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

Standards and datasets for reporting cancers

Dataset for histopathological reporting of primary invasive cutaneous squamous cell carcinoma and regional lymph nodes

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Comments	This document will replace the previous edition, first published in 2014. This is to incorporate the *TNM Classification of Malignant Tumours (8th edition)* from the Union for International Cancer Control (UICC) published in 2017. In accordance with the College's pre-publications policy, this document was on the College website for consultation from 6 September to 4 October 2018. Responses and authors' comments are available to view on request. **Dr Brian Rous** **Clinical Lead for Guideline Review (Cellular Pathology)**

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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 Appendix D1, D2, E1 and E2) that are mandated for inclusion in the Cancer Outcomes and Services Dataset (COSD – previously the National Cancer Dataset) in England. Core data items are items 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 organisations were consulted during its preparation and approved the dataset:

- British Association of Dermatologists (BAD; member of the RCPath Specialty Advisory Committee on Dermatopathology)
- British Society for Dermatopathology (BSD; member of the RCPath Specialty Advisory Committee on Dermatopathology)
- participating members of the National Specialist Dermatopathology External Quality Assessment (NSDEQA) scheme (member of the RCPath Speciality Advisory Committee on Dermatopathology).

This dataset has been constructed taking into account the strong evidence that is contained in, and forms the basis for, the following national and international publications. All publications have widespread national and/or international peer acceptance and reflect the current accepted professional standards and practice in skin cancer:

- Union for International Cancer Control (UICC)[1]
- American Joint Committee on Cancer (AJCC)[2]
- World Health Organization (WHO) Classification of Skin Tumours[3]
- National Institute for Health and Clinical Excellence (NICE) Guidance and Quality Standards on skin cancer and melanoma[4,5]
- NHS Evidence[6]
- Clinical guidelines published by the BAD and other professional bodies[7]
- Public Health England (PHE) Cancer Outcomes and Services Dataset (COSD)[8]
- NHS England Quality Surveillance Programme (QSP; formerly the National Cancer Peer Review Program)[9]
- National Comprehensive Cancer Network (NCCN)[10]
- Armed Forces Institute of Pathology (AFIP) Atlas of Tumour Pathology (noting AFIP disestablished in 2011 and now under American Registry of Pathology [ARP] Press)[11]
- Healthcare Improvement Scotland: Scottish Intercollegiate Guidelines Network (SIGN)[12]

- College of American Pathologists (CAP).[13]

Evidence for the revised dataset was obtained from updates to international tumour grading, staging and classification systems and by electronically searching medical literature databases for relevant research evidence, systematic reviews and national or international publications on uterine sarcomas. The level of evidence for the recommendations has been summarised (Appendix G). Unless otherwise stated, the level of evidence corresponds to 'Good practice point (GPP): Recommended best practice based on the clinical experience of the authors of the writing group'. The sections of this dataset that indicate compliance with each of the AGREE II standards are indicated in Appendix H.

No major organisational changes have been identified that would hinder the implementation of the dataset, which is fully integrated with the COSD, and there are no new major financial or work implications arising from the implementation, compared to the 2002 dataset.

A formal revision cycle for all cancer datasets takes place on a three-yearly basis. However, each year, the College will ask the author of the dataset, in conjunction with the relevant subspecialty 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, i.e. revisions to core data items (the only exception being 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 two 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 Clinical Effectiveness department, Lay Governance Group and Working Group on Cancer Services (WGCS) and was placed on the College website for a consultation with the membership from 6 September to 4 October 2018. All comments received from the WGCS and membership were addressed by the authors, to the satisfaction of the Chair of the Working Group and Clinical Lead for Guideline Review (Cellular Pathology).

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 Clinical Effectiveness department and are available on request. The authors have declared no conflicts of interest.

1 Introduction

1.1 Target users and health benefits of this guideline

The primary target users of this dataset are consultant and trainee cellular pathologists and biomedical scientists and, on their behalf, the suppliers of information technology products to laboratories. Other target users are clinicians in secondary and primary care within the NHS and members of skin cancer multidisciplinary teams (MDTs). Secondary users are NHS England and NHS Scotland, each involved in quality surveillance, cancer networks, cancer alliances and those involved in skin cancer data collection via the NHS, including PHE and in particular the National Cancer Registration and Analysis Service (NCRAS). Standardised cancer reporting and MDT working reduce the risk of histological misdiagnosis and help to ensure that clinicians have all of the relevant pathological information required for tumour staging, management and prognosis. The collection of standardised cancer-specific data also provides information for epidemiologists and facilitates international benchmarking and research.

1.2 Purpose of the dataset

This document provides the dataset for the histological reporting of cutaneous squamous cell carcinoma (cSCC) and replaces the previous edition.

The meticulous diagnosis and reporting of squamous cell carcinoma is important because histological parameters play a significant role in defining patient treatment. Similarly, recording of pathological parameters in the dataset has direct implications for the staging and prognosis of individual patients. The use of datasets (and the background information that forms part of the datasets) in the context of the MDT meeting is advocated to optimise decisions related to patient treatment, to facilitate regular audit and review of all aspects of the service, to enable the collection of accurate data for NCRAS and to provide feedback for those caring for patients with cancer. It is important to have robust local mechanisms in place to ensure that the MDT clinical leads and NCRAS are apprised of supplementary or revised histology reports that may affect patient treatment and data collection.

1.3 Changes since the previous edition

1.3.1 Pathological tumour, node and metastases (pTNM) stage

It must be noted, in general and whenever possible, that UICC TNM is the version favoured by NCRAS in the UK. UICC is, in essence, the international custodian of TNM, although it is recognised that the AJCC TNM version, although intended for use in the USA, also enjoys favour elsewhere. UICC and AJCC are, however, common stakeholders in TNM and ideally both versions should be the same. The staging of cSCC in the previous edition of this dataset was, however, based on AJCC TNM 7. The latter was selected at the time by the RCPath for skin cancers because of the high number of errors contained in UICC TNM 7, some of which still remained uncorrected in its subsequent supplementary publication.

AJCC TNM 8 has a chapter on staging cSCC of head and neck, which also incorporates other non-melanoma skin cancers (NMSC), including basal cell carcinoma and adnexal carcinomas but not Merkel cell carcinoma, as that has its own separate chapter. AJCC TNM 8, however, has no staging system for cSCC on the remainder of the body. By contrast, UICC TNM 8 has not only a chapter on staging skin carcinoma of the head and neck but also a staging system for carcinoma of the skin for the remainder of the body (essentially limbs and trunk but excluding the eyelid and genitals). These incorporate the same types of NMSC as AJCC TNM 8; the physical boundary between the two body regions is the acromio-clavicular joint anteriorly and the upper aspect of the shoulder blade posteriorly. Accordingly, both AJCC and UICC TNM 8 staging systems have been assessed critically to determine which system should be recommended by RCPath for national use in the UK and the RCPath skin cancer datasets and in particular by PHE, NCRAS and COSD. The UICC and AJCC TNM 8 staging systems for cutaneous melanoma and Merkel cell carcinoma are now identical, taking into account subsequent website errata (www.wileyanduicc.com; www.cancerstaging.org). Accordingly, the final decision to use UICC TNM 8 and not AJCC TNM 8 has been based on the staging of NMSC.

In general, the terms microscopic and macroscopic have, where appropriate, been replaced in TNM 8 by the respective terms clinically occult and clinically detected.

UICC TNM 8, unlike AJCC TNM 8, has continued, in common with UICC and AJCC TNM 7, to place NMSC of the vermillion (non-hair-bearing) lip in the staging chapter for lip and oral cavity and not skin carcinoma.

pT category

The pT category for both UICC and AJCC TNM 8 is entirely different from UICC and AJCC TNM 7.

pT subcategories for T1, T2 and T3 are now defined by stratification of the maximum tumour dimension at 20 mm or 40 mm. T1 and T2 can be upstaged to T3 by the presence of one or more risk factors comprising specifically defined perineural invasion, or deep invasion representing either a tumour thickness/depth >6 mm* and/or invasion beyond/further than the subcutaneous fat. T3 is also defined by minor bone erosion, T4a by gross cortical/marrow invasion and T4b by axial skeleton/skull base or foraminal invasion.

This signifies that cSCC thickness/depth must be entered as a core item if >6 mm. As will be discussed later, however, careful consideration has also been given as to the relevance of cSCC tumour thickness/depth with respect to broader risk stratification. There is considerable support for the idea that cSCC ≤2 mm have negligible risk of nodal spread and those over 4 mm have a significant risk of metastasis. Accordingly, cSCC thickness/depth is now stratified as a core item as ≤2 mm, >2 mm to 4 mm, >4 mm to 6 mm and >6 mm.

If perineural invasion is present, an entry is required if it meets the broadly agreed criteria to upstage to T3 (a named nerve or large calibre ≥0.1 mm diameter or beyond the dermis). AJCC TNM 8 contains all the criteria, whereas UICC is confined to a named nerve, which may include clinical or imaging detection. Named nerves and those beyond the dermis, however, are invariably large calibre in type, over 0.1 mm in diameter.

UICC and AJCC versions of TNM 8 are very similar but not identical. Whereas UICC stratifies T1, T2 and T3 at ≤20 mm, >20 mm to ≤40 mm and >40 mm, respectively, AJCC stratifies at <20 mm, ≥20 mm to <40 mm and ≥40 mm, respectively. At the time of writing the dataset, neither UICC nor AJCC have published an erratum on their websites, although it is more likely that UICC breakpoints are the most appropriate version, as its stratification is identical to that used by both UICC and AJCC TNM 8 for Merkel cell carcinoma, TNM 8 tumours of the lip and oral cavity and also in TNM 7. UICC TNM 8 also excludes the vermilion border of the lip (as with UICC and AJCC TNM 7), whereas AJCC TNM 8 includes the site.

AJCC states that the maximum dimension should be a clinical measurement on the evidence base available, but a pathological measurement is permitted if a clinical one is not available. UICC are not specific on matters of measurement, other than recommending physical examination. This dataset also recommends use of the clinical measurement but supports use of a pathological measurement if the clinical one is absent. Indicating which one is used for staging is a new dataset item. Preferably, this should be the macroscopic measurement, unless in a particular case use of a microscopic one is unavoidable.

It is envisaged that TNM 8 will provide a better prognostic discrimination of the T categories for cSCC than that achieved in TNM 7. In AJCC TNM 7, many cSCC were placed into T2 and T3 and T4 cases were rare.

*Tumour thickness/depth is stated to be measured in millimetres from the granular layer of the nearest normal adjacent epidermis to the base of the tumour (see Figures 1 and 2).

pN category

As with UICC and AJCC TNM 7, UICC and AJCC TNM 8 nodal staging is still based on the size, number and location of positive nodes, although minor differences exist between TNM 7 and TNM 8. Similarly, UICC TNM 8 carcinoma of the skin (essentially limbs and trunk but excluding the eyelid and genitals) and skin carcinoma of the head and neck display minor differences. AJCC TNM 8 head and neck, with one minor addition (pT2a includes the presence of extranodal extension [ENE] in a node ≤30 mm), is identical to UICC TNM 8 head and neck.

pN categories of UICC TNM 8 carcinoma of the skin are based purely on ipsilateral nodes. Contralateral nodes are regarded as distant metastases for UICC TNM 8 but not for AJCC

TNM 8. For single positive nodes, pN stratification for pN1, pN2 and pN3 is ≤30 mm, >30 mm to 60 mm and >60 mm, respectively. Multiple nodes ≤60 mm are also pN2.

pN categories of UICC TNM 8 skin carcinoma of the head and neck and carcinoma of the skin are similar with regard to the size of nodes and number, although for head and neck, single and multiple nodes below 60 mm in pN2 are defined as pN2a and pN2b, respectively. A bilateral or contralateral node ≤60 mm for head and neck is defined as pN2c and a positive node >60 mm is defined as pN3a.

A major development in pN3 for both UICC and AJCC TNM 8 head and neck is the recognition of ENE. ENE was not part of staging in TNM 7. ENE can have either clinical or pathological definitions and its presence defines pN3b.

There is an expectation that a minimum of six nodes will be identified in lymphadenectomy specimens for carcinoma of the skin and ten or 15 nodes for selective or radical/modified radical lymphadenectomy, respectively.

pTNM 8 stage group
The TNM 8 stage group is largely similar to TNM 7.

UICC TNM 8, however, divides Stage IV into Stage IVA and Stage IVB depending on the absence or presence of a distant metastasis. Stage IV is not subdivided in AJCC.

Selection of UICC TNM 8
For NMSC (except Merkel cell carcinoma), UICC TNM 8 covers the entire skin surface in two chapters titled 'Carcinoma of the Skin' and 'Skin Carcinoma of the Head and Neck'. By contrast, AJCC has only one chapter titled 'Head and Neck for Cutaneous Squamous Cell Carcinoma'. Overall, however, there are extremely close similarities in the UICC and AJCC TNM 8 staging of skin cancer. Accordingly, the authors of the RCPath datasets were confident to recommend the use of UICC TNM 8 and thereby also ensure coverage of the entire skin surface for NMSC.

1.3.2 Lymph nodes
Two proformas are now used to cover lymph nodes from the head and neck and non-head and neck regions (as defined in section 1.3.1).

1.3.3 Pathological risk factors for clinical management
Building on basic anatomical stage, both UICC and AJCC in TNM 7 and 8 have introduced the concept of prognostic/risk stratification by virtue of prognostic grids (covering stage, the tumour, the host and the environment) or prognostic stage groups, respectively. AJCC are also working towards risk assessment models for each site and cancer as personalised medicine develops. Unfortunately, the UICC prognostic grids are still based on UICC TNM 7 and, to date, AJCC has developed no risk assessment models for skin.

The UK national clinical guidelines on both basal cell and squamous cell carcinoma, however, introduced the concept of risk stratification/status.[7] In broad terms, high risk correlates with significantly greater clinical risk for local recurrence, nodal metastatic disease and reduced disease-specific survival. The evidence base for this has been endorsed by NICE, the previous NHS Cancer Action Team and SIGN in their publications.[4–6,8,9,12] Knowledge of risk status remains vital for the correct clinical management, treatment and skin cancer MDT case discussion.

