| **Core/**  **Non-Core** | **Element name** | **Values** | **Commentary** | **Implementation notes** |
| --- | --- | --- | --- | --- |
| Core | OPERATIVE PROCEDURE | Multi selection value list (select all that apply):  • Not specified  OR  • Biopsy (incisional, excisional, diagnostic sampling)  • Resection, specify   * Temporal bone resection * Sleeve resection (cartilaginous portion of canal, * including tympanic membrane) * Lateral temporal bone resection (sleeve and * middle ear) * Radical external auditory canal resection * Subtotal temporal bone resection * Radical temporal bone resection (mastoidectomy, * petrousectomy)   • Parotidectomy  • Neck (lymph node) dissection\*, specify  • Other, specify | The anatomy and surgical interventions of the ear and temporal bone are complex, with unfamiliar terminology frequently used (**See Figure 1. Diagram of ear and temporal bone anatomic landmarks**). Thus, it is absolutely critical to maintain open communication with the treating surgeon, oncologist, dermatologist and radiologist with respect to exact anatomic site of involvement, tumour laterality, and specific operative procedures or landmarks identified to yield the most accurate information.1-4  **References**  1 Cristalli G, Manciocco V, Pichi B, Marucci L, Arcangeli G, Telera S and Spriano G (2009). Treatment and outcome of advanced external auditory canal and middle ear squamous cell carcinoma. J Craniofac Surg 20(3):816-821.  2 Isipradit P, Wadwongtham W, Aeumjaturapat S and Aramwatanapong P (2005). Carcinoma of the external auditory canal. J Med Assoc Thai 88(1):114-117.  3 Madsen AR, Gundgaard MG, Hoff CM, Maare C, Holmboe P, Knap M, Thomsen LL, Buchwald C, Hansen HS, Bretlau P and Grau C (2008). Cancer of the external auditory canal and middle ear in Denmark from 1992 to 2001. Head Neck 30(10):1332-1338.  4 Nakagawa T, Kumamoto Y, Natori Y, Shiratsuchi H, Toh S, Kakazu Y, Shibata S, Nakashima T and Komune S (2006). Squamous cell carcinoma of the external auditory canal and middle ear: an operation combined with preoperative chemoradiotherapy and a free surgical margin. Otol Neurotol 27(2):242-248; discussion 249. | \*If a neck dissection is submitted, then a separate dataset is used to record the information. |
| Core | SPECIMENS SUBMITTED | Single selection value list:  • Not specified  • Biopsy only  OR  Multi selection value list (select all that apply):  • Sleeve resection of temporal bone  • Lateral temporal bone  • Subtotal temporal bone resection  • Partial mastoidectomy with middle ear contents  • Radical mastoidectomy  • Parotidectomy (whether superficial and/or deep lobes)  • Neck dissection, specify extent  • Other, specify | In light of the complex anatomy and often unfamiliar surgical interventions of the ear and temporal bone, it is imperative to obtain information about the exact anatomic site of involvement, tumour laterality, and specific operative procedures or landmarks identified to yield the most accurate information.1  ‘Not specified’ should be used rarely and only after good faith effort has been employed to obtain the requisite information.  **References**  1 Kollert M, Draf W, Minovi A, Hofmann E and Bockmuhl U (2004). [Carcinoma of the external auditory canal and middle ear: therapeutic strategy and follow up]. Laryngorhinootologie 83(12):818-823. | . |
| Core | TUMOUR SITE | Multi selection value list (select all that apply):  • Cannot be assessed  OR  • External auditory canal (EAC)   * Left * Right * Laterality not specified   • Middle ear   * Left * Right * Laterality not specified   • Temporal bone (including mastoid, petrous)   * Left * Right * Laterality not specified   • Inner ear   * Left * Right * Laterality not specified   • Other, specify including laterality | It is important to document the exact site of the tumour, as tumour location is correlated with patient outcome. As an example, patients with middle ear squamous cell carcinomas have a worse outcome than patients with squamous cell carcinoma of the external auditory canal.1-4  **References**  1 Cristalli G, Manciocco V, Pichi B, Marucci L, Arcangeli G, Telera S and Spriano G (2009). Treatment and outcome of advanced external auditory canal and middle ear squamous cell carcinoma. J Craniofac Surg 20(3):816-821.  2 Madsen AR, Gundgaard MG, Hoff CM, Maare C, Holmboe P, Knap M, Thomsen LL, Buchwald C, Hansen HS, Bretlau P and Grau C (2008). Cancer of the external auditory canal and middle ear in Denmark from 1992 to 2001. Head Neck 30(10):1332-1338.  3 Yin M, Ishikawa K, Honda K, Arakawa T, Harabuchi Y, Nagabashi T, Fukuda S, Taira A, Himi T, Nakamura N, Tanaka K, Ichinohe M, Shinkawa H, Nakada Y, Sato H, Shiga K, Kobayashi T, Watanabe T, Aoyagi M, Ogawa H and Omori K (2006). Analysis of 95 cases of squamous cell carcinoma of the external and middle ear. Auris Nasus Larynx 33(3):251-257.  4 Stell PM and McCormick MS (1985). Carcinoma of the external auditory meatus and middle ear. Prognostic factors and a suggested staging system. J Laryngol Otol 99(9):847-850. |  |
