| **Version 2.0 Thymic Epithelial Tumours 2nd revision, published September 2017** | | | | |
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| **Core/ Non-core** | **Element name** | **Values** | **Commentary** | **Implementation notes** |
| Non-core | CLINICAL INFORMATION | Multi select value list (choose all that apply): • Not provided • Myasthenia gravis • Pure red cell aplasia  • Rheumatoid arthritis • Hypogammaglobulinemia (Good’s syndrome) • Lupus  • Addison’s disease • Cushing’s disease • Previous neoplasm (specify)  • Preoperative therapy (specify) • Other disorders (specify) | It is helpful to know whether the patient has myasthenia gravis or other conditions including neoplasms that can be associated with thymomas. Knowledge of any neoadjuvant treatment is also important as it may explain necrosis and scarring seen macroscopically and microscopically, and allows the pathologist to comment on histologic treatment response. If clinical conditions other than those listed are provided, then these should be noted under ‘Other disorders’. |  |
| Non-core | OPERATIVE PROCEDURE | Single selection value list: • Extended thymectomy  • Radical thymectomy • Partial thymectomy  • Total thymectomy • Not specified  • Other (specify) | Documentation of the operative procedure is useful, as correlation of the type of procedure with the material received can be important for both pathological diagnosis and patient safety. Further, the type of surgical procedure is important in determining the assessment of surgical margins.1 The surgeon should inform the pathologist of the type of operation/procedure. A thymectomy is an operation to remove the thymus. A partial thymectomy is the removal of less than the whole thymus. A total (standard) thymectomy is the removal of the thymus gland without surrounding fatty tissue. An extended thymectomy is the removal of the thymus gland including the fatty tissue of the mediastinum and neck. A radical (maximal) thymectomy is the removal of the thymus gland and wide resection of fatty tissue of the middle and anterior mediastinum and neck from the diaphragm to the thyroid gland and between both phrenic nerves; the technique includes visualization of recurrent laryngeal and phrenic nerves and wide opening of both pleural spaces.  References 1 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. |  |
| Core | SPECIMEN(S) SUBMITTED | Multi select value list (choose all that apply): • Not specified • Partial thymus • Complete thymus • Thymus plus surrounding tissue (radical thymectomy) • Mediastinal pleura • Pericardium  • Lung  o Right  • Wedge  • Lobe  • Entire Lung  o Left  • Wedge  • Lobe  • Entire Lung • Phrenic nerve   • Right  • Left • Great vessels   • Brachiocephalic (innominate) vein  • Superior vena cava  • Extrapericardial pulmonary artery/veins  • Aorta (ascending, arch or descending)  • Arch vessels  • Intrapericardial pulmonary artery  • Myocardium • Diaphragm • Separate extrathymic tumour nodules  • Lymph nodes  • Other (specify) | Specimen type should indicate what was submitted.1 Specimen type varies according to the type of operation. If the specimen was obtained by a radical thymectomy, the specimen type is indicated as “Thymus plus surrounding tissue.”  Specimens obtained by combined resection with other organs or parts thereof, should be itemised, such as lung, pleura, pericardium, great vessels and myocardium. Other organs or tissues are reported as “Other” and details should be recorded.1-3 Separate extrathymic tumour nodules submitted should be recorded; these include pleural and pericardial seedings, pulmonary intraparenchymal nodules and distant organ metastases. The location, number and size of extrathymic nodules are described later in the dataset (see SEPARATE EXTRATHYMIC TUMOUR NODULES/METASTASES). Submitted lymph nodes should also be recorded.4,5 These may be submitted separately or within a combined mediastinal specimen, so labelling or discussion with the surgeon may be required. Further details on lymph nodes are captured later in the dataset (see LYMPH NODE STATUS).  Orientation of the specimen is crucial given the prognostic importance of margin status and pathologic tumour stage in resected thymic epithelial tumours (TETs). Once the tumour is removed from the tumour bed, orientation becomes difficult. Furthermore, the fatty tissue can become easily disrupted. Therefore, orientation of the specimen ideally should be started in situ by the surgeon and areas of concern need to be clearly communicated to the pathologist. Orientating the specimen on a mediastinal board is encouraged (Figure 1).1 Anterior, posterior, right and left surfaces should be clearly distinguished (e.g. inked with different colours or with a detailed block key). Furthermore, the surgeon should mark areas of concern and also representative areas adjacent to the pericardium, the innominate (brachiocephalic) vein and superior vena cava (or mark these structures if resected) and right/left mediastinal pleural surfaces (if resected).   Figure 1: Mediastinal board that could be used to orient the specimen1 Mediastinal board. A diagram on a soft board is useful in maintaining proper dimensions and orientation of specimens. Printing this figure as a full page corresponds roughly to the normal mediastinal dimensions and can be placed directly on a standard soft specimen board that is generally available in surgical pathology departments.  (Reprinted from Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738 with permission from Elsevier)  References 1 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. 2 Detterbeck FC, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Frazier AA, Giaccone G, Huang J, Kim J, Kondo K, Lucchi M, Marino M, Marom EM, Nicholson AG, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposal for an evidence-based stage classification system for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S65-72. 3 Nicholson AG, Detterbeck FC, Marino M, Kim J, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kondo K, Lucchi M, Marom EM, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the T Component for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S73-80. 4 Kondo K, Van Schil P, Detterbeck FC, Okumura M, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Lucchi M, Marino M, Marom EM, Nicholson AG and Ruffini E (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the N and M components for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S81-87. 5 Bhora FY, Chen DJ, Detterbeck FC, Asamura H, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Kondo K, Lucchi M, Marino M, Marom EM, Nicholson AG, Okumura M, Ruffini E and Van Schil P (2014). The ITMIG/IASLC Thymic Epithelial Tumors Staging Project: A Proposed Lymph Node Map for Thymic Epithelial Tumors in the Forthcoming 8th Edition of the TNM Classification of Malignant Tumors. J Thorac Oncol 9(9 Suppl 2):S88-96. |  |