For squamous cell carcinoma, knowledge of risk status is essential to manage margin clearance. All cSCC cases with involved margins and high-risk cases posing management problems require skin cancer MDT discussion.[4,9] Trusts may also prefer to discuss cases with non-involved margins <1 mm (so-called 'clear but close' margins) within the context of an MDT.

On that basis, a new core data item was introduced in the second edition, in the form of an entry as to whether the cancer was of low- or high-risk type, based on pathological parameters relevant to clinical management. It was acknowledged that additional knowledge of clinical high-risk factors, unknown or uncertain at the time of reporting, may have subsequently upgraded low risk to high risk, and in particular during skin cancer MDT discussion.

This core item, however, has caused numerous practical and clinical difficulties, reflected in the low level of acceptance and usage identified in the joint BAD–RCPath audit on NMSC.[14] For cSCC, particular confusion was generated by different risk factors being used for TNM upstaging compared with the tumour itself. For example, >2 mm thickness/depth was used in upstaging to pT2, whereas >4 mm was an independent high-risk factor for the cSCC itself. In addition, binary low- and high-risk stratification at times oversimplified a more complex clinicopathological situation, with intermediate/middle-risk groups appearing not uncommonly, yet remaining unacknowledged by this binary stratification. Furthermore, a summation of the number of high-risk factors present indicated clinical importance but was largely ignored.

It now appears more logical to base the risk status of a patient with squamous or basal cell carcinoma on either the judgement of clinicians overseeing care or on skin cancer MDT discussion, considering all known risk factors within each personalised setting. Accordingly, risk factor status has been removed as a core item from this dataset and moved into the non-core section.

The current dataset does, however, still provide all of the relevant raw data relating to core items that constitute risk factors and still provides guidance on the interpretation of these factors. This information is included for use by clinicians and/or skin cancer MDTs.

In summary, as with TNM staging, risk stratification is now considered as an activity that is best undertaken by each patient's clinician and/or by a skin cancer MDT, rather than as a specific core entry in a histopathology report. This also appears to reflect a better approach to personalised medicine.

1.3.4 Changes in 2018

The authors are mindful that significant changes in skin cancer are likely to be published during 2018. These include a new (second) edition of the WHO Classification of Skin Tumours and new national clinical guidelines on NMSC from the BAD. Any such changes will be captured in the first revision of this dataset. After consideration, rather than await these changes, it was agreed that this new dataset would proceed to facilitate use of the new TNM classification from 1 January 2018.

1.4 Core and non-core data items

Data items are now divided into core and non-core types.

As defined in the foreword, core items in RCPath cancer datasets are robust, evidence-based data items that are required for cancer staging, management and prognosis. These data items are expected to be available routinely for cancer MDT meetings, are recorded by MDT management systems and are used as part of the national QSP.

The foreword also sets out that non-core data items are not considered mandatory on a national basis, but some or all may be included to provide a more comprehensive report or to meet locally agreed clinical or research requirements.

The core pathological data items are summarised in structured proforma style, which may be used as the reporting format, or combined with free text as required. There is peer support for the idea that the use of structured proformas (or protocols/checklists) contributes

substantially to improving the quality of histopathology reports. An electronic version is also available from the RCPath.

2 Clinical information required on the specimen request form

The provision of clinical information is the responsibility of the clinician submitting a specimen for pathological examination. The requirement for clinical information is based on the proposed UK National Histopathology Request Form (Appendix C) and COSD.[8] The information is required for MDT discussion and also conforms to NICE requirements[4–6] for the clinician. As a minimum these include the site of origin and type of specimen. Similarly, for NMSC, it is vital to emphasise that T1, T2 and T3 categories are best based, according to available evidence, on the maximum clinical dimension/diameter of the tumour. This must be recorded on the request form and in the clinical notes by the clinician. The maximum pathological dimension/diameter, however, can be used if the clinical dimension is absent on the request form.

Other clinical items are recognised to be important but since their provenance is not the primary responsibility of the pathologist, they are listed as non-core items to encourage their collection and inclusion in the histology report.

3 Preparation of specimens before dissection

3.1 Skin specimen

The overall size of the submitted specimen must be measured. When appropriate, and in particular with excision specimens, this should incorporate three dimensions. Any unusual features that could be diagnostically important should be recorded.

The presence, absence or any uncertainty about the existence of a lesion or abnormality to the naked eye must be recorded. When a lesion is apparent, measurements should include the maximum diameter and elevation.

Inking the margins of all skin specimens with potential skin cancer should be considered. Standard techniques include the use of substances such as Indian ink, silver nitrate, alcian blue, crayon or commercial preparations. Excepting Mohs surgery, inking is the best way to obtain a reasonably accurate assessment of surgical margins and thereby lesion clearance. Discretion and flexibility should, however, be applied in this decision. The potential for dye to track and give rise to false margins should be taken into account in the final histopathological assessment. Its routine use in large specimens, especially with a clearly visible small central lesion, is debatable. Even in these circumstances, however, inking may be useful because of the possibility of unexpected microscopic extension of the lesion. It is not necessary to ink curetted specimens or incisional, shave and punch biopsies as these are not performed for excisional purposes.

During examination of specimens submitted to the laboratory with prior designated orientation (by sutures or inking, for example), different coloured inks must be used on different margins, notching the specimen or the insertion of coloured agar into the processing cassette.

3.2 Regional lymphadenectomy specimens

The generalities of macroscopic neck and axillary block dissection, described for head and neck cancer and breast cancer,[15–17] apply equally to skin cancer. Inguinal dissections can be approached as axillary dissections.

The overall dimensions of the fixed tissue must be described, with particular note of any designated orientation and, in particular, any apical node. Nodes should be identified by inspection and palpation. The use of clearing agents is time consuming and increases cost. Accordingly, this is not regarded as essential.

If relevant to the specimen, evidence of ENE should also be recorded, e.g. fixation to skin or adjacent structures included in the specimen.

3.3 Sentinel lymph node biopsy

Sentinel lymph node biopsy (SLNB) does not appear in either UICC or AJCC TNM 8 staging classifications for cSCC. In addition, there is no current sound evidence base to support the use of SLNB for either general or, more particularly, high-risk cSCC, although scientific evaluation of this area is ongoing. TNM 8 does not contain specific advice about handling a SLNB for NMSC. Where appropriate, the dataset guidance contained in nodal excisions of head and neck carcinomas[15,16] can be used and modified according to general advice in AJCC TNM 8. Alternatively, the bread-loaf or bivalve techniques described in Merkel cell carcinoma[18] or malignant melanoma datasets,[19] respectively, can be used, but omitting or modifying their immunohistochemical component.

4 Specimen handling, dissection and block selection

4.1 Skin specimen

The method of handling excisional biopsies depends on the size of the specimen, whether the lesion can be seen, the position of the lesion on the specimen, the uniformity of the lesion and the type of processing technology. It is recommended that a separate judgement be made on each individual case, taking these variables into account, assisted by the following general comments.

Very small specimens may not require trimming. In this situation, however, it must be appreciated that a histological section along the longitudinal axis may not accurately reflect the nearest peripheral margin.

Laboratories using rapid processing technology must ensure that trimmed tissue is no more than 2–3 mm in maximum thickness, whereas those using conventional processing technology can increase this to 4–5 mm.

Specimens that need to be trimmed, and in which the lesion can be seen, should be cut at regular intervals so that the nearest naked-eye margin to the lesion can be assessed histopathologically. For many skin ellipses, this will require transverse rather than longitudinal sectioning. When multiple sections are required, this should be undertaken by the ‘sliced bread/toast rack’ method.

To obtain an accurate assessment of surgical margins, as much of the specimen as possible should be examined. Accordingly, for specimens under 10 mm, it is recommended that most or all of the lesion be examined. For specimens over 10 mm, the extent of sampling should take into account the proximity of the lesion to the margins, maximum lesional thickness, lesional uniformity and any unusual features. When the lesion can be clearly identified, sampling the polar margins of skin ellipses should be discretionary and based predominantly on whether the lesion is close (under 1–2 mm) to the margin or is less than that in the shorter transverse axis. In this situation, the polar ends from the long axis of a skin ellipse should be examined. These can be placed in one or two cassettes, depending on whether orientation of the specimen has been identified clinically.

When the lesion cannot be identified, or there is uncertainty, the whole of the specimen should be submitted for processing.

In some very large specimens, as well as sampling the lesion, the peripheral margins at selected points can be sampled, although the limitation in assessing margin clearance should be appreciated.

The dissection of a wedge excision (e.g. ear or lip) can be flexible depending on the nature of the specimen, whether there is a location marker and the position of the lesion. The same flexibility applies to whether the specimen needs to be inked. The selection of blocks taken, however, must be clearly documented and frequently a diagram can be useful. Additionally, if necessary, this should be accompanied by direct liaison between the person dissecting the specimen and the later reporting pathologist. This is the recommended approach to avoid potential problems in block interpretation during subsequent reporting. The blocks selected, however, must be able to measure the lesional margins to the same degree of accuracy stated in the dataset for the type of skin cancer present. Sometimes, there is only one so-called wedge margin and no peripheral and deep margins. If applicable, the presence or absence of cartilage invasion should be stated in the report.

The requirement for step-levels/sections in any type of specimen is dependent on the requirement to identify a lesion, achieve full-face assessment, establish a diagnosis and assess the margins. Requests for levels at cut-up can be used flexibly but with the proviso that laboratory protocols and technical experience must ensure that sufficient material remains in the paraffin block for further investigations if subsequently proved necessary.

Trimmed pieces of tissue of different thickness or the processing of more than two pieces of tissue in one cassette, incurs an increased risk of incorrect orientation and sectioning, with potential loss of diagnostic and margin information.

Re-excision specimens are covered in section 11.2.

4.2 Regional lymphadenectomy specimens

All potential lymph nodes must be removed, blocked and recorded in a manner that permits an accurate microscopic count of lymph nodes, number involved and measurement of the maximum diameter of the largest metastasis. Nodes can be bisected or sliced at 4–5 mm intervals.

The dimensions of the largest macroscopic metastatic deposit should be recorded. Representative sampling is acceptable, taking into account the need to measure the largest metastasis, ascertain whether more than one node is involved and to identify potential extracapsular invasion. Ascertaining the maximum diameter of the largest metastasis should be achieved by adopting a pragmatic approach, using both macroscopic and microscopic information. The lymph node or tumour closest to the surgical margin, within a macroscopic distance of 5 mm, should be identified and sampled.

If relevant to the specimen, evidence of ENE should also be recorded, e.g. fixation to skin or adjacent structures included in the specimen.

Inking for the specimen surface is not regarded as essential.

5 Core data items

5.1 Clinical

The core clinical data that must be recorded on the pathology report are the site of origin, type of specimen and maximum clinical dimension/diameter. The latter is a primary determinant for establishing TNM 8 subcategories T1, T2 and T3.

[Level of evidence B – The maximum clinical dimension/diameter of a lesion is a principal staging determinant.]

If invasion of a named nerve is identified clinically in NMSC, the clinician must advise the pathologist on the request form as this is an upstaging determinant.

[Level of evidence B – Clinical invasion of a named nerve is an upstaging determinant.]

When identified in head and neck NMSC (excluding Merkel cell carcinoma), the clinician should inform the pathologist on the request form that ENE has been demonstrated clinically. This can be the presence of skin involvement or soft tissue invasion with deep fixation/tethering to underlying muscle or adjacent structures or clinical signs of nerve involvement.

[Level of evidence B – Clinical ENE is a principal nodal staging determinant for head and neck carcinomas (excluding Merkel cell carcinoma.)]

5.2 Pathological: macroscopic

5.2.1 Skin

The three-dimensional size of the overall specimen should be recorded in millimetres. The overall size of the specimen can, at times, assist clinical discussion on a case. Specimen size can also be occasionally vitally useful in specimen identification and distinction, if there are issues relating to multiple specimens in one or multiple specimen containers.

The maximum dimension/diameter of all lesions must be recorded in millimetres.

5.2.2 Lymph node

The three-dimensional size of the overall specimen must be recorded in millimetres.

Localising markers attached by the clinician must be recorded.

The maximum dimension/diameter of the largest metastatic deposit must be recorded in millimetres.

[Level of evidence B – Maximum dimension/diameter of the skin lesion and largest metastatic deposit are primary staging determinants.]

5.3 Pathological: microscopic

5.3.1 Histopathological subtype

This dataset uses a modified WHO classification of squamous cell carcinoma.[7] In addition, it recognises that the origin of squamous cell carcinoma may be from either surface epidermal or follicular squamous epithelium. Both can have in situ or invasive and low-risk or high-risk variants.

For the purpose of skin cancer MDT management, some subtypes of invasive cSCC are regarded as clinically high-risk variants in the national clinical guidelines and by NICE.[6,9] These are specifically defined as acantholytic, desmoplastic and spindle cell variants. These

subtypes are associated with an increased risk of local recurrence and/or metastasis. AJCC and SIGN also support desmoplastic cSCC as a high-risk subtype.[2,12] The desmoplastic variant is defined as having a desmoplastic stromal component greater than 30%. Both the national clinical guidelines and WHO regard the spindle cell variant of squamous cell carcinoma as a high-risk variant. There is, however, debate about this issue and the AFIP has a slightly different view.[8] The AFIP accept spindle cell squamous cell carcinoma developing after radiotherapy as a high-risk variant, but regard spindle cell squamous cell carcinoma arising on light-exposed areas as not having the same aggressive potential. AJCC regard so-called sarcomatoid cSCC as a high-risk subtype.[2] Invasive squamous cell carcinoma with adjacent Bowen's disease is also usually regarded as a high-risk variant, although there is now increasing debate as to whether this should be restricted to non-UV light-exposed areas.

