg_date
, hessg_trust_code
FROM ( SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM ( SELECT tc.tumourid, ho.opdate-tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY ho.opdate, hl.datayear,hl.epikeyanon,POS) AS rk
, ho.opdate
, procode3 AS hessg_trust_code
FROM tr_tumour_cohort tc

49
CAS-SOP #4: Linking treatment tables

INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
AND ho.opertn IN ('G421','G431','G146','G171','G438') AND tc.tumour_code IN ('C15'))
WHERE rk=1));

--------------------------------------------------------------------------------

7) ---------------- STOMACH C16 - AT_TREATMENT_ENGLAND ------------------

CREATE a surgery flag for the tumour if:
-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery
(event is '01a', '01b', or '01z')
-- and the opcs4 code is a fibreoptic endoscopic resection of lesions of upper gastrointestinal tract AND
oesophagus (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is TNM stage 1a (a stage-specific tumour resection flag will incorporate this stage
criteria in the final table)

CREATE TABLE tr_av_stomach AS(
SELECT DISTINCT
    tumourid,
    CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS stomach_avtreat,
    eventdate AS avsg_date,
    avsg_trust_code
FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM (SELECT tc.tumourid,
    avtreat.eventdate - tc.diagnosisdatebest AS datediff,
    RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
    avtreat.eventdate,
    avtreat.trust_code AS avsg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
WHERE rk=1));
CAS-SOP #4: Linking treatment tables

AND avtreat.opcs4_code IN ('G421','G146','G449') AND tc.tumour_code IN ('C16')
WHERE rk=1));

--8)------------------ STOMACH C16 - HES ------------------

-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is a fibreoptic endoscopic resection of lesions of upper gastrointestinal tract AND oesophagus (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is TNM stage 1a (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)
-- and the patient only had one tumour in the time period of interest (this is also incorporated in the final table)

CREATE TABLE tr_hes_stomach AS(
SELECT DISTINCT
  tumourid,
  CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS stomach_hes,
  opdate AS hessg_date,
  hessg_trust_code
FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
AND ho.opertn IN ('G421','G146','G449') AND tc.tumour_code IN ('C16'))
WHERE rk=1));
CAS-SOP #4: Linking treatment tables

--9)--------------------- BLADDER CANCERS (C67) - AT_TREATMENT_ENGLAND---------------------

-- Create a surgery flag for the tumour if:
-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery
(event is '01a', '01b', or '01z')
-- and the opcs4_code is a endoscopic resections of lesion of bladder (TURBT) (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is T1 (non-muscle invasive) (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)

CREATE TABLE tr_av_bladder AS (
SELECT DISTINCT tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS bladder1_avtreat,
uevo_trust_code
FROM (
SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM (SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
avtreat.eventdate, avtreat.trust_code AS avsg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('01a', '01b', '01z') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
AND avtreat.opcs4_code IN ('M421', 'M422', 'M423', 'M428', 'M429') AND tc.tumour_code IN ('C67'))
WHERE rk=1));

--10)--------------------- BLADDER CANCERS (C67) - HES---------------------

-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is a endoscopic resections of lesion of bladder (TURBT) (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is T1 (non-muscle invasive) (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)
-- and the patient only had one tumour in the time period of interest (this is also incorporated in the final table)
CREATE TABLE tr_hes_bladder AS(
    SELECT DISTINCT tumourid,
    CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS bladder1_hes,
    opdate AS hessg_date,
    hessg_trust_code
    FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM (SELECT tc.tumourid, ho.opdate - tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY ho.opdate, hl.datayear, hl.epikeyanon, POS) AS rk, ho.opdate, procode3 AS hessg_trust_code FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
AND ho.opertn IN ('M421', 'M422', 'M423', 'M428', 'M429') AND tc.tumour_code IN ('C67')) WHERE rk=1));

--11)--------------------- CERVICAL CANCERS; CONE BIOPSIES - AT_TREATMENT_ENGLAND ---------------------

--The final treatment table will create a surgery flag for the tumour if:
--The tumour received a cone biopsy and was FIGO stage 1a (see SOP Appendices for list of opcs4 codes)
--Or the tumour received a cone biopsy and was FIGO stage 1b & 1b1 disease, if the tumour also received a lymphadenectomy
--Tables 11-14 flag the cone biopsies and lymphadenectomies, AND a cervical tumour resection flag will bring this together in the final table
-- Create a cone biopsy flag for the tumour if:
-- there is a record in at_treatment_england which states that the tumour was treated with surgery (event is '01a', '01b', or '01z')
-- and the opcs4_code is a cone biopsy
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
Create a cone biopsy flag for the tumour if:
-- There is an inpatient HES episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is a cone biopsy (see SOP Appendices for list of opcs4 codes)
-- and the operation date (operation) occurred in the relevant timeframe (see SOP)
-- and the patient only had one tumour in the time period of interest (this is incorporated in the final table)
CAS-SOP #4: Linking treatment tables

RANK() OVER (PARTITION BY tc.tumourid ORDER BY ho.opdate, hl.datayear, hl.epikeyanon, POS) AS rk
, ho.opdate
, procode3 AS hessg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
AND ho.opdate - tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
AND ho.opertn IN ('Q014', 'Q033', 'Q031', 'Q032') AND tc.tumour_code = 'C53'
WHERE rk = 1));

--13)------------------ CERVICAL CANCERS; LYMPHADENECTOMIES - AT_TREATMENT_ENGLAND -------
------------

-- Create a lymphadenectomy flag for the tumour if:
-- there is a record in at_treatment_england which states that the tumour was treated with surgery (event is '01a', '01b', or '01z')
-- and the opcs4_code is a lymphadenectomy (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)

CREATE TABLE tr_av_lymph AS
SELECT DISTINCT
    tumourid,
    CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS lymph_avtreat,
    eventdate AS avsg_date
, avsg_trust_code
FROM ( SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM ( SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
avtreat.eventdate
, avtreat.trust_code AS avsg_trust_code
FROM ( SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM ( SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
avtreat.eventdate
, avtreat.trust_code AS avsg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid = tc.tumourid
WHERE rk = 1));

55
AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
AND avtreat.opcs4_code IN ('T856','T859','T865') AND tc.tumour_code='C53')
WHERE rk=1));

--14)----------------- CERVICAL CANCERS; LYMPHADENECTOMIES - HES -----------------
-- Create a lymphadenectomy flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- And the opcs4_code is a lymphadenectomy (see SOP Appendices for list of opcs4 codes)
-- And the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- And the patient only had one tumour in the time period of interest (this is incorporated in the final table)
CREATE TABLE tr_hes_lymph AS(
SELECT DISTINCT
  tumourid,
  CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS lymph_hes,
  opdate AS hessg_date,
  hessg_trust_code
FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM (SELECT tc.tumourid,
  ho.opdate - tc.diagnosisdatebest AS datediff,
  RANK() OVER (PARTITION BY tc.tumourid ORDER BY ho.opdate, hl.datayear, hl.epikeyanon, pos) AS rk,
  ho.opdate,
  procode3 AS hessg_trust_code
  FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM (SELECT tc.tumourid
   INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
   INNER JOIN heslive.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid
   INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon
   INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon
   AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time
   AND ho.opertn IN ('T856','T859','T865') AND tc.tumour_code='C53')
WHERE rk=1))
WHERE

--15)-------------- COLORECTAL CANCERS; ENDOSCOPIES - AT_TREATMENT_ENGLAND-----------
-- Create a surgery flag for the tumour if:
CAS-SOP #4: Linking treatment tables

-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery (event is '01a', '01b', or '01z')
-- and the opcs4_code is an endoscopic resection or endoscopic biopsy procedure (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opernt) occurred in the relevant timeframe (see SOP)
-- and the tumour is TNM stage 1 (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)

CREATE TABLE tr_av_colorec AS(
SELECT DISTINCT
  tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS colorec_avtreat,
  eventdate AS avsg_date,
  avsg_trust_code
FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code
FROM (SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
        RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
        avtreat.eventdate,
        avtreat.trust_code AS avsg_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate - tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time)
AND avtreat.opcs4_code IN ('H201','H412','H206','H231','H236','H205','H202','H122','H235','H239','H402','H232','H261','H208','H341','H418',
'H209','H248','H238','H204','H419','H221','H251','H259','H229','H281','H181','H191','H561')
AND tc.tumour_code in ('C18', 'C19', 'C20'))
WHERE rk=1));

--16)------------------- COLORECTAL CANCERS; ENDOSCOPIES - HES -------------------
-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is an endoscopic resection or endoscopic biopsy procedure (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opernt) occurred in the relevant timeframe (see SOP)
-- and the tumour is TNM stage 1 (a stage-specific tumour resection flag will incorporate this stage criteria in the final table)
-- and the patient only had one tumour in the time period of interest (this is also incorporated in the final table)

CREATE TABLE tr_hes_colorec AS(
    SELECT DISTINCT tumourid, 
    CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS colorec_hes, 
    opdate AS hessg_date, 
    hessg_trust_code 
    FROM (SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM ( SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM tr_tumour_cohort tc 
    INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code 
    INNER JOIN hesliveline.hes_linkage_av_apc@casref01 hl ON tc.patientid = hl.patientid 
    INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon 
    INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon 
    AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time 
    AND ho.opertn IN ('H201','H412','H206','H231','H236','H205','H202','H122','H235','H239','H402','H232', 'H261','H208','H341', 'H418','H209','H248','H238','H204','H419','H221','H251','H259','H229','H181','H281','H191','H561') 
    AND tc.tumour_code in ('C18', 'C19', 'C20')) 
    WHERE rk=1));

--17)---------------- COLORECTAL CANCERS; APPENDECTOMIES FOR APPENDIX TUMOURS ONLY 
C18.1 - AT_TREATMENT_ENGLAND ----------------
-- Create a surgery flag for the tumour if: 
-- there is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with surgery 
(event is '01a', '01b', or '01z')
-- And the opcs4_code is an appendectomy procedure (see SOP Appendices for list of opcs4 codes)
-- And the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- And the tumour is an appendix tumour (C18.1)
CREATE TABLE tr_av_coloappen AS (SELECT DISTINCT tumourid, CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS colorec_avtreat_appen, eventdate AS avsg_date, avsg_trust_code FROM (SELECT tumourid, datediff, rk, eventdate, avsg_trust_code FROM (SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk, avtreat.eventdate, avtreat.trust_code AS avsg_trust_code FROM tr_tumour_cohort tc INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid AND eventcode IN ('01a','01b','01z') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time) AND avtreat.opcs4_code IN ('H024','H019','H011') AND tc.siite_icd10_o2 in ('C181')) WHERE rk=1));

-- Create a surgery flag for the tumour if:
-- There is an inpatient hes episode with a tumour resection opcs-4 code in one of the operation fields
-- and the opcs4_code is an appendectomy procedure (see SOP Appendices for list of opcs4 codes)
-- and the operation date (opertn) occurred in the relevant timeframe (see SOP)
-- and the tumour is an appendix tumour (C18.1)
-- and the patient only had one tumour in the time period of interest (this is also incorporated in the final table)

CREATE TABLE tr_hes_coloappen AS (SELECT DISTINCT tumourid, CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS colorec_hes_appen, opdate AS hessg_date, hessg_trust_code FROM (SELECT tumourid, datediff, rk, eventdate, hessg_trust_code FROM (SELECT tumourid, datediff, rk, eventdate, hessg_trust_code FROM (SELECT tc.tumourid, hes.eventdate - tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY hes.eventdate, hes.eventid) AS rk, hes.eventdate, hes_trust_code AS hessg_trust_code FROM tr_tumour_cohort tc INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 hes ON hes.tumouricdsite3code = tc.tumour_code INNER JOIN hes2018.at_treatment_england@casref01 hes ON hes.tumourid=tc.tumourid AND eventcode IN ('01a','01b','01z') AND (hes.eventdate-tc.diagnosisdatebest BETWEEN -31 AND hes.resect_time) AND hes.opcs4_code IN ('H024','H019','H011') AND tc.siite_icd10_o2 in ('C181')) WHERE rk=1));
FROM (  
SELECT tumourid, datediff, rk, opdate, hessg_trust_code FROM (  
SELECT tc.tumourid,  
ho.opdate-tc.diagnosisdatebest AS datediff,  
RANK() OVER (PARTITION BY tc.tumourid ORDER BY ho.opdate, hl.datayear, hl.epikeyanon, POS) AS rk  
, ho.opdate  
, procode3 AS hessg_trust_code  
FROM tr_tumour_cohort tc  
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code  
INNER JOIN heslive.hes_linkage_av@casref01 hl ON tc.patientid = hl.patientid  
INNER JOIN heslive.hesapc@casref01 ha ON ha.datayear = hl.datayear AND ha.epikeyanon = hl.epikeyanon  
INNER JOIN heslive.hesapc_opertn@casref01 ho ON ho.datayear = hl.datayear AND ho.epikeyanon = hl.epikeyanon  
AND ho.opdate-tc.diagnosisdatebest BETWEEN -31 AND tim.resect_time  
AND ho.opertn IN ('H024','H019','H011') AND tc.site_icd10_o2 in ('C181'))  
WHERE rk=1));

----------------------------------------------------------------------------------------------------------------------------------
-------------
-----------
CREATE CHEMO FLAG TABLES --------------------------
----------------------------------------------------------------------------------------------------------------------------------
--19)------------- ALL SITES - AVCT TABLE ---------------
-- Create a chemo flag for the tumour if:
-- There is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with chemotherapy (event is either 'Cytotoxic Chemotherapy' (code = 02) or 'CT - Other' (code = CTX) or 'chemoradiotherapy' (code = 04) or 'radioisotope therapy (including radioiodine)' (code = 19) or 'Immunotherapy' (code = 15))
-- AND the event date (eventdate) occurred in the relevant timeframe (see SOP)
CREATE TABLE tr_av_ct AS(  
SELECT DISTINCT  
tumourid,  
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS avct_flag  
, eventdate AS avct_date  
, avct_trust_code  
FROM (  
SELECT tumourid, datediff, rk, eventdate, avct_trust_code FROM (  
SELECT tc.tumourid,  
avtreat.eventdate-tc.diagnosisdatebest AS datediff,  
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk  
, avtreat.eventdate  
FROM (  
SELECT tumourid, datediff, rk, eventdate, avct_trust_code FROM (  
SELECT tc.tumourid,
CAS-SOP #4: Linking treatment tables