| Non-core | SPECIMEN INTEGRITY | Single select value list: • Intact specimen • Surface disrupted  • Fragmented specimen | Although there are no studies specifically evaluating the prognosis of patients who underwent thymectomy where the capsule was disrupted intraoperatively or the lesion was resected in fragments, it is important to record these features because in these circumstances the pathologist cannot properly evaluate the presence of capsular invasion or completeness of resection. The latter are important prognostic features. • ‘Intact specimen’ means that a TET is either completely surrounded by a fibrous capsule or is present in its entirety within the submitted specimen, without rupture of the tumour into surrounding tissues or on to the external surface of the specimen.  • ‘Surface disrupted’ means that a TET remains in one piece but shows exposure of the tumour onto the external surface of the specimen, secondary to disruption.  A fragmented specimen is when a TET is submitted in piecemeal form that precludes satisfactory identification of margins.  References 1 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. 2 Nicholson AG, Detterbeck FC, Marino M, Kim J, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kondo K, Lucchi M, Marom EM, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the T Component for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S73-80. |  |
| Non-core | MACROSCOPIC SITE OF PRIMARY TUMOUR | Single select value list: • Not specified • Thymic  o Single tumour  o >1 tumour • Ectopic (specify site/s) | TETs usually arise as a single nodule or mass in the thymus in the anterior mediastinum. However, cases of multiple, synchronous TETs have been described.1-3 Although synchronous TETs generally occur in the thymus in the anterior mediastinum, these tumours can also occur at ectopic sites. Although rare, ectopic TETs have been described in the neck, posterior mediastinum, pretracheal fat, deep to phrenic nerves, posterior to brachiocephalic (innominate) vein, aortopulmonary window, aortocaval groove, anterior mediastinal fat, cardiophrenic fat and base of skull. Ectopic thymomas can also present in the lung, where they should be dealt with as primary pulmonary neoplasms. Importantly, ectopic TETs should be distinguished from pleural or pericardial implants and metastases because the latter will up-stage the tumour. Many reported synchronous TETs differ in tumour subtype and stage. In addition, a case of synchronous thymoma and thymic carcinoid tumour has been reported in a patient with multiple neuroendocrine neoplasia type I.4 Therefore, when synchronous TETs are identified, each tumour should be recorded, microscopically reviewed and staged.   References 1 Suzuki H, Yoshida S, Hiroshima K, Nakatani Y and Yoshino I (2010). Synchronous multiple thymoma: report of three cases. Surgery today 40:456-459. 2 Bernatz PE, Harrison EG and Clagett OT (1961). Thymoma: a clinicopathological study. J Thorac Cardiovasc Surg 42:424-444. 3 Leuzzi G, Marino M, Alessandrini G, Sciuto R, Pescarmona E and Facciolo F (2015). Synchronous triple thymoma and true thymic hyperplasia simultaneously detected by F FDG PET-CT. Rev Esp Med Nucl Imagen Mol 34(4):272-274. 4 Miller BS, Rusinko RY and Fowler L (2008). Synchronous thymoma and thymic carcinoid in a woman with multiple endocrine neoplasia type 1: case report and review. Endocr Pract 14:713-716. |  |
| Non-core | MAXIMUM DIMENSION OF PRIMARY TUMOUR | Numeric: \_\_mm OR Cannot be assessed | A retrospective analysis of 5845 cases showed that size was not useful in predicting survival in relation to staging of TETs, so this is viewed as a non-core rather than as a core parameter.1 Identification of the primary tumour may be uncertain in cases with multiple foci and therefore the maximum dimension of the largest tumour should be recorded.  The maximum tumour size should still be recorded as the number of blocks sampled in a resected tumour is recommended to be 1 per centimetre of the maximum diameter. Inadequate sampling may lead to incorrect tumour classification.2   References 1 Nicholson AG, Detterbeck FC, Marino M, Kim J, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kondo K, Lucchi M, Marom EM, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the T Component for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S73-80. 2 Moran CA and Suster S (2000). On the histologic heterogeneity of thymic epithelial neoplasms. Impact of sampling in subtyping and classification of thymomas. Am J Clin Pathol 114(5):760-766. |  |