| Non-Core | TUMOUR FOCALITY | Single selection value list:  • Unifocal  • Bilateral  • Multifocal, specify number of tumours in specimen  • Cannot be assessed, specify | The identification of bilateral tumours, especially in the setting of endolymphatic sac tumours,1,2 paraganglioma,3,4 acoustic/vestibular Schwannoma5 and meningioma5 increases the potential discovery of inherited or syndrome associated disease.  **References**  1 Bausch B, Wellner U, Peyre M, Boedeker CC, Hes FJ, Anglani M, de Campos JM, Kanno H, Maher ER, Krauss T, Sanso G, Barontini M, Letizia C, Hader C, Schiavi F, Zanoletti E, Suarez C, Offergeld C, Malinoc A, Zschiedrich S, Glasker S, Bobin S, Sterkers O, Ba Huy PT, Giraud S, Links T, Eng C, Opocher G, Richard S and Neumann HP (2016). Characterization of endolymphatic sac tumors and von Hippel-Lindau disease in the International Endolymphatic Sac Tumor Registry. Head Neck 38 Suppl 1:E673-679.  2 Michaels L (2007). Origin of endolymphatic sac tumor. Head Neck Pathol 1(2):104-111.  3 Alvarez-Morujo RJ, Ruiz MA, Serafini DP, Delgado IL, Friedlander E and Yurrita BS (2016). Management of multicentric paragangliomas: Review of 24 patients with 60 tumors. Head Neck 38(2):267-276.  4 Boedeker CC (2011). Paragangliomas and paraganglioma syndromes. GMS Curr Top Otorhinolaryngol Head Neck Surg 10:Doc03.  5 Slattery WH (2015). Neurofibromatosis type 2. Otolaryngol Clin North Am 48(3):443-460. |  |
| Core/  Non-Core | TUMOUR DIMENSIONS | Numeric:  • Maximum tumour dimension (largest tumour) \_\_\_ mm  Non-Core  • Additional dimensions (largest tumour)  \_\_\_ mm x \_\_\_ mm  OR  • Cannot be assessed, specify | The single greatest tumour dimension, using macroscopic and/or microscopic measurements, should be used to determine the most accurate extent of tumour. In biopsy samples, it may be underestimated. Thus, to be as thorough as possible, the documentation of the tumour dimension may require additional clinical or imaging information to yield this value. |  |
| Core | HISTOLOGICAL TUMOUR TYPE | Multi selection value list (select all that apply):  • Squamous cell carcinoma  • Ceruminous adenocarcinoma   * Ceruminous adenocarcinoma, not otherwise specified (NOS) * Ceruminous mucoepidermoid carcinoma * Ceruminous adenoid cystic carcinoma   • Ceruminous adenoma   * Ceruminous adenoma (NOS) * Ceruminous pleomorphic adenoma * Ceruminous syringocystadenoma papilliferum   • Aggressive papillary tumour  • Endolymphatic sac tumour  • Middle ear adenoma (carcinoid)  • Middle ear adenocarcinoma  • Meningioma (ectopic or direct extension)  • Vestibular schwannoma  • Paraganglioma (jugulotympanic glomus tumour)  • Other, specify  • Cannot be assessed, specify | The types of ear and temporal bone primary tumours are limited. Few cases have been reported for several specific tumour categories, and thus prognostication about each specific tumour type is limited, at best. Overall, the most common tumour type is squamous cell carcinoma, and it is known to have the worst patient outcome.1-4 When adenoid cystic carcinoma and mucoepidermoid carcinoma are the ceruminous adenocarcinoma type, parotid gland evaluation is recommended to exclude origin from the parotid gland with secondary invasion into the external canal.5,6  World Health Organization (WHO) classification of tumours of the eara7   | **Descriptor** | **ICD-O codes** | | --- | --- | | Squamous cell carcinoma | 8070/3 | | Ceruminous adenocarcinoma | 8420/3 | | Ceruminous adenoid cystic carcinoma | 8200/3 | | Ceruminous mucoepidermoid carcinoma | 8430/3 | | Ceruminous adenoma | 8420/0 | | Aggressive papillary tumour | 8260/1 | | Endolymphatic sac tumour | 8140/3 | | Vestibular schwannoma | 9560/0 | | Meningioma | 9530/0 | | Middle ear adenoma | 8140/0 |   a The morphology codes are from the International Classification of Diseases for Oncology (ICD-O). Behaviour is coded /0 for benign tumours; /1 for unspecified, borderline, or uncertain behaviour; /2 for carcinoma in situ and grade III intraepithelial neoplasia; and /3 for malignant tumours.  © WHO/International Agency for Research on Cancer (IARC). Reproduced with permission  **References**  1 Hosokawa S, Mizuta K, Takahashi G, Okamura J, Takizawa Y, Hosokawa K, Yamatodani T and Mineta H (2014). Carcinoma of the external auditory canal: histological and treatment groups. B-ent 10(4):259-264.  