, avtreat.trust_code AS avct_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('02','04','15','19','CTX') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.CHEMO_TIME)
)
WHERE rk=1));

--20)---------------------------ALL SITES - SACT LEGACY -- UP TO 31 MARCH 2018 -------------------------------------
-- Create a chemo flag for the tumour if:
-- there is a record in SACT LEGACY (excluding those null or classified as 'hormones' or 'Not chemo' or 'Zoledronic acid' or 'Pamidronate' or 'Denosumab')
-- AND the start date of the regimen (start_date_of_regimen) occurred in the relevant timeframe
-- AND the patient only had one tumour in the time period of interest (this is also incorporated in the final table)
-- AND the start date of the regimen is up to 31 March 2018
CREATE TABLE tr_sact AS (
SELECT DISTINCT tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS sact_flag,
, start_date_of_regimen AS sact_date,
, sact_trust_code
FROM ( SELECT tumourid,datediff,rk, start_date_of_regimen, sact_trust_code
FROM ( SELECT tc.tumourid, sr.start_date_of_regimen - tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION BY tc.tumourid ORDER BY sr.start_date_of_regimen, sr.merged_regimen_id, st.merged_tumour_id) AS rk
, sr.start_date_of_regimen,
, SUBSTR(st.organisation_code_of_provider,1,3) AS sact_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN sact_legacy.patient@casref01 sp ON tc.nhsnumber=sp.nhs_number
INNER JOIN sact_legacy.tumour@casref01 st ON sp.merged_patient_id=st.merged_patient_id
INNER JOIN sact_legacy.regimen@casref01 sr ON st.merged_tumour_id=sr.merged_tumour_id
AND (NOT (benchmark_group IN ('NOT CHEMO','HORMONES','ZOLEDRONIC ACID','PAMIDRONATE','DENOSUMAB') OR benchmark_group IS NULL))
AND sr.start_date_of_regimen-tc.diagnosisdatebest BETWEEN -31 AND tim.CHEMO_TIME
AND sr.start_date_of_regimen<=TO_DATE('2018-03-31','YYYY-MM-DD')
) WHERE rk=1
));
--21)----------ALL SITES - SACT ENCORE -- FROM 1 APRIL 2018 --------------------------

-- Create a chemo flag for the tumour if:
-- there is a record in SACT ENCORE (excluding those null or classified as 'hormones' or 'Not chemo' or 'Zoledronic acid' or 'Pamidronate' or 'Denosumab')
-- AND the start date of the regimen (start_date_of_regimen) occurred in the relevant timeframe
-- AND the patient only had one tumour in the time period of interest (this is also incorporated in the final table)
-- AND the start date of the regimen is from 1 April 2018 onwards

CREATE TABLE tr_sact_2 AS
(SELECT
DISTINCT tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS sact2_flag,
start_date_of_regimen AS sact2_date
, sact2_trust_code
FROM (SELECT /*+ USE_HASH(tc tim) USE_HASH(tim sp) USE_HASH(st st) USE_HASH(sp sr)*/
tumourid, datediff ,rk, start_date_of_regimen, sact2_trust_code
FROM (SELECT tc.tumourid,
sr.start_date_of_regimen
- tc.diagnosisdatebest AS datediff, RANK() OVER (PARTITION
BY tc.tumourid ORDER BY sr.start_date_of_regimen, sr.merged_regimen_id, st.sact_tumour_id) AS rk,
sr.start_date_of_regimen, SUBSTR(st.organisation_code_of_provider,1,3) AS sact2_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 TIM ON
TIM.tumouricdsite3code = tc.tumour_code
INNER JOIN sact.at_patient_england@cas2102 sp ON tc.nhsnumber=sp.nhs_number
INNER JOIN sact.at_tumour_england@cas2102 st ON sp.encore_patient_id =
st.encore_patient_id
INNER JOIN sact.at_regimen_england@cas2102 sr ON
st.sact_tumour_id=sr.sact_tumour_id
AND (NOT (benchmark_group IN ('NOT CHEMO','HORMONES','ZOLEDRONIC ACID','PAMIDRONATE','DENOSUMAB') OR benchmark_group IS NULL))
AND sr.start_date_of_regimen-tc.diagnosisdatebest BETWEEN -31 AND TIM.chemo_time
AND sr.start_date_of_regimen>=TO_DATE('2018-04-01','YYYY-MM-DD')
) WHERE rk=1
));

------------------------------------------------------------------------------
---------------- CREATE RADIOTHERAPY FLAG TABLES ------------------
-----------------------------------------------------------------------------
--22)----------- ALL SITES - AT_TREATMENT_ENGLAND ----------------------
--- Create a radiotherapy flag for the tumour if:
--- There is a record in AT_TREATMENT_ENGLAND which states that the tumour was treated with radiotherapy
--- (event is either 'RT - Teletherapy' (code = 05) or 'chemoradiotherapy' (code = 04) or 'radiosurgery' (code = 22) or 'RT - Other/ NK' (code = RTX))
--- AND the event date (eventdate) occurred in the relevant timeframe (see SOP)

CREATE TABLE tr_av_rt AS(
SELECT DISTINCT
tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS avrt_flag,
, eventdate AS avrt_date,
, avrt_trust_code
FROM (SELECT tumourid, datediff, rk, eventdate, avrt_trust_code FROM (SELECT tc.tumourid, avtreat.eventdate - tc.diagnosisdatebest AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY avtreat.eventdate, avtreat.eventid) AS rk,
, avtreat.eventdate,
, avtreat.trust_code AS avrt_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code = tc.tumour_code
INNER JOIN av2018.at_treatment_england@casref01 avtreat ON avtreat.tumourid=tc.tumourid
AND eventcode IN ('04','05','22','RTX') AND (avtreat.eventdate-tc.diagnosisdatebest BETWEEN -31 AND tim.RADIO_TIME)
WHERE rk=1));