| Core | HISTOLOGICAL TUMOUR TYPE |  | Tumours should be classified according to the World Health Organisation (WHO) 2015 classification system for thymic tumours (see below).1-3  In cases of TETs showing more than one morphological subtype the following should be applied:  1) TETs showing more than one histological thymoma subtype: The diagnosis in such tumours should list all the histological WHO types, starting with the predominant component and then minor components. All should be quantified in 10% increments. This rule does not apply to AB thymoma which is a distinct entity (this should be documented as type AB 100%).2,4 2) TETs consisting of a thymic carcinoma component together with one or more thymoma component: Irrespective of the size/percentage of the thymic carcinoma component the diagnosis in such tumours should begin with the label “thymic carcinoma” (specifying the histological type and percentage) followed by the thymoma component(s) (quantified in 10% increments).1,2  3) TETs consisting of more than one thymic carcinoma component (with or without a thymoma component, and excluding thymic small cell carcinoma and thymic large cell neuroendocrine carcinoma, see below): the diagnosis in such tumours should begin with the predominant carcinoma; minor carcinoma components should be quantified next in 10% increments, eventually followed by the thymoma components, if present.1,2  4) Heterogeneous thymic tumours with a small cell or large cell neuroendocrine carcinoma component: These tumours are labelled ‘combined small cell carcinoma’ or ‘combined large cell neuroendocrine carcinoma’; the various components should be given and quantified in 10% increments.  References 1 WHO (World Health Organization) (2015). WHO Classification of Tumours of the Lung, Pleura, Thymus and Heart. Fourth edition Travis WD, Brambilla E, Burke AP, Marx A and Nicholson AG. IARC Press, Lyon, France. 2 Marx A, Ströbel P, Badve SS, Chalabreysse L, Chan J, Chen G, de Leval L, Detterbeck F, Girard N, Huang J, Kurrer MO, Lauriola L, Marino M, Matsuno Y, Molina TJ, Mukai K, Nicholson AG, Nonaka D, Rieker R, Rosai J, Ruffini E and Travis WD (2014). ITMIG Consensus Statement on the Use of the WHO Histological Classification of Thymoma and Thymic Carcinoma: Refined Definitions, Histological Criteria and Reporting. J Thor Oncol 9:596-611. 3 Marx A, Chan JK, Coindre JM, Detterbeck F, Girard N, Harris NL, Jaffe ES, Kurrer MO, Marom EM, Moreira AL, Mukai K, Orazi A and Strobel P (2015). The 2015 World Health Organization Classification of Tumors of the Thymus: Continuity and Changes. J Thorac Oncol 10(10):1383-1395. 4 Strobel P, Bauer A, Puppe B, Kraushaar T, Krein A, Toyka K, Gold R, Semik M, Kiefer R, Nix W, Schalke B, Muller-Hermelink HK and Marx A (2004). Tumor recurrence and survival in patients treated for thymomas and thymic squamous cell carcinomas: a retrospective analysis. J Clin Oncol 22(8):1501-1509. | Heading Use the 2015 WHO classification. Where relevant, if more than one subtype, list in 10% increments |
| Core | Thymoma | Single selection value list: • Not identified  • Present |  | if present, record predominant subtype and other subtypes |
| Core | Predominant subtype | List type (2015 WHO classification) and % |  |  |
| Core | Other subtype | List type (2015 WHO classification) and % |  | Repeat for each other subtype |
| Core | Thymic carcinoma | Single selection value list: • Not identified  • Present |  | if present, record predominant subtypes and other thymic carcinoma patterns |
| Core | Predominant subtype | List type (2015 WHO classification) and % |  |  |
| Core | Other subtype | List type (2015 WHO classification) and % |  | Repeat for each other subtype |
| Core | Thymic neuroendocrine tumours | Single selection value list: • Not identified  • Present |  | If present, record subtypes and percentage |
| Core | Typical carcinoid tumour | Numeric:\_\_\_% |  |  |
| Core | Atypical carcinoid tumour | Numeric:\_\_\_% |  |  |
| Core | Large cell neuroendocrine carcinoma | Numeric:\_\_\_% |  |  |
| Core | Small cell carcinoma | Numeric:\_\_\_% |  |  |
| Core | Final histological diagnosis | Text |  | Use 2015 WHO classification for combined tumours |
| Core | EXTENT OF DIRECT INVASION |  | The Masaoka-Koga staging system has been the most frequently used for staging,1,2 with refinement of definitions for anatomic staging parameters proposed in 2011,3 but this staging system has now been superseded by a TNM-based classification based on data from the ITMIG retrospective database of over 8000 patients analysed by an International Association for the Study of Lung Cancer (IASLC), thymic domain, committee.4,5 The T category is dependent on extent of direct local invasion. Use of an elastic stain is strongly recommended in assessing involvement of mediastinal structures in relation to elastic layers within mediastinal and visceral pleura, fibrous layer of the pericardium and the adventitia and media of the great vessels.  In relation to the new TNM-based staging system, the presence of capsular invasion was not prognostically significant in data from the ITMIG retrospective database study and tumours are therefore categorised as pT1a, independent of whether the capsule is breached, if the tumour has not directly infiltrated the mediastinal pleura. Similar data were found in separate meta-analyses.5,6 Invasion through the mediastinal pleura was also not found to be of prognostic significance in the cases from the ITMIG database, although evidence from Japanese patients demonstrated that invasion of the mediastinal pleura was associated with the cumulative incidence of recurrence (CIR)7 so this parameter remains part of the dataset, to be collected for further review and is categorised as pT1b, although it is recognised that this anatomic margin may not be easily identifiable on histology.5 Discussion with the surgeon may facilitate its identification in specimens.8  In order to maintain consistency in data collection, the following definitions, agreed by expert consensus, were proposed by an ITMIG-based group: • Pericardial invasion - microscopic involvement of the pericardium (either partial in the fibrous layer or penetrating through the serosal layer); • Visceral pleura/lung - microscopically confirmed direct penetration through the outer elastin layer of the visceral pleura with or without invasion into the lung parenchyma. In relation to the great vessels, opinions differed between involvement being defined as tumour cells being present within the adventitia, media or lumen. The consensus opinion, in the context of great vessels, was that tumour cells present within the media is the preferred histological compartment through which to define involvement, as it is easily seen compared to the adventitia on an elastic stain, and its involvement is likely relevant to surgical management in terms of need for partial resection and repair. In a similar fashion, involvement of the phrenic nerve is defined as tumour cells being present within the perineurium. ‘Other’ should be used if tumours infiltrate structures such as myocardium, trachea, oesophagus or chest wall. Involvement of muscle layers is viewed as the most reproducible parameter through which to collect data on positive involvement.   References 1 Masaoka A, Monden Y, Nakahara K and Tanioka T (1981). Follow-up study of thymomas with special reference to their clinical stages. Cancer 48(11):2485-2492. 2 Koga K, Matsuno Y, Noguchi M, Mukai K, Asamura H, Goya T and Shimosato Y (1994). A review of 79 thymomas: modification of staging system and reappraisal of conventional division into invasive and non-invasive thymoma. Pathol Int 44(5):359-367. 3 Detterbeck FC, Nicholson AG, Kondo K, Van Schil P and Moran C (2011). The Masaoka-Koga stage classification for thymic malignancies: clarification and definition of terms. J Thorac Oncol 6(7 Suppl 3):S1710-1716. 4 Bhora FY, Chen DJ, Detterbeck FC, Asamura H, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Kondo K, Lucchi M, Marino M, Marom EM, Nicholson AG, Okumura M, Ruffini E and Van Schil P (2014). The ITMIG/IASLC Thymic Epithelial Tumors Staging Project: A Proposed Lymph Node Map for Thymic Epithelial Tumors in the Forthcoming 8th Edition of the TNM Classification of Malignant Tumors. J Thorac Oncol 9(9 Suppl 2):S88-96. 5 Nicholson AG, Detterbeck FC, Marino M, Kim J, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kondo K, Lucchi M, Marom EM, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the T Component for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S73-80. 6 Gupta R, Marchevsky AM, McKenna RJ, Wick M, Moran C, Zakowski MF and Suster S (2008). Evidence-based pathology and the pathologic evaluation of thymomas: transcapsular invasion is not a significant prognostic feature. Arch Pathol Lab Med 132(6):926-930. 7 Ogawa K, Uno T, Toita T, Onishi H, Yoshida H, Kakinohana Y, Adachi G, Itami J, Ito H and Murayama S (2002). Postoperative radiotherapy for patients with completely resected thymoma: a multi-institutional, retrospective review of 103 patients. Cancer 94(5):1405-1413. 8 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. | Heading |
| Core | Tumour capsule | Single selection value list: • No invasion beyond capsule or limit of the thymus • Invasion beyond the mediastinum |  |  |
| Core | Mediastinal pleura | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Pericardium | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Lung (pulmonary parenchyma, visceral pleura, or both) | Single selection value list: • Not involved • Involved (specify lobe/s of the lung) • Cannot be assessed • Not applicable |  |  |
| Core | Great vessels |  |  | Heading |
| Core | Brachiocephalic (innominate) vein | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Superior vena cava | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Extrapericardial pulmonary artery or veins | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Aorta (ascending, arch or descending) | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Arch vessels | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Intrapericardial pulmonary artery | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Phrenic nerve | Single selection value list: • Not involved • Involved • Cannot be assessed • Not applicable |  |  |
| Core | Other involved organ(s)/site(s) by direct spread | Text |  |  |
| Core | SEPARATE EXTRATHYMIC TUMOUR NODULES/METASTASES |  | Separate extrathymic tumour nodules must be recorded as they form part of the TNM staging system. These are divided into two groups: first, those nodules that are limited to the pericardium and/or pleura (sometimes referred to as pericardial and pleural seeding), which constitute pM1a in TNM staging: second, nodules that are either within the lung parenchyma or distant organs, which constitute pM1b.1,2 The number of nodules in the pleura/pericardium should be recorded as there is some evidence that greater numbers portend an adverse prognosis.3 These synchronous metastatic foci will usually have the same morphology as the primary thymic neoplasm and need to be distinguished from the far rarer synchronous primary thymic epithelial tumours (see MACROSCOPIC SITE OF PRIMARY TUMOUR).4,5   References 1 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. 2 Kondo K, Van Schil P, Detterbeck FC, Okumura M, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Lucchi M, Marino M, Marom EM, Nicholson AG and Ruffini E (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the N and M components for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S81-87. 3 Okuda K, Yano M, Yoshino I, Okumura M, Higashiyama M, Suzuki K, Tsuchida M, Usuda J and Tateyama H (2014). Thymoma patients with pleural dissemination: nationwide retrospective study of 136 cases in Japan. Ann Thorac Surg 97(5):1743-1748. 4 Bernatz PE, Harrison EG and Clagett OT (1961). Thymoma: a clinicopathological study. J Thorac Cardiovasc Surg 42:424-444. 5 Leuzzi G, Marino M, Alessandrini G, Sciuto R, Pescarmona E and Facciolo F (2015). Synchronous triple thymoma and true thymic hyperplasia simultaneously detected by F FDG PET-CT. Rev Esp Med Nucl Imagen Mol 34(4):272-274. | Heading |
| Core | Pleural and/or pericardial | Single selection value list: • Not identified  • Present (specify location/s and optionally the number/location) |  |  |
| Core | Pulmonary intraparenchymal | Single selection value list: • Not identified  • Present |  |  |
| Core | Distant organ | Single selection value list: • Not identified  • Present (specify site(s)) |  |  |
| Non-core | RESPONSE TO NEOADJUVANT THERAPY | Single selection value list: • Cannot be assessed • Prior treatment not known • No prior treatment  • No response  • Positive response   o No or minimal tumour response  o Partial tumour response  o Complete | There is no recommended or agreed system for tumour regression grading (TRG) in TETs. There are sparse reports documenting the effects of neoadjuvant chemotherapy on TETs1 but there are no systematic studies on this subject. In other organ systems including carcinomas of the breast, stomach, oesophagus and colorectum, there is evidence that the response to neoadjuvant therapy provides prognostic information. Schemes for TRG for several of these organ systems have been published.2 Steroid therapy may also affect morphology by eliminating lymphocytes although this is not viewed as part of neoadjuvant therapy. In TETs, RECIST (Response Evaluation Criteria In Solid Tumours) parameters have been recorded as indicators of TRG. Histological features which have been assessed as TRG factors include decrease in number of viable cells,3,4 fibrosis,5 necrosis6,7 and cystic change. Biological cell cycle markers (e.g. p53) were used in one study combined with viability according lung cancer parameters (25% increments).4 However, few studies have systematically recorded TRG elements in a methodical fashion1 and there are no studies which have correlated TRG with disease outcome. A scoring system for the degree of fibrosis, adapted from lung cancer TRG, has been applied to TETs5 and it has been suggested that macroscopic evaluation with microscopic confirmation of the extent of necrosis should be recorded and that the viable tumour cell proportion should be recorded in 10% increments.8,9 It should be noted that similar changes to those documented in neoadjuvant-treated TETs may be observed in non-treated thymomas (necrosis, cystic change) as degenerative features.1  It is recommended that the response to neoadjuvant treatment in TET be recorded with the following provisos: 1. TRG is performed on resection specimens 2. Resected specimens should be adequately sampled (at least 1 block per centimetre of maximum tumour diameter) 3. The amount of viable tissue should be assessed as a percentage of the tumour 4. TRG should be scored using a 3-tier system – refer to Table 1.   Table 1: Proposed 3-tiered TRG system  Score 1: Criterion: Mainly viable tumour with no or minimal regression-associated fibro-inflammatory and cystic change\* limited to a few foci. TRG: No or minimal tumour response Score 2: Criterion: Multifocal or diffuse regression associated fibro-inflammatory changes and cystic change\*, with viable tumour ranging from diffuse sheets, streaks or nodules, to extensive regression with multifocal but easily identifiable residual tumour. TRG: Partial tumour response Score 3: Criterion: Mainly regression, with few irregularly scattered individual tumour cells or cell groups (all measuring less than 2 mm), or no residual tumour identified. TRG: Complete or near-complete response \* Regression associated fibro-inflammatory changes: fibrosis associated with macrophages, including foam cells, mixed inflammatory cells and calcification.     References 1 Weissferdt A and Moran CA (2013). The impact of neoadjuvant chemotherapy on the histopathological assessment of thymomas: a clinicopathological correlation of 28 cases treated with a similar regimen. Lung 191(4):379-383. 2 McCluggage WG, Judge MJ, Clarke BA, Davidson B, Gilks CB, Hollema H, Ledermann J, Matias-Guiu X, Mikami Y, Stewart CJR, Vang R and Hirschowitz L (2015). Dataset for reporting of ovary, fallopian tube and primary peritoneal carcinoma: Recommendations from the International Collaboration on Cancer Reporting (ICCR). Mod Path 28(8):1101-1122. 3 Korst R.J et al (2014). Neoadjuvant chemoradiotherapy for locally advanced thymic tumors: a phase II, multi-institutional clinical trial. J Thorac Cardiovasc Surg 147(1):36-44, 46 e31. 4 Mineo TC et al (2010). New predictors of response to neoadjuvant chemotherapy and survival for invasive thymoma: a retrospective analysis. Ann Surg Oncol 17(11):3022-3029. 5 Kawasaki H et al (2014). Weekly chemotherapy with cisplatin, vincristine, doxorubicin, and etoposide followed by surgery for thymic carcinoma. Eur J Surg Oncol 40(9):1151-1155. 6 Wright CD et al (2008). Induction chemoradiotherapy followed by resection for locally advanced Masaoka stage III and IVA thymic tumors. Ann Thorac Surg 85(2):385-389. 7 Kim ES et al (2004). Phase II study of a multidisciplinary approach with induction chemotherapy, followed by surgical resection, radiation therapy, and consolidation chemotherapy for unresectable malignant thymomas: final report. Lung Cancer 44(3):369-379. 8 Detterbeck FC, Moran C, Huang J, Suster S, Walsh G, Kaiser L and Wick M (2011). Which way is up? Policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol 6:S1730-1738. 9 Huang J et al (2010). Standard outcome measures for thymic malignancies. J Thorac Oncol 5(12):2017-2023. |  |
| Non-core | COEXISTENT PATHOLOGY | Multi select value list (choose all that apply): • Thymic hyperplasia   o Follicular  o Epithelial   o True • Cystic changes  o In tumour  o In adjacent thymus • Other (specify) | Thymectomy specimens from myasthenia gravis patients commonly demonstrate pathologic findings in the non-neoplastic thymus and the most common feature is thymic follicular hyperplasia. Thymic hyperplasia can be classified into three types: follicular, epithelial and true hyperplasia. Follicular hyperplasia is defined by the presence of B-cell follicles irrespective of the size or weight of the thymus. The standardised macroscopic and histopathological work-up of thymectomy specimens including the grading of thymic follicular hyperplasia has been reported by MGTX .1,2 Epithelial hyperplasia (nodular epithelial hyperplasia, also called ‘microscopic thymoma’) is a thymic epithelial cell proliferation forming discrete microscopic islands and it is not infrequently observed in thymic tissue from myasthenia gravis patients.3,4 It should be differentiated from ‘microthymoma’ which represents microscopic-sized true thymoma.5 True thymic hyperplasia is an increase in volume of the thymus which maintains normal histology.6 Because of wide variations of sizes and weights of the thymus in the normal population, true thymic hyperplasia is difficult to define except for extreme cases. The presence of thymic hyperplasia adjacent to a thymoma, irrespective of the type, has no known clinical significance.  Cystic changes can involve both thymic epithelial tumours and adjacent thymus.7-11 The description of cystic changes, although not of prognostic significance, may be important for clinicopathological correlation.   a Thymectomy and Myasthenia gravis multicentre, international clinical trial (MGTX)   References 1 Ströbel P, Moritz R, Leite MI, Willcox N, Chuang WY, Gold R, Nix W, Schalke B, Kiefer R, Müller-Hermelink HK, Jaretzki III A, Newsom-Davis J and Marx A (2008). The ageing and myasthenic thymus: A morphometric study validating a standard procedure in the histological workup of thymic specimens. J Neuroimmunol 201-202:64-73. 2 Marx A, Pfister F, Schalke B, Nix W and Ströbel P (2012). Thymus pathology observed in the MGTX trial. Ann NY Acad Sci 1275:92-100  3 Pescarmona E, Rosati S, Pisacane A, Rendina EA, Venuta F and Baroni CD (1992). Microscopic thymoma: histological evidence of multifocal cortical and medullary origin. Histopathology 20:263-266. 4 Puglisi F, Finato N, Mariuzzi L, Marchini C, Floretti G and Beltrami CA (1995). Microscopic thymoma and myasthenia gravis. J Clin Pathol 48:682-683. 5 Cheuk W, Tsang WY and Chan JK (2005). Microthymoma: definition of the entity and distinction from nodular hyperplasia of thymic epithelium (so-called microscopic thymoma). Am J Sur Pathol 29:415-419  6 Hofmann WJ, Möller P and Otto HF (1987). Thymic hyperplasia. I. True thymic hyperplasia. Review of the literature. Klin Wochenschr 65:49-52. 7 Suster S and Rosai J (1991). Multilocular thymic cyst: an acquired reactive process. Study of 18 cases. Am J Surg Pathol 15(4):388-398. 8 Moran CA and Suster S (2001). Thymoma with prominent cystic and hemorrhagic changes and areas of necrosis and infarction: a clinicopathologic study of 25 cases. Am J Surg Pathol 25(8):1086-1090. 9 Weissferdt A and Moran CA (2011). Thymic carcinoma associated with multilocular thymic cyst: a clinicopathologic study of 7 cases. Am J Surg Pathol 35(7):1074-1079. 10 Nakamura S, Tateyama H, Taniguchi T, Ishikawa Y, Kawaguchi K, Fukui T, Mizuno T, Ishiguro F and Yokoi K (2012). Multilocular thymic cyst associated with thymoma. A clinicopathologic study of 20 cases with an emphasison the pathogenesis of cyst formation. Am J Surg Pathol 36:1857-1864. 11 Araki T, Sholl LM, Gerbaudo VH, Hatabu H and Nishino M (2014). Intrathymic cyst: clinical and radiologic features in surgically resected cases. Clin Radiol 69(7):732-738 |  |
| Core | MARGIN STATUS | Single selection value list: • Cannot be assessed • Not involved  • Involved  o Macroscopic (specify margin/s, if possible)  o Microscopic (specify margin/s, if possible) | Complete resection has been repeatedly shown to be a prognostic parameter in thymomas and thymic carcinomas.1-3 Therefore, the evaluation and recording of the margin status is important. To be able to assess the margins, orientation of the specimen is crucial. As discussed earlier (see MACROSCOPIC SITE OF PRIMARY TUMOUR), once the tumour is removed from the tumour bed, orientation becomes difficult. Furthermore, the fatty tissue can become easily disrupted. Therefore, orientation of the specimen should ideally be started in situ by the surgeon and areas of concern need to be clearly communicated to the pathologist. Anterior, posterior, right and left surfaces should be clearly distinguished (e.g. inked with different colours or with a detailed block key). Furthermore, the surgeon should mark areas of concern and also representative areas adjacent to the pericardium, the large vessels (or mark these structures if resected) and right/left mediastinal pleural surfaces (if resected). If the resection specimen includes neighbouring organs such as lung, or large vessels, margins need to be evaluated on those organs as well. R0 resection is defined as complete resection without macroscopic or microscopic involvement of the margin by the tumour. R1 (incomplete) resection indicates microscopic tumour at the resection margin. R2 (incomplete) resection is defined as macroscopic tumour present at the resection margin. If the specimen is disrupted at the time of gross evaluation and cannot be reconstructed, then the assessment of margins might not be possible.  References 1 Kondo K and Monden Y (2003). Lymphogenous and hematogenous metastasis of thymic epithelial tumors. Ann Thorac Surg 76(6):1859-1864; discussion 1864-1855. 2 Ruffini E, Detterbeck F, Van Raemdonck D, Rocco G, Thomas P, Weder W, Brunelli A, Evangelista A, Venuta F and European Association of Thoracic Surgeons (ESTS) Thymic Working Group (2014). Tumours of the thymus: a cohort study of prognostic factors from the European Society of Thoracic Surgeons database. Eur J Cardiothorac Surg 46(3):361-368. 3 Moser B, Scharitzer M, Hacker S, Ankersmit J, Matilla JR, Lang G, Aigner C, Taghavi S and Klepetko W (2014). Thymomas and thymic carcinomas: prognostic factors and multimodal management. Thorac Cardiovasc Surg. 62(2):153-160. |  |
| Core | LYMPH NODE STATUS | Single selection value list: • No nodes submitted or found • Not involved • Involved | Involvement of lymph nodes by TETs is an adverse prognostic factor.1,2 Lymph node status should be recorded according to the recommended anatomic map in relation to the ITMIG & IASLC TNM system,1,3 namely anterior (perithymic) nodes (N 1) and deep intrathoracic or cervical nodes (N 2), whilst any positive lymph node was viewed as stage IVb within the Masaoka-Koga system. As the location of lymph nodes found during the gross inspection of a thymectomy specimen may be problematic, either the specimen needs to be properly oriented by the surgeon, or labelled specifically within separate pots. Lymph nodes outside N1 and N2 are regarded as distant metastasis (pM1b).1  References 1 Kondo K, Van Schil P, Detterbeck FC, Okumura M, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Lucchi M, Marino M, Marom EM, Nicholson AG and Ruffini E (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the N and M components for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S81-87. 2 Viti A, Bertolaccini L and Terzi A (2014). What is the role of lymph nodal metastases and lymphadenectomy in the surgical treatment and prognosis of thymic carcinomas and carcinoids? Interact Cardiovasc Thorac Surg 19(6):1054-1058. 3 Bhora FY, Chen DJ, Detterbeck FC, Asamura H, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Kondo K, Lucchi M, Marino M, Marom EM, Nicholson AG, Okumura M, Ruffini E and Van Schil P (2014). The ITMIG/IASLC Thymic Epithelial Tumors Staging Project: A Proposed Lymph Node Map for Thymic Epithelial Tumors in the Forthcoming 8th Edition of the TNM Classification of Malignant Tumors. J Thorac Oncol 9(9 Suppl 2):S88-96. | if involved, record Number of lymph nodes examined and Number of positive lymph nodes for each location type |
| Core | Anterior (perithymic) nodes ( N1) | Number of lymph nodes examined AND Number of positive lymph nodes OR Number cannot be determined |  |  |
| Core | Deep intrathoracic or cervical nodes (N2) | Number of lymph nodes examined AND Number of positive lymph nodes OR Number cannot be determined |  |  |
| Core | Unspecified location within N 1 or 2 | Number of lymph nodes examined AND Number of positive lymph nodes OR Number cannot be determined |  |  |
| Core | Location/s outside N 1 or 2 (M1b disease) | Number of lymph nodes examined AND Number of positive lymph nodes OR Number cannot be determined |  |  |
| Non-core | ANCILLARY STUDIES |  |  | Heading |
| Non-core | Immunohistochemical markers | Single selection value list: • Not performed • Performed | Immunohistochemical analysis of thymic resection specimens may be performed for several reasons: 1. To exclude or confirm the presence of a tumour of thymic epithelial origin1 2. To aid in subtyping of thymomas2 3. To establish the origin of a thymic carcinoma as either a primary thymic carcinoma or a metastasis The differential diagnostic spectrum of thymoma is related to either its epithelial component or to the lymphoid component. The lymphoid component of “B-type” thymoma and of thymic follicular hyperplasia may raise the suspicion of non-Hodgkin lymphoma, especially T-lymphoblastic leukaemia/lymphoma. Immunohistochemistry may be applied to type the lymphoid population [normally composed of immature, CD3/terminal deoxynucleotidyl transferase (TdT/CD1a/CD99+) lymphocytes], or to confirm the presence of an epithelial component, which may be highlighted by pan-cytokeratin and/or p63 stains. The epithelial component in thymic epithelial tumours with a sparse lymphoid component may raise the possibility of either a germ cell tumour or metastatic carcinoma.1,3 Germ cell tumours may be diagnosed by appropriate immunohistochemical stains including SALL4, OCT4, CD117, CD30, D2-40, human chorionic gonadotropin (hCG), placental alkaline phosphatase (PLAP), and α-fetoprotein (AFP).1 Subtyping of thymomas is primarily based on histology; immunohistochemical stains (cytokeratin and/or p63) may be helpful in the evaluation of the density of the epithelial cells in B-type thymoma thus aiding the diagnosis of B1/2/3 thymoma. Similarly, cytokeratin stains may be used to confirm the epithelial nature of the spindle cells in type A, type AB and in metaplastic thymoma. Epithelial expression of CD20 is reported to be more frequent among type A and AB thymomas.4 Neuroendocrine markers may be useful to rule out neuroendocrine tumours.2 Distinguishing thymoma (in particular type B3 thymoma) and thymic carcinoma may occasionally be problematic; there are no immunohistochemical markers that can reliably segregate these entities. However, CD5, CD117 and the recently described markers GLUT1 and MUC1 show a higher incidence of staining in thymic carcinoma (in particular, thymic squamous cell carcinoma) compared to thymoma.5,6 Ki-67 labelling index in epithelial tumour cells of ≥13.5% has been suggestive of thymic carcinoma.7  The diagnosis of thymic carcinoma essentially involves the exclusion of metastasis; immunohistochemical analysis may support a diagnosis of thymic carcinoma but cannot establish the diagnosis with certainty. Expression of CD5, particularly in combination with CD117 positivity, lends some support to a diagnosis of thymic carcinoma. Several new markers (FoxN1 and CD205) may further support a diagnosis of thymic carcinoma. Other markers may be applied to rule out thymic carcinoma by confirming a non-thymic origin, such as TTF-1. However, given the great diversity in histological subtypes of thymic carcinoma, the specificity of markers routinely used to diagnose carcinoma of a particular origin may be considerably lower in this situation.8   References 1 den Bakker MA and Oosterhuis JW (2009). Tumours and tumour-like conditions of the thymus other than thymoma; a practical approach. Histopathology 54(1):69-89. 2 den Bakker MA, Roden AC, Marx A and Marino M (2014). Histologic classification of thymoma: a practical guide for routine cases. J Thorac Oncol 9(9 Suppl 2):S125-130. 3 Marchevsky A, Marx A, Strobel P, Suster S, Venuta F, Marino M, Yousem S and Zakowski M (2011). Policies and reporting guidelines for small biopsy specimens of mediastinal masses. J Thorac Oncol 6(7 Suppl 3):S1724-1729. 4 Chilosi M, Castelli P, Martignoni G, Pizzolo G, Montresor E, Facchetti F, Truini M, Mombello A, Lestani M, Scarpa A and et al. (1992). Neoplastic epithelial cells in a subset of human thymomas express the B cell-associated CD20 antigen. Am J Surg Pathol 16(10):988-997. 5 Kaira K, Murakami H, Serizawa M, Koh Y, Abe M, Ohde Y, Takahashi T, Kondo H, Nakajima T and Yamamoto N (2011). MUC1 expression in thymic epithelial tumors: MUC1 may be useful marker as differential diagnosis between type B3 thymoma and thymic carcinoma. Virchows Arch 458(5): 615-620. 6 Kojika M, Ishii G, Yoshida J, Nishimura M, Hishida T, Ota SJ, Murata Y, Nagai K and Ochiai A (2009). Immunohistochemical differential diagnosis between thymic carcinoma and type B3 thymoma: diagnostic utility of hypoxic marker, GLUT-1, in thymic epithelial neoplasms. Mod Pathol 22(10):1341-1350. 7 Roden AC, Yi ES, Jenkins SM, Donovan JL, Cassivi SD, Garces YI, Marks RS and Aubry MC (2015). Diagnostic significance of cell kinetic parameters in World Health Organization type A and B3 thymomas and thymic carcinomas. Hum Pathol 46(1):17-25. 8 Marx A, Ströbel P, Badve SS, Chalabreysse L, Chan J, Chen G, de Leval L, Detterbeck F, Girard N, Huang J, Kurrer MO, Lauriola L, Marino M, Matsuno Y, Molina TJ, Mukai K, Nicholson AG, Nonaka D, Rieker R, Rosai J, Ruffini E and Travis WD (2014). ITMIG Consensus Statement on the Use of the WHO Histological Classification of Thymoma and Thymic Carcinoma: Refined Definitions, Histological Criteria and Reporting. J Thor Oncol 9:596-611. | If performed, record positive, negative and equivocal markers and interpretation and conclusions |
| Non-core | Positive antibodies | Text |  |  |
| Non-core | Negative antibodies | Text |  |  |
| Non-core | Equivocal antibodies | Text |  |  |
| Non-core | Interpretation and conclusions | Text |  |  |
| Non-core | Molecular studies | Single selection value list: • Not performed • Performed | Molecular studies have not been applied routinely for the diagnosis of thymic epithelial tumours. A diagnosis of NUT carcinoma needs immunohistochemical and/or molecular genetic confirmation.1,2 The sensitivities of NUT immunohistochemical staining have been reported as 60% and 87%.1,2 There have been a few reports of primary mediastinal synovial sarcoma confirmed by FISH.   References 1 French CA (2010). Demystified molecular pathology of NUT midline carcinomas. J Clin Pathol 63(6):492-496. 2 Haack H, Johnson LA, Fry CJ, Crosby K, Polakiewicz RD, Stelow EB, Hong SM, Schwartz BE, Cameron MJ, Rubin MA, Chang MC, Aster JC and French CA (2009). Diagnosis of NUT midline carcinoma using a NUT-specific monoclonal antibody. Am J Surg Pathol 33(7):984-991. | If performed, record specific tests and results |
| Non-core | Tests and results | Text |  |  |
| Core | TNM 8th edition Pathologic Staging for Thymic Epithelial Tumours |  | At least 15 different stage classification systems have been proposed, beginning as far back as 1978.1 Until 2016, the most widely used was the Masaoka system,2 modified and refined in 1994,3 with refinement of definitions for anatomic staging parameters proposed in 2011.4 This has now been replaced by a TNM-based classification based on data from the ITMIG retrospective database of over 8000 patients.5 In the new TNM 8th editions, both UICC6 and AJCC7, T stage is based on the extent of direct invasion of mediastinal structures (see above section),8 nodal disease is based on involvement of lymph nodes in anterior (perithymic) (N1) and deep/cervical (N2) compartments, and M stage based on the presence of separate pleural and pericardial nodules (M1a) and pulmonary intraparenchymal nodule or distant organ metastasis (M1b).9 The Masaoka-Koga system could still be used if part of ongoing studies but the TNM system should be used henceforth as the method of staging.10  References 1 Filosso PL, Ruffini E, Lausi PO, Lucchi M, Oliaro A and Detterbeck F (2014). Historical perspectives: The evolution of the thymic epithelial tumors staging system. Lung Cancer 83(2):126-132. 2 Masaoka A, Monden Y, Nakahara K and Tanioka T (1981). Follow-up study of thymomas with special reference to their clinical stages. Cancer 48(11):2485-2492. 3 Koga K, Matsuno Y, Noguchi M, Mukai K, Asamura H, Goya T and Shimosato Y (1994). A review of 79 thymomas: modification of staging system and reappraisal of conventional division into invasive and non-invasive thymoma. Pathol Int 44(5):359-367. 4 Detterbeck FC, Nicholson AG, Kondo K, Van Schil P and Moran C (2011). The Masaoka-Koga stage classification for thymic malignancies: clarification and definition of terms. J Thorac Oncol 6(7 Suppl 3):S1710-1716. 5 Bhora FY, Chen DJ, Detterbeck FC, Asamura H, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Kondo K, Lucchi M, Marino M, Marom EM, Nicholson AG, Okumura M, Ruffini E and Van Schil P (2014). The ITMIG/IASLC Thymic Epithelial Tumors Staging Project: A Proposed Lymph Node Map for Thymic Epithelial Tumors in the Forthcoming 8th Edition of the TNM Classification of Malignant Tumors. J Thorac Oncol 9(9 Suppl 2):S88-96. 6 Brierley JD, Gospodarowicz MK and Wittekind C (eds) (2016). UICC TNM Classification of Malignant Tumours, 8th Edition, Wiley-Blackwell. 7 Amin MB, Edge SB and Greene FL et al (eds) (2017). AJCC Cancer Staging Manual. 8th ed., Springer, New York. 8 Nicholson AG, Detterbeck FC, Marino M, Kim J, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kondo K, Lucchi M, Marom EM, Okumura M, Ruffini E and Van Schil P (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the T Component for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S73-80. 9 Kondo K, Van Schil P, Detterbeck FC, Okumura M, Stratton K, Giroux D, Asamura H, Crowley J, Falkson C, Filosso PL, Giaccone G, Huang J, Kim J, Lucchi M, Marino M, Marom EM, Nicholson AG and Ruffini E (2014). The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposals for the N and M components for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol 9(9 Suppl 2):S81-87. 10 Rami-Porta R (ed) (2016). Staging Manual in Thoracic Oncology, 2nd edition: An International Association for the Study of Lung Cancer Publication, Developed in collaboration with AJCC and UICC, Editorial Rx Press, North Fort Myers, FL, US. | Heading Note that permission to publish cancer staging tables may be needed in your implementation. It is advisable to check. |
| Core | Suffixes | Record as applicable • r - recurrent • m - multiple primary tumours • y - post treatment |  |  |
| Core | Primary tumour (pT) | Per 8th edition |  |  |
| Core | Regional lymph nodes (pN) | Per 8th edition |  |  |
| Core | Distant metastases (pM) | Per 8th edition |  |  |