Basaloid squamous cell carcinoma is uncommon in the skin but it must be carefully distinguished from basal cell carcinoma, using appropriate immunohistochemistry (BerEP4 and EMA).[20,21] These tumours may arise in pre-existing basaloid Bowen's disease and are considered by definition to be poorly differentiated and may be associated with metastasis.[20] They may show weak to focal moderate BerEP4 expression in common with basaloid Bowen's disease but are usually EMA positive (in contrast to the basaloid epithelium of basal cell carcinoma).

If none of the subtype features listed above are present, a squamous cell carcinoma of surface epidermal origin is defined in this dataset as being of no special type or classic. Any diagnostic uncertainty with regard to subtype can be entered in the proforma as 'Uncertain' in the 'Other' category.

RCPath has noted the current WHO terminology, which considers keratoacanthoma as synonymous with invasive squamous cell carcinoma of keratoacanthomatous type.[3] RCPath, however, similarly notes that there is still considerable national and international debate as to whether keratoacanthoma is truly a pathologically benign or malignant neoplasm. Despite this debate, it is generally recognised that, to date, no one single criterion can make a reliable distinction between squamous cell carcinoma and keratoacanthoma. In each individual case, the diagnosis must be approached by using a constellation of clinical and pathological diagnostic features. The term 'keratoacanthoma' should perhaps be avoided in an immunosuppressed patient, with large lesions in a subungual location, as the latter are all considered to have a greater potential for aggressive behaviour. By clinical definition, a diagnosis of keratoacanthoma must be accompanied by a history of a period of initial rapid growth over a few weeks and subsequent stabilisation or involution over several months.

The diagnosis then requires support by the following additional histological features. The whole of the intact lesion should be available for histopathological examination, as this is the only reliable means to accurately assess the overall architecture. The diagnosis should be avoided if there is adjacent surface epidermal involvement or continuity with surface epidermal dysplasia or surface in situ squamous cell carcinoma. The lesion is characterised by an exo-endophytic growth pattern and, in the fully developed stage, there is a central keratin-filled crater-like appearance and symmetrical peripheral surface epidermal lipping/buttressing. The silhouette of the periphery is usually gently curving or with blunt downgrowths. Although not recognised by all authorities, some consider that there is an early proliferative stage that may display a more infiltrative pattern with increased mitotic activity and prominent pleomorphism. In all areas of the lesion, however, the peripheral zone evolves centrally into distinctive fully maturing cells, with abundant eosinophilic glassy cytoplasm and well-formed keratin. Acantholysis (in the absence of intraepithelial microabscesses) should not be present. The transition from peripheral proliferative to central maturing cells may be quite abrupt. Centrally within the maturing epithelium there should be little nuclear pleomorphism and a normal nuclear/cytoplasmic ratio. Although more nuclear pleomorphism and mitotic figures are permissible in the peripheral zone, solid zones extending beyond the rounded profile or into the subcutis should be absent. Severe and extensive cellular

anaplasia must be absent. Atypical mitotic figures must give rise to diagnostic caution, but should not necessarily exclude the diagnosis in an otherwise classic case. In more mature lesions, the central keratin whorls are typically rounded and laminated. There are frequently micro-abscesses within the epithelium, which can include neutrophils and eosinophils. Intraepithelial incorporation of elastic and collagen fibres can be seen both peripherally and centrally, although this feature may also be observed sometimes in invasive squamous cell carcinoma. Perineural and vascular invasion are generally considered to have no adverse effect on prognosis for keratoacanthoma, although larger studies are required. In general, keratoacanthomas show no surface ulceration, no stromal desmoplasia and no extension below the depth of adnexal structures. They may commonly show entrapment of elastic and collagen fibres and a lichenoid inflammatory response. Even in early proliferative lesions, epithelial infiltration from the base of the lesion must be viewed with diagnostic caution.

If these clinicopathological criteria are met, RCPath is able to endorse the diagnostic use of the term 'keratoacanthoma', with its implied expected benign clinical behaviour. This approach also supports clinical guidance from the BAD, which comments on the benign nature of keratoacanthoma.[22]

RCPath's support for keratoacanthoma as a clinicopathological diagnostic entity also extends, with an appropriate previous clinical history, to the diagnosis of regressing or regressed keratoacathoma. This lesion often has a crateriform or cystic appearance. There is a lack of epithelial atypia and significant epithelial proliferation, with a frequently attenuated squamous epithelium consequent upon a previous or ongoing lichenoid inflammatory response. There may be an underlying band of dermal fibrosis with granulomas responding to keratin or elastic fibres. The latter may also be seen in the overlying squamous epithelium.

There is also an additional view that keratoacanthoma has the rare potential to transform into classic invasive squamous cell carcinoma.[23]

It cannot be overemphasised, however, how difficult the entire area can be diagnostically. Although there is always room for clinical and pathological discretion, completion of a cancer dataset and referral to a skin cancer MDT would not appear essential for a case of classic or regressing/regressed keratoacanthoma that has been diagnosed in the above clinicopathological manner and is completely excised. There must, however, be no hesitation to refer any lesion to a skin cancer MDT that does not appear straightforward or is problematical in some way. This would include any element of clinical or histopathological diagnostic uncertainty, an uncertain or poorly documented clinical history relating to growth and/or potential regression, potential incomplete excision, a fragmented specimen or biopsy, one with perineural or vascular invasion or any case originating from primary care, especially from a non-accredited practitioner in the field of skin cancer. As mentioned above, some cases must also be discussed with the skin cancer MDT. These comprise cases involving immunosuppressed patients, cases with large or subungual lesions and cases in association with drug therapy (in particular BRAF inhibitors). Although not regarded as mandatory, it is noted that because of the diagnostic difficulties involved, many centres refer all potential keratoacanthomas and related lesions to a MDT. Some of the above cases may necessitate MDT referral under the diagnostic umbrella term of 'squamoproliferative lesion of uncertain type' (SPLUT; see below), pending further information at the MDT (such as clinical history).

This dataset further adopts an approach that an apparent invasive squamous cell carcinoma, with some but not all features of keratoacanthoma, is best classified as invasive squamous cell carcinoma with some keratoacanthomatous-like features. This is to avoid potential confusion with the WHO term of 'keratoacanthomatous-type of invasive squamous cell carcinoma', regarded as synonymous with keratoacanthoma. It should also be noted that some types of squamous cell carcinoma (such as Ferguson-Smith) can display clinical regression and have a strong genetic component.

Several different types of invasive carcinoma are already recognised to have a follicular origin, such as those arising from follicular-derived (sebaceous/pilar or epidermal) cysts, pilomatrixoma, tricholemmoma and follicular poroma.

There is, however, increasing support for the diagnosis of a specific follicular variant of squamous cell carcinoma, with in situ and/or invasive growth patterns.[24–26] Diagnostic criteria include an abrupt demarcation of the lesion with rounded peripheral profiles arising from the follicular infundibulum. In pure rather than hybrid cases, there is an absence of continuity with the surface epithelium, absent surface epidermal dysplasia and absent surface Bowen's disease. Centrally, tumours often have multiple infundibular-like downgrowths with central keratin, which is often vertically orientated. Infundibular keratinisation with keratohyaline granules is seen in the superficial parts of the tumour, with tricholemmal keratinisation more deeply. The infundibular connections with the surface epidermis are frequently multiple and particularly apparent at the lateral edges. Most lesions display squamous epithelium (often with relatively mild cellular pleomorphism) but varying clear cell change may be present. Uncommonly, lesions are dominated by basaloid cells, which require distinction from basal cell carcinoma (see previously). Subtle peripheral palisading is frequently present, but generally, stromal mucin in retraction spaces is not a feature. Central acantholytic spaces containing acidic mucin is a distinctive feature of many lesions.

A large number of cases are highly circumscribed and appear to represent in situ lesions, despite being centred on the reticular dermis. Excised lesions that are considered to be in situ, in common with other in situ squamous lesions, do not require skin cancer MDT discussion. The invasive tumour is generally considered to be of low-risk clinical and pathological type, with a very low incidence of recurrence or metastasis, although higher grade variants can occasionally occur. The latter, in particular, relates to lesions with more pleomorphism and more extensive irregular dermal and subcutaneous infiltration. Lesions are usually recognisable without the requirement for histochemistry, although they are typically negative for CD34 (in contrast to tricholemmoma and tricholemmal carcinoma) and negative for HPV (which can be present in follicular poroma). To avoid the pathological allocation of an inappropriate high-risk status or tumour stage, there has been a proposal that staging parameters such as thickness should be measured in a modified manner, although this approach has yet to be confirmed.[27] So-called infundibulo-cystic invasive squamous cell carcinoma appears to be included in the above follicular variant.

It is also recognised by RCPath that a definitive diagnostic distinction between entities may not always be possible. This may be the case, for example, between squamous cell carcinoma and keratoacanthoma or between squamous cell carcinoma and pseudocarcinomatous hyperplasia, for example in nodular prurigo or hypertrophic lichen planus. Essentially, these ambiguous/borderline cases represent SPLUT. In this situation, each individual case should be reported descriptively in a pragmatic, descriptive, free-text manner, mentioning cancer dataset parameters as appropriate. Such cases should receive skin cancer MDT discussion but, as with all borderline lesions, it is desirable to minimise use of this category.

As an important practical point, it must be remembered that solitary or multiple keratoacanthomas can occur as a Koebner phenomenon at the edge of a previous surgical excision (including those for previous keratoacanthoma or squamous cell carcinoma). Awareness of this biological feature can help circumvent diagnostic confusion and error.

[Level of evidence B/C – Different histological subtypes correlate with different clinical risk status.]

5.3.2 Grade

When possible, UICC and AJCC regard tumour grade as an important prognostic factor for all tumours. Both equate Grades 1, 2, 3 and 4 with well, moderately, poorly and undifferentiated, respectively, but accept that Grades 3 and 4 can be combined.

A poorly differentiated squamous cell carcinoma is a solitary high-risk feature for skin cancer MDT management.[4,7]

Tumour grade/differentiation is a core item for all tumours in the COSD.[8]

Evidence indicates that increasing de-differentiation correlates with an increasing risk of recurrence and metastasis.[2]

Although AJCC TNM 8 lists 'poorly differentiated' as a high-risk feature, its definitions are broad. They are summarised below:

- low-grade tumours are defined as showing considerable cellular differentiation, uniform cell size, infrequent cellular mitoses and infrequent nuclear irregularity. Intact intercellular bridges are also present
- high-grade tumours are described as showing poor differentiation, frequent spindle cell characteristics, necrosis and high mitotic activity.

Use of the original Broders method of classifying differentiation was considered in this dataset. Here, four grades are defined using the percentage of well-differentiated tumour present and the surrogate marker for differentiation in this context is usually taken to indicate keratinisation. After consultation, however, a decision was taken to adopt a three-grade classification, which incorporates additional elements such as cytological features and mitotic activity.[28]

The three grades are defined as follows:

- well-differentiated tumours are characterised by squamous epithelium that frequently shows easily recognisable and often abundant keratinisation. The epithelium is obviously squamous and intercellular bridges (prickles) are readily apparent. The tumours display minimal pleomorphism and mitotic figures are mainly basally located.
- moderately differentiated tumours show rather more structural disorganisation in which the squamous epithelial derivation is less obvious. Nuclear and cytoplasmic pleomorphism is more pronounced and mitotic figures (including abnormal forms) are much more commonly seen. Usually, less keratin formation is evident, often being limited to the formation of keratin pearls (concentric laminated whorls of keratinised squames), horn cysts and scattered individual keratinised cells.
- in the poorly differentiated variants, it may be difficult to establish the true nature of the lesion unless intercellular bridges are identified or small foci of keratinisation found.

Rarely, the tumour is completely anaplastic and an origin in an overlying dysplastic epithelium may be the only clue to the diagnosis. Here, the immunohistochemical demonstration of keratin expression is often of value.

Unfortunately, AJCC TNM 8 provides no guidance as to the percentage of differentiated components required to establish tumour grade. On that basis, this dataset has adopted the widely recognised approach that a tumour should be classified according to its most poorly differentiated region, irrespective of the percentage present.

This approach is also advocated by the NCCN and is used in some other RCPath cancer datasets (such as mucosal malignancies of the oral cavity).[10,16] The percentage of various differentiated components can be entered as a non-core dataset item.

There appears to be greater clinical support for providing the traditional level of tumour differentiation/grade, rather than merely stating whether a poorly differentiated component is

present or absent, although the latter would fully meet risk assessment requirements. Providing the exact level/grade has therefore been maintained in this dataset.

[Level of evidence B – The loss of tumour differentiation correlates with clinical risk status.]

5.3.3 Thickness/depth

In TNM 7 and TNM 8, the terminology used for this parameter, by both UICC and AJCC, is variable and guidance is limited in UICC TNM 8. The terms used most frequently are thickness and/or depth, although thickness appears favoured. Depth of invasion (DoI) is also used by AJCC and would be a logical twin to the term level of invasion. Unfortunately, however, DoI receives varying usage, sometimes even meaning level of invasion. Breslow thickness is now universally used in melanoma and is defined in relation to the granular layer over the tumour. Furthermore, in TNM 7, Breslow thickness was also used for NMSC. In TNM 8, however, although it is recommended that the measurement of thickness/depth is made from the granular layer to the base of the tumour, the granular layer of the adjacent normal epidermis is now used instead. This could be regarded as a modified Breslow thickness. AJCC explain that this change has been instigated to avoid various issues. They state that, in cSCC, the granular layer is often lost and simply measuring from the surface of the tumour to the base may overestimate prognostic impact because the dead keratotic surface of some tumours may contribute little prognostically. They further state that some exophytic cSCCs, such as the keratoacanthoma-like type, have a low risk of metastasis.

Therefore, to achieve uniformity in terminology, the RCPath recommend that the most appropriate term to use in NMSC is also thickness, although accepting it has the same interchangeable meaning in this context as depth. On that basis, thickness or thickness/depth (in section 1.3 relating to new changes) are the terms used in this dataset. Furthermore, the RCPath also acknowledges that this means no term is currently uniformly available to describe the maximum vertical distance, from the top to bottom, of the malignant cells within a tumour. Accordingly, it is recommended that the term absolute thickness (stated in millimetres) is used for this dimension.

The reason for implementing the new method of measuring thickness in TNM 8 appears to have logic and RCPath Figures 1 and 2 illustrate the measuring methodology in tumours of either classic ulcerative or endo-exophytic type. In the consultation on the datasets, however, RCPath Fellows have conveyed not uncommon difficulties in the practical application of this method. This may lead to variable and inconsistent practice and over- or under-rating thickness measurements, thereby potentially impacting on pathological stage and clinical risk status. It is evident that numerous architectural variations of tumour and adjacent epidermis can occur that are not adequately covered by the TNM 8 guidance. Advice has been sought from both the UICC and AJCC but this enquiry is still under active consideration. Therefore, in the interim, the RCPath consider it appropriate to provide provisional guidance, to reduce the subjectivity and variation in the measurement of tumour thickness, in these problematical areas.

Three situations appear to present themselves. First, tumours may be cup-shaped or crateriform and, as already discussed in section 5.3.1, this most often applies to the follicular variant of cSCC. In this situation, measuring from the adjacent normal epidermal granular layer will give a falsely high thickness measurement and thereby result in inappropriately high staging and risk status for clinical management. Therefore, on this basis, the RCPath recommend applying the method of Fernandez-Flores.[27] In this, the thickness measurement is made from the lowest bottom edge of the central lumen/space to the deepest base of the tumour. It is important to emphasise, however, that use of this method must be accompanied by certainty that the lesion is truly invasive and not in situ, as judged by the presence of an irregular or budding rather than rounded and smooth peripheral border.

Second, occasionally all of an exophytic tumour may originate at the level of or above the granular layer of the adjacent normal epidermis. As a zero or negative thickness value could

be viewed as lacking credibility, the RCPath recommends that these cases are recorded as <2 mm. This thickness will correlate with an extremely low risk of metastasis.

Third, and not uncommonly, the appearance may fail to conform to any current model. In some instances, the adjacent normal epidermis is sloping, irregular or has undulating crests and troughs. Not infrequently, there may be gradations between reactive, dysplastic or in-situ malignancy and the invasive component, either at the edge or over the tumour. This may give rise to sloping or curved squamous epithelium from the normal epithelium, up along the edge of the tumour and on to its top. Sometimes the granular layer can be absent. Use of classic Breslow thickness in this situation would appear inappropriate for the reasons already explained by AJCC. Measuring from the base of the epidermis would be confronted with the same problems and estimating a theoretical average height of normal granular layer could be difficult to apply in practice. Accordingly, until definitive guidance is available, the RCPath recommend that absolute thickness in millimetres (as defined above) is recorded in this situation. In particular, it is believed that this approach will not falsely under-rate the thickness measurement. If absolute thickness is used for this measurement, it would appear desirable to mention its use as free text in the comments section of the report, especially to inform colleagues reviewing the case for MDT purposes. It is believed that the gain in uniformity with this interim approach will outweigh the variation in measurement by using the TNM 8 guidance in an ad hoc, subjective and variable manner. Indeed, much of the published evidence correlating thickness with prognosis will have been probably based on the equivalent of absolute thickness, rather than the TNM 7 Breslow or TNM 8 modified Breslow methods. In view of these acknowledged difficulties, measuring thickness of NMSC may, at times, require a pragmatic approach to the problem.

Tumour thickness can be measured using an ocular micrometer, Vernier scale or an eye-piece measurement graticule.

It is established that increasing thickness of invasive cSCC is associated with increasing metastatic potential. Primary tumours that are ≤2 mm in thickness are not generally associated with significant metastatic potential and therefore complete excision is usually curative. Tumours over 10 mm are very high risk, with high potential mortality.

UICC and AJCC TNM 8 regards a thickness >6 mm as deep invasion and a solitary high-risk factor that upstages T1 or T2 to T3.

Some studies have identified an elevated risk status for an invasive thickness of >2 mm to 6 mm. This has sometimes been defined as high risk and a thickness >6 mm as very high risk. A tumour thickness of >2 mm was also a joint high-risk feature for cSCC, contributing to upstaging from pT1 to pT2 in TNM 7, although this definition has not been maintained in TNM 8.

A tumour thickness of >4 mm in invasive cSCC is regarded as a solitary high risk for skin cancer MDT management in national clinical guidelines, NICE and SIGN.[4,7,12] A low- and high-risk division at 4 mm has support in other publications.[29–31]

Tumour thickness should be recorded to the nearest millimetre within the bands below. Measurement to the nearest whole integer over 6 mm is a non-core item. Recording a tumour thickness of >2 mm is still currently a site-specific item in the COSD.[8] This is, however, a reflection of TNM 7 and will be modified in a future TNM 8 version of COSD for cSCC.

The absence of specific measurement requirements for <2 mm should simplify measurement in cases with very early invasion.

On the basis of the above, this dataset recommends measuring cSCC thickness/depth as a core item, using the following bands: ≤2 mm, >2 mm to 4 mm, >4 mm to 6 mm, and >6 mm.

It is hoped that the use of these bands will help circumvent some of the problems in measuring thickness discussed above.

>6 mm can also be recorded as a whole integer as a non-core item.

[Level of evidence B – Tumour thickness/depth correlates with clinical risk status and is a staging determinant.

Figure 1: Measuring the thickness/depth of an ulcerative tumour

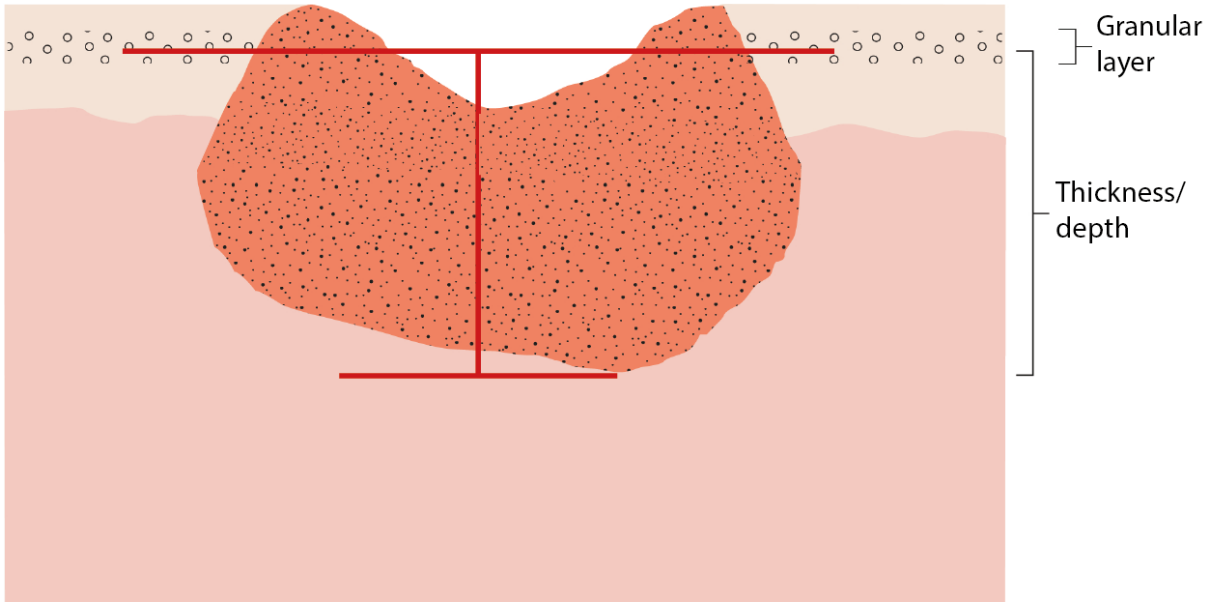
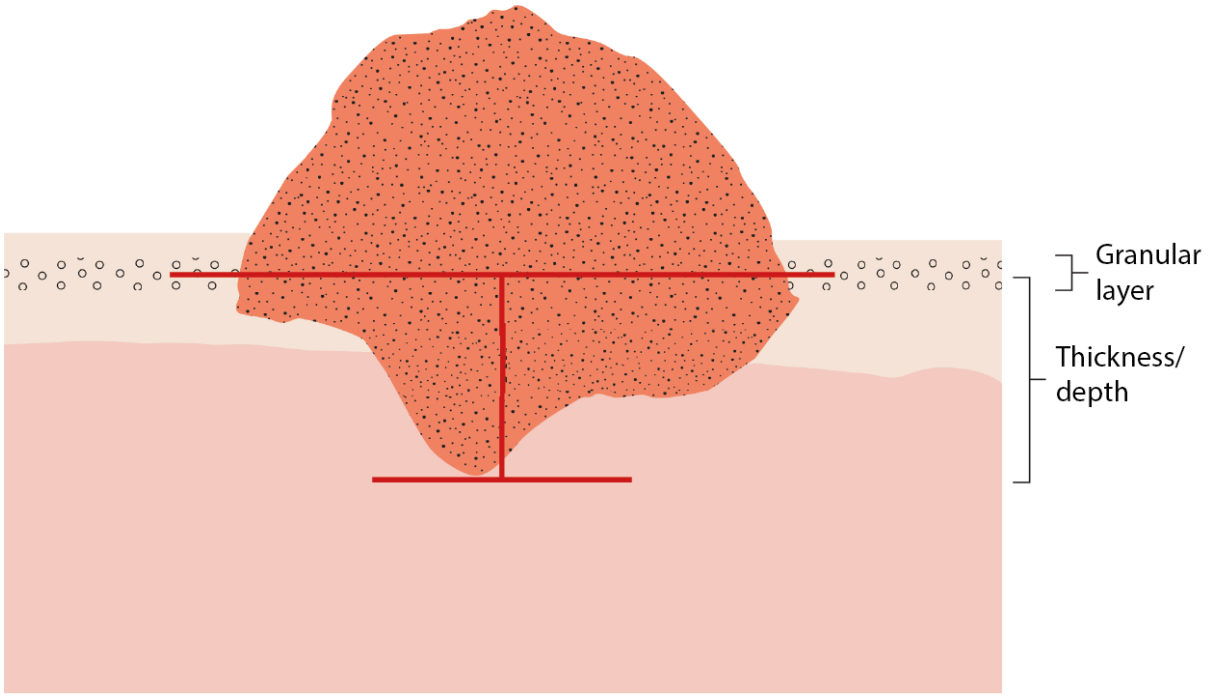


Figure 2: Measuring the thickness/depth of an endo-exophytic tumour



5.3.4 Level of invasion

TNM 8 defines invasion of tumour cells beyond or further than the subcutaneous fat as deep invasion and a solitary high-risk factor, which upstages T1 or T2 to T3.

The importance of invasion beyond the subcutaneous fat (beyond Clark level 5) is supported in other publications.[32,33] Clark levels are defined in detail in the RCPath melanoma dataset[19] but in general, when possible, it is recommended that they not be used for cSCC.

TNM 8 also defines T3 by minor bone invasion. pT4a is defined by gross cortical or marrow invasion. pT4b is defined by axial skeleton or skull base or foraminal invasion.

Invasive cSCC extending into or beyond the subcutaneous fat is regarded by the national clinical guidelines, NICE and SIGN as a solitary high-risk determinant for skin cancer MDT management.[4,7,12] Inclusion of invasion into the subcutaneous fat as a high-risk factor, rather than when beyond the subcutaneous, is less robust but has some support in publications.[30] As with a tumour thickness of 4 mm or 6 mm, these two divisions of level of invasion are more akin to high and very high risk.

Invasion into or beyond the reticular dermis is a site-specific item in the COSD.[8] The degree of extension beyond the reticular dermis must be specified and this includes extension into bone. As with tumour thickness, however, this reflects previous TNM 7 and this entry will be modified in the new COSD version for TNM 8 and cSCC.

Assessment of the level of invasion in TNM 8 will now be made much easier – simplified by the absence of a requirement to specify invasion into the papillary dermis (Clark level II), interface between the papillary and reticular dermis (Clark level III) or the reticular dermis (Clark level IV).

[Level of evidence B – The level of invasion is a clinical risk factor and is a staging determinant.]

5.3.5 Lymphovascular invasion

Evidence to indicate that lymphovascular invasion correlates with recurrence, metastasis or prognosis is limited. It has no role in cSCC staging. It is a high-risk feature in the national clinical guidelines and should be considered a high-risk factor according to SIGN.[7,12] The presence of an endothelial-lined space is an essential criterion for lymphovascular invasion, as it is essential to distinguish retraction artefact, but it is not necessary to distinguish lymphatic and venous invasion.

Unlike malignant melanoma, there are no TNM definitions for satellite, microsatellite or in-transit metastasis for cSCC. In particular, there are no definitions with regard to size or distance from the primary tumour. As with Merkel cell carcinoma in the skin, it is recommended that the term ‘in-transit metastasis’ be used empirically for any metastasis between the primary tumour and regional nodes. If present, this can be specified in the lymphovascular section.

Lymphovascular invasion may correlate with in-transit metastasis.

[Level of evidence D – Lymphovascular invasion may indicate increased risk of local recurrence and metastasis.]

5.3.6 Perineural invasion

Perineural invasion (not otherwise specified) is a core item in the national clinical guidelines,[7] SIGN[12] and a site-specific item in the COSD.[8]

Perineural invasion, when conforming to specified defined criteria, is a high-risk feature that upstages T1 or T2 to T3. The criteria include a named nerve or large calibre ≥0.1 mm

diameter or beyond the dermis. AJCC TNM 8 contains all the criteria, whereas UICC TNM 8 is currently confined to a named nerve, which may include clinical or imaging detection. Named nerves and those beyond the dermis are invariably large calibre in type, over 0.1 mm in diameter. On that basis, it appears appropriate to apply all of these criteria.

Tumour cells within the actual nerve constitutes significant neural invasion, but occurs too infrequently to know whether this should also be an upstaging criterion.
Clinical identification of invasion of a named nerve is also an upstaging criterion from T1 or T2 to T3.

There is no evidence to indicate whether perineural invasion in the context of skin applies to intratumoral or extratumoral invasion, including the invading front. Some, however, restrict the term to extratumoral invasion. This information can be included as a non-core item.

In re-excision specimens it is important to ensure that apparent perineural invasion is not so-called 're-excision perineural invasion'. This reflects the presence of benign perineural epithelial cells in previously biopsied areas, most likely representing reactive/reparative proliferation of traumatised eccrine sweat gland ducts into a plane of lower resistance. Immunohistology can be used to make the distinction.[34]

[Level of evidence B – Perineural invasion indicates an increased risk of local recurrence and is a staging determinant.]

5.3.7 Margins

Tumour recurrence and clinical morbidity are influenced by the completeness and adequacy of primary excision. In general, however, use of the words 'complete/incomplete' and 'adequate/inadequate' should be avoided in routine histopathological reports. Unless all of the margins have been examined, it is difficult to be certain about the completeness of excision. Traditionally, the term 'complete' has been more acceptable in the context of Mohs surgery, where the peripheral margin has been examined in virtually its entirety. This view is now significantly weakened in the context of modern paraffin wax histology, with its considerably more thorough sampling of margins, and with the more recent methods of specimen handling, as advocated in this and previous datasets. Adequacy/inadequacy usually incorporates a degree of clinicopathological subjective judgement and is therefore more applicable in the context of skin cancer MDT discussion. However, it is well recognised that in a significant number of cases where tumour extends to a margin, there is no residual tumour present on re-excision. This indicates that the term 'incomplete' is inappropriate in this situation. Similarly, lesions not at the margin can occasionally recur and therefore may not be completely excised as originally thought. In non-excision specimens with therapeutic intent (e.g. double curettage and cautery), the term 'edge' is increasingly favoured. This is to aid distinction from the normal use of the term margin, as here the true surgical margin lies beyond the zone of cautery not represented in the specimen. Accurate margin assessment in this situation requires clinical input with regard to the nature of the procedure undertaken and the degree of certainty that therapeutic intent was achieved. This often requires discussion within the context of a skin cancer MDT.

Although evidence is more robust for peripheral margins, there is broad peer agreement that comments are necessary about the clearance of both peripheral and deep excision margins. The words 'peripheral' or 'radial' rather than 'lateral' are generally preferred, to avoid problems by possible inference of a medial margin. The words 'lateral' and 'medial' may be applicable to specifically defined and designated margins in orientated specimens. Careful consideration has been given as to whether the extent of peripheral and deep clearance should be measured in quantitative terms. It is certainly clinically necessary to have information about whether the peripheral and deep excision margins are not involved or involved by tumour. Although all RCPath datasets are standardised to the term not involved (uninvolved internationally), the term 'clear' is preferable to minimise potentially important errors in the use of 'involved' and 'not involved'. These occur not uncommonly in reports

dictated from a template. Although less frequently used, negative or positive correlates acceptably with 'not involved' (clear) and 'involved', respectively. Clinicians invariably also wish to know whether the tumour is 'close' to the nearest margin to evaluate the potential risk of recurrence, the necessity for further treatment and follow-up. 'Close' is, however, a poorly defined term and used inconsistently for skin cancer treatment and management. The evidence base for the term is also limited.

Guidance on adequate clinical margins is available in the national clinical cuidelines and adequacy of clearance is essentially a risk assessment of percentage chance of recurrence, based on margin clearance and low/high-risk status of the tumour. For squamous cell carcinoma and clinical margins this varies between 4 and 6 mm or more.[8] Information on histological margins is more limited. For basal cell carcinoma, the histological definition of close, based on recurrence, is variable and has included measurements between 0.31 mm and 0.84 mm, or less than 1 high power field.[20,21] The figures vary according to growth pattern; approximately 10% of infiltrative basal cell carcinomas with margins greater than 0.75 mm will recur. Few, if any, basal cell carcinomas will recur with a histological margin beyond 0.84 mm. It is interesting that the Cancer Council of Australia and the Australian Cancer Network defined histological margins of less than 0.5 mm for basal cell carcinoma as inadequate. On that basis a robust evidence-based histological definition of 'close' is still awaited and use of the term therefore remains subjective. Although some information is available for basal cell carcinoma, less information is available for cSCC. Accordingly, the reporting of margins below 1 mm to one decimal point is supported as a non-core rather than core item.

Consultation between the RCPath and BAD in 2001 revealed strong support for clinical purposes in knowing whether basal (and squamous cell) carcinoma excision margins are histologically involved (0 mm), not involved (or clear) below 1 mm and not involved (or clear) above 1 mm. Although accepted as having a degree of subjectivity, both the BAD and RCPath agreed that non-involved margins below 1 mm can usefully be termed 'clear but close'.

As a core data element for skin cancer, the COSD records whether tumour excision margins are clear by more than 5 mm, clear by at or greater than 1 mm but less than or equal to 5 mm, or less than 1 mm but without tumour reaching the margin.[9] Skin cancer margins should therefore be measured in relation to both 1 mm and 5 mm breakpoints. There is also additional peer support for auditing the excision margins of all skin cancer specimens between different Trusts and general practices within a cancer network/alliance and between different clinical specialities and clinicians. Measuring resection margins over 1 mm histologically to within 1 mm is one way to facilitate this objective; this could also represent a reasonable surrogate marker for clinical margins as defined in national guidelines. This dataset recommends measuring peripheral and deep margins histologically as <1 mm, 1 mm to 5 mm and >5 mm. Measuring to a whole millimetre integer over 1 mm is included as a non-core item.

It is important that assessment of a margin below 1 mm is undertaken on blocks selected according to the RCPath protocol, on 'full-face' sections, with a low threshold to request additional levels to increase the accuracy of assessment.

It should be noted that margin definitions used for mucosal malignancies of the oral cavity, including vermilion lip (>5 mm clear, 1 mm to 5 mm close and <1 mm involved), are not regarded as applicable to cSCC, including hair-bearing lip.

This dataset defines margin clearance that is either involved or not involved but <1 mm as high risk. Using <1 mm as the definition takes into account the limited evidence base in this area and errs on the side of clinical safety to incorporate different variables such as tumour type, fixation shrinkage, lesion sampling and levels.

Although not listed in NICE guidance, there is increasing clinical practice for so-called clear but close margins to receive skin cancer MDT review. This can then take into account the degree of histological closeness to within 0.1 mm, the growth pattern, the extent of closeness and its position, especially in the event of an orientated specimen. In the previous edition of the dataset, this information was a non-core item. Consideration has therefore been given as to whether this should now become a core item in the current dataset. Consideration has also been given as to whether the information could be better assessed by the pathologist reviewing the case for a skin cancer MDT. Certainly the microscopical demonstration of these histological features facilitates MDT discussion and permits a team consensus on the possible degree of clearance of the lesion, adequacy of treatment and whether further treatment is indicated. Although equivocal, the RCPath consider that there is still insufficient evidence or clinical guidance to alter the approach used in the previous dataset, taking into account that this information can be still currently provided as a non-core item in the report. It is recommended that if this approach is adopted, however, that the minimum non-core information needs to be margin distance to 0.1 mm. The RCPath are aware that new clinical guidelines on basal cell carcinoma and SCC will be published by the BAD in 2019 and this may include a recommendation to refer all cases with clear but close margins to a skin cancer MDT. In this eventuality, the RCPath are likely to then support clear but close margins below 1 mm, being reported as core items, to include at least a margin measurement to the nearest 0.1 mm. This change would require consideration of a change in workload scoring for this group.

[Level of evidence B – Margin status correlates with the risk of clinical recurrence.]

5.3.8 Maximum dimension/diameter

The maximum dimension/diameter is the major breakpoint determinant to define T categories in TNM 8: ≤20 mm, >20 mm to ≤40 mm and >40 mm defines T1, T2 and T3 categories, respectively, although T1 and T2 can be upstaged to T3 by the presence of one or more defined high-risk factors (see Appendix A).

AJCC states that the maximum dimension should be a clinical measurement on the evidence base available, but permitting a pathological measurement if the clinical one is not available. UICC are not specific on this point other than recommending that the measurement be assessed by physical examination. This dataset also recommends the use of clinical measurement but supports the use of pathological measurement if the clinical type is absent. Indicating the one used for staging is a new dataset item. Preferably, this should be the macroscopic measurement, unless in a particular case use of a macroscopic and/or microscopic one is unavoidable.

[Level of evidence B – Maximum diameter is a primary staging determinant and a determinant of risk permitting excision in community care by general practitioners.]

5.3.9 Lymph nodes (regional and/or intraparotid): number of nodes involved and maximum size of metastatic deposit

The number of involved regional and/or intraparotid nodes and the size of the largest metastatic deposit are primary pN staging determinants. There are staging breakpoints at 30 mm and 60 mm. Note that size relates to metastatic deposit and not lymph node. The number of nodes identified and the number of nodes involved are a core requirement in the COSD.[8] The anatomical site and laterality of the lymph nodes must be recorded.

[Level of evidence B – The number of nodes involved and maximum size of metastatic deposit are primary staging determinants.]

5.3.10 Lymph nodes: extranodal extension (spread/invasion)

This is widely regarded as a manifestation of potential biological aggression and considered to be associated with a worse prognosis. This finding prompts consideration of the use of adjuvant chemotherapy.

ENE is a staging parameter for skin carcinoma of the head and neck (but not for carcinoma of the skin) and its presence signifies pN3b.

ENE is defined as invasion beyond the nodal capsule into the surrounding soft tissue, although a stromal reaction is not required.

ENE detected on histological examination is designated as ENEmi (microscopic ENE ≤2 mm) or ENEma (major ENE >2 mm), although both qualify as just ENE for pN staging.

ENE can also be identified on a clinical basis (see section 5.1) and this information should be conveyed to the pathologist.

[Level of evidence B – The presence of extracapsular extension is a pN staging parameter for skin carcinoma of the head and neck.]

5.3.11 Lymph nodes: highest/apical node

Clinicians often identify the highest/apical lymph node in lymphadenectomy specimens. If identified, the report must indicate whether this contains a metastatic tumour deposit.

[Level of evidence D – This information is often requested by clinicians and considered to have some prognostic value.]

5.3.12 Lymph nodes: margin clearance of lymphadenectomy specimen

Clinicians require information as to whether the peripheral margins of lymphadenectomy specimens are clear of tumour.

[Level of evidence D – The presence of positive margins instigates consideration of adjuvant chemotherapy.]

6 Non-core data items

These can be included to create a more comprehensive report, taking into account the local cancer alliance, clinical preferences, audit and research. These data items have been supported during the informal consultation on the dataset.

6.1 Pathological risk status/stratification for skin cancer

This is largely integrated from AJCC,[2] BAD,[7] NICE,[4] QSP,[9] SIGN,[12] CAP,[13] AFIP,[11] NCCN[10] and other publications.[29–35]

High-risk status relates to risk of recurrent disease, metastatic nodal disease, systemic disease and disease-specific death. The term ‘high risk’ has developed in two different situations and both incorporate clinical and histological parameters. The clinical parameters are covered in clinical items under non-core aspects of the dataset, as their collection is not the primary responsibility of the pathologist.

There are two situations where pathological risk factors present in an invasive squamous cell carcinoma must be known: first, during clinical and MDT management; and second, in relation to TNM 8 staging definitions.

Clinical and MDT management

The NICE and QSP criteria for mandatory MDT referral/review are listed in section 11.1. Awareness of the presence of high-risk factors facilitates MDT decision-making and, in particular, the extent of desirable margin clearance. It also helps to assess prognosis, decide the duration of follow-up and clarify whether the latter is best undertaken in primary or secondary care.

Although NICE and QSP list mandatory reasons for MDT referral, any case can be referred to a skin MDT if considered appropriate by any member of the skin cancer MDT team – in particular, in cases of non-involved margins of <1 mm. Although a non-involved margin of <1 mm is not regarded by NICE and QSP as a mandatory reason for MDT referral/review, each case must still receive careful consideration and be referred to the MDT if there is any degree of uncertainly over the degree of adequacy of margin clearance.

As discussed in section 1.3.3, risk stratification for basal cell carcinoma and cSCC has classically been undertaken in a binary low- and high-risk manner. This is well illustrated by the approach undertaken in national clinical guidelines, NICE, QSP, SIGN and the previous editions of the RCPath basal cell carcinoma and cSCC datasets.

Increasingly, however, there has been a realisation that the terms low and high risk are too limiting. At times, intermediate- or middle-risk situations appear to be present; in other situations, the terms little/negligible risk, low risk, high risk and very high risk seem preferable. Without doubt, the problem arises as all these terms are subjective and rarely accompanied by a numerical definition.

Without any additional factors, any cSCC <20 mm in diameter or <2 mm in thickness will rarely recur or metastasise. Although clearly low risk, they are in reality negligible risk.

Low risk is widely interpreted as an adverse consequence rate below 5% (based on recurrence, nodal spread, systemic spread or death).

High risk can be defined as an adverse consequence rate between 5 and 20% and over 20% as very high risk.

A new approach to dividing risk has recently been proposed by Baum *et al.* based on the Brigham and Women's Hospital staging system for cSCC.[35] This terminology defines a 5–20% adverse consequence rate as intermediate risk and over 20% as high risk. Indeed, it could be argued that such terminology appears to more closely mirror the continuous spectrum of risk seen in clinical practice. The RCPath consider, however, that restricting the term high risk to over 20% is inappropriate and that such cases are better classified as very high risk. The RCPath consider that the intermediate risk cases described by Baum *et al.*[35] are better regarded as high risk and their high-risk cases as very high risk. The RCPath believes that the proposals by Baum *et al.* could potentially leave some serious intermediate cases under-rated in terms of risk and thereby receive inappropriate clinical management.

Evidence also strongly suggests that a summation of the number of high-risk factors present also has significant clinical importance; the greater the number of factors, the greater the overall risk.[33]

In conclusion, risk stratification is now considered an activity better undertaken by the clinician overseeing the patient and/or by a skin cancer MDT, rather than as a specific core entry in a histopathology report. This appears to reflect a better approach to personalised medicine in any individual case. This view is strongly supported by the joint RCPath and BAD audit on NMSC.[14] The audit revealed that risk status was a frequently omitted core data item in basal cell carcinoma and SCC histopathology reports.

High-risk pathological factors for clinical management
Any one equals high-risk status.

i. Squamous cell carcinoma and stage

- Type:

Desmoplastic, spindle/sarcomatoid	AJCC TNM 8/BAD/WHO/SIGN
Spindle only if previous radiotherapy	AFIP
Acantholytic	BAD/WHO
Adenosquamous	WHO/AFIP
RCPath: any of above	

- Grade:

Poorly differentiated	BAD (text)/AJCC TNM 8/SIGN/ WHO/NCCN
Moderately differentiated	BAD (table)/NCCN
RCPath: poorly differentiated	

- Perineural invasion:

Present	BAD/NICE/WHO/TNM8/NCCN/ SIGN
RCPath: perineural invasion present	

- Lymphovascular invasion:

Present	BAD/CAP
RCPath: lymphovascular invasion present	

- Thickness:

Thickness >4 mm	BAD/NICE/NCCN/SIGN
RCPath: thickness >4 mm	

- Level of invasion:

≥ Subcutaneous fat	BAD/NICE/WHO
≥ Reticular dermis	NCCN
RCPath: ≥ subcutaneous fat	

- TNM pathological (p) stage:

T2, T3, T4	BAD/NICE
RCPath: T2, T3, T4	

ii. Margins

- Histological margins:

Margins that are involved (0 mm)	NICE/BAD
Margins that are not involved but <1 mm	RCPath/BAD
RCPath: margins that are involved (0 mm) or not involved and <1 mm	

Note that a low-risk squamous cell carcinoma using histological criteria may be upgraded to an overall high-risk lesion when summated with any clinical high-risk features present (supplied by the clinician and/or at an MDT).

[Level of evidence B – Knowledge of defined high-risk pathological features is required for appropriate clinical management, treatment and MDT discussion.]

High-risk pathological and clinical features to upstage T1 or T2 to T3
These comprise:

- deep invasion: a tumour thickness >6 mm or
- deep invasion: invasion beyond the subcutaneous fat or
- specified perineural invasion
  - named nerve or ≥0.1 mm diameter or beyond dermis or
- minor bone erosion.

[Level of evidence B – Defined pathological high-risk features constitute staging parameters.]

6.2 Non-core clinical items

These are based on the national clinical guidelines,[7] core and site-specific items in COSD[8] SIGN[12] and the draft UK National Histopathology Request Form (Appendix C). They also conform to NICE requirements[4] and can be captured if provided by the clinician.

They include:

- grade of clinician undertaking procedure
- clinical diagnosis/description
- procedure intention of clinician (diagnostic or therapeutic biopsy)
- a tumour recurrence
- previous histology reference number(s)
- an immunocompromised patient
- a tumour arising in an area of radiation or thermal injury, chronic draining sinus, chronic ulcer, chronic inflammation or Bowen's disease
- a tumour arising in an individual genetically predisposed to cancer
- clinical high-risk factors for skin cancer MDT treatment/management[4] (any one equals high risk):
  - anatomic location – ear and hair-bearing (non-glabrous) lip* [BAD, SIGN][7,12]
  - recurrent or persistent [BAD][6]
  - reduced immune status [BAD][6,12]
  - genetics [BAD][6]
  - area of radiation, thermal injury, chronic draining sinuses, chronic ulcers or chronic inflammation [BAD][6]
  - arising in non-exposed sites such as perineum, sacrum, sole of foot [BAD].[6]

6.3 Non-core pathological items

The following are non-core pathological items:

- tumour growth pattern at closest margin: circumscribed/cohesive, infiltrative/non-cohesive
- degree of budding and cell nest size at invading edge of tumour

- percentage of well, moderately and poorly differentiated components
- tumour thickness measured to nearest 1 mm as a whole integer
- margins: not involved below 1 mm measured to nearest 0.1 mm
- margins: not involved over 1 mm measured to whole millimetre integer
- extent of involvement or closeness at a margin. Here it is useful to know if the tumour abuts or transects a margin and whether the involvement is focal or more widespread. This can be expressed as a distance in millimetres.
- margins: information on involved or nearest peripheral and deep margins in relation to designated specimen orientation
- perineural/lymphovascular invasion: intratumoral, extratumoral or multifocal; distance to nearest margin
- in incisional biopsies, whether subcutaneous fat is present
- distance of tumour to nearest margin in lymphadenectomy specimens
- blood vessel invasion in lymphadenectomy specimens
- pTNM stage: minimum on the information available
- high-risk status score: a summation of the number of high-risk factors present
- clearance/completeness: RCPath recognises that many clinicians and MDTs look for guidance from their histopathologists with regard the probability/likelihood of completeness of tumour clearance. As already discussed, this is a subjective and somewhat visionary area and accordingly cannot be included as a core item. An individually or locally agreed statement of probability of clearance is, however, not unreasonable and accordingly is included as a non-core item, with possible terminology as suggested below. If used, it must be firmly understood by the clinician and/or MDT that this is a subjective and not an objective assessment, with variation in the degree of potential accuracy.

  Suggested terminology could include:

  - clearance appears apparently complete
  - clearance appears close but probably complete
  - clearance appears close but possibly complete
  - clearance appears uncertain.

7 Diagnostic coding and staging

TNM and SNOMED are required for the COSD.[8]

7.1 pTNM stage and stage group

By TNM convention, TNM/cTNM (c meaning clinical) refers to staging a primary tumour that has not been previously treated. Clinical staging can therefore incorporate some pathological diagnostic information but the T category is still referred to as T and not pT. Similarly, by convention, pTNM (p meaning pathological) refers to staging after surgical treatment. The pathological information for pTNM is designated pT, pN and pM with reference to the three component TNM categories.

pTNM stage/stage group for skin cancer must be recorded according to UICC and not AJCC TNM 8.[1]

pTNM staging/stage grouping must be deferred until all TNM information is available and, if appropriate, during or after skin cancer MDT discussion.

A pTNM stage/stage group can be added to a histopathology report as a non-core item, but the report should indicate that this is the minimum stage based on the information in the report.
The pTNM stage categories are conveniently condensed into four stage groups:

- stage 0: in situ
- stage I: localised disease
- stage II: more extensive localised disease
- stage III: regional nodal disease
- stage IV: metastasis.

Although pTNM classically refers to the anatomic extent of disease, more recently this has, at times, incorporated additional non-anatomic prognostic information giving rise to so-called prognostic groups (UICC) or prognostic stage groups (AJCC).

pTNM stage is based on three anatomical categories: pT (Tumour), pN (Node), M or pM (Metastasis).

- pT – Primary tumour
  - pTx: Primary tumour cannot be assessed
  - pTis: Carcinoma – in situ
  - pT has multiple subcategories, i.e. pT0, pT1, pT2, pT3, pT4, reflecting increasing pT stages
- pN – Regional lymph nodes
  - pN has multiple subcategories, i.e. pN0, pN1, pN2, pN3
  - for melanoma and Merkel cell carcinoma, isolated tumour cells are defined as N1
- M – Distant metastasis
  - M/pM (if confirmed histopathologically) has two categories, i.e. M0, M1/pM1
  - it should be noted that there is no MX nor pM0
- Additional descriptors can be used:
  - the suffix ‘m’ indicates the presence of multiple synchronous primary tumours in a single organ (i.e. skin) within four months of diagnosis and is recorded in parentheses, e.g. pT1 (m). The highest T category should be used. Over four months they are regarded as new metachronous tumours and staged separately.
  - the suffix 'sn' indicates a SLNB and is shown in parentheses, e.g. pN1 (sn)
  - the prefix 'r' indicates a recurrent tumour with a disease-free interval or disease that has progressed with no interval. This can be designated ‘rp’ if based on pathological information.
  - the TNM R classification for residual tumour is not used as margin status; information is provided in more detail elsewhere in the dataset.

Full details are available in Appendix A.

7.2 SNOMED codes

SNOMED Topography (T) code should be recorded for the site.

SNOMED Morphology (M) code should be recorded for the diagnosis/tumour morphology.

SNOMED Procedure (P) codes should be recorded for the procedure. P codes vary according to the SNOMED system in use in different organisations; therefore, local P codes should be recorded and used for audit purposes.

However, it is noted that SNOMED is now in a practical transition phase, as part of the intended full implementation by the NHS and PHE of SNOMED CT. SNOMED ceased to be licensed by the International Health Terminology Standards Development Organisation from 26 April 2017.

A list of applicable T and M SNOMED and SNOMED CT codes is provided in Appendix B. Mapping SNOMED CT terminology is provided.

8 Reporting of small biopsy specimens

When a procedure is carried out with the clear intention of establishing a diagnosis (e.g. some punch biopsies, incisional biopsies and some shave or curettings), data items should be restricted to diagnosis and indicators of high-risk status.

A full dataset should, however, be completed when a procedure is undertaken with therapeutic intent. This could include curettings, a punch excision or shave. It is, however, appreciated that perhaps all dataset items cannot be provided.

9 Reporting of frozen sections

Frozen sections should be limited to Mohs micrographic surgery, where horizontal sections are used to accurately assess margin status. Vertical frozen sections should not be used to assess margins as they are insufficiently representative of the entire margin.

The use of frozen sections for a specific clinical diagnostic problem usually cannot be supported as this circumvents the desirable standard of prospective skin cancer MDT discussion and potential patient involvement in the decision-making process.

Frozen sections have no role in lymph node assessment.

10 Cytological diagnosis

Cytology has little role in the primary diagnosis of cSCC.

Fine needle aspiration cytology and biopsy is an appropriate modality to investigate clinically and/or radiologically abnormal regional lymph nodes for potential metastatic squamous cell carcinoma. Lymph node involvement is discussed in section 9 above and in the RCPath dataset for the histopathological reporting of nodal excisions associated with head and neck carcinomas.[15]

11 Specific aspects of individual tumours not covered elsewhere

11.1 MDT referral

Invasive squamous cell carcinoma cases that must be referred for local skin cancer MDT discussion:[4,9]

- those involving the excision margin(s)
- patients suitable for Mohs surgery
- cases for nodal dissection or SNLB (see below)
- immunocompromised patients.

Case to be referred to the specialist/central skin cancer MDT:[4,9]

- high-risk squamous cell carcinomas that pose management difficulty
- metastatic squamous cell carcinoma
- immunocompromised patients
- cases for nodal dissection or SLNB
- patients suitable for Mohs surgery.

Although defined as a pathological high-risk factor in this dataset, and accordingly requiring careful consideration in each individual case, the MDT referral/review status of lesions with non-involved histological margins <1 mm remains a clinical decision (by a clinician and/or pathologist) or as agreed in any locally agreed protocol.

See Appendix F for a summary of high-risk factors for clinical and MDT management.

11.2 Re-excision specimens

There has been considerable debate as to the extent of the examination that is required of wider local excision specimens for skin cancer. Macroscopic examination is essential. This is the most reliable means to record that the re-excision has been undertaken while noting the dimensions of the wider excision specimen. The fixed specimen should also be sliced every 2–4 mm to detect any macroscopic abnormalities such as potential satellite metastases. Each slice with a macroscopic abnormality must be examined histologically, to ensure that margin status can be assessed.

The debate centres on the cost efficiency of examining an entire specimen that is macroscopically normal when abnormalities were not present at the margins of the index specimen. Some peers consider that this is the only guaranteed way to ensure that residual disease or metastases are not overlooked. Some also consider that the specimen should always be examined in its entirety with a biomedical scientist-led cut-up. There does, however, appear to be considerable latitude for discretion in this area. An acceptable compromise would be to sample the specimen in its shortest transverse axis, incorporating the area where the scar appears closest to the margin. This can generally be achieved in one to four cassettes of tissue. Clinicians require information about whether the specimen contains a scar and whether the scar is completely excised.

If abnormalities were reported to extend to the resection margins in the index specimen, the specimen should be examined more extensively. For specimens up to 10 mm, the entire specimen should be sampled. Specimens over 10 mm should be sampled pragmatically according to the nature of the original margin involvement.

11.3 Reporting pathologist

NICE and QSP recommend that, whenever possible, lymph node cytopathology and histopathology resulting from the investigation and treatment of primary skin cancer should be undertaken by the same team of pathologists involved in the reporting of the cutaneous specimens. This is to improve the sensitivity and specificity of investigative pathological methodology and to facilitate skin cancer MDT discussion and audit.[4,9]

This NICE recommendation relates primarily to inguinal and axillary SLNB and lymph node dissections for skin cancer. Head and neck SLNB for skin cancer also lies within the competence of specialist dermatopathologists. These topics all lie within the area covered by the National Specialist Dermatopathology EQA. Lymph node dissection of the head and neck and associated reporting, however, must only be undertaken by those having appropriate skills and competence in the area. This is primarily demonstrated by regular practice in the field and participating in an appropriate EQA scheme. In general, this therefore limits head and neck lymph node dissection and reporting to individuals regularly involved in this area of head and neck pathology. Head and neck lymph node dissection must be undertaken and reported according to RCPath's neck dissection cancer dataset.[15]

12 Criteria for audit

12.1 Recommended by NICE[4]

- Skin cancer excision margins between specialties and clinicians.
- Skin cancer specimens in primary care.
- Histopathology reporting times (see section 12.2 below).
- Audit of all basal cell carcinomas and squamous cell carcinomas not discussed at the MDT meeting.

12.2 Recommended by the RCPath as key performance indicators

See *Key Performance Indicators – Proposals for implementation* (July 2013) on http://www.rcpath.org/profession/quality-improvement/kpis-for-laboratory-services.html:

- 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 were required to implement the structured recording of core pathology data in the COSD by January 2016 and to update their systems in line with subsequent COSD updates.
  - standard: 95% of reports must contain structured data.
- histopathology cases must be reported, confirmed and authorised within seven to ten calendar days of the procedure
  - standard: 80% of cases must be reported within seven calendar days and 90% within ten calendar days.

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Appendix A UICC TNM 8 pathological staging of primary cutaneous carcinoma

This combines the UICC TNM 8 chapter guidance for skin carcinoma of the head and neck and carcinoma of the skin (essentially limbs and trunk but excluding the eyelid, vulval, penile or perianal skin).

This includes basal cell carcinoma, squamous cell carcinoma and adnexal carcinoma but excludes Merkel cell carcinoma and carcinomas of the eyelid, vulva, penis, non-hair bearing lip or non-hair bearing perianal skin (within 5 cm of the perianal margin).

The clinico-pathological implications of TNM 8 for skin cancer have been reviewed jointly by the BAD and RCPath.[36]

Definitions of pTNM

Primary tumour (pT)

pTX	Primary tumour cannot be assessed
pT0	No evidence of primary tumour
pTis	Carcinoma in situ
pT1	Tumour ≤20 mm or less in maximum dimension (this is the clinical dimension but the pathological dimension, usually macroscopic, can be used if the clinical is not available)
pT2	Tumour >20 mm to ≤40 mm in maximum dimension (this is the clinical dimension but the pathological dimension, usually macroscopic, can be used if the clinical is not available)
pT3	Tumour >40 mm in maximum dimension (this is the clinical dimension but the pathological dimension, usually macroscopic, can be used if the clinical is not available) OR pT1 or pT2 can be upstaged to pT3 by one or more high-risk clinical/pathological features including deep invasion,* specifically defined perineural invasion* or minor bone erosion
pT4a	Tumour with gross cortical/marrow invasion
pT4b	Tumour with axial skeleton/skull base/foraminal invasion

*High-risk features in relation to pT1 and pT2 upstaging to pT3

Definitions
Deep invasion: this is defined as a level of invasion beyond/further than the subcutaneous fat and/or tumour thickness >6 mm. Thickness is measured in millimetres from the granular layer of the nearest adjacent normal epidermis to the deepest point of the tumour.

UICC TNM 8 currently defines upstaging/specified perineural invasion by either clinical or imaging criteria or histological invasion of a named nerve. However, as discussed in the 5.3.6 the RCPath consider it appropriate to extend the definition of specified perineural invasion to include a nerve ≥0.1 mm diameter and/or or a nerve deeper than the dermis.

Comment: UICC TNM 8 states pT is identical to T.

Regional lymph nodes (pN)

The division between head and neck and non-head and neck (trunk and limbs) regions anteriorly represents the level of the acromio-clavicular joint and posteriorly the level of the upper margin of the shoulder blade.

Carcinoma of the skin (essentially limbs and trunk but excluding the eyelid, vulva, penis or perianal area)

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node ≤30 mm in greatest dimension

pN2 Metastasis in a single ipsilateral lymph node >30 mm but not >60 mm in greatest dimension or in multiple ipsilateral lymph nodes, but not >60 mm in greatest dimension

pN3 Metastasis in a lymph node >60 mm in greatest dimension

A contralateral nodal metastasis (unlike with skin carcinoma of head and neck; see below) represents a distant metastasis.

There is an expectation that at least six lymph nodes will be identified in a lymphadenectomy specimen.

Skin carcinoma of head and neck (excluding vermillion lip)

pNX Regional lymph nodes cannot be assessed

pN0 No regional lymph node metastasis

pN1 Metastasis in a single ipsilateral lymph node ≤30 mm in greatest dimension, without extranodal extension.

pN2a Metastasis in a single ipsilateral lymph node, more than 30 mm but not >60 mm in greatest dimension, without extranodal extension.

pN2b Metastasis in multiple ipsilateral lymph nodes, none >60 mm in greatest dimension, without extranodal extension.

pN2c Metastasis in bilateral or contralateral lymph nodes, none >60 mm in greatest dimension, without extranodal extension

pN3a Metastasis in a lymph node, >60 mm in greatest dimension, without extranodal extension

pN3b Metastasis in a lymph node with extranodal extension

Extranodal extension can be defined by clinical or pathological criteria.

There is an expectation that at least ten lymph nodes will be identified by selective lymphadenectomy and at least 15 in radicle or modified radicle lymphadenectomy.

Distant metastasis (M)

M0 No distant metastasis

M1/pM1 Distant metastatic disease.

Comment: MX and pM0 do not exist

pTNM stage group

Stage	T	N	M
Stage 0	Tis	N0	M0
Stage I	T1	N0	M0
Stage II	T2	N0	M0
Stage III	T3	N0	M0
	T1, T2, T3	N1	M0
Stage IV	T1, T2, T3	N2, N3	M0
	T4	N Any	M0
	T Any	N Any	M1

Appendix B Cutaneous squamous cell carcinoma SNOMED coding

Topographical codes	SNOMED	SNOMED CT terminology	SNOMED CT code
Skin	T01000	Skin structure (body structure)	39937001
Lymph node	TC4000 (SNOMED 3) T08000 (SNOMED 2)	Structure of lymph node (body structure)	59441001

Morphological codes	SNOMED	SNOMED CT terminology	SNOMED CT code
Invasive squamous cell carcinoma, NOS	M80703	Squamous cell carcinoma, no ICD-O subtype (morphologic abnormality)	28899001
Keratinising squamous cell carcinoma	M80713	Squamous cell carcinoma, keratinising (morphologic abnormality)	18048008
Non-keratinising squamous cell carcinoma	M80723	Squamous cell carcinoma, large cell, non-keratinising (morphologic abnormality)	45490001
Spindle squamous cell carcinoma	M80743	Squamous cell carcinoma, spindle cell (morphologic abnormality)	10288008
Pseudoglandular, acantholytic, adenoid squamous cell carcinoma	M80753	Adenoid squamous cell carcinoma (morphologic abnormality)	85956000
Verrucous squamous cell carcinoma	M80513	Verrucous carcinoma (morphologic abnormality)	89906000
Metastatic squamous cell carcinoma	M80706	Squamous cell carcinoma, metastatic (morphologic abnormality)	64204000
Keratoacanthoma	M72860	Keratoacanthoma – category (morphologic abnormality)	416378000
Keratoacanthoma-like squamous cell carcinoma	M80713	Squamous cell carcinoma, keratinising (morphologic abnormality)	18048008

Procedure

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

Appendix C (Draft) UK National Histopathology Request Form for skin biopsies

Devised by the PHE Skin Site-Specific Reference Group and kindly provided for RCPath dataset information by PHE. Permission for use should be sought from the PHE. This histopathology request form has been approved by the BAD; the mode of national implementation is under consultation. This could be useful to ensure that the maximum clinical dimension of a lesion is always recorded.

The UK National Histopathology Request form for skin biopsies

Date of surgical procedure

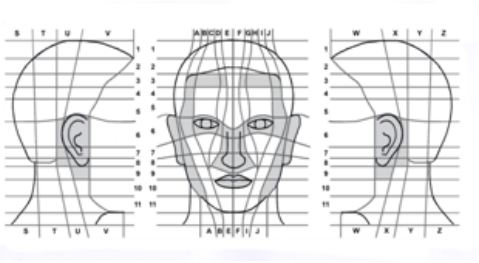
Please attach patient details

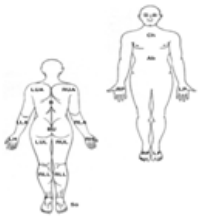
Name of surgeon

Grade of surgeon: Nurse, Specialist trainee, Consultant, Hospital Practitioner, Other

Clinical diagnosis: free text

Mandatory for Clinician to complete:	First biospy	Second	Third	Fourth
Site Code as per image (insert LUL etc)				
Clinical Diagnosis (select either BCC, SCC, Melanoma, Atypical Mole, other tumour or other). For inflammatory lesions add clinical details as free text.				
Clinical size of lesion sampled (max diameter) (mm)				
Intention of the surgeon (select *biopsy, excision or curative curettage*				
Procedure (select *curettage, shave biopsy, punch, incisional biopsy or excision)*				
For tumours give measured surgical clinical margin (mm)				
Is this a recurrent tumour?	Y/N	Y/N	Y/N	Y/N
Is the pateint immunocompromised?	Y/N			
Is this a tumour arising in areas of radiation or thermal injury, chronic draining sinuses, chronic ulcers, chronic inflammation or Bowen's Disease	Y/N	Y/N	Y/N	Y/N
Is this a tumour arising in a genetically predisposed individual?	Y/N			





Please mark site of samples taken on the above images For head and neck skin cancers the site code will be made up of the number in the horizontal grid and the letter from the vertical grid (e.g. for a tumour in the middle of the nose that might be code 8E). Where a lesion lies across grid lines then that grid reference in which the greater part of the tumour lies should be used OR if the lesion impacts on a grey shaded area or on the lips then that code should be used. Where the tumour is on the marked lips then the code LIP should be used. For tumours outside the head and neck the letters are indicated on the body map. e.g. a tumour on the left lower arm is LLA).

Free text

Appendix D1 Reporting proforma for cutaneous invasive squamous cell carcinoma removed with therapeutic intent

Surname……Forenames…… Date of birth…….. Sex…...

Hospital……Hospital no…… NHS/CHI no……..

Date of procedure……..Date of receipt……..…….. Date of reporting……...

Pathologist……Surgeon…… Report no ……

Clinical data

Clinical site …….....

Maximum clinical dimension/diameter.....mm

Specimen type†:

Not stated □

Incision Diagnostic □

Excision Diagnostic □ Therapeutic □ Uncertain □ Re-excision □ Wider local excision □

Punch Diagnostic □ Therapeutic □ Uncertain □

Curettings Diagnostic □ Therapeutic □ Uncertain □

Shave Diagnostic □ Therapeutic □ Uncertain □

Other □ Specify ….....

Macroscopic description

Dimension of specimen Length ……mm Breadth …….mm Depth …….mm

Maximum dimension/diameter of lesion†: ...……mm Uncertain □ No lesion seen □

Histological data

Subtype†: No special type (classic) □ No special type (classic) with adjacent Bowen's □
Verrucous □ Acantholytic (pseudoglandular/adenoid/pseudovascular) □ Desmoplastic □
Spindle/sarcomatoid □ Keratoacanthomatous-like □ Follicular □
Adenosquamous (SCC with divergent differentiation) □ Other (specify).....

Grade†: Well differentiated □ Moderately differentiated □ Poorly differentiated □
Uncertain □ Cannot be assessed □

Thickness: ≤2 mm □ >2–4 mm □ >4–6 mm □ >6 mm □ **(= deep invasion: upstage pT1/pT2 to pT3)**
Uncertain □ Cannot be assessed □

Level of invasion: Dermis □ Subcutaneous (s/c) fat □ Beyond s/c fat □ Not identifed □
Uncertain □ Cannot be assessed □

If invasion beyond subcutaneous fat present: **(= deep invasion: upstage pT1/pT2 to pT3)**

Specify tissue: Fascia □ Muscle □ Perichondrium □ Cartilage □ Paratendon/tendon □
Periosteum □ Bone □

If bone invasion present:

Minor bone erosion Present □ **(pT3)** Not identified □ Uncertain □ Cannot be assessed □

Gross cortical/marrow invasion: Present □ **(pT4a)** Not identified □ Uncertain □ Cannot be assessed □

Axial/skull base/foraminal invasion: Present □ **(pT4b)** Not identified □ Uncertain □ Cannot be assessed □

Perineural invasion: Present □ Not identified □ Uncertain □ Cannot be assessed □

If present: Meets specified criteria to upstage pT1/pT2 to pT3 (named nerve or ≥0.1 mm or beyond dermis)
Yes □ **(pT3)** No □

If yes: Named nerve □ ≥ 0.1 mm □ Beyond dermis □

Lymphovascular invasion† Present □ Not identified □ Uncertain □ Cannot be assessed □

Margins†

	Involved	Not involved			Uncertain	Not applicable
		<1 mm	1–5 mm	>5 mm		
Peripheral	☐	☐	☐	☐	☐	☐
Deep	☐	☐	☐	☐	☐	☐

Maximum dimension/diameter of lesion

Indicate which used:

Clinical ☐ OR Macroscopic ☐ OR Microscopic ☐

Maximum dimension

≤20 mm ☐ >20 – ≤40 mm ☐ >40 mm ☐ Uncertain ☐ Cannot be ascertained ☐

pTNM† **pT..... (UICC TNM 8)**

SNOMED codes†……..

COMMENTS

Pathologist……..... **Date……**

†Data items that are part of the Cancer Outcomes and Services Dataset (COSD) version 8

Appendix D2 Reporting proforma for regional lymph nodes associated with cutaneous invasive squamous cell carcinoma (including skin carcinoma of head and neck and carcinoma of skin, essentially trunk and limbs but excluding eyelid and genitals)

D2.1 Invasive squamous cell carcinoma of head and neck

Surname…… Forenames……..… Date of birth…….. Sex…...

Hospital…….…….…… Hospital no…….…… NHS/CHI no……..

Date of procedure…….. Date of receipt……..…….. Date of reporting……...

Pathologist…….…… Surgeon…….…. Report no ……

Clinical data

Anatomical site: Neck □ Axillary □ Other □ (specify):.....

Laterality: Right □ Left □

Macroscopic description

Dimension of specimen .....mm x .....mm x .....mm

Localising indicator present? Not identified □ Yes □ If yes: details.....

Macroscopic abnormality? Not identified □ Yes □ If yes: maximum dimension .....mm

Uncertain □

Macroscopic extranodal extension Not identified □ Yes □ Uncertain □

Histological data for nodes with invasive squamous cell carcinoma of head and neck

LYMPHADENECTOMY

Number of nodes identified†.....

Nodes involved No □ Yes □

Highest/apical node involved No □ Yes □ If yes: ipsilateral □ and/or contralateral □

Not identified clinically □

If nodes are involved

IPSILATERAL

Number involved†.....…

Maximum size of metastasis	≤30 mm □		>30 mm – ≤60 mm □	>60 mm □
Extranodal extension	No □	Yes □	Uncertain □	Cannot be assessed □
Margin involved	No □	Yes □	Uncertain □	Cannot be assessed □

CONTRALATERAL

Number involved.....

Maximum size of metastasis	≤30 mm □		>30 mm – ≤60 mm □	>60 mm □
Extranodal extension	No □	Yes □	Uncertain □	Cannot be assessed □
Margin involved	No □	Yes □	Uncertain □	Cannot be assessed □

pTNM† pN… (UICC TNM 8)

SNOMED codes…….....…

COMMENTS

Pathologist…….. Date……..

†Data items that are part of the Cancer Outcomes and Services Dataset (COSD) version 8

OR D2.2 Invasive squamous cell carcinoma of trunk and limbs (excluding eyelid and genitals)

Surname…… Forenames……..… Date of birth…….. Sex…...

Hospital…….…… Hospital no…… NHS/CHI no……..

Date of procedure…….. Date of receipt……..…….. Date of reporting……...

Pathologist…….…… Surgeon…….…… Report no ……

Clinical data

Anatomical site: Axillary □ Inguinal □ Other □ (specify):.....

Laterality: Right □ Left □

Macroscopic description

Dimension of specimen .....mm x .....mm .....mm

Localising indicator present? Not identified □ Yes □ If yes: details.....

Macroscopic abnormality? Not identified □ Yes □ If yes: maximum dimension .....mm
Uncertain □

Macroscopic extranodal extension Not identified □ Yes □ Uncertain □

Histological data for nodes with invasive squamous cell carcinoma of trunk and limb

LYMPHADENECTOMY

Number of ipsilateral nodes identified†.....

Nodes involved No □ Yes □

Highest/apical node involved No □ Yes □ Not identified clinically □

Number involved†.....…

Maximum size of metastasis ≤30 mm □ >30 mm – ≤60 mm □ >60 mm □

Extranodal extension No □ Yes □ Uncertain □ Cannot be assessed □

Margin involved No □ Yes □ Uncertain □ Cannot be assessed □

---

pTNM† pN… (UICC TNM 8)

SNOMED codes…….....…

COMMENTS

Pathologist…….. Date……..

†Data items that are part of the Cancer Outcomes and Services Dataset (COSD) version 8

Appendix E1 Reporting proforma for cutaneous invasive squamous cell carcinoma removed with therapeutic intent in list format

Element name	Values	Implementation comments
Clinical site	Free text	
Maximum clinical dimension/diameter	Size in mm	
Specimen type	Single selection value list: • Not stated • Incision, Diagnostic • Excision, Diagnostic • Excision, Therapeutic • Excision, Uncertain • Re-excision • Wider local excision • Punch, Diagnostic • Punch, Therapeutic • Punch, Uncertain • Curettings, Diagnostic • Curettings, Therapeutic • Curettings, Uncertain • Shave, Diagnostic • Shave, Therapeutic • Shave, Uncertain • Other	
Specimen type, Other, Specify	Free text	Only applicable if 'Specimen type, Other' is selected.
Dimension of specimen, Length	Size in mm	
Dimension of specimen, Breadth	Size in mm	
Dimension of specimen, Depth	Size in mm	
Maximum dimension of lesion	Size in mm	
Lesion dimension not given, reason	Single selection value list: • Uncertain • No lesion seen • Not applicable	Not applicable if value given for 'Maximum dimension of lesion'.
Subtype	Single selection value list: • No special type (classic) • No special type (classic) with adjacent Bowen's	

	• Verrucous • Acantholytic (pseudoglandular/adenoid/ pseudovascular) • Desmoplastic • Spindle/sarcomatoid/ metaplastic • Keratoacanthomatous-like • Follicular • Adenosquamous (SCC with divergent differentiation) • Other	
Subtype, Other, Specify	Free text	Only applicable if 'Subtype, Other' is selected.
Grade	Single selection value list: • Well differentiated • Moderately differentiated • Poorly differentiated • Uncertain • Cannot be assessed	
Thickness	Single selection value list: • ≤2 mm • >2–4 mm • >4–6 mm • >6 mm • Uncertain • Cannot be assessed	
Level of invasion	Multiple selection value list: • Dermis • Subcutaneous fat • Beyond subcutaneous fat • Not identified • Uncertain • Cannot be assessed	
Level of invasion beyond subcutaneous fat	Multiple selection value list: • Fascia • Muscle • Perichondrium • Cartilage	Only applicable if 'Level of invasion beyond subcutaneous fat' is selected.

	• Paratendon/tendon • Periosteum • Bone	
Minor bone erosion	Single selection value list: • Present • Not identified • Uncertain • Cannot be assessed • Not applicable	Only applicable if 'Level of invasion beyond subcutaneous fat, Bone' is selected.
Gross cortical/marrow invasion	Single selection value list: • Present • Not identified • Uncertain • Cannot be assessed • Not applicable	Only applicable if 'Level of invasion beyond subcutaneous fat, Bone' is selected.
Axial/skull base/foraminal invasion	Single selection value list: • Present • Not identified • Uncertain • Cannot be assessed • Not applicable	Only applicable if 'Level of invasion beyond subcutaneous fat, Bone' is selected.
Perineural invasion	Single selection value list: • Present • Not identified • Uncertain • Cannot be assessed • Not applicable	
Perineural invasion, criteria to upstage to pT3	Single selection value list: • Yes • No	Only applicable if 'Perineural invasion, Present' is selected.
Perineural invasion, features	Multiple selection value list: • Named nerve • ≥0.1 mm • Beyond dermis	Only applicable if 'Perineural invasion, criteria to upstage to pT3' is selected.
Lymphovascular invasion	Single value selection list: • Present • Not identified	

	• Uncertain • Cannot be assessed	
Margins, Peripheral	Single selection value list: • Involved • Not involved but <1 mm • Not involved 1–5 mm • Not involved >5 mm • Uncertain • Not applicable	
Margins, Deep	Single selection value list: • Involved • Not involved but <1 mm • Not involved 1–5 mm • Not involved >5 mm • Uncertain • Not applicable	.
Basis of diameter measurement	Single selection value list: • Clinical • Macroscopic • Microscopic	
Dimension	Single selection value list: • ≤20 mm • >20 – ≤40 mm • >40 mm • Uncertain • Cannot be assessed	
pT category	Single selection value list: • X • 0 • 1 • 2 • 3 • 4a • 4b	
TNM version	UICC8	UICC8 automatically selected.
SNOMED codes	May have multiple codes. Look up from SNOMED tables.	

Appendix E2 Reporting proforma for regional lymph nodes associated with cutaneous invasive squamous cell carcinoma (including skin carcinoma of head and neck and carcinoma of skin – essentially trunk and limbs but excluding eyelid and genitals) in list format

E2.1 Invasive squamous cell carcinoma of head and neck

Element name	Values	Implementation comments
Anatomical site	Single selection value list: • Neck • Axillary • Other	
Anatomical site, Other, specify	Free text	Only applicable if 'Anatomical site, Other' is selected.
Laterality	Single selection value list: • Right • Left	
Dimension of specimen, dimension 1	Size in mm	
Dimension of specimen, dimension 2	Size in mm	
Dimension of specimen, dimension 3	Size in mm	
Localising indicator present	Single selection value list: • Not identified • Yes	
Localising indicator present, details	Free text	Only applicable if 'Localising indicator present, Yes' is selected.
Macroscopic abnormality present	Single selection value list: • Not identified • Yes • Uncertain	
Maximum dimension of macroscopic abnormality	Size in mm	Only applicable if 'Macroscopic abnormality present, Yes' is selected.
Macroscopic extranodal extension	Single selection value list: • Not identified • Yes • Uncertain	
Number of nodes identified	Integer	

Nodes involved	Single selection value list: • No • Yes	
Highest/most apical node involved	Single value selection list: • No • Yes • Not identified clinically • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Number of nodes involved	Integer	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Maximum size of metastasis	Single value selection list: • ≤30 mm • >30 mm – ≤60 mm • >60 mm • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Extranodal/capsular extension	Single value selection list: • Yes • No • Uncertain • Cannot be assessed • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Margin involved	Single selection value list: • No • Yes • Uncertain • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Contralateral, Number of nodes involved	Integer	Not applicable if 'Nodes involved, No' is selected.
Contralateral, Maximum size of metastasis	Single value selection list: • ≤30 mm • >30 mm – ≤60 mm • >60 mm • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Contralateral, Extranodal/capsular extension	Single value selection list: • No • Yes • Uncertain	Not applicable if 'Nodes involved, No' is selected.

	• Cannot be assessed • Not applicable	
Contralateral, Margin involved	Single selection value list: • No • Yes • Uncertain • Not applicable	Not applicable if 'Nodes involved, No' is selected.
pN category	Single selection value list: • X • 0 • 1 • 2a • 2b • 2c • 3a • 3b	
TNM version	UICC8	UICC8 automatically selected.
SNOMED codes	May have multiple codes. Look up from SNOMED tables.	

E2.2 Invasive squamous cell carcinoma of trunk and limbs (excluding the eyelid and genitals)

Element name	Values	Implementation comments
Anatomical site	Single selection value list: • Axillary • Inguinal • Other	
Anatomical site, Other, specify	Free text	Only applicable if 'Anatomical site, Other' is selected.
Laterality	Single selection value list: • Right • Left	
Dimension of specimen, dimension 1	Size in mm	
Dimension of specimen, dimension 2	Size in mm	
Dimension of specimen, dimension 3	Size in mm	
Localising indicator present	Single selection value list: • Not identified • Yes	
Localising indicator present, details	Free text	Only applicable if 'Localising indicator present, Yes' is selected.
Macroscopic abnormality present	Single selection value list: • Not identified • Yes • Uncertain	
Maximum dimension of macroscopic abnormality	Size in mm	Only applicable if 'Macroscopic abnormality present, Yes' is selected.
Macroscopic extranodal extension	Single selection value list: • Not identified • Yes • Uncertain	
Number of ipsilateral nodes identified	Integer	
Nodes involved	Single selection value list: • No	

	• Yes	
Highest/most apical node involved	Single value selection list: • No • Yes • Not identified clinically • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Number of nodes involved	Integer	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Maximum size of metastasis	Single value selection list: • ≤30 mm • >30 mm – ≤60 mm • >60 mm • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Extranodal/capsular extension	Single value selection list: • Yes • No • Uncertain • Cannot be assessed • Not applicable	Not applicable if 'Nodes involved, No' is selected.
Ipsilateral, Margin involved	Single selection value list: • No • Yes • Uncertain • Not applicable	Not applicable if 'Nodes involved, No' is selected.
pN category	Single selection value list: • X • 0 • 1 • 2 • 3	
TNM version	UICC8	UICC8 automatically selected.
SNOMED codes	May have multiple codes. Look up from SNOMED tables.	

Appendix F Comparison table of high-risk factors for clinical and NICE/QSP MDT management and TNM 8 T1 or T2 upstaging to T3

High-risk factors	Clinical and MDT management – pathology high risk	TNM 8 staging – high risk to upstage T1 or T2 to T3[a]
Minimum number of risk factors required	One	One
Clinical criteria	Not included in pathology risk assessment but to be used by clinician and/or MDT Low-risk pathology may be upstaged by a high-risk clinical factor[b]	
SCC and stage		
• Grade	Poorly differentiated	Not applicable
• Thickness	>4 mm	>6 mm
• Level of invasion	≥Subcutaneous fat	>Beyond subcutaneous fat
• Perineural invasion (PNI)	Present	Specified PNI present[a]
• Lymphovascular invasion	Present	Not applicable
• High-grade subtype[c]	Present	Not applicable
• TNM	pT2, 3, 4	Not applicable
Margin status		
• Involved (0 mm)	Present	Not applicable
• Not involved <1 mm	See note d	Not applicable

Notes

a. The presence of any one of the listed high-risk factors upstages T1 or T2 to T3.

Specified PNI criteria are a named nerve or ≥0.1 mm or beyond the dermis.

T3 is clinically *very* high risk.

b. Clinical information from a clinician or notes, and/or available at an MDT, can upstage pathology low-risk status to high risk for NICE/QSP MDT purposes.

c. Desmoplastic, spindle/sarcomatoid/metaplastic, acantholytic, adenosquamous.

d. Pathological non-involved margins <1 mm are not defined as high risk by NICE/QSP for mandatory MDT referral/review. They are, however, regarded as pathologically high risk in this cancer dataset for broader clinical management. The requirement for MDT referral/review must be considered and decided individually in each case by a clinician and/or pathologist or according to a locally agreed protocol. MDT referral/review should be particularly considered when there is any reasonable uncertainty with regard to the adequacy of margin clearance.

Appendix G Summary table – Explanation of levels of evidence

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

Level of evidence	Nature of evidence
Level A	At least one 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 cancer type 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.
Level 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, a high probability that the relation is causal and which are directly applicable to the target cancer type or Extrapolation evidence from studies described in A.
Level 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 cancer type or Extrapolation evidence from studies described in B.
Level 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 compliance monitoring sheet

The cancer datasets of the Royal College of Pathologists comply with the AGREE II standards for good quality clinical guidelines. The sections of this dataset 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.	Foreword, 1
2 The health question(s) covered by the guideline is (are) specifically described.	Foreword, 1
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.	1
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, 1
12 There is an explicit link between the recommendations and the supporting evidence.	2–11
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.	2–11
16 The different options for management of the condition or health issue are clearly presented.	2–11
17 Key recommendations are easily identifiable.	2–11
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 A–F
20 The potential resource implications of applying the recommendations have been considered.	Foreword
21 The guideline presents monitoring and/or auditing criteria.	12
Editorial independence	
22 The views of the funding body have not influenced the content of the guideline.	Foreword
23 Competing interests of guideline development group members have been recorded and addressed.	Foreword