--- Create a radiotherapy flag for the tumour if:
--- There is a record in rtds (excluding those classified as Brachytherapy, i.e., with RTTREATMENTMODALITY='06')
--- AND the appointment date (APPTDATE) occurred in the relevant timeframe
--- AND the patient only had one tumour in the time period of interest (this is also incorporated in the final table)
CREATE TABLE
tr_rtds
AS(
SELECT DISTINCT
tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS rtds_flag
, apptdate AS rtds_date
, rtds_trust_code
FROM (  
SELECT tumourid,datediff,rk , apptdate, rtds_trust_code FROM (  
SELECT tc.tumourid, rl.apptdate-tc.diagnosisdatebest AS datediff,
RANK() OVER (PARTITION BY tc.tumourid ORDER BY rl.apptdate, rl.attendid, rl.orgcodeprovider, pr.radiotherapyepisodeid, pr.prescriptionid) AS rk  
, rl.apptdate
, CAST(SUBSTR(pr.orgcodeprovider,1,3) AS VARCHAR(3)) AS rtds_trust_code
FROM tr_tumour_cohort tc
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouridsite3code = tc.tumour_code
INNER JOIN rtds2016.opcds_cas1712_linkage rl ON tc.patientid=rl.patientid AND rl.apptdate- 
tc.diagnosisdatebest BETWEEN -31 AND tim.radio_time
INNER JOIN rtds2016.rtds_prescriptions pr ON pr.orgcodeprovider = rl.orgcodeprovider AND pr.attendid = rl.attendid
AND pr.apptdate = rl.apptdate AND pr.rttreatmentmodality NOT IN ('06')
)
WHERE rk=1
)
);  

--24)--------- ALL SITES - RTDS POST APRIL 2016 (COLLECTED BY NCRAS; PROCESSED BY ENCORE) ---------
-- Create a radiotherapy flag for the tumour if:
-- There is a record in rtds (excluding those classed as Brachytherapy, i.e., with RTTREATMENTMODALITY='06')
-- AND the appointment date (APPTDATE) occurred in the relevant timeframe
-- AND the patient only had one tumour in the time period of interest (this is also incorporated in the final table)
-- Do not flag the patient as receiving radiotherapy if the appointment date was before 1st April 2016

CREATE TABLE tr_rtds_2 AS (  
SELECT DISTINCT  
tumourid,
CASE WHEN datediff IS NULL THEN 0 ELSE 1 END AS rtds2_flag
, TO_DATE(apptdate) AS rtds2_date
, rtds2_trust_code
FROM (  

64
SELECT tumourid,datediff, rk, apptdate, rtds2_trust_code FROM (  
SELECT tc.tumourid, TO_DATE(pr.apptdate)-tc.diagnosisdatebest AS datediff  
  , TO_DATE(pr.apptdate) AS apptdate,  
RANK() OVER (PARTITION BY tc.tumourid ORDER BY  
TO_DATE(pr.apptdate),pr.attendid,pr.orgcodeprovider,pr.radiotherapyepisodeid,pr.prescriptionid) AS rk  
  , pr.orgcodeprovider AS rtds2_trust_code  
FROM tr_tumour_cohort tc  
INNER JOIN analysislouisereynolds.timeframe_lookup_13_18@casref01 tim ON tim.tumouricdsite3code  
  = tc.tumour_code  
INNER JOIN rtds.at_prescriptions_england@cas2102 pr ON pr.patientid=tc.patientid AND  
pr.rttreatmentmodality NOT IN ('06')  
  AND pr.orgcodeprovider <>'7A3'  
AND TO_DATE(pr.apptdate)-tc.diagnosisdatebest BETWEEN -31 AND tim.radio_time AND  
TO_DATE(pr.apptdate) BETWEEN TO_DATE('01-APR-16', 'dd-mm-yy') AND TO_DATE('31-DEC-2012 23:59:00', 'DD/MM/YY HH24:MI:SS')  
)  
WHERE rk=1  
);  
;  ------------ Index the tables from above--------------------------  
;  CREATE UNIQUE INDEX analysislouisereynolds.tr_AVCT_tumourid_uq ON analysislouisereynolds.tr_av_CT ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_AVRT_tumourid_uq ON analysislouisereynolds.tr_av_RT ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_AVSG_tumourid_uq ON analysislouisereynolds.tr_av_sg ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_bladder1_tumourid_uq ON analysislouisereynolds.tr_av_bladder ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_coloappen_tumourid_uq ON analysislouisereynolds.tr_av_coloappen ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_colorec_tumourid_uq ON analysislouisereynolds.tr_av_colorec ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_conebiops_tumourid_uq ON analysislouisereynolds.tr_av_conebiops ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_liver_tumourid_uq ON analysislouisereynolds.tr_av_liver ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_lymph_tumourid_uq ON analysislouisereynolds.tr_av_lymph ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_oesoph_tumourid_uq ON analysislouisereynolds.tr_av_oesoph ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
CREATE UNIQUE INDEX analysislouisereynolds.tr_av_stomach_tumourid_uq ON analysislouisereynolds.tr_av_stomach ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;  
;
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_CT')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_AVCT_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_RT')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_AVRT_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_sg')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_AVSG_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_bladder')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_bladder1_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_AVSG_tumourid_uq')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_AVSG_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_coloappen')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_coloappen_tumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_colorec')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_colorec_tumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_conebiops')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_conebiops_tumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_liver')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_liver_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_lymph')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_lymph_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_oesoph')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_oesoph_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_av_stomach')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_av_stomach_tumourid_uq')

CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_sg_tumourid_uq ON analysislouisereynolds.tr_hes_sg ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_bladder1_tumid_uq ON analysislouisereynolds.tr_hes_bladder ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_coloappen_tumid_uq ON analysislouisereynolds.tr_hes_coloappen ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_colorec_tumourid_uq ON analysislouisereynolds.tr_hes_colorec ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_conebiops_tumid_uq ON analysislouisereynolds.tr_hes_conebiops ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_liver_tumourid_uq ON analysislouisereynolds.tr_hes_liver ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_lymph_tumourid_uq ON analysislouisereynolds.tr_hes_lymph ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_oesoph_tumourid_uq ON analysislouisereynolds.tr_hes_oesoph ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_hes_stomach_tumourid_uq ON analysislouisereynolds.tr_hes_stomach ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUE INDEX analysislouisereynolds.tr_rtds_tumourid_uq ON analysislouisereynolds.tr_rtds ( tumourid ) NOLOGGING TABLESPACE analysisdata_IX;
CREATE UNIQUINDEX analysislouisereynolds.tr_rtds_2_tumourid_uq ON analysislouisereynolds.tr_rtds_2 (tumourid) NOLOGGING TABLESPACE analysisdata_IX;

CREATE UNIQUINDEX analysislouisereynolds.tr_sact_tumourid_uq ON analysislouisereynolds.tr_sact (tumourid) NOLOGGING TABLESPACE analysisdata_IX;

CREATE UNIQUINDEX analysislouisereynolds.tr_sact_2_tumourid_uq ON analysislouisereynolds.tr_sact_2 (tumourid) NOLOGGING TABLESPACE analysisdata_IX;

EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_sg')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_sg_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_bladder')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_bladder1_tumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_coloappenn')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_coloappentumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_colorec')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_coloarcatumid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_conebiops')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_conebiopi_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_colorec')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_colorec_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_conebiops')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_conebiopi_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_conebiops')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_conebiopi_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_liver')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_liver_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_lymph')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_lymph_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_oesoph')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_oesoph_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_hes_stomach')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_hes_stomach_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_rtds')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_rtds_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_rtds_2')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_rtds_2_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_sact')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_sact_tumourid_uq')
EXECUTE dbms_stats.gather_table_stats('analysislouisereynolds', 'tr_sact_2')
EXECUTE dbms_stats.gather_index_stats('analysislouisereynolds', 'tr_sact_2_tumourid_uq')

CREATE TABLE av_treatment_1318_4p6 NOLOGGING COMPRESS
AS
SELECT

--------------------------------------------
----------- Create final table drawing on all previous tables------------
--------------------------------------------

CREATE TABLE av_treatment_1318_4p6 NOLOGGING COMPRESS
AS
SELECT
CAS-SOP #4: Linking treatment tables

--Create radiotherapy (RT) flag for the tumour
--Only use the patient level datasets (rtds, rtds2) if the patient had no other tumours recorded in the 18 months before or after this tumour diagnosis

CASE
WHEN avrt_flag=1 THEN 1
WHEN rtds_flag=1 AND tc.tumour_flag=0 THEN 1
WHEN rtds2_flag=1 AND tc.tumour_flag=0 THEN 1
ELSE 0
END AS rt_flag

--Create chemo (CT) flag for the tumour
--Only use the patient level datasets (sact, sact2) if the patient had no other tumours recorded in the 18 months before or after this tumour diagnosis

CASE
WHEN avct_flag=1 THEN 1
WHEN sact_flag=1 AND tc.tumour_flag=0 THEN 1
WHEN sact2_flag=1 AND tc.tumour_flag=0 THEN 1
ELSE 0
END AS ct_flag

--Create resection flag for the tumour
--Only use the patient level datasets (hes) if the patient had no other tumours recorded in the 18 months before or after this tumour diagnosis

CASE
-- Firstly, incorporate non-stage specific resection flag using opcs4 resection lookup table
WHEN AVSG_flag=1 THEN 1
WHEN hessg_flag=1 AND tc.tumour_flag=0 THEN 1

-- Secondly, incorporate stage specific rules for particular cancer sites
-- Cervical
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2))) IN ('1A','IA') AND conebiops_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2))) IN ('1A','IA') AND conebiops_hes=1 AND tc.tumour_flag=0 THEN 1
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo)) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_avtreat=1) AND (lymph_avtreat=1) THEN 1
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B', '1B') OR upper(SUBSTR(tc.figo,1,3)) IN ('1B1', '1B1')) AND (conebiops_avtreat=1) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN 1
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B', '1B') OR upper(SUBSTR(tc.figo,1,3)) IN ('1B1', '1B1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_avtreat=1) THEN 1
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B', '1B') OR upper(SUBSTR(tc.figo,1,3)) IN ('1B1', '1B1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN 1

-- colorectal:
WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_hes=1 AND tc.tumour_flag=0 THEN 1

-- Sub rule for appendectomies for colorectal:
WHEN avt.site_icd10_o2 IN ('C181') AND colorec_avtreat_appen=1 THEN 1
WHEN avt.site_icd10_o2 IN ('C181') AND colorec_hes_appen=1 AND tc.tumour_flag=0 THEN 1

-- bladder
WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder1_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder1_hes=1 AND tc.tumour_flag=0 THEN 1

-- liver
WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_hes=1 AND tc.tumour_flag=0 THEN 1

-- oesophagus
WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best, 1,2)='1A' AND oesoph_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best,1,2)='1A' AND oesoph_hes=1 AND tc.tumour_flag=0 THEN 1

-- stomach
WHEN avt.site_icd10_o2_3char IN ('C16') AND SUBSTR(avt.stage_best,1,2)='1A' AND stomach_avtreat=1 THEN 1
WHEN avt.site_icd10_o2_3char IN ('C16') AND SUBSTR(avt.stage_best,1,2)='1A' AND stomach_hes=1 AND tc.tumour_flag=0 THEN 1
ELSE 0

END AS sg_flag

--------------------------------------------------------------------------------
-- Create cancer site names

CASE WHEN tumour_code IN ('C67') THEN 'BLADDER'

WHEN tumour_code IN ('C50') THEN 'BREAST'

WHEN tumour_code IN ('C53') THEN 'CERVICAL'

WHEN tumour_code IN ('C18','C19') THEN 'COLON'

WHEN tumour_code IN ('C20') THEN 'RECTUM'

WHEN tumour_code IN ('C01', 'C09', 'C10') THEN 'OROPHARYNX'

WHEN tumour_code IN ('C02', 'C03', 'C04', 'C06') THEN 'ORAL_CAVITY'

WHEN tumour_code IN ('C07', 'C08') THEN 'SALIVARY_GLANDS'

WHEN tumour_code IN ('C12', 'C13') THEN 'HYOPHARYNX'

WHEN tumour_code IN ('C32') THEN 'LARYNX'

WHEN tumour_code IN ('C05', 'C11', 'C14', 'C30', 'C31') THEN 'OTHER_HEAD_AND_NECK'

WHEN tumour_code IN ('C64', 'C65', 'C66', 'C68') THEN 'KIDNEY'

WHEN tumour_code IN ('C22') THEN 'LIVER'

WHEN tumour_code IN ('C33', 'C34') AND tc.morph_icd10_o2 IN ('8041','8042','8043','8044','8045') THEN 'NSCLC'

WHEN tumour_code IN ('C25') THEN 'PANCREAS'

WHEN tumour_code IN ('C61') THEN 'PROSTATE'

WHEN tumour_code IN ('C15') THEN 'OESOPHAGUS'

WHEN tumour_code IN ('C56', 'C57','C48OVARY', 'D39OVARY') THEN 'OVARY'

WHEN tumour_code IN ('C16') THEN 'STOMACH'

WHEN tumour_code IN ('C54', 'C55') THEN 'UTERINE'

WHEN tumour_code IN ('C51') THEN 'VULVA'

WHEN tumour_code IN ('C70', 'C71', 'C72') THEN 'MALIGNANT BRAIN'

WHEN tumour_code IN ('D32BRAIN', 'D33BRAIN', 'D42BRAIN', 'D43BRAIN') THEN 'NON-MALIGNANT BRAIN'

WHEN tumour_code IN ('D35BRAIN') THEN 'BENIGN ENDOCRINE'

WHEN tumour_code IN ('C75RAIN', 'D44BRAIN') THEN 'NON-BENIGN ENDOCRINE'

WHEN tumour_code IN ('C62', 'D29TESTES') THEN 'TESTES'

WHEN tumour_code IN ('C43') THEN 'MELANOMA'

WHEN tumour_code IN ('C44BCC') THEN 'NMSC_BCC'

WHEN tumour_code IN ('C44CSCC') THEN 'NMSC_CSICC'

WHEN tumour_code IN ('C44OTHER') THEN 'NMSC_OTHER'

WHEN SUBSTR(tumour_code,1,1)= 'D' AND tumour_code NOT IN ('D01','D03','D04','D06','D07','D11','D13','D15','D16','D18','D25','D27','D36','D40','D48', 'D29TESTES', 'D32BRAIN', 'D33BRAIN', 'D35BRAIN', 'D39OVARY', 'D39OVARY', 'D42BRAIN', 'D43BRAIN', 'D44BRAIN') THEN 'OTHER NON-MALIGNANT'

ELSE 'OTHER MALIGNANT'

END AS cancergroup
CASE

WHEN ncr.cal19nm = 'National Cancer Vanguard: Greater Manchester' THEN 'Greater Manchester'
WHEN ncr.cal19nm = 'National Cancer Vanguard: North Central AND North East London' THEN 'North Central AND North East London'
WHEN ncr.cal19nm = 'National Cancer Vanguard: North West AND South West London' THEN 'North West AND South West London'
WHEN ncr.cal19nm = 'West Yorkshire' THEN 'West Yorkshire AND Harrogate'
ELSE ncr.cal19nm
END AS cal19nm

-- Select all other variables
avt.tumourid
avt.diagnosisyear
avt.age
avt.dco
avt.basisofdiagnosis
avt.ccg_code
avt.gor_code
avt.fiveyearageband
avt.sex
avt.ethnicity
chrl.chrl_tot_27_03
imd.quintile_2015
ncr.cal19cd
-- For checking
avt.morph_icd10_o2
tc.figo
avt.t_best
avt.stage_best
tc.site_icd10_o2
site_icd10_o2_3char
tc.tumour_flag

-- Select dates of treatment from at_treatment_england
avt.diagnosisdatebest
avt.deathdatebest
avct.avct_date
avrt.avrt_date
avsg.avsg_date
--Select dates of treatment from patient-level datasets where only 1 tumour was diagnosed in 18 months before or after that tumour

, CASE WHEN tc.tumour_flag=0 THEN sact.sact_date END AS sact_date
, CASE WHEN tc.tumour_flag=0 THEN sact2.sact2_date END AS sact2_date
, CASE WHEN tc.tumour_flag=0 THEN rtds.rtds_date END AS rtds_date
, CASE WHEN tc.tumour_flag=0 THEN hessg.hessg_date END AS hessg_date
, CASE WHEN tc.tumour_flag=0 THEN rtds2.rtds2_date END AS rtds2_date

--Select date of surgery where there were additional site-specific resections flagged:

-- Take date of cone biopsy in at_treatment_england if:
-- The tumour received a cone biopsy and was FIGO stage 1a
-- Or the tumour received a cone biopsy and was FIGO stage 1b & 1b1 disease, if the tumour also received a lymphadenectomy

, CASE
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2)) IN ('1A','IA')) AND conebiops_avtreat=1 THEN cbavt.avsg_date
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_avtreat=1) AND (lymph_avtreat=1) THEN cbavt.avsg_date
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_avtreat=1) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN cbavt.avsg_date
END AS cbavsg_date

-- Take date of cone biopsy in hes if:
-- The tumour received a cone biopsy and was FIGO stage 1a
-- Or the tumour received a cone biopsy and was FIGO stage 1b & 1b1 disease, if the tumour also received a lymphadenectomy
-- and only 1 tumour was diagnosed in 18 months before or after that tumour

, CASE
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2)) IN ('1A','IA')) AND conebiops_hes=1 AND tc.tumour_flag=0 THEN cbhes.hessg_date
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_avtreat=1) THEN cbhes.hessg_date
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN cbhes.hessg_date
END AS cbhessg_date

------------------------colorectal------------------------
CAS-SOP #4: Linking treatment tables

-- As with cervical, select the date of the stage-specific resection for each tumour, according to the rules specified earlier for generating the stage-specific resection flag for that tumour site

,CASE WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_avtreat=1 THEN coloavt.avsg_date
END AS coloavsg_date

,CASE WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_hes=1 AND tc.tumour_flag=0 THEN colohes.hessg_date
END AS colohessg_date

, CASE WHEN avt.site_icd10_o2_3char IN ('C181') AND colorec_avtreat_appen=1 THEN coloavt_appen.avsg_date
END AS appenavsg_date

, CASE WHEN avt.site_icd10_o2_3char IN ('C181') AND colorec_hes_appen=1 AND tc.tumour_flag=0 THEN colohes_appen.hessg_date
END AS appenhessg_date

---------------

bladder
----------------------------------

,CASE WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder1_avtreat=1 THEN blad1_avt.avsg_date
END AS bladavsg_date

, CASE WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder1_hes=1 AND tc.tumour_flag=0 THEN blad1_hes.hessg_date
END AS bladhessg_date

-------------

liver
---------------------------------

, CASE WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_avtreat=1 THEN livavt.avsg_date
END AS livavsg_date

, CASE WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_hes=1 AND tc.tumour_flag=0 THEN livhes.hessg_date
END AS livhessg_date

---------

oesophageal
---------------------------------

, CASE WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best,1,2)='1A' AND oesoph_avtreat=1 THEN oesoavt.avsg_date
END AS oesoavsg_date

, CASE WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best,1,2)='1A' AND oesoph_hes=1 AND tc.tumour_flag=0 THEN oesohes.hessg_date
END AS oesohessg_date

-------------------

stomach
---------------------------------

, CASE WHEN avt.site_icd10_o2_3char IN ('C16') AND SUBSTR(avt.stage_best,1,2)='1A' AND stomach_avtreat=1 THEN stomavt.avsg_date
END AS stomavsg_date
```sql
-- Select trust codes from at_treatment_england
, avsg.avsg_trust_code
, avct_trust_code
, avrt_trust_code

-- Select trust codes of treatment from patient-level datasets where only 1 tumour was diagnosed in 18 months before or after that tumour
, CASE WHEN tc.tumour_flag=0 THEN hessg.hessg_trust_code END AS hessg_trust_code
, CASE WHEN tc.tumour_flag=0 THEN sact.sact_trust_code END AS sact_trust_code
, CASE WHEN tc.tumour_flag=0 THEN sact2.sact2_trust_code END AS sact2_trust_code
, CASE WHEN tc.tumour_flag=0 THEN rtds.rtds_trust_code END AS rtds_trust_code
, CASE WHEN tc.tumour_flag=0 THEN rtds2.rtds2_trust_code END AS rtds2_trust_code

-- Select trust codes of surgery where there were additional site-specific resections flagged:

---------
-- Take trust code of cone biopsy in at_treatment_england if:
-- The tumour received a cone biopsy and was FIGO stage 1a
-- Or the tumour received a cone biopsy and was FIGO stage 1b & 1b1 disease, if the tumour also received a lymphadenectomy

, CASE
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2)) IN ('1A','1A')) AND conebiops_avtreat=1 THEN cbavt.avsg_trust_code
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','1B1') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','1B1')) AND (conebiops_avtreat=1) AND (lymph_avtreat=1) THEN cbavt.avsg_trust_code
WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','1B1') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','1B1')) AND (conebiops_avtreat=1) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN cbavt.avsg_trust_code
END AS cbavsg_trust_code

-- Take date of cone biopsy in hes if:
-- The tumour received a cone biopsy AND was FIGO stage 1a
-- Or the tumour received a cone biopsy AND was FIGO stage 1b & 1b1 disease, if the tumour also received a lymphadenectomy
-- AND only 1 tumour was diagnosed in 18 months before or after that tumour
, CASE
WHEN avt.site_icd10_o2_3char='C53' AND (upper(SUBSTR(tc.figo,1,2)) IN ('1A','IA')) AND conebiops_hes=1 AND tc.tumour_flag=0 THEN cbhes.hessg_trust_code

WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_avtreat=1) THEN cbhes.hessg_trust_code

WHEN avt.site_icd10_o2_3char='C53' AND (upper(tc.figo) IN ('1B','IB') or upper(SUBSTR(tc.figo,1,3)) IN ('1B1','IB1')) AND (conebiops_hes=1 AND tc.tumour_flag=0) AND (lymph_hes=1 AND tc.tumour_flag=0) THEN cbhes.hessg_trust_code

END AS cbhessg_trust_code

---------------
colo
rectal------------------------------

As with cervical, select the date of the stage-specific resection for each tumour, according to the rules specified earlier for generating the stage-specific resection flag for that tumour site.

,CASE WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_avtreat=1 THEN coloavt.avsg_trust_code
END AS coloavsg_trust_code

,CASE WHEN avt.site_icd10_o2_3char IN ('C18','C19','C20') AND SUBSTR(avt.stage_best,1,1)='1' AND colorec_hes=1 AND tc.tumour_flag=0 THEN colohes.hessg_trust_code
END AS colohessg_trust_code

,CASE WHEN avt.site_icd10_o2 IN ('C181') AND colorec_avtreat_appen=1 THEN coloavt_appen.avsg_trust_code
END AS appenavsg_trust_code

,CASE WHEN avt.site_icd10_o2 IN ('C181') AND colorec_hes_appen=1 AND tc.tumour_flag=0 THEN colohes_appen.hessg_trust_code
END AS appenhessg_trust_code

---------------
blood
-----------------------

,CASE WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder_avtreat=1 THEN blad1_avt.avsg_trust_code
END AS bladavsg_trust_code

,CASE WHEN avt.site_icd10_o2_3char IN ('C67') AND SUBSTR(avt.t_best, 1,1) = '1' AND bladder_hes=1 AND tc.tumour_flag=0 THEN blad1_hes.hessg_trust_code
END AS bladhessg_trust_code

---------------
liver---------------------------------

,CASE WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_avtreat=1 THEN livavt.avsg_trust_code
END AS livavsg_trust_code

,CASE WHEN avt.site_icd10_o2_3char IN ('C22') AND SUBSTR(avt.stage_best,1,1)='1' AND liver_hes=1 AND tc.tumour_flag=0 THEN livhes.hessg_trust_code
END AS livhessg_trust_code

---------------
oesophageal---------------------------------

,CASE WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best,1,2)='1A' AND oesoph_avtreat=1 THEN oesoavt.avsg_trust_code
CAS-SOP #4: Linking treatment tables

END AS oesovasg_trust_code
, CASE WHEN avt.site_icd10_o2_3char IN ('C15') AND SUBSTR(avt.stage_best,1,2)='1A' AND oesoph_hes=1 AND tc.tumour_flag=0 THEN oesohes.hessg_trust_code
END AS oesohessg_trust_code
---------stomach-------------------------
, CASE WHEN avt.site_icd10_o2_3char IN ('C16') AND SUBSTR(avt.stage_best,1,2)='1A' AND stomach_avtreat=1 THEN stomavt.avsg_trust_code
END AS stomavsg_trust_code
, CASE WHEN avt.site_icd10_o2_3char IN ('C16') AND SUBSTR(avt.stage_best,1,2)='1A' AND stomach_hes=1 AND tc.tumour_flag=0 THEN stomhes.hessg_trust_code
END AS stomhessg_trust_code
---------------------------------------------------------------------
-- final join of tables with flags
-- Treatment flag tables
-- Do not flag surgery for non-ovarian C48 tumour morphologies (these are classified as "other" tumours)

FROM av2018.at_tumour_england@casref01 AVT
INNER JOIN analysislouisereynolds.tr_tumour_cohort@casref01 tc ON avt.tumourid=tc.tumourid
LEFT JOIN analysislouisereynolds.tr_av_ct@casref01 avct ON avt.tumourid=avct.tumourid
LEFT JOIN analysislouisereynolds.tr_sact@casref01 sact ON avt.tumourid=sact.tumourid
LEFT JOIN analysislouisereynolds.tr_sact_2@casref01 sact2 ON avt.tumourid=sact2.tumourid
LEFT JOIN analysislouisereynolds.tr_av_rt@casref01 avrt ON avt.tumourid=avrt.tumourid
LEFT JOIN analysislouisereynolds.tr_av_sg@casref01 avsg ON avt.tumourid=avsg.tumourid AND (tc.tumour_code NOT IN ('C48OTHER'))
LEFT JOIN analysislouisereynolds.tr_rtds@casref01 rtds ON avt.tumourid=rtds.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_sg@casref01 hesg ON avt.tumourid=hessg.tumourid AND (tc.tumour_code NOT IN ('C48OTHER'))
LEFT JOIN analysislouisereynolds.tr_rtds_2@casref01 rtds2 ON avt.tumourid=rtds2.tumourid

-- Add further joins for stage-specific resections:
-- add gynae tables:

LEFT JOIN analysislouisereynolds.tr_av_conebiops@casref01 CBAVT ON avt.tumourid=cbavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_conebiops@casref01 CBhes ON avt.tumourid=cbhes.tumourid
LEFT JOIN analysislouisereynolds.tr_av_lymph@casref01 lyavt ON avt.tumourid=lyavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_lymph@casref01 lyhes ON avt.tumourid=lyhes.tumourid

-- add colorectal tables:

LEFT JOIN analysislouisereynolds.tr_av_colorec@casref01 coloavt ON avt.tumourid=coloavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_colorec@casref01 colohes ON avt.tumourid=colohes.tumourid
LEFT JOIN analysislouisereynolds.tr_av_colappen@casref01 coloavt_appen ON avt.tumourid=coloavt_appen.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_colappen@casref01 colohes_appen ON avt.tumourid=colohes_appen.tumourid

-- add urological tables:
LEFT JOIN analysislouisereynolds.tr_av_bladder@casref01 blad1_avt ON avt.tumourid=blad1_avt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_bladder@casref01 blad1_hes ON avt.tumourid=blad1_hes.tumourid

-- add UGI tables:
LEFT JOIN analysislouisereynolds.tr_av_liver@casref01 livavt ON avt.tumourid=livavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_liver@casref01 livhes ON avt.tumourid=livhes.tumourid
LEFT JOIN analysislouisereynolds.tr_av_oesoph@casref01 oesoavt ON avt.tumourid=oesoavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_oesoph@casref01 oesohes ON avt.tumourid=oesohes.tumourid
LEFT JOIN analysislouisereynolds.tr_av_stomach@casref01 stomavt ON avt.tumourid=stomavt.tumourid
LEFT JOIN analysislouisereynolds.tr_hes_stomach@casref01 stomhes ON avt.tumourid=stomhes.tumourid

-- Additional demographics
LEFT JOIN imd.id2015@casref01 imd ON imd.lsoa11_code=avt.lsoa11_code
LEFT JOIN av2018.charlson_2006to2018@casref01 chrl ON chrl.tumourid=avt.tumourid
LEFT JOIN analysisncr.lsoa_ccg_ca_stp_2019@casref01 ncr ON ncr.lsoa11cd=avt.lsoa11_code

LEFT JOIN (select avtu.tumourid,
    CASE WHEN avtu.stage_best is null THEN 'X'
    WHEN (SUBSTR(avtu.stage_best,1,1) NOT IN ('1','2','3','4')) THEN 'X'
    ELSE SUBSTR(avtu.stage_best,1,1) END AS stage
from av2018.at_tumour_england@casref01 avtu
WHERE avtu.diagnosisyear BETWEEN 2012 AND 2018
    AND (NOT (avtu.site_icd10_o2_3char='C50' AND SUBSTR(avtu.stage_best,1,1)=0') or avtu.stage_pi is null)
) stage_nopagets
ON stage_nopagets.tumourid=avt.tumourid
;
;
### Appendix 5: Datasets used

<table>
<thead>
<tr>
<th>Treatment type</th>
<th>Dataset</th>
<th>Data table version</th>
<th>Follow up period available</th>
<th>Linkage type</th>
<th>Data quality notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemotherapy</td>
<td>Registry data from AT_TREATMENT_ENGLAND</td>
<td>AV2018.AT_TREATMENT_ENGLAND@CASREF01</td>
<td>Historical – November 2020</td>
<td>Tumour level</td>
<td>Corresponds with snapshot CAS2102.</td>
</tr>
<tr>
<td>Systemic Anti-Cancer Therapy (SACT) 2018</td>
<td>SACT_LEGACY.PATIENT, SACT_LEGACY.TUMOUR and SACT_LEGACY.REGIMEN @CASREF01</td>
<td>SACT_LEGACY.PATIENT, SACT_LEGACY.TUMOUR and SACT_LEGACY.REGIMEN @CASREF01</td>
<td>January 2013 – August 2020</td>
<td>Patient and tumour level</td>
<td>Data was not submitted regularly from all NHS Trusts until July 2014 onwards. Regimen start date used to identify date of chemotherapy may be inaccurate for some tumours diagnosed at the start of 2013.</td>
</tr>
<tr>
<td>Tumour resection</td>
<td>Registry data from AT_TREATMENT_ENGLAND</td>
<td>AV2018.AT_TREATMENT_ENGLAND@CASREF01AT_TREATMENT_ENGLAND</td>
<td>Historical – November 2020</td>
<td>Tumour level</td>
<td>Corresponds with snapshot CAS2102.</td>
</tr>
<tr>
<td>Inpatient Hospital Episodes Statistics (HES) 2018</td>
<td>HESLIVE.HESAPC and HESLIVE.HESAPC_OPERT N @CASREF01</td>
<td>HESLIVE.HESAPC and HESLIVE.HESAPC_OPERT N @CASREF01</td>
<td>April 2000 – November 2020</td>
<td>Patient level</td>
<td>Where a time period of 18 months has been used, some tumours diagnosed in 2018 will not yet have surgery data recorded in HES, so the percentage receiving a tumour resection may be an underestimate.</td>
</tr>
<tr>
<td>Radiotherapy</td>
<td>Registry data from AT_TREATMENT_ENGLAND</td>
<td>AV2018.AT_TREATMENT_ENGLAND@CASREF01AT_TREATMENT_ENGLAND</td>
<td>Historical – November 2020</td>
<td>Tumour level</td>
<td></td>
</tr>
<tr>
<td>Radiotherapy Dataset (RTDS) collected by NATCANSAT, pre April 2016</td>
<td>RTDS2016.RTDS_PRESCHR IPTIONS@CASREF01</td>
<td>RTDS2016.RTDS_PRESCHR IPTIONS@CASREF01</td>
<td>April 2009 – April 2016</td>
<td>Patient level</td>
<td>Brachytherapy &amp; teletherapy variable known to be inaccurate (there is over allocation to brachytherapy &amp; underreporting of teletherapy). Data may be incomplete for selected NHS Trusts. There are known to be undercounts in RTDS in the period between mid 2015 and March 2016.</td>
</tr>
<tr>
<td>Radiotherapy Dataset (RTDS) collected by PHE, post April 2016</td>
<td>RTDS.AT_PRESCRIPTIONS@CAS2102</td>
<td>RTDS.AT_PRESCRIPTIONS@CAS2102</td>
<td>April 2016 – December 2020</td>
<td>Patient level</td>
<td>As above</td>
</tr>
</tbody>
</table>
Appendix 6: Sensitivity analysis – impact of tumour resection code update

The list of relevant tumour resection codes was updated for SOP (v4.4) and previous versions of CAS-SOP#4, from a previous list that did not include stage-specific resections (available here). Please note, this analysis is from SOP (v4.4) and has not been updated for this v4.6 SOP update. Below is a comparison of the previous coding used and the current version, which includes stage-specific resections. The previous codelist was applied to the current sites (selected with the same ICD10 codes), and the same timeframes obtained from this SOP.

Findings

- For the 22 cancer sites with defined tumour resections codes, 41% of tumours had a tumour resection using the previous list of codes, and 45% had a tumour resection when using the updated list of codes, plus the site-specific additions (as listed in Appendix 3).
- Statistically significant differences between the proportions are present for all but three of the 22 sites (non-small lung cancer, small cell lung cancer and uterine cancers).
- The differences are most noticeable for bladder cancer (36% absolute difference), cervical (14% absolute difference), salivary glands (13% absolute difference), liver (13% absolute difference), and other head and neck (12% absolute difference).
Appendix 7: Sensitivity analysis – impact of timeframe update

The timeframes as defined above may not capture all treatments for certain cancer sites (underestimate of true figure), or include treatments for recurrence (overestimate of true figure). Therefore, follow-up periods of 6/12/18 months were tested and the results are shown below. Please note, this analysis is from SOP (v4.4) and has not been updated for this v4.6 SOP update.

Chemotherapy
Tumour resections

Findings

- Overall across all sites (excluding NMSC), 27% of tumours received chemotherapy within six months of diagnosis, increasing to 29% within 12 and 18 months. Sites with the greatest absolute differences in proportions from six to 18 months are bladder, kidney, liver, oral cavity, rectum and other (3-4% absolute difference).

- Of the 22 cancer sites with defined tumour resections codes (excluding ‘Other’ sites), 43% of tumours received a tumour resection within six months of diagnosis, increasing to 45% within 12 and 18 months. Sites with the greatest absolute differences in proportions from six to 18 months are rectum, breast, hypopharynx and oropharynx (5-9% absolute difference).
Overall across all sites (excluding NMSC), 20% of tumours received radiotherapy within six months of diagnosis, increasing to 28% within 12 months and 29% within 18 months. Sites with the greatest absolute differences in proportions from six to 18 months are breast, prostate, small cell lung cancer and oesophageal (8-26% absolute difference).