2 Rodriguez Paramas A, Gil Carrasco R, Arenas Britez O and Yurrita Scola B (2004). [Malignant tumours of the external auditory canal and of the middle ear]. Acta Otorrinolaringol Esp 55(10):470-474.  3 Testa JR, Fukuda Y and Kowalski LP (1997). Prognostic factors in carcinoma of the external auditory canal. Arch Otolaryngol Head Neck Surg 123(7):720-724.  4 Shen W, Sakamoto N and Yang L (2014). Prognostic models to predict overall and cause-specific survival for patients with middle ear cancer: a population-based analysis. BMC Cancer 14:554.  5 Choi JY, Choi EC, Lee HK, Yoo JB, Kim SG and Lee WS (2003). Mode of parotid involvement in external auditory canal carcinoma. J Laryngol Otol 117(12):951-954.  6 Crain N, Nelson BL, Barnes EL and Thompson LD (2009). Ceruminous gland carcinomas: a clinicopathologic and immunophenotypic study of 17 cases. Head Neck Pathol 3(1):1-17.  7 El-Naggar AK, Chan JKC, Grandis JR, Takata T, Slootweg PJ Eds. (2017). WHO Classification of Head and Neck Tumours (4th Edition). IARC, Lyon, France. | Value list from the WHO Classification of Head and Neck Tumours (2017).  Note that permission to publish the WHO classification of tumours may be needed in your implementation. It is advisable to check with the International Agency on Cancer research (IARC). |
| Core | HISTOLOGICAL TUMOUR GRADE | Single selection value list:  • Not applicable  • Low grade (well differentiated)  • Intermediate grade (moderately differentiated)  • High grade (poorly differentiated)  • Cannot be assessed, specify | Generally, grades are applied to squamous cell carcinoma or salivary gland primaries only, while other tumour types for the most part do not have tiered grading systems (such as ceruminous adenocarcinoma, middle ear adenoma, endolymphatic sac tumours or schwannoma). Poorly differentiated tumours portend a poor patient survival.1 The same grading of central nervous system meningiomas is applied to ear and temporal bone, realising that >95% are World Health Organization (WHO) grade 1 tumours.  **References**  1 Leong SC, Youssef A and Lesser TH (2013). Squamous cell carcinoma of the temporal bone: outcomes of radical surgery and postoperative radiotherapy. Laryngoscope 123(10):2442-2448. |  |
| Core | EXTENT OF INVASION | Multi selection value list (select all that apply):  • Not identified  OR  • Bone and/or cartilage invasion (EAC)  • Jugular bulb  • Carotid artery invasion  • Dura  • Brain parenchyma invasion  • Parotid gland  • Temporomandibular joint (TMJ)  • Soft tissue involvement  • Skin involvement  • Nerve invasion, specify nerve if possible (e.g. facial nerve, tympanic nerve, glossopharyngeal nerve, lesser petrosal nerve, greater petrosal nerve)  • Other, specify  • Cannot be assessed, specify | The extent of invasion may need to be evaluated by imaging or during intraoperative assessment, as histologic identification of these structures may not be feasible. If there is involvement of any of these recognized structures, documentation will provide prognosis and management information. For example, patients with primary ear and temporal bone carcinoma with parotid gland involvement have a worse prognosis than patients without parotid gland involvement.1 If there is advanced disease clinically, then parotid gland resection is generally recommended.1 Similarly, when there is destructive cartilage and/or bone invasion, the patients tend to have a worse prognosis.2-6 The macroscopic and microscopic extent of tumour frequently overlap. Thus, invasion “microscopically” into any of these structures is for the most part not recognized, unless the part is specifically stated to be from the site. Thus, on histologic examination, you may not recognize the specific structure. Therefore, correlation between macroscopic and microscopic findings is encouraged to yield the most meaningful findings.4,7-10 As an example, patients who exhibit dura involvement, will have a worse patient outcome.6,10  Due to the type of samples, tumour budding or tentacular pattern of invasion may not be histologically identified. However, if this type of growth is seen in squamous cell carcinoma, patients tend to have a shorter survival.11-13  **References**  1 Choi JY, Choi EC, Lee HK, Yoo JB, Kim SG and Lee WS (2003). Mode of parotid involvement in external auditory canal carcinoma. J Laryngol Otol 117(12):951-954.  2 Gidley PW (2009). Managing malignancies of the external auditory canal. Expert Rev Anticancer Ther 9(9):1277-1282.  3 Hosokawa S, Mizuta K, Takahashi G, Okamura J, Takizawa Y, