The Royal College of Pathologists
Pathology: the science behind the cure

Standards and datasets for reporting cancers

Dataset for the histopathological reporting of nodal excisions and neck dissection specimens

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Comments	This document will, in part, replace the 1st edition of the *Dataset for the histopathological reporting of nodal excisions and neck dissection specimens associated with head and neck carcinomas*, published in November 2013. In accordance with the College's pre-publications policy, this document will be on the Royal College of Pathologists' website for an abridged consultation from 14 March 2024 to 28 March 2024 due to additions to the document (pages 22–30). Responses and authors' comments will be available to view on publication of the final document. **Dr Brian Rous**

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Foreword

The cancer datasets published by The Royal College of Pathologists (RCPath) are a combination of textual guidance, educational information and reporting proformas. The datasets enable pathologists to grade and stage cancers in an accurate, consistent manner in compliance with international standards and provide prognostic information thereby allowing clinicians to provide a high standard of care for patients and appropriate management for specific clinical circumstances. This guideline has been developed to cover most common circumstances. However, we recognise that guidelines cannot anticipate every pathological specimen type and clinical scenario. Occasional variation from the practice recommended in this guideline may therefore be required to report a specimen in a way that maximises benefit to the patient.

Each dataset contains core data items (see Appendices C and D) that are mandated for inclusion in the Cancer Outcomes and Services Dataset (COSD) v9.0 in England. Core data items are those that are supported by robust published evidence and are required for cancer staging, optimal patient management and prognosis. Core data items meet the requirements of professional standards (as defined by the Information Standards Board for Health and Social Care [ISB]) and it is recommended that at least 95% of reports on cancer resections should record a full set of core data items. Other, non-core, data items are described. These may be included to provide a comprehensive report or to meet local clinical or research requirements. All data items should be clearly defined to allow the unambiguous recording of data.

The following stakeholders will be contacted to consult on this document:

- The British Association of Head and Neck Oncologists (BAHNO)
- ENT-UK
- The British Association of Oral and Maxillofacial Surgeons
- The UK and Ireland Association of Cancer Registries
- National Cancer Registration and Analysis Service

- The Association of Clinical Pathologists (ACP)
- British Division of the International Academy of Pathology (BDIAP)

Comments from specialist and general histopathologists on the draft document that was published on the RCPath's website have been considered as part of the review of the dataset.

The information used by the authors to develop this dataset was obtained by undertaking a search of the PubMed database for relevant primary research evidence and systematic reviews on regional lymph node metastasis, neck dissection and sentinel lymph node biopsy in head and neck malignancies from January 2010 to September 2023 (inclusive). Key search terms searched included cervical node metastasis, neck metastasis, neck dissection, lymph node dissection, sentinel lymph node, clinical trial, prognosis, survival, surgery, chemotherapy and radiotherapy. In addition, abstracts from selected conference proceedings from American Society of Clinical Oncology (ASCO) were screened. The recommendations are in line with those of other national pathology organisations (College of American Pathologists, the Royal College of Pathologists of Australasia) and the ENT-UK Consensus document for the management of patients with head and neck malignancies (www.entuk.org/publications). They incorporate the core data items and commentary from the International Collaboration on Cancer Reporting (ICCR).[1] Evidence evaluation is weighted towards upper aerodigestive tract squamous cell carcinoma, but also takes into consideration publications relating to management of regional lymph nodes in head and neck cutaneous malignancies and head and neck mucosal melanoma, as well as thyroid and salivary cancers. The level of evidence for the recommendations has been summarised according to modified SIGN guidance (see Appendix H) and the grade of evidence is indicated in the text. No major conflicts in the evidence have been identified and minor discrepancies between studies have been resolved by expert consensus. Gaps in the evidence were identified by College members via feedback received during consultation.

The laboratory handling of sentinel lymph nodes biopsy (SLNB) for early-stage oral cavity squamous cell carcinoma incurs significant cost. Input from pathology services during all stages of multidisciplinary business planning is necessary prior to implementing a local SLNB service.[2] In relation to neck dissection no major organisational changes or cost implications have been identified that would hinder the implementation of the neck dissection or non-sentinel lymph node assessment aspects of this dataset.[2,3] All cancer datasets are formally revised every 3 years. However, each year, the College will ask the

author of the dataset, in conjunction with the relevant sub-specialty adviser to the College, to consider whether or not the dataset needs to be updated or revised. A full consultation process will be undertaken if major revisions are required. Major revisions to core data items, apart from changes to international tumour grading and staging schemes that have been approved by the Specialty Advisory Committee on Cellular Pathology and affiliated professional bodies. These changes will be implemented without further consultation. If minor revisions or changes to non-core data items are required, an abridged consultation process will be undertaken whereby a short note of the proposed changes will be placed on the College website for 2 weeks for members' attention. If members do not object to the changes, the short notice of change will be incorporated into the dataset and the full revised version (incorporating the changes) will replace the existing version on the College website.

The dataset has been reviewed by the Professional Guidelines team, Working Group on Cancer Services and some members of the Lay Advisory Group and was placed on the College website for consultation with the membership from 7 December 2023 to 4 January 2024. Following changes to the document (see pages 22–30), this document will be placed on the College website for an abridged consultation from 14 March to 28 March 2024. All comments received from the Working Group and membership will be addressed by the author to the satisfaction of the Chair of the Working Group and the Clinical Lead for Guideline Review.

This dataset was developed without external funding to the writing group. The College requires the authors of datasets to provide a list of potential conflicts of interest; these are monitored by the Professional Guidelines team and are available on request. The authors have declared that they have no conflicts of interest.

1 Introduction

The dataset has been developed for the reporting of lymph node dissection specimens for carcinoma and melanoma of the head and neck. Lymph node biopsies and nodal excisions for lymphomas and sarcomas are beyond the scope of this dataset. While SLNB for melanoma and Merkel cell carcinoma are established procedures, any reference to SLNB in this dataset only relates to squamous cell carcinoma of the oral cavity.

The primary purpose of this document is twofold:

- to define the set of data necessary for the uniform recording and staging of the core pathological features in lymph node dissections and SLNB for head and neck tumour resections.
- to describe its application in sufficient detail and clarity that reports from different departments will contain equivalent information, allowing comparison of clinical practice and outcomes.

The guidelines should be implemented for the following reasons:

- Certain features of metastases to the regional lymph nodes are strong predictors of clinical outcome.[4–14]
- These features may be important in:
  - deciding the most appropriate treatment for individual patients, including the extent of surgery and adjuvant treatment regimes.
  - monitoring epidemiological changing patterns of disease. The core data items are incorporated into the (COSD) and are collected for epidemiological analysis by Cancer Registries on behalf of the National Cancer Intelligence Network (NCIN).
- To provide sufficiently accurate pathological information that can be used in conjunction with clinical data for the patient to be given a prognosis.
- To allow the accurate and equitable comparison of surgeons in different surgical units.
- To identify good surgical and histopathology practice.
- To compare patient outcomes in clinical trials.

1.1 Design of this protocol

RCPath recognises the authority of internationally accepted guidance documents (WHO, AJCC/UICC TNM and ICCR) and, to promote consistent reporting practice, adopts the recommendations of these organisations. This structured reporting protocol has been developed using the framework and data items specified in the ICCR *Dataset for the reporting of nodal excisions and neck dissection specimens for head and neck tumours* (published in 2019).[1] This protocol includes all the ICCR cancer dataset elements as well as additional information, elements and commentary. Core references have been updated to include relevant new information from 2018 to 2022.

ICCR dataset elements for these cancers have been included verbatim and are indicated by the blue ICCR logo. ICCR core elements are mandatory, form part of the COSD data and are therefore represented as standards in this document. ICCR (and RCPath) non-core elements are recommended and may be included as guidelines or used routinely according to local practice. Additional non-core items which have not been included in the ICCR dataset but recommended by RCPath are recommendations on handling and reporting of sentinel lymph nodes biopsies from head and neck squamous cell carcinomas and the documentation of the lymph node ratio.

These guidelines are presented as a proforma that lists the core data items that may be applied across the head and neck region. The proforma may be used as the main reporting format or may be combined with free text as required. Individual centres may wish to expand the detail in some sections to facilitate the recording of the data for particular tumour types.

1.2 Target users and health benefits of this guideline

The dataset is primarily intended to be used by consultant and trainee pathologists when reporting neck dissections specimens. Surgeons and oncologists may refer to the dataset when interpreting histopathology reports and core data should be available at multidisciplinary meetings to inform discussions on the management of head and neck cancer patients.

1.3 Changes since the second edition

The first edition of this dataset (November 2013) incorporated neck dissection specimens. In this revision, the guidance has been revised to include recent recommendations evidence supporting the inclusion of specific data items including adoption of the 8th edition of the AJCC and UICC TNM classification, lymph node ratio and categorisation of extranodal extension (ENE) into major (ENE_{ma}) and minor (ENE_{mi}) forms. The current edition also contains a section detailing the laboratory handling and reporting of SLNB for oral cavity squamous cell carcinomas with supporting evidence.

The strength of the basis in published evidence for the recommended core data items has been reviewed (see Appendix E). The primary reasons for inclusion of core data are the need for accurate classification and staging and the desire to predict those carcinomas that are likely to recur at nodal sites so that appropriate surveillance, surgery, radiotherapy and/or chemotherapy can be delivered to mitigate the effects of recurrence. The UICC

TNM staging, in isolation, does not provide sufficient information for management and prognosis and additional factors need to be considered.[15]

2 Terminology

2.1 Terminology of node groups

The best known classification of lymph node groups in the neck is the so-called Robbins' classification, originally proposed by the American Academy of Otolaryngology – Head and Neck Surgery in which the lymph node basins of the neck are divided into levels I to VI, as per the anatomical boundaries described further below and illustrated in Figure 1 (see Figure 1).[16]

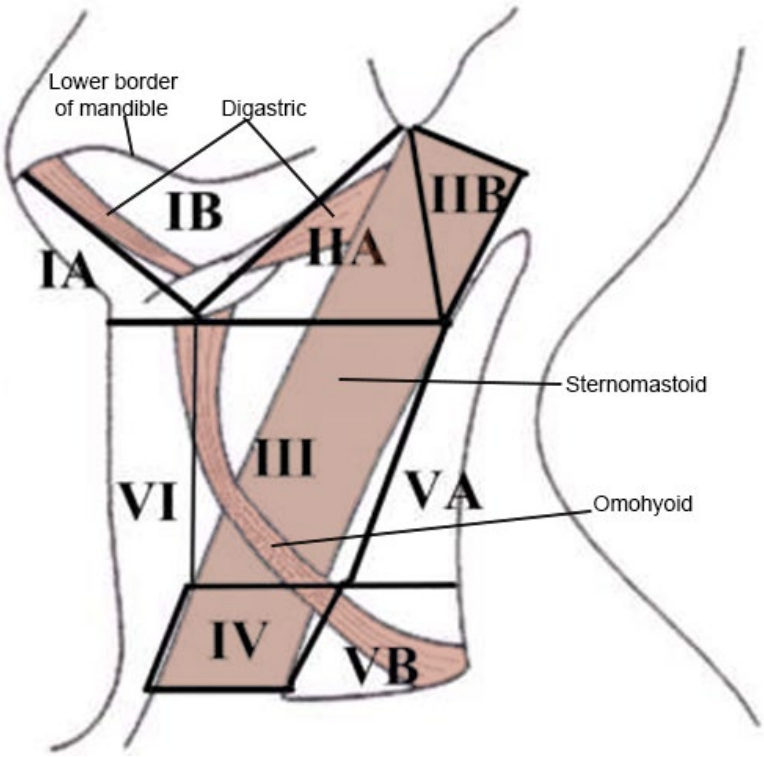

Figure 1: Diagrammatic representation of lymph node levels in the neck.

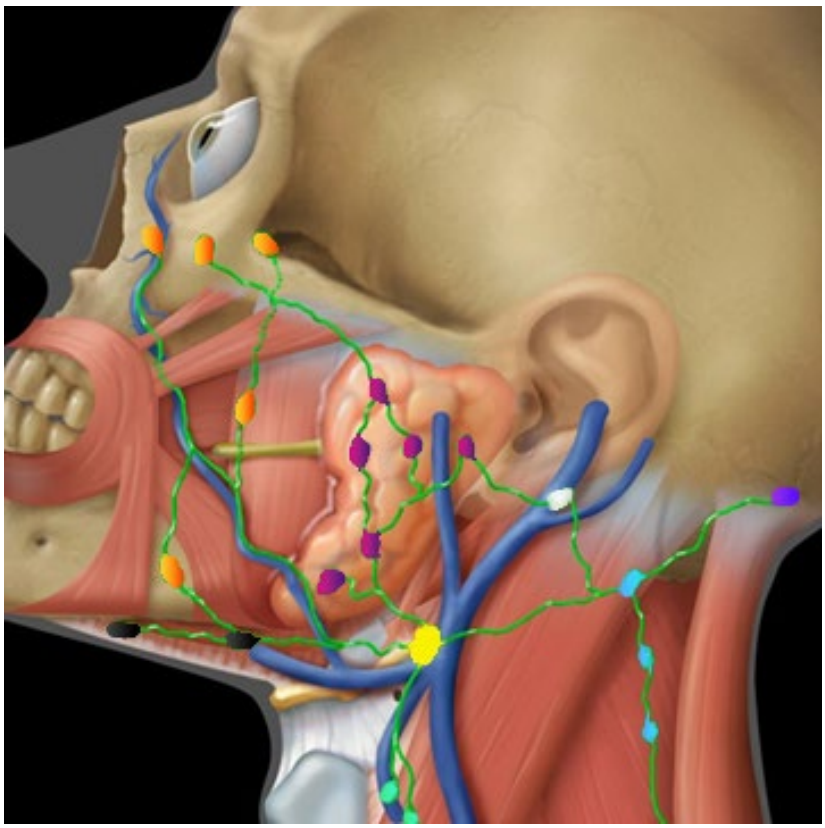

Figure 2: Head and neck lymph node groups of the facial and superior cervical area, demonstrating the parotid (magenta), bucco-facial (orange), submandibular (level I, dark grey), jugulo-digastric (level IIa, yellow) retroauricular (level IIb, white), upper cervical (levels IIa, III, green), deep cervical (light blue, levels IIb, Va) and occipital groups (purple). Note that the bucco-facial and parotid groups are not part of the neck levels.

These nodes are more commonly involved with tumours of the head and neck skin and parotid gland. This figure was modified from cervical lymph nodes (page 253). *In*: Harsnberger HR, Osborn AG, Macdonald AJ, Ross J, (eds.) *Diagnostic and Surgical Imaging Anatomy: Brain, Head & Neck, Spine.* Salt Lake City, USA: Amirsys, 2006. Reproduced with permission.

This classification only includes lymph nodes commonly removed during neck dissection procedures, and therefore it does not include all the head and neck node groups such as the facial nodes. Level VII (the superior mediastinal lymph node compartment) is included in the illustration for completeness, but except for thyroid cancer, it is rarely involved by head and neck cancer. Additional node groups described in the TNM atlas terminology not included in the levels listed below retropharyngeal, parotid, bucco-facial and retroauricular groups (Figure 2).[17] Further subdivisions of several node levels, based on specific anatomical landmarks, has clinical significance because they tend to be involved preferentially by tumours of specific primary sites. For instance, level IIB is more

commonly involved by primary tumours of the oropharynx or nasopharynx, than by primaries of the oral cavity, hypopharynx or larynx.[18]

The boundaries of the lymph node groups found within the levels and sublevels of the neck are as follows.[19]

2.1.1 Submental (sublevel IA)

Lymph nodes within the triangular boundary of the anterior belly of the digastric muscles and the hyoid bone. These nodes are at greatest risk for harbouring metastases from cancers arising from the floor of mouth, anterior oral tongue, anterior mandibular alveolar ridge and lower lip.

2.1.2 Submandibular (sublevel IB)

Lymph nodes within the boundaries of the anterior belly of the digastric muscle, the stylohyoid muscle, and the body of the mandible. It includes the pre-glandular and the post-glandular nodes and the pre-vascular and post-vascular nodes. The submandibular gland is included in the specimen when the lymph nodes within the triangle are removed. These nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, anterior nasal cavity, soft tissue structures of the midface and submandibular gland.

2.1.3 Upper jugular (level II, including sublevels IIA and IIB)

Lymph nodes located around the upper third of the internal jugular vein and adjacent spinal accessory nerve extending from the level of the skull base (above) to the level of the inferior border of the hyoid bone (below). The anterior (medial) boundary is the stylohyoid muscle (the radiologic correlate is the vertical plane defined by the posterior surface of the submandibular gland) and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle. Sublevel IIA nodes are located anterior (medial) to the vertical plane defined by the spinal accessory nerve. Sublevel IIB nodes are located posterior (lateral) to the vertical plane defined by the spinal accessory nerve. The upper jugular nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, nasal cavity, nasopharynx, oropharynx, hypopharynx, larynx and parotid gland.

2.1.4 Middle jugular (level III)

Lymph nodes located around the middle third of the internal jugular vein extending from the inferior border of the hyoid bone (above) to the inferior border of the cricoid cartilage (below). The anterior (medial) boundary is the lateral border of the sternohyoid muscle and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle.

These nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, nasopharynx, oropharynx, hypopharynx and larynx.

2.1.5 Lower jugular (level IV)

Lymph nodes located around the lower third of the internal jugular vein extending from the inferior border of the cricoid cartilage (above) to the clavicle below. The anterior (medial) boundary is the lateral border of the sternohyoid muscle and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle. The point at which the omohyoid muscle crosses deep to the sternocleidomastoid muscle is a useful landmark separating levels III and IV. These nodes are at greatest risk for harbouring metastases from cancers arising from the hypopharynx, thyroid, cervical oesophagus and larynx.

2.1.6 Posterior triangle group (includes sub levels VA and VB)

The group is composed predominantly of the lymph nodes located along the lower half of the spinal accessory nerve and the transverse cervical artery. The supraclavicular nodes are also included in posterior triangle group. The superior boundary is the apex formed by convergence of the sternocleidomastoid and trapezius muscles, the inferior boundary is the clavicle, the anterior (medial) boundary is the posterior border of the sternocleidomastoid muscle and the posterior (lateral) boundary is the anterior border of the trapezius muscle. Sublevel VA is separated from sublevel VB by a horizontal plane marking the inferior border of the anterior cricoid arch. Thus, sublevel VA includes the spinal accessory nodes, whereas sublevel VB includes the nodes following the transverse cervical vessels and the supraclavicular nodes with the exception of the Virchow node, which is located in level IV. The posterior triangle nodes are at greatest risk for harbouring metastases from cancers arising from the nasopharynx, oropharynx and cutaneous structures of the posterior scalp and neck.

2.1.7 Anterior compartment group (level VI)

Lymph nodes in this compartment include the pretracheal and paratracheal nodes, precricoid (Delphian) node and the perithyroidal nodes including the lymph nodes along the recurrent laryngeal nerves. The superior boundary is the hyoid bone, the inferior boundary is the suprasternal notch and the lateral boundaries are the common carotid arteries. These nodes are at greatest risk for harbouring metastases from cancers arising from the thyroid gland, glottic and subglottic larynx, apex of the piriform sinus and cervical oesophagus.

2.1.8 Superior mediastinal (level VII)

Lymph nodes in this group include pretracheal, paratracheal and oesophageal groove lymph nodes, extending from the level of suprasternal notch cephalad and up to the innominate artery caudad. These nodes are at greatest risk of involvement by thyroid cancer and cancer of the oesophagus.

2.2 Terminology of neck dissection specimens

The most widely used classification of neck dissection procedures is based on the original system proposed by the Committee for Head and Neck Surgery and Oncology of the American Academy of Otolaryngology-Head and Neck Surgery which has undergone several revisions.[16,20–22] The classification includes 4 basic procedures: radical neck dissection, modified radical neck dissection, extended neck dissection and selective neck dissection.

2.2.1 Radical neck dissection

A radical neck dissection involves removal of levels I-V, as well the sternocleidomastoid muscle, spinal accessory nerve and internal jugular vein.

2.2.2 Modified radical neck dissection

A modified radical neck dissection spares at least 1 of the following structures: sternocleidomastoid muscle, spinal accessory nerve and internal jugular vein.

2.2.3 Extended neck dissection

An extended neck dissection involves removal of additional lymph nodes groups (e.g. levels VI and VII) or non-lymphatic structures, beyond those removed as part of a radical neck dissection.

2.2.4 Selective neck dissection

This involves removal of the nodal group(s) considered to be the most likely site for metastasis, preserving 1 or more nodal groups that are typically removed in a radical dissection. A selective neck dissection is a more limited procedure, in which 1 or more of the level I to V lymph node groups are spared, typically for malignancies of specific locations and with no or limited clinical evidence of lymph node involvement (N0 or N1).[23] The subtypes of selective neck dissection are:

- Supraomohyoid neck dissection which refers to removal of levels I to III and is commonly performed for tumours of the oral cavity. Lateral neck dissection refers to removal of levels II to IV, performed for tumours of the larynx, oropharynx and

hypopharynx. Posterolateral neck dissection refers to removal of levels II to V, for example for skin malignancies of the posterior scalp or upper, posterolateral neck.

- Central or anterior compartment neck dissection removes level VI nodes (pretracheal, paratracheal, precricoid/Delphian and perithyroidal nodes) and is most commonly performed during surgery for thyroid carcinoma. Level VI lymph nodes are uncommonly received as neck dissections for head and neck skin or mucosal malignancies, but these nodes may be involved by primary cancers of the larynx or hypopharynx. Superior mediastinal nodes (level VII) may also be removed in central neck dissections, particularly for thyroid cancer.

2.2.5 Comprehensive neck dissection

The term comprehensive neck dissection refers to any neck dissection in which all nodes in levels I to V are removed and therefore it includes radical, modified radical and extended neck dissections.

3 Pathology request form

Optimal reporting of specimens from the head and neck area requires a partnership between the pathologist and surgeon/oncologist. The surgeon can help the pathologist to provide the information necessary for patient management by the appropriate handling and labelling of the specimen in the operating theatre. The regular discussion of cases at clinicopathological or multidisciplinary team meetings and correlation with pre-operative imaging studies are important in maintaining and developing this partnership.

3.1 Patient demographic data

The request form should include patient demographic data, which includes:

- the patient's name
- date of birth
- sex
- hospital and NHS/CHI number (where appropriate), or other patient identification number.

3.2 Clinical information

Clinical information should include:

- the duration of symptoms
- details of the surgery and whether the intent is curative, salvage or palliative
- details of previous histopathology and cytopathology reports
- site, laterality and histological type of the primary tumour
- clinical TNM stage (for correlation with pathological findings)
- a history of previous biopsy, resection, radiotherapy or chemotherapy should be included as this may influence the interpretation of the histological changes and should prompt a comment on the extent of any response to treatment
- if metastasis is expected or suspected, the node group/level, size of the metastasis and clinical ENE status should be stated
- whether the patient is currently enrolled in a clinical trial (give details of the trial).

3.3 Specimen details

Specimen details should include:

- the name of the clinician requesting the investigation
- the date and time of the operation
- the date and time at which the specimen was fixed
- the date and time the specimen was received in the laboratory
- laterality (right, left or bilateral)
- type of neck dissection. As the terminology applied to modified operations is potentially confusing, neck dissections should be described by specifying which node groups and non-lymphatic structures have been dissected and the relevant non-lymphatic structures that have been preserved or removed. To avoid misinterpretation, it is recommended that neck dissections should include:[22]
  - the levels and/or sublevels removed, e.g. I–III, II–IV
  - in functional neck dissections, any non-lymphatic structures removed, e.g. sternocleidomastoid muscle, internal jugular vein, submandibular gland.

The request form should include the opportunity for surgeons to provide annotated diagrams of specimens, either as free-hand drawings or on standard diagrams.

Macroscopic photographs of the specimen annotated by the surgical team may be used as an alternative to diagrams.

3.4 Sentinel lymph node biopsies

The following only apply to cT1-2 squamous cell carcinoma of the oral cavity. For sentinel lymph node biopsies, the following information should be provided for each node:

- site and laterality of the primary tumour. The greatest dimension, depth and pattern of invasion, and the presence/absence of perineural and lymphovascular invasion of the primary carcinoma should be included if known.[24]
- laterality
- anatomical neck level. If more than 1 sentinel lymph node is removed from the same level, the nodes should be clearly distinguished
- the size of the lymph node as measured per-operatively
- the intra-operative nodal and background scintigraphy counts
- if non-sentinel lymph nodes are submitted, these should be clearly distinguished from sentinel nodes.

Any lymph node with a scintigraphy count 10 times that of the background may be considered a sentinel node.[25] The average number of sentinel lymph nodes per procedure is between 3-4.[2] For midline tumours, up to 8 sentinel nodes[25] may be submitted per procedure and scintigraphy counts may allow for prioritisation of the laboratory processing. An example of a sentinel lymph node request form is provided in Appendix D.

4 Receipt and preparation of specimens prior to sampling

Neck dissections should be orientated by the surgeon and should be pinned or sutured to an appropriate mount (e.g. cork board, polystyrene block, foam sponge, KliniTray™). The surgeon should indicate surgically critical margins using metal tags or sutures and identify the general territories of node groups by placing markers such as metal tags or sutures at the centre of each anatomical group. Fixation is in neutral buffered formalin for 24–48 hours in a container of adequate size (the volume of fixative should be 10 times that of the tissue). Resection specimens identified as a biohazard risk should be fixed for at least 48 hours (e.g. HIV, tuberculosis). If tissue is sent fresh from theatres, this should reach the

pathology laboratory promptly. Refer to the COVID-19 Resources Hub for the latest COVID-19 related guidance (www.rcpath.org/profession/coronavirus-resource-hub.html) as appropriate. Photography of the specimen may be used to record the extent of the disease and the sites from which tissue blocks are selected.

A practical alternative for selective dissections is for the surgeon to separate the node groups, mark the superior margin of each group with a suture and place each group in a separately labelled container. Nodes in addition to the main groups, e.g. parapharyngeal nodes, should be sent as separate specimens.

[Level of evidence – GPP.]

5 Specimen handling and block selection

The specimen handling and preparation protocol described below is based on contemporary practice and should be regarded as a guide only; it may require modifying in individual cases. A detailed dissection protocol is beyond the scope of these guidelines, but a summary of dissection methods and block selection is included to facilitate recording of the core data items. Greater detail can be found in the relevant sections of the RCPath *Tissue pathways for head and neck pathology*.[26] It is frequently not possible to accurately subdivide the anatomical levels of the neck ex vivo since the structural landmarks may not be part of the specimen. Therefore, accurate anatomical level subdivision of the neck dissection specimen should be undertaken by the surgical team prior to receipt in the histopathology laboratory. Knowledge of current radiological imaging or reports may inform the approach to specimen sampling and block selection. For example, the radiology report may mention the neck levels where metastases are expected, matted lymph nodes, ENE or involvement of extranodal structures, all of which should be correlated with macroscopic and microscopic findings.

5.1 Specimen dissection, selection and recording of blocks for histology for neck dissection specimens

5.1.1 Overall assessment, identification and description of component structures

From the outer aspect: if included in the specimen, the submandibular salivary gland, the sternocleidomastoid muscle, the omohyoid muscle, the external jugular vein, the spinal accessory nerve, the tail of the parotid gland may be identified. Some dissections may include skin or other structures such as the stylohyoid and digastric muscles. From the

deep aspect, identify the internal jugular vein. Care should be given to avoid transecting the tumour during separation of the neck dissection from the main specimen. The points of separation on the main specimen and neck dissection should be inked.

Most neck dissections without lymph node involvement or with limited involvement (in which nodes are freely mobile and not matted or grossly involving non-lymphatic structures) will not need to be inked. However, as margin assessment is recommended, specimens with large tumour deposits, particularly in which ENE is considered likely, should be inked (at least surrounding the mass itself). Known or suspected margins of interest may be inked with an appropriate dye to facilitate the later recording of the proximity of tumour to the margin.

It is important to identify if the patient has been enrolled in a clinical trial before starting to undertake a macroscopic examination of the tumour and the selection of blocks, as the clinical trial protocol may dictate specific requirements in this regard.

5.1.2 Lymph node identification

Lymph nodes are identified by inspection and palpation around the vein, and around the submandibular gland and adipose tissue of the anterior and posterior triangles and assigned to the appropriate anatomical level. Each discrete node is dissected out with attached pericapsular adipose tissue. Grossly negative lymph nodes should be submitted in toto. Nodes 5 mm or more should be bisected through the hilum or multisected to give tissue sections of 2–3 mm thickness. Grossly involved lymph node and soft tissue metastases need not be submitted in toto, but 1 section per cm in greatest dimension is a reasonable approach. Sections should focus on potential areas of extranodal extension, involvement of non-lymphatic structures and the margin. More than 1 piece of tissue can be processed in a cassette provided slices from the same lymph node are readily identifiable. If there is obvious metastatic tumour, the slice(s) with the most extensive tumour should be processed, together with perinodal tissues to show the extent of ENE. For lymph node dissection specimens, it is important to record the macroscopic dimensions of the tumour deposit, the closest margins and any gross invasion of muscle, nerve or vessel wall. If the node appears negative, all slices should be processed. Several small nodes (from the same anatomical level) may be processed in the same cassette. A single haematoxylin and eosin-stained section from each block is usually sufficient for routine assessment.

Some centres may receive each anatomical level of the neck dissection as separate specimens. In these circumstances, lymph nodes may be dissected as described above or the specimen may be bisected or serially sliced and submitted in their entirety.

In previously irradiated necks surgically removed as part of a salvage procedure, consideration may be given to serially slicing the fixed specimen and submission of the entire specimen for embedding. Careful macroscopic description, with an estimate of the number of nodes in each anatomical level, is recommended. Care should be taken at dissection and microscopy not to double count nodes that are present across multiple slices or blocks.

5.1.3 Lymph node yield

Lymph node yield corresponds to prognosis and may be used as a quality-of-life indicator.[4] Nodal yield varies according to specimen type. For example, in previously unirradiated necks, a radical neck dissection usually yields an average of 20 nodes (range 10−30, although on occasion 50−100 nodes may be identified) whereas a selective neck dissection normally contains 18 or more nodes. The recommended nodal yield should be ≥18 per previously unirradiated neck dissection specimen and it is expected that all palpable nodes greater than 3 mm in diameter should be sampled.[27–29]

5.1.4 Lymph node ratio

The lymph node ratio (also known as the lymph node density) is defined as the ratio of positive lymph nodes to the total number of lymph nodes evaluated.[30] Several recent meta-analyses indicate lymph node ratio to be an independent prognostic factor which may demonstrate greater prognostic utility compared to current nodal staging criteria alone.[5,10–12,14,29,31–33]

5.1.5 Other blocks for histology

The submandibular gland, internal jugular vein and sternocleidomastoid muscle should be sampled if there is macroscopic suspicion of tumour involvement. The submandibular gland may also be involved by direct spread from the primary tumour or in cases of high neck node burden with ENE.[34]

5.1.6 Sentinel lymph nodes

There is currently no agreed consensus protocol for the handling of laboratory handling and processing of sentinel lymph nodes from oral cavity squamous cell carcinoma. Protocols for other tumour sites such as breast and melanoma are not directly applicable to the head and neck. Serial step sections with immunohistochemistry improves diagnostic

accuracy.[2,35] The following briefly describes the protocol utilised in the multicentre Sentinel European Node Trial (SENT) that has been adopted by most UK centres.[24,36,37]

- Sentinel lymph nodes <3 mm thickness are submitted whole. Those between 3–6 mm are hemisected along the hilum and nodes >6 mm are sliced into 3 mm pieces in the plane of the hilum.
- Following shallow trimming, 4 serial step sections are obtained, 1 of which is stained for H&E. If carcinoma is detected, no further laboratory procedure is required for this lymph node.
- If no carcinoma is detected in the index H&E section, 125 µm of the paraffin block is trimmed and discarded. Then, 4 serial sections are obtained, 1 of which is immunohistochemically stained for pan-cytokeratin (e.g. AE1/AE3). This process is repeated until all tissue within the block is exhausted. The remaining 3 unstained sections at each 125 µm interval provide spare material should further ancillary staining be required.

Some centres utilise modifications of the above protocol, including limiting the procedure to 4–6 serial step sections. There are currently no studies comparing the clinical efficacy of different laboratory protocols. Therefore, all centres providing a sentinel lymph node biopsy service should be subjected to regular audit to assess the sensitivity of the technique against clinical outcomes.

6 Core data items

We have set out to use the ICCR dataset in its current form, with appropriate qualifications and clarifications for implementation in UK clinical practice. In addition to the main dataset items, as outlined below, demographic and clinical data should be collected, as per the ICCR dataset. This includes the patient's name, date of birth, sex, hospital and NHS/CHI number (where appropriate), or other patient identification number.

1 ICCR	**Descriptor**	**Core/Non-core**	**Responses**
	Specimens submitted	Core	Multi selection value list (select all that apply): • Right – Lymph nodes

			○ Not specified ○ Submental (IA) ○ Submandibular (IB) ○ Upper jugular (II) ○ Middle jugular (III) ○ Lower jugular (IV) ○ Posterior triangle (V) ○ Retropharyngeal ○ Parotid/periparotid ○ Perifacial ○ Other, specify – Non-lymphoid tissue – Nerve – Muscle – Vein – Salivary gland – Other, specify • Left – Lymph nodes ○ Not specified ○ Submental (IA) ○ Submandibular (IB) ○ Upper jugular (II) ○ Middle jugular (III) ○ Lower jugular (IV) ○ Posterior triangle (V) ○ Retropharyngeal

			○ Parotid/periparotid ○ Perifacial ○ Other, specify – Non-lymphoid tissue – Nerve – Muscle – Vein – Salivary gland – Other, specify • Central compartment (VI +/- VII) – Non-lymphoid tissue ○ Thymus ○ Parathyroid ○ Other, specify

Specimens submitted commentary:

This section provides a listing of all lymph node groups and the associated non-lymphoid tissue received as part of a single surgery and should correlate with the “operative procedure” designation. Accurate identification of the lymph node levels requires orientation of the specimen(s) by the surgeon, either with the use of sutures, a diagram, or by submitting each level in a separate specimen container.[23] In cases in which orientation is not possible, it is recommended to review the specimen with the surgeon prior to gross submission of the lymph nodes. The designation of non-lymphoid tissue is non-specific, but more accurate naming of these tissues is desirable, when possible.

The lymph node groups may be received as multiple specimens from a single operative procedure. It is of benefit to combine the nodes from multiple specimens into 1 comprehensive report, rather than creating multiple sections for a single report. If a patient is known to have had a prior lymph node excisional biopsy (for example for diagnostic purposes), a comment to this effect is suggested. The result should be considered in the pN category assigned, with reference to the surgical pathology report number, when possible.

RCPath comments:

If submitted together, non-sentinel should be clearly distinguished from sentinel nodes.

[Level of evidence – GPP.]

2	Descriptor	Core/Non-core	Responses
ICCR	Histological tumour type	Core	Multi selection value list (select all that apply): • Squamous cell carcinoma (SCC) – Squamous cell carcinoma, conventional – HPV-mediated/p16 positive oropharyngeal carcinoma – Basaloid squamous cell carcinoma – Papillary squamous cell carcinoma – Spindle cell squamous carcinoma (sarcomatoid carcinoma) – Adenosquamous cell carcinoma – Acantholytic squamous cell carcinoma – Carcinoma cuniculatum – Undifferentiated (lymphoepithelial) carcinoma • Salivary gland carcinoma – Acinic cell carcinoma – Secretory carcinoma – Mucoepidermoid carcinoma Single selection value list: ○ Low grade mucoepidermoid carcinoma ○ Intermediate grade mucoepidermoid carcinoma

			○ High grade mucoepidermoid carcinoma – Adenoid cystic carcinoma Single selection value list: ○ Tubular/cribriform pattern predominant ○ Solid pattern >30% – Polymorphous adenocarcinoma Single selection value list: ○ Classic ○ Grade, specify ○ Cribriform – Epithelial-myoepithelial carcinoma – (Hyalinizing) Clear cell carcinoma – Basal cell adenocarcinoma – Sebaceous adenocarcinoma – Intraductal carcinoma ○ Single selection value list: ○ Low grade ○ High grade – Cystadenocarcinoma – Adenocarcinoma, not otherwise specified (NOS) – Salivary duct carcinoma – Myoepithelial carcinoma – Carcinoma ex pleomorphic adenoma ○ Type(s), specify

			▪ Carcinosarcoma – Poorly differentiated carcinoma: Neuroendocrine and non-neuroendocrine Single selection value list: o Undifferentiated carcinoma o Large cell neuroendocrine carcinoma o Small cell neuroendocrine carcinoma – Lymphoepithelial carcinoma – Squamous cell carcinoma – Oncocytic carcinoma – Other, specify • Neuroendocrine carcinoma Single selection value list: – Well-differentiated (typical carcinoid) – Moderately differentiated (atypical carcinoid) – Poorly differentiated (high grade neuroendocrine carcinoma), large cell type – Poorly differentiated (high grade neuroendocrine carcinoma), small cell type • Mucosal melanoma • Nasopharyngeal carcinoma Single selection value list: – Squamous cell carcinoma, keratinising

			– Squamous cell carcinoma, non-keratinising, differentiated – Squamous cell carcinoma, non-keratinising, undifferentiated – Squamous cell carcinoma, basaloid • Nasopharyngeal papillary adenocarcinoma • Other (e.g. primary adnexal skin cancers), specify type

Histological tumour type commentary:

Identification of the histological tumour type is crucial for several reasons, including: 1) confirmation that a metastasis is of the same type as the resected primary tumour, 2) facilitating a clinical search in cases of unknown primary tumours, 3) determining the correct T and N categories (see below), 4) guiding treatment, which varies by tumour type and lymph node status.[19]

Histological type and grade are typically determined from the histology of the primary site, but this is not possible for tumours of unknown origin. Tissue from a neck metastasis may be required for ancillary testing [e.g. p16 immunohistochemistry (followed by HPV specific testing if positive) or in situ hybridisation for Epstein Barr virus encoded RNA/EBER]. For patients with occult primary squamous cell carcinoma in level II or III, the cN or pN categories are influenced by EBV and HPV status.[38] EBV-related and HPV-related carcinomas are given the N category that applies to nasopharyngeal and HPV-related oropharyngeal carcinomas, respectively.[19]

Note that verrucous carcinoma and carcinoma cuniculatum are not included in the above list of squamous cell carcinoma variants, as it has no capacity to metastasise to lymph nodes.

A classification for neuroendocrine tumours is included, which applies to tumours of the hypopharynx, larynx, trachea and parapharyngeal space as per the latest World Health Organization (WHO) head and neck tumour classification. Neuroendocrine tumours elsewhere in the head and neck (for example the nasal cavity and salivary glands) tend to be high grade.[17] In most cases, an appropriate choice can be made from the list provided, but sites may choose to use the “other” category, as per local needs or convention.

Primary tumour site has been included at the end of this section for cases in which the neck dissection is received as a separate surgical specimen from the primary tumour. As this is not always the case, it is deemed a non-core item.

RCPath comments: None

[Level of evidence – C.]

3 ICCR	Descriptor	Core/Non-core	Responses
	Lymph node status	Core	Right sided lymph nodes See Right sided lymph node table Text/numeric: • Maximum dimension of largest lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm Soft tissue metastasis • Not identified • Present, specify site (level) Left sided lymph nodes See Left sided lymph node table Text/numeric: • Maximum dimension of largest lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm Soft tissue metastasis • Not identified • Present, specify site (level) Central compartment lymph nodes Text/numeric:

			• Number of lymph nodes examined* ___ • Number of lymph nodes positive* ___ ENE** Single selection value list: • Not identified • ENEmi (≤2 mm) • ENEma (>2 mm) • Maximum dimension of largest lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm Soft tissue metastasis • Not identified • Present, specify site (level)

* Insert “cannot be determined” when applicable.

Lymph node status commentary:

Lymph node status may be presented in tabular form for ease of interpretation as follows:

Level and side	Number of nodes examined	Number of nodes positive	ENE minor or major	Number of nodes with ENE
II right				
III right				
etc				

For cases in which an involved lymph node or tumour deposit straddles more than one lymph node level, it is recommended to include it in the level in which the bulk of the deposit is found, with an explanatory comment. In other cases, it may not be possible to precisely divide the neck dissection into individual levels and more than one level may need to be combined. If a neck dissection is received without any level designation, clarification from the surgeon involved is suggested. If this is not obtained, the data may be reported without further qualification, such as “right neck dissection, not further specified”.

“Soft tissue metastasis” refers to a deposit of tumour in connective tissue, without a microscopically identifiable residual lymph node. This may represent venous invasion, lymphatic invasion or, most likely, a totally replaced node or nodes. It does not refer to intralymphatic tumour emboli in adipose tissue surrounding the lymph nodes. In many cases, a soft tissue metastasis is the largest focus of tumour in the specimen. Rarely, very small soft tissue metastases (e.g. < 1 mm in greatest dimension) are identified that appear unlikely to be of nodal origin. Special stains and deeper levels may help to identify a vascular origin for these deposits, and the pathologist may use his/her discretion as to their designation as positive lymph nodes, perhaps with the use of a clarifying comment.

For tumour deposits in which there is residual lymph node tissue with widespread extranodal extension, a combined gross and microscopic estimate of the number of involved lymph nodes is suggested. Correlation with pre-surgical imaging studies may also be of benefit. The largest metastatic focus may be an intranodal or a soft tissue metastasis. Determination of the size of the largest metastasis may be difficult in cases where multiple tumour deposits are identified in a single lymph node. Options including measuring the greatest dimension of the largest deposit, combining the sizes of the deposits to give an aggregate dimension, and measuring the greatest dimension “end-to-end” from a single slide, including discontinuous tumour deposits. The latter is recommended.

The size of the largest involved lymph node is the basis upon which clinicians determine N category and thereby the stage. Although there is some debate about whether the greatest dimension of the largest tumour deposit or that of the largest involved lymph node is the more relevant measurement, both are considered “core” items in this dataset. This is to provide the maximum amount of data that may be relevant for clinical decision-making. The greatest dimension of the largest involved lymph node should be used to determine the pN category. In some cases, the largest node in a specimen may be a reactive node with no tumour. Therefore, the measurement must be of the largest node involved by metastatic tumour. Neck dissections may be performed as salvage surgery for a persistent neck mass following adjuvant radiation therapy. In this circumstance, only viable tumour – not necrotic keratinous debris or keratin granulomas – should be considered as a positive lymph node. Extra sampling of residual neck deposits may be required to evaluate these specimens. The prefix “yp” should be added to the TNM category.

Extranodal extension:

Extranodal extension (ENE) refers to extension of tumour outside the capsule of a lymph node and into the perinodal soft tissue. It is also known as “extracapsular

extension/spread", but the term "extranodal extension" has been adopted in the 8th edition of the American Joint Committee on Cancer (AJCC) Staging Manual[19] and the Union for International Cancer Control (UICC)[15] and therefore is used here. ENE is a poor prognostic factor in cervical node positive head and neck carcinoma. In HPV-mediated oropharyngeal cancer, the exact clinical significance of ENE has yet to established, and so it is considered a "non-core" item, with reporting up to local discretion.[39–41] The presence of ENE in other head and neck cancers correlates with the risk of regional recurrence and outcome. It is an important factor for oncologists when considering treatment with postoperative radiotherapy or chemoradiotherapy.[41,42]

Interobserver variation in the determination of ENE may be minimised if the following guidance is used.

1. Lymph nodes, especially smaller nodes and those in the parotid area, may not have a complete capsule. The node hilum may merge with adipose tissue, or there may be a rim of lymphoid tissue external to the capsule. Generally speaking, a conservative approach is recommended. For instance, tumour within fat near the hilum of a node should be considered intranodal if benign lymphoid tissue is identified nearby. Tumour within lymphatics near an involved lymph node should not be considered ENE. However, tumour extending beyond a clearly identifiable node capsule is extranodal, even if there is a surrounding lymphoid response. A stromal desmoplastic reaction is not necessarily required.[19]
2. Grossly "matted" lymph nodes. Grossly adherent lymph nodes may represent true macroscopic ENE or several closely-aggregated lymph nodes with thickened nodal capsules without microscopic evidence of ENE. Additional levels and sections are recommended to exclude ENE. The presence of matted nodes, their site, size and an estimated of the number involved, should be included in the gross description and may be mentioned in a comment. At least one study has shown that radiographically matted lymph nodes are a risk factor for distant metastases and decreased survival in oropharyngeal cancer.[43]
3. Lymphatic spread to lymph nodes versus direct extension from the primary tumour. Some tumours may extend directly into lymph nodes without intervening normal tissue. This is not uncommon in parotid tumours as there are multiple lymph nodes within the parotid parenchyma itself, but it also occurs with large oral and oropharyngeal primaries. Direct extension into lymph nodes is staged in the same manner as discontinuous metastases.[19] Determination of ENE should be based on any component of the capsule that is discontinuous with the primary tumour. A comment is recommended for clarity.

The lymph node capsule is often markedly thickened and altered by large metastases with obliteration of the subcapsular sinus. ENE is measured as the greatest extent of tumour spread perpendicular to the external aspect of the node capsule. The exact site of the latter is subjective but may be estimated by examination of the remaining intact capsule and contour of the node (see Figures 3 and 4).

RCPath comment: None

[Level of evidence – C.]

7 Non-core data items

NC1	Descriptor	Core/Non-core	Responses
ICCR	Operative procedure	Non-core	Multi selection value list (select all that apply): • Not specified OR • Selective neck dissection Single selection value list: – Supraomohyoid – Lateral – Posterolateral – Central (anterior) compartment • Comprehensive neck dissection Single selection value list: – Modified radical neck dissection – Radical neck dissection – Extended radical neck dissection • Lymph node biopsy, specify site • Other, specify

Operative procedure commentary:

Accurate designation of the operative procedure requires appropriate information from the head and neck surgeon, ideally with specimen orientation. A single operation may encompass more than 1 of the above-designated procedures, and the terminology may vary by institution. Some experts have proposed eliminating the above terminology, in

favour of a more simplistic designation that includes the lymph node levels received and a listing of non-lymphatic structures that accompany them.[22] In some cases, it is not possible to specify or be certain of the operative procedure, and thus this element is considered non-core.

The best known classification of lymph node groups in the neck is the so-called Robbins' classification, originally proposed by the American Academy of Otolaryngology – Head and Neck Surgery[16] in which the lymph node basins of the neck are divided into levels I to VI, as per the anatomical boundaries described further below and illustrated in Figure 1. This classification only includes lymph nodes commonly removed during neck dissection procedures, and therefore it does not include all the head and neck node groups such as the facial nodes. Level VII (the superior mediastinal lymph node compartment) is included in the illustration for completeness, but except for thyroid cancer, it is rarely involved by head and neck cancer. Additional node groups are described in the TNM atlas terminology, which divides the nodes into 12 groups, including retropharyngeal, parotid, buccal, retroauricular and occipital nodes.[45] Further subdivisions of several node levels, based on specific anatomical landmarks, has clinical significance because they tend to be involved preferentially by tumours of specific primary sites. For instance, level IIb is more commonly involved by primary tumours of the oropharynx or nasopharynx, than by primaries of the oral cavity, hypopharynx or larynx.[17] The boundaries of the lymph node groups found within the levels and sublevels of the neck are described in Section 6.[18]

The most widely used classification of neck dissection procedures is based on the original system proposed by the Committee for Head and Neck Surgery and Oncology of the American Academy of Otolaryngology-Head and Neck Surgery in 1991.[45] This was revised in 2002[19] and updated in 2008.[46] The classification includes 4 basic procedures: radical neck dissection, modified radical neck dissection, extended neck dissection and selective neck dissection. The term comprehensive neck dissection refers to any neck dissection in which all nodes in levels I to V are removed, and therefore it includes radical, modified radical and extended neck dissections, as explained below.[47]

A radical neck dissection involves removal of levels I–V, as well the sternocleidomastoid muscle, spinal accessory nerve and internal jugular vein. A modified radical neck dissection spares at least 1 of the above non-lymphatic structures. An extended neck dissection involves removal of additional lymph nodes or non-lymphatic structures, beyond those removed as part of a radical neck dissection.

A selective neck dissection is a more limited procedure, in which 1 or more of the levels I to V lymph node groups are spared, typically for malignancies of specific locations and with no or limited clinical evidence of lymph node involvement (N0 or N1).[22] Supraomohyoid neck dissection refers to removal of levels I to III and is commonly performed for tumours of the oral cavity. Lateral neck dissection refers to removal of levels II to IV, performed for tumours of the larynx, oropharynx and hypopharynx. Posterolateral neck dissection refers to removal of levels II to V, for example for skin malignancies of the posterior scalp or upper, posterolateral neck.

Central or anterior compartment neck dissection removes level VI nodes (pretracheal, paratracheal, precricoid/Delphian and perithyroidal nodes) and is most commonly performed during surgery for thyroid carcinoma. Level VI lymph nodes are uncommonly

received as neck dissections for head and neck skin or mucosal malignancies, but these nodes may be involved by primary cancers of the larynx or hypopharynx. Superior mediastinal nodes (level VII) may also be removed in central neck dissections, particularly for thyroid cancer.

A conspicuous member of the "other" category is the parotid lymph node basin, which is usually received as part of a parotidectomy specimen for primary salivary gland tumours or for metastatic skin cancers of the face and scalp.

RCPath comment:
This dataset includes the reporting of SLNB for oral cavity squamous cell carcinoma which was not detailed by the ICCR.

[Level of evidence – B.]

NC2	Descriptor	Core/Non-core	Responses
ICCR	Margin status	Non-Core	Single selection value list: • Involvement of perinodal surgical margin – Involved by carcinoma – Not involved by carcinoma Multi selection value list (select all that apply): • Left • Central • Right • Laterality not specified • Cannot be assessed, specify

Margin status commentary:
Although neck dissections are not typically "margin" surgeries, tumours with ENE must be excised with a clear margin. Margin positivity increases the risk of local recurrence and is an indication for additional radiotherapy to that site.[48,49] The site of margin positivity can be used by the radiation oncologist to direct treatment to the area of greatest risk.

RCPath comment:

Where possible, the margin distance should be recorded. There is currently insufficient evidence to define margin distance criteria for ‘clear’, ‘close’ and ‘involved’ margins in neck dissections.

[Level of evidence – C.]

NC3	Descriptor	Core/Non-core	Responses
ICCR	Ancillary studies	Non-core	Single selection value list: • Not performed • Performed, specify

Ancillary testing commentary:

Ancillary testing for head and neck cancers most commonly refers to testing for high-risk human papilloma virus (HPV) status in tumours of the oropharynx (typically using the surrogate marker of p16 immunohistochemistry and HPV specific testing in p16 positive cases) and EBV status in tumours of the nasopharynx (typically using in situ hybridisation for EBV-encoded RNA, EBER). If ancillary testing is performed, it is recommended to include the type of testing, the result and interpretive guidelines if applicable.[50]

Oropharyngeal carcinoma is frequently HPV associated, with these tumours having improved survival versus HPV negative cases.[18] Testing for p16 status in oropharyngeal squamous cell carcinoma is a requirement of the 8th edition of the AJCC TNM staging system[18] and UICC TNM staging system[51], and separate staging categories have been devised for p16 negative and p16 positive tumours.[18] p16 status should be reported in all oropharyngeal primary squamous cell carcinomas (testing either the primary site or from a metastatic focus). Overexpression of p16 is defined as diffuse, strong nuclear and often cytoplasmic expression (2–3+ intensity) in ≥70% of tumour cells. The specificity of p16 expression is dependent on the antibody clone and local centres should have validated protocols in place.[37,52] All p16 positive carcinomas should be subject to HPV specific testing since the former lacks optimal specificity for the virus.[53–56] p16 expression is currently not applicable as a surrogate for HPV in non-oropharyngeal head and neck subsites as HPV is infrequent and p16 expression is non-specific.

p16 immunohistochemistry should be performed on all metastatic carcinomas to lymph nodes in the head and neck from an unknown primary, followed by HPV specific testing if positive. While HPV positivity in metastatic carcinomas from an unknown primary strongly suggests an oropharyngeal origin, non-oropharyngeal cannot be entirely excluded since HPV positive carcinomas are known to arise in the oral cavity, sinonasal tract, nasopharynx hypopharynx, larynx, and ocular surface. HPV positive metastasis outside the jugular chain (e.g. retropharyngeal or parotid), should prompt the search for a non-oropharyngeal origin. In situ hybridisation for EBER is recommended for p16 negative, non-keratinising or undifferentiated carcinomas, or if there is clinical suspicion of a nasopharyngeal primary.

RCPath comment:

HPV specific testing should be undertaken on all p16 positive carcinomas where available.

[Level of evidence – B.]

NC4	Descriptor	Core/Non-core	Responses
ICCR	ENE subcategorisation	Non-core	Single selection value list • ENE_{mi} • ENE_{ma}

ENE subcategorization commentary

ENE is subcategorised pathologically as microscopic (ENEmi, less than or equal to 2 mm in extent) and major (ENEma, more than 2 mm in extent, Figures 3, 4). These subcategories are not required for N categorisation but are recommended for data collection and future analysis.[18] The 5-point grading system for ENE (Lewis *et al*) is not validated and is not currently recommended.[57]

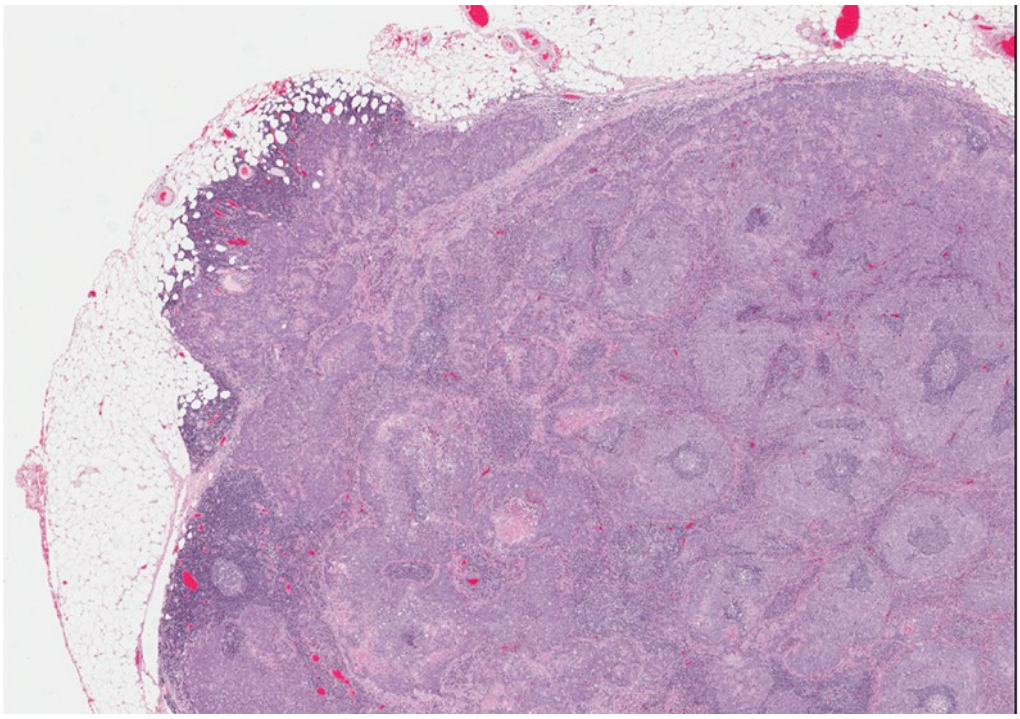

Figure 3: Low power image of a lymph node containing metastatic squamous cell carcinoma, with extranodal extension into perinodal adipose tissue (20x). Copyright Dr Martin Bullock. Reproduced with permission.

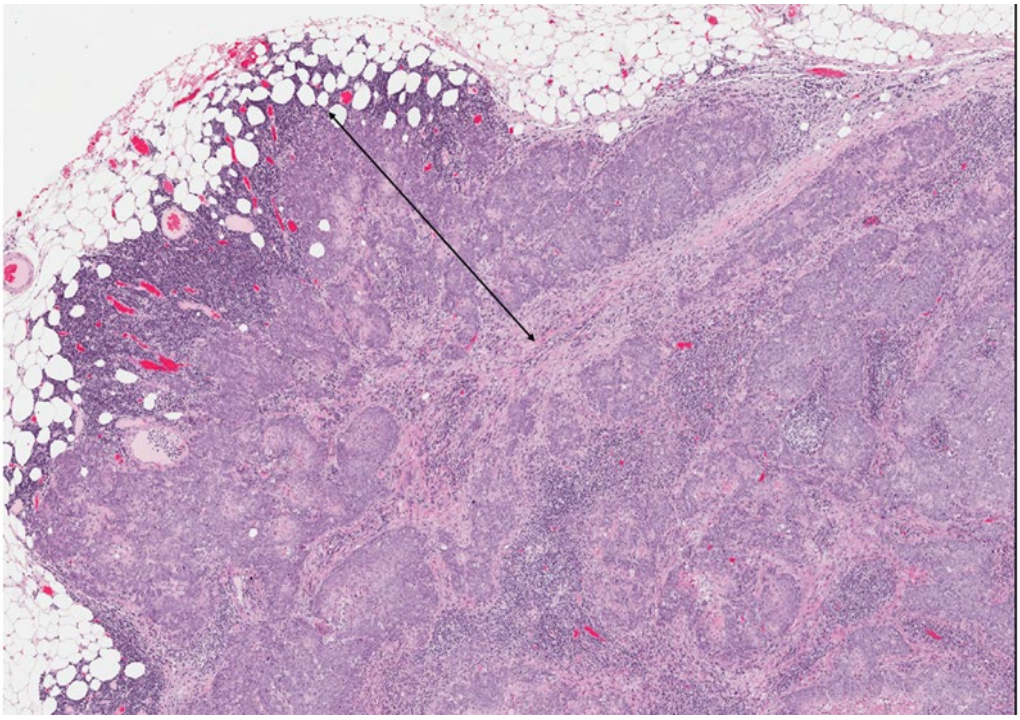

Figure 4: The extent of extranodal extension should be measured from external aspect of the capsule, or estimated site thereof, to the furthest point of tumour extension into the surrounding tissue. Copyright Dr Martin Bullock, reproduced with permission.

The lymph node capsule is often markedly thickened and altered by large metastases with obliteration of the subcapsular sinus. ENE is measured as the greatest extent of tumour spread perpendicular to the external aspect of the node capsule. The exact site of the latter is subjective but may be estimated by examination of the remaining intact capsule and contour of the node (see Figures 3 and 4). If the greatest extent of ENE is provided, the measurement can be rounded to the nearest millimetre or tenth of a millimetre, as per local convention (keeping in mind that if ENE is more than 2 mm, the measurement should not be rounded down to 2 mm). More precise measurements are not warranted due to the subjectivity required and lack of known clinical relevance.

RCPath comment: None

[Level of evidence – C.]

NC5	Descriptor	Core/Non-core	Responses
ICCR	Lymph node ratio	Non-core	[Number of lymph nodes with metastasis]/ [Total number of lymph nodes retrieved]

Lymph node ratio commentary

The lymph node ratio (also known as the lymph node density) is defined as the ratio of positive lymph nodes to the total number of lymph nodes evaluated.[29] This item has

been included as a non-core item in this current dataset since several recent meta-analyses indicate lymph node ratio to be an independent prognostic factor.[5,10–12,14,28,30–32] The lymph node ratio does not currently influence the nodal stage, but demonstrates greater prognostic utility compared to current staging criteria alone.

RCPath comment: None

[Level of evidence – C.]

8 Diagnostic coding and staging

8.1 Staging

4	Descriptor	Core/Non-core	Responses
ICCR	Regional lymph node categorisation (UICC TNM 8th Edition) TNM descriptors	Core	Choose if applicable: • r - recurrent • y - post-therapy
	For primary carcinomas of the lip and oral cavity, major salivary glands, nasal cavity and paranasal sinuses, oropharynx (p16 negative), hypopharynx, larynx, cutaneous head and neck carcinomas (with the exception of Merkel cell carcinoma) and unknown primary squamous cell carcinomas that are p16 and EBV-negative.	Core	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis • N1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without ENE • N2 Metastasis described as: – N2a Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension with ENE or more than 3 cm but not more than 6 cm in greatest dimension without ENE

			– N2b Metastasis in multiple ipsilateral nodes, none more than 6 cm in greatest dimension, without ENE – N2c Metastasis in bilateral lymph nodes, none more than 6 cm in greatest dimension, without ENE • N3a Metastasis in a lymph node more than 6 cm in greatest dimension without ENE • N3b Metastasis in a lymph node more than 3 cm in greatest dimension with ENE or, multiple ipsilateral, or any contralateral or bilateral node(s) with ENE
	HPV-mediated (p16+) oropharyngeal carcinoma	Core	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis • N1 Metastasis in 1 to 4 lymph node(s) • N2 Metastasis in 5 or more lymph node(s)
	Nasopharyngeal carcinoma	Core	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis

			• N1 Unilateral metastasis in cervical lymph node(s) and/or unilateral or bilateral metastasis in retropharyngeal lymph node(s), 6 cm or smaller in greatest dimension, above the caudal border of cricoid cartilage • N2 Bilateral metastasis in cervical lymph node(s), • 6 cm or smaller in greatest dimension, above the caudal border of cricoid cartilage • N3 Metastasis in cervical lymph node(s), greater than 6 cm in dimension, and/or extension below the caudal border of the cricoid cartilage

Regional lymph node commentary

Note that (i) Midline nodes are considered ipsilateral nodes and (ii) ENE detected on histopathologic examination is designated as ENEmi (microscopic ENE ≤2 mm) or ENEma (major ENE >2 mm). Both ENEmi and ENEma qualify as ENE(+) for definition of pN.

Clinical and pathological ENE should be recorded as ENE(-) or ENE(+).

Information on lymph node status is crucial for the staging and treatment of head and neck malignancies. Assignment of a pN category is applicable for patients who are treated surgically with a cervical lymph node dissection, rather than single lymph node excisional biopsy, in which case the cN category is used.[18]

The above staging conforms to the 8th edition of the AJCC[1] and the UICC[51] cancer staging manuals. The new TNM system (AJCC Cancer Staging Manual 8th edition) became effective 1 January 2018, and introduced considerable changes to the staging of head and neck cancers.[18] These changes include, among others:

1) restructuring pharyngeal carcinoma by separating p16+ oropharyngeal carcinoma from p16-oropharyngeal and hypopharyngeal carcinoma,

2) inclusion of extranodal extension in the N category for p16- oropharyngeal , unknown primary, hypopharyngeal, oral cavity, larynx, skin, major salivary gland, nasal cavity and paranasal sinus cancers,

3) introduction of a separate category for occult primary tumours of the head and neck, with p16 and EBV tumour testing recommended in patients who remain an unknown primary squamous or undifferentiated carcinoma after clinical and radiographic evaluation

4) introduction of a separate chapter for cutaneous squamous cell carcinoma and other carcinomas, with the exception of Merkel cell carcinoma.

Nasopharyngeal carcinoma (NPC) commonly presents with bulky nodal neck disease, and a lymph node biopsy may occasionally precede biopsy of the primary site. However, nasopharyngeal carcinoma is not a surgically-treated disease[58] and therefore pathologists are rarely called upon to provide a pN category for NPC. A single positive lymph node biopsy would contribute to the cN categorisation.

RCPath comment:
UICC TNM 7th edition staging criteria may be used as a non-core item in addition to UICC TNM 8th edition for continuity purposes in audit and research (e.g. ongoing clinical trials and cancer registry databases).

[Level of evidence – C.]

5	**Descriptor**	**Core/Non-core**	**Responses**
ICCR	Sentinel lymph node biopsy	Core	Single selection value list: • Carcinoma cells present • Metastasis • Micrometastasis • Isolated tumour cells • No carcinoma cells present, pN0(sn)
For sentinel nodes, the following suffixes are used after the pN stage: • (sn) to indicate sentinel node biopsy • (mi) to indicate micrometastases			

- (i+) to indicate isolated tumour cells (ITCs)

When different sizes of metastases are present, only the size of the largest deposit should be considered for staging purposes. In pN1(sn) and pN2(sn) scenarios the sentinel lymph node biopsy report should state that final staging ought to take into account pathological findings of the completion neck dissection. Conversely, when the completion neck dissection is negative, staging needs to include all sentinel nodes assessed according to protocol as upstaging might be relevant in informing the decision to provide adjuvant therapy.

Sentinel lymph node biopsy staging commentary

TNM7

- ITCs. TNM7 does not recognise ITCs as being positive in the context of oral cancer, and therefore indicates that the presence of ITCs alone be designated as pN0(sn)(i+). Emerging data indicate that the ITCs impact on the patient's prognosis and most centres will require completion neck dissection following the identification of ITCs.[23,36,59] Therefore, until further data becomes available, the presence of ITCs should be reported as positive and not pN0(sn)(i+) as indicated by TNM7.
- Bilateral sentinel nodes. Under TNM7, there is no provision for nodal status staging in bilateral positive sentinel nodes. Therefore, when staging, the presence of bilateral positive sentinel nodes should be indicated separately.

TNM8

- (sn) suffix. This is applied only in cases where SLNB is performed in the absence of the completion neck dissection. Therefore, for oral cavity squamous cell carcinomas, the (sn) suffix should only be reserved for negative SLNB cases only i.e. pN0(sn).[18]
- ITCs. While TNM8 states that ITCs 'usually are categorised as N0', it also acknowledges that there are site-specific exceptions, staging of SLNBs continues to evolve warranting further study and the 'clinical judgement of the managing physician should prevail' for final staging purposes.[18] ITCs in oral squamous cell carcinoma should therefore be considered positive and staged as metastases e.g. pN1(sn)(i+).

9 Support of research and clinical trials

It is important to be aware of local protocols for tissue banking and engagement with national initiatives for the further classification of tumours. Pathology support in clinical trials should comply with current national guidelines.[60] Other features, such as assessment

of the effects of biological therapy/immunotherapy may be important but are currently beyond the remit of this dataset.

10 Criteria for audit

As recommended by the RCPath Key assurance indicators (see *Key assurance indicators for pathology services*, November 2019) and those in other relevant standards (e.g. ISO 15189), a structured program of audit and service evaluation is recommended to cover all aspects of the reporting of these specimens. The standards to be employed were previously stated in the RCPath Key performance indicators (KPIs) documentation (see *Key Performance Indicators – Proposals for implementation*, July 2013). While this document has been replaced, many of the standards therein are useful benchmarks for a quality service. These recommendations should only be taken as a guide and standards audited should be subject to local agreement of quality parameters.

The following are recommended by the RCPath as key assurance indicators and KPIs:

- cancer resections must be reported using a template or proforma, including items listed in the English COSD which are, by definition, core data items in RCPath cancer datasets. English trusts are required to implement the structured recording of core pathology data in the COSD.
  - standard: 95% of reports must contain structured data.
  - standard: 80% of resection specimens will include 100% data items presented in a structured format.
- the RCPath KPI document requires a statement of agreement between the laboratory and users of the laboratory services regarding turnaround times for specific patient pathways. Suggested turnaround times for biopsies and resection specimens are presented below, but these should be subject to local agreement:
  - standard: 80% diagnostic biopsies will be reported within 7 calendar days of the biopsy being taken.
  - standard: 80% of all histopathology specimens (excluding those requiring decalcification) will be reported within 10 calendar days of the specimen being taken.
- the inclusion of SNOMED-CT codes:

- standard: 95% reports should have body structure and morphological SNOMED-CT codes.

- the availability of pathology reports and data at MDT meetings:
  - standard: 90% of cases discussed at MDT meetings where biopsies or resections have been taken should have pathology reports/core data available for discussion.
  - standard: 90% of cases where pathology has been reviewed for the MDT meeting should have the process of review recorded.
- utilisation of ancillary tests:
  - standard: 90% of metastatic carcinomas of unknown primary are tested using p16 immunohistochemistry and/or EBV in situ hybridisation and are reported as p16/HPV or EBV positive or negative according to the recommended cut offs.
- diagnostic sensitivity of SLNB:
  - standard: overall diagnostic sensitivity of 87% using neck lymph node recurrence as the reference standard.[34] This audit criterion requires multidisciplinary histopathological, surgical and nuclear medicine input. Failure to reach this standard may result from errors in laboratory processing, histological interpretation, or the perioperative pathway.

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Appendix A SNOMED coding

Versions of SNOMED prior to SNOMED-CT ceased to be licenced by the International Health Terminology Standards Development Organisation (IHTSDO) from 26 April 2017. Note: This is not a comprehensive list of all malignancies and other codes should be used as necessary.

Topographical codes	**SNOMED RT**	**SNOMED-CT terminology**	**SNOMED-CT code**
Lymph node	T-C4000	Structure of lymph node (body structure)	59441001
Skeletal muscle	T-13000	Skeletal muscle system structure (body structure)	79984008
Submandibular salivary gland	T-55200	Oropharyngeal structure (body structure)	31389004

Morphology

Morphological codes	**SNOMED RT**	**SNOMED-CT terminology**	**SNOMED-CT code**
Metastatic squamous cell carcinoma and variants			
Squamous cell carcinoma	M-80706	Squamous cell carcinoma, metastatic (morphologic abnormality)	64204000
Keratinising squamous cell carcinoma	M-80713	Squamous cell carcinoma, keratinising (morphologic abnormality)	18048008
Non-keratinising squamous cell carcinoma	M-80723	Squamous cell carcinoma, large cell, nonkeratinising (morphologic abnormality)	45490001
Spindle cell squamous cell carcinoma	M-80743	Squamous cell carcinoma, spindle cell (morphologic abnormality)	10288008
Adenoid squamous cell carcinoma	M-80753	Adenoid squamous cell carcinoma	85956000

		(morphologic abnormality)	
Adenosquamous carcinoma.	M-85603	Adenosquamous carcinoma (morphologic abnormality)	59367005
Metastatic salivary malignancies			
Acinic cell carcinoma	M-85503	Acinar cell carcinoma (morphologic abnormality)	45410002
Mucoepidermoid carcinoma	M-84303	Mucoepidermoid carcinoma (morphologic abnormality)	4079000
Adenoid cystic carcinoma	M-82003	Adenoid cystic carcinoma (morphologic abnormality)	11671000
Polymorphous adenocarcinoma	M-85253	Polymorphous low grade adenocarcinoma (morphologic abnormality)	128702009
Epithelial-myoepithelial carcinoma	M-85623	Epithelial-myoepithelial carcinoma (morphologic abnormality)	9618003
Basal cell adenocarcinoma	M-81473	Basal cell adenocarcinoma (morphologic abnormality)	34603009
Sebaceous carcinoma	M-84103	Sebaceous adenocarcinoma (morphologic abnormality)	54734006
Papillary cystadenocarcinoma	M-84503	Papillary cystadenocarcinoma (morphologic abnormality)	2735009
Mucinous adenocarcinoma	M-84803	Mucinous adenocarcinoma (morphologic abnormality)	72495009

Oncocytic carcinoma	M-82903	Oxyphilic adenocarcinoma (morphologic abnormality)	57596004
Salivary duct carcinoma	M-85003	Infiltrating duct carcinoma (morphologic abnormality)	82711006
Adenocarcinoma, not otherwise specified	M-81403	Adenocarcinoma, no subtype (morphologic abnormality)	35917007
Myoepithelial carcinoma	M-89823	Malignant myoepithelioma (morphologic abnormality)	128884000
Carcinoma ex pleomorphic adenoma	M-89413	Carcinoma ex pleomorphic adenoma (morphologic abnormality)	17264009
Squamous cell carcinoma	M-80703	Squamous cell carcinoma, no International Classification of Diseases for Oncology (ICO-O) subtype (morphologic abnormality)	28899001
Small cell carcinoma	M-80413	Small cell carcinoma (morphologic abnormality)	74364000
Undifferentiated carcinoma.	M-80203	Carcinoma, undifferentiated (morphologic abnormality)	38549000

Procedure

Local P codes should be recorded. At present, P codes vary according to the SNOMED system used in different institutions.

Appendix B TNM 8 classification for nodal status

Lip and oral cavity primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension.

pN2 Metastasis described as:

- pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or, more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension
- pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension
- pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension.

pN3 Metastasis described as:

- pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension.
- pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or, multiple ipsilateral, or any contralateral or bilateral node(s) with extranodal extension.

In sentinel lymph node biopsies (SLNBs), isolated tumour cells (ITCs) should be regarded as pN(sn) if present in a single ipsilateral sentinel node, pN2b(sn) if present in multiple ipsilateral sentinel nodes and pN2c(sn) if present in bilateral or contralateral sentinel nodes.

Oropharynx – p16 Negative and Hypopharynx primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension.

pN2 Metastasis described as:

pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension.

pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension.

pN3 Metastasis described as:

pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or, multiple ipsilateral, or any contralateral or bilateral node(s) with extranodal extension.

Oropharynx – p16 Positive primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in 1 to 4 lymph node(s)

pN2 Metastasis in 5 or more lymph node(s)

Nasopharynx primary

NX Regional lymph nodes cannot be assessed

N0 No regional lymph node metastasis

N1 Unilateral metastasis, in cervical lymph node(s), and/or unilateral or bilateral metastasis in retropharyngeal lymph nodes, 6 cm or less in greatest dimension, above the caudal border of cricoid cartilage

N2 Bilateral metastasis in cervical lymph node(s), 6 cm or less in greatest dimension, above the caudal border of cricoid cartilage

N3 Metastasis in cervical lymph node(s) greater than 6 cm in dimension and/or extension below the caudal border of cricoid cartilage

Larynx primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension

pN2 Metastasis described as:

- pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension
- pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension
- pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN3 Metastasis described as:

- pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension
- pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or multiple ipsilateral, or any contralateral or bilateral node(s) with extranodal extension

Sinonasal primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension

pN2 Metastasis described as:

- pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or, more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension

pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN3 Metastasis described as:

pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension

pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or multiple ipsilateral, or any contralateral or bilateral node(s) with extranodal extension

Carcinoma of unknown primary – EBV or HPV/p16 negative or unknown

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension

pN2 Metastasis described as:

pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension

pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN3 Metastasis described as:

pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension

pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or multiple ipsilateral, or any contralateral, or bilateral node(s) with extranodal extension

Carcinoma of unknown primary – HPV/p16 positive

pN1 Metastasis in 1 to 4 lymph node(s)

pN2 Metastasis in 5 or more lymph node(s)

Carcinoma of unknown primary – EBV positive

N1 Unilateral metastasis, in cervical lymph node(s), and/or unilateral or bilateral metastasis in retropharyngeal lymph nodes, 6 cm or less in greatest dimension, above the caudal border of cricoid cartilage

N2 Bilateral metastasis in cervical lymph node(s), 6 cm or less in greatest dimension, above the caudal border of cricoid cartilage

N3 Metastasis in cervical lymph node(s) greater than 6 cm in dimension and/or extension below the caudal border of cricoid cartilage

Major salivary gland primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension

pN2 Metastasis described as:

- pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or, more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension
- pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension
- pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN3 Metastasis described as:

- pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension
- pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or multiple ipsilateral, or any contralateral, or bilateral node(s) with extranodal extension

Head and neck skin carcinoma primary

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension

pN2 Metastasis described as:

- pN2a Metastasis in a single ipsilateral lymph node, less than 3 cm in greatest dimension with extranodal extension or, more than 3 cm but not more than 6 cm in greatest dimension without extranodal extension
- pN2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension
- pN2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

pN3 Metastasis described as:

- pN3a Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension
- pN3b Metastasis in a lymph node more than 3 cm in greatest dimension with extranodal extension or multiple ipsilateral, or any contralateral or bilateral node(s) with extranodal extension

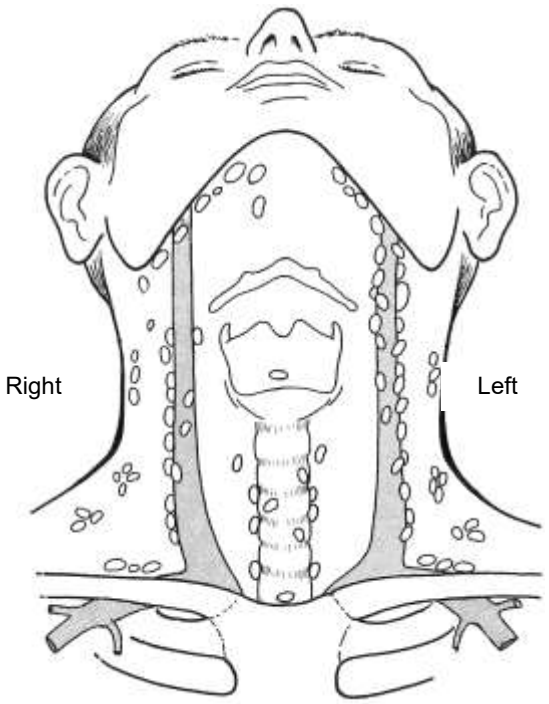
Appendix C Draft request form for node dissections

Surname	**Consultant**
Forename	**Location**
Date of birth	
Sex	
Hospital no.	**NHS/CHI no.**

Relevant medical or dental history	**Clinical diagnosis**
Site of lesion	Previous reports (lab. no. if known)
Duration of symptoms	
Predisposing factors	Other information
Date of operation	
Signature	

Please tick appropriate boxes:

	Right neck dissection	**Left neck dissection**
Levels submitted		
I		
II (total)		
IIA		
IIB		
III		
IV		
V		
VI		
Other (specify)		
Non-nodal structures		
Sternomastoid		
Submandibular gland		
Internal jugular vein		
Other (specify)		



Appendix D Draft request for sentinel node biopsies

Please give patient details	Surname:		Forename(s):
	Hospital/Unit No:		NHS number:
	Date of birth:	Sex:	Date of biopsy:
	Clinical information:		

Please give contact details	Hospital:		Consultant surgeon:
	Phone no.:	Mobile no.:	Fax no.:
	Address for report:		

Site of primary oral cavity T1 or T2 oral cavity squamous cell carcinoma: ……

Date of proposed MDT discussion: ……

Right sentinel node(s)					**Left sentinel node(s)**				
	Neck level	**Scint. count**	**Bed count**	**Blue (Y/N)**		**Neck level**	**Scint. count**	**Bed count**	**Blue (Y/N)**
Node 1					**Node 1**				
Node 2					**Node 2**				
Node 3					**Node 3**				
Node 4					**Node 4**				

Is this part of a training or validation program?	Yes □ No □
If part of training or validation program, please state hospital pathology department where elective neck dissection sent:	
Has patient consented for additional tissue to be banked for research?	Yes □ No □

Use table below if any non-sentinel nodes were removed at time of procedure and submitted together with sentinel node to the same pathology laboratory.

Right non-sentinel node(s)					**Left non-sentinel node(s)**				
	Neck level	**Scint. count**	**Bed count**	**Blue (Y/N)**		**Neck level**	**Scint. count**	**Bed count**	**Blue (Y/N)**
Node 1					**Node 1**				
Node 2					**Node 2**				
Node 3					**Node 3**				
Node 4					**Node 4**				

Appendix E Reporting proforma for nodal excisions and neck dissection specimens

Surname……	Forenames……	Date of birth…….Sex.....
Hospital……	Hospital no……....	NHS/CHI no……..
Date of receipt……	Date of reporting…….…...	Report no…….....
Pathologist……	Surgeon……	

Right neck

Levels submitted	**IA□ IB□ IIA□ IIB□ III□ IV□ V□ Central compartment (VI+/-VII)□ Retropharyngeal□ Parotid/periparotid□ Perifacial□ Not specified Other (specify ……)□**		
Node level	**No. nodes examined**	**No. positive nodes**	**No. of positive nodes with extranodal extension (ENE)*†**
IA			
IB			
II (total)			
IIA			
IIB			
III			
IV			
V			
V+/-VII			
Retropharyngeal			
Parotid/periparotid			
Perifacial			
Not specified			
Other			
Totals			

Non-lymphoid tissue

Nerve □ Muscle □ Vein □ Salivary gland □ Other □, specify……

*Not applicable for HPV-related/p16 positive oropharyngeal carcinoma or nasopharyngeal carcinoma

†State “cannot be determined” when applicable

Left neck

Levels submitted	**IA□ IB□ IIA□ IIB□ III□ IV□ V□ Central compartment (VI+/-VII)□ Retropharyngeal□ Parotid/periparotid□ Perifacial□ Not specified Other (specify ……)□**		
Node level	**No. nodes examined**	**No. positive nodes**	**No. of positive nodes with extranodal extension (ENE)*†**
IA			
IB			
II (total)			
IIA			
IIB			
III			
IV			
V			
V+/-VII			
Retropharyngeal			
Parotid/periparotid			
Perifacial			
Not specified			
Other			
Totals			

Non-lymphoid tissue

Nerve □ Muscle □ Vein □ Salivary gland □ Other □, specify……

*Not applicable for HPV-related/p16 positive oropharyngeal carcinoma or nasopharyngeal carcinoma

†State “cannot be determined” when applicable

Histological tumour type

Squamous cell carcinoma

Squamous cell carcinoma, conventional □

HPV-mediated/p16 positive oropharyngeal carcinoma □

Basaloid squamous cell carcinoma □

Papillary squamous cell carcinoma □

Spindle cell squamous carcinoma (sarcomatoid carcinoma) □

Adenosquamous cell carcinoma □

Acantholytic squamous cell carcinoma □

Undifferentiated (lymphoepithelial) carcinoma □

Salivary gland carcinoma

Acinic cell carcinoma □

Secretory carcinoma □

Mucoepidermoid carcinoma

Low grade mucoepidermoid carcinoma □
Intermediate grade mucoepidermoid carcinoma □
High grade mucoepidermoid carcinoma □

Adenoid cystic carcinoma

Tubular/cribriform pattern predominant □ Solid pattern >30% □

Polymorphous adenocarcinoma

Classic □ Grade, specify……. Cribriform □

Epithelial-myoepithelial carcinoma □

(Hyalinizing) Clear cell carcinoma □

Basal cell adenocarcinoma □

Sebaceous adenocarcinoma □

Intraductal carcinoma

Low grade □ High grade □

Cystadenocarcinoma □

Adenocarcinoma, not otherwise specified (NOS) □

Salivary duct carcinoma □

Myoepithelial carcinoma □

Carcinoma ex pleomorphic adenoma □

Type(s), specify …….

Carcinosarcoma □

Poorly differentiated carcinoma □

Neuroendocrine and non-neuroendocrine □

Undifferentiated carcinoma □

Large cell neuroendocrine carcinoma □

Small cell neuroendocrine carcinoma □

Lymphoepithelial carcinoma □

Squamous cell carcinoma □

Oncocytic carcinoma □

Other □, specify……..……..…

Neuroendocrine carcinoma

Well-differentiated (typical carcinoid) □

Moderately differentiated (atypical carcinoid) □

Poorly differentiated (high grade neuroendocrine carcinoma), large cell type □

Poorly differentiated (high grade neuroendocrine carcinoma), small cell type □

Mucosal melanoma □

Nasopharyngeal carcinoma

Squamous cell carcinoma, keratinising □

Squamous cell carcinoma, non-keratinising differentiated □

Squamous cell carcinoma, non- keratinising, undifferentiated □

Squamous cell carcinoma, basaloid □

Nasopharyngeal papillary adenocarcinoma □

Other □ (e.g. primary adnexal skin cancers), specify type……

Lymph node status

Right sided lymph node status

Maximum dimension of largest lymph node metastasis (if applicable) _____ mm

Maximum dimension of largest involved lymph node (if applicable) _____mm

Soft tissue metastasis

Not identified □ Present, specify site (level) □ ……..

Left sided lymph nodes status

Maximum dimension of largest lymph node metastasis (if applicable) _____ mm

Maximum dimension of largest involved lymph node (if applicable) _____mm

Soft tissue metastasis

Not identified □ Present, specify site (level) □ ……..

Regional lymph node categorisation (UICC TNM 8th edition) TNM descriptors

Choose if applicable: r (recurrent) □ y (post-therapy) □

For primary carcinomas of the lip and oral cavity, major salivary glands, nasal cavity and paranasal sinuses, oropharynx (p16 negative), hypopharynx, larynx, cutaneous head and neck carcinomas (with the exception of Merkel cell carcinoma) and unknown primary squamous cell carcinomas that are p16 and EBV-negative.

NX Regional lymph nodes cannot be assessed □

N0 No regional lymph node metastasis □

N1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without ENE □

N2 Metastasis described as:

N2a Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension with ENE or more than 3 cm but not more than 6 cm in greatest dimension without ENE □

N2b Metastasis in multiple ipsilateral nodes, none more than 6 cm in greatest dimension, without ENE □

N2c Metastasis in bilateral lymph nodes, none more than 6 cm in greatest dimension, without ENE □

N3 Metastasis described as:

N3a Metastasis in a lymph node more than 6 cm in greatest dimension, without ENE □

N3b Metastasis in a lymph node more than 3 cm in greatest dimension, with ENE or, multiple ipsilateral, or any contralateral or bilateral node(s) with ENE □

HPV-mediated (p16+) oropharyngeal carcinoma

NX Regional lymph nodes cannot be assessed □

N0 No regional lymph node metastasis □

N1 Metastasis in 1 to 4 lymph node(s) □

N2 Metastasis in 5 or more lymph node(s) □

Nasopharyngeal carcinoma

NX Regional lymph nodes cannot be assessed □

N0 No regional lymph node metastasis □

N1 Unilateral metastasis in cervical lymph node(s) and/or unilateral or bilateral metastasis in retropharyngeal lymph node(s), 6 cm or smaller in greatest dimension, above the caudal border of cricoid cartilage □

N2 Bilateral metastasis in cervical lymph node(s), 6 cm or smaller in greatest dimension, above the caudal border of cricoid cartilage □

N3 Metastasis in cervical lymph node(s), greater than 6 cm in dimension, and/or extension below the caudal border of the cricoid cartilage □

Mucosal melanoma

NX Regional lymph nodes cannot be assessed □

N0 No regional lymph node metastasis □

N1 Regional lymph node metastasis present □

Sentinel lymph node biopsy

Carcinoma cells present □

No carcinoma cells present, pN0(sn) □

Appendix F Reporting proforma for nodal excisions and neck dissection specimens in list format

Element name	Values	Implementation notes	COSD v9
Submitted specimens	Multi selection value list (select all that apply): Right Lymph nodes • Not specified • Submental (IA) • Submandibular (IB) • Upper jugular (II) • Middle jugular (III) • Lower jugular (IV) • Posterior triangle (V) • Retropharyngeal • Parotid/periparotid • Perifacial • Other, specify Non-lymphoid tissue • Nerve • Muscle • Vein • Salivary gland • Other, specify Left Lymph nodes • Not specified		

Element name	Values	Implementation notes	COSD v9
	• Submental (IA) • Submandibular (IB) • Upper jugular (II) • Middle jugular (III) • Lower jugular (IV) • Posterior triangle (V) • Retropharyngeal • Parotid/periparotid • Perifacial • Other, specify Non-lymphoid tissue • Nerve • Muscle • Vein • Salivary gland • Other, specify Central compartment (VI +/- VII) Non-lymphoid tissue • Thymus • Parathyroid • Other, specify		
Histological tumour type	Multi selection value list (select all that apply): Squamous cell carcinoma (SCC) • Squamous cell carcinoma, conventional		

Element name	Values	Implementation notes	COSD v9
	• HPV-mediated/p16 positive oropharyngeal carcinoma • Basaloid squamous cell carcinoma • Papillary squamous cell carcinoma • Spindle cell squamous carcinoma (sarcomatoid carcinoma) • Adenosquamous cell carcinoma • Acantholytic squamous cell carcinoma • Carcinoma cuniculatum • Undifferentiated (lymphoepithelial) carcinoma • Salivary gland carcinoma • Acinic cell carcinoma • Secretory carcinoma • Mucoepidermoid carcinoma – Low grade mucoepidermoid carcinoma – Intermediate grade mucoepidermoid carcinoma		

Element name	Values	Implementation notes	COSD v9
	– High grade mucoepidermoid carcinoma • Adenoid cystic carcinoma – Tubular/cribriform pattern predominant – Solid pattern >30% • Polymorphous adenocarcinoma – Classic – Grade, specify – Cribriform • Epithelial-myoepithelial carcinoma • (Hyalinizing) Clear cell carcinoma • Basal cell adenocarcinoma • Sebaceous adenocarcinoma • Intraductal carcinoma – Low grade – High grade • Cystadenocarcinoma • Adenocarcinoma, not otherwise specified (NOS) • Salivary duct carcinoma • Myoepithelial carcinoma		

Element name	Values	Implementation notes	COSD v9
	• Carcinoma ex pleomorphic adenoma – Type(s), specify • Carcinosarcoma • Poorly differentiated carcinoma: neuroendocrine and non-neuroendocrine Single selection value list: – Undifferentiated carcinoma – Large cell neuroendocrine carcinoma – Small cell neuroendocrine carcinoma • Lymphoepithelial carcinoma • Squamous cell carcinoma • Oncocytic carcinoma • Other, specify • Neuroendocrine carcinoma Single selection value list: – Well-differentiated (typical carcinoid) – Moderately differentiated (atypical carcinoid)		

Element name	Values	Implementation notes	COSD v9
	– Poorly differentiated (high grade neuroendocrine carcinoma), large cell type – Poorly differentiated (high grade neuroendocrine carcinoma), small cell type • Mucosal melanoma • Nasopharyngeal carcinoma Single selection value list: – Squamous cell carcinoma, keratinising – Squamous cell carcinoma, non-keratinising, differentiated – Squamous cell carcinoma, non-keratinising, undifferentiated – Squamous cell carcinoma, basaloid – Nasopharyngeal papillary adenocarcinoma • Other (e.g. primary adnexal skin cancers), specify type		
Lymph node status **Right sided lymph nodes**	See right sided lymph node table. Text/numeric:		

Element name	Values	Implementation notes	COSD v9
	• Maximum dimension of largest • lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm Soft tissue metastasis • Not identified • Present, specify site (level)		pHN9420
Lymph node status **Left sided lymph nodes**	See left sided lymph node table. Text/numeric: • Maximum dimension of largest lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm Soft tissue metastasis • Not identified • Present, specify site (level)		pHN9410
Lymph node status	Text/numeric: • Number of lymph nodes examined* ___	* Insert “cannot be determined” when applicable. ** Non-core item for HPV-	pCR0890 pCR0900

Element name	Values	Implementation notes	COSD v9
Central compartment lymph nodes	• Number of lymph nodes positive* ___ • ENE** Single selection value list: – Not identified – ENEmi (≤2 mm) – ENEma (>2 mm) • Maximum dimension of largest lymph node metastasis (if applicable) ___ mm • Maximum dimension of largest involved lymph node (if applicable) ___mm • Soft tissue metastasis – Not identified – Present, specify site (level)	related/p16 positive oropharyngeal cancer and nasopharyngeal cancer.	pHN9430
Regional lymph node categorisation (UICC TNM 8th edition) TNM descriptors	Choose if applicable: • r - recurrent • y - post-therapy		
For primary carcinomas of the lip and oral cavity, major salivary glands, nasal cavity and	Single selection value list: • NX Regional lymph nodes cannot be assessed		pCR0920

Element name	Values	Implementation notes	COSD v9
paranasal sinuses, oropharynx (p16 negative), hypopharynx, larynx, cutaneous head and neck carcinomas (with the exception of Merkel cell carcinoma) and unknown primary squamous cell carcinomas that are p16 and EBV-negative.	• N0 No regional lymph node metastasis • N1 Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without ENE • N2 Metastasis described as: – N2a Metastasis in a single ipsilateral lymph node, 3 cm – or less in greatest dimension with ENE or more than 3 cm but not more than 6 cm in greatest dimension without ENE – N2b Metastasis in multiple ipsilateral nodes, none more than 6 cm in greatest dimension, without ENE – N2c Metastasis in bilateral lymph nodes, none more than 6 cm in greatest dimension, without ENE • N3 Metastasis described as: – N3a Metastasis in a lymph node more than 6		

Element name	Values	Implementation notes	COSD v9
	cm in greatest dimension without ENE – N3b Metastasis in a lymph node more than 3 cm in greatest dimension with ENE or, multiple ipsilateral, or any contralateral or bilateral node(s) with ENE		
HPV-mediated (p16+) oropharyngeal carcinoma	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis • N1 Metastasis in 1 to 4 lymph node(s) • N2 Metastasis in 5 or more lymph node(s)		pCR0920
Nasopharyng-al carcinoma	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis • N1 Unilateral metastasis in cervical lymph node(s) and/or unilateral or bilateral metastasis in retropharyngeal lymph node(s), 6 cm or smaller in greatest		pCR0920

Element name	Values	Implementation notes	COSD v9
	dimension, above the caudal border of cricoid cartilage • N2 Bilateral metastasis in cervical lymph node(s), 6 cm or smaller in greatest dimension, above the caudal border of cricoid cartilage • N3 Metastasis in cervical lymph node(s), greater than 6 cm in dimension, and/or extension below the caudal border of the cricoid cartilage		
Mucosal melanoma	Single selection value list: • NX Regional lymph nodes cannot be assessed • N0 No regional lymph node metastasis • N1 Regional lymph node metastasis present		pCR0920
Sentinel lymph node biopsy	Single selection value list: • Carcinoma cells present – Metastasis – Micrometastasis – Isolated tumour cells • No carcinoma cells present, pN0(sn)		

Comment: There is emerging evidence to suggest that lymph node ratio is a predictor of poor prognosis in head and neck squamous cell carcinoma. It may be clinically useful to provide information on non-lymphatic structures involved by tumour within the neck

dissection specimen. This can also provide correlation with pre-operative radiological findings. If available, the primary site of tumour should be recorded and a summary of the overall staging provided including any previous resections.

Appendix G Summary table – Explanation of grades of evidence

(modified from Palmer K *et al. BMJ* 2008;337:1832)

Grade (level) of evidence	Nature of evidence
Grade A	At least 1 high-quality meta-analysis, systematic review of randomised controlled trials or a randomised controlled trial with a very low risk of bias and directly attributable to the target population or A body of evidence demonstrating consistency of results and comprising mainly well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias, directly applicable to the target cancer type.
Grade B	A body of evidence demonstrating consistency of results and comprising mainly high-quality systematic reviews of case-control or cohort studies and high-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relation is causal and which are directly applicable to the target population or Extrapolation evidence from studies described in A.
Grade C	A body of evidence demonstrating consistency of results and including well-conducted case-control or cohort studies and high- quality case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relation is causal and which are directly applicable to the target population or Extrapolation evidence from studies described in B.
Grade D	Non-analytic studies such as case reports, case series or expert opinion or Extrapolation evidence from studies described in C.
Good practice point (GPP)	Recommended best practice based on the clinical experience of the authors of the writing group.

Appendix H AGREE II guideline monitoring sheet

The cancer datasets guidelines of The Royal College of Pathologists comply with the AGREE II standards for good quality clinical guidelines. The sections of this autopsy guideline that indicate compliance with each of the AGREE II standards are indicated in the table.

AGREE standard	Section of guideline
Scope and purpose	
1 The overall objective(s) of the guideline is (are) specifically described	Introduction
2 The health question(s) covered by the guideline is (are) specifically described	Introduction
3 The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described	Foreword
Stakeholder involvement	
4 The guideline development group includes individuals from all the relevant professional groups	Foreword
5 The views and preferences of the target population (patients, public, etc.) have been sought	Foreword
6 The target users of the guideline are clearly defined	Introduction
Rigour of development	
7 Systematic methods were used to search for evidence	Foreword
8 The criteria for selecting the evidence are clearly described	Foreword
9 The strengths and limitations of the body of evidence are clearly described	Foreword
10 The methods for formulating the recommendations are clearly described	Foreword
11 The health benefits, side effects and risks have been considered in formulating the recommendations	Foreword and Introduction
12 There is an explicit link between the recommendations and the supporting evidence	All sections
13 The guideline has been externally reviewed by experts prior to its publication	Foreword
14 A procedure for updating the guideline is provided	Foreword
Clarity of presentation	
15 The recommendations are specific and unambiguous	All sections
16 The different options for management of the condition or health issue are clearly presented	All sections
17 Key recommendations are easily identifiable	All sections
Applicability	
18 The guideline describes facilitators and barriers to its application	Foreword
19 The guideline provides advice and/or tools on how the recommendations can be put into practice	Appendices
20 The potential resource implications of applying the recommendations have been considered	Foreword
21 The guideline presents monitoring and/or auditing criteria	Section 10
Editorial independence	
22 The views of the funding body have not influenced the content of the guideline	Foreword
23 Competing interest of guideline development group members have been recorded and addressed	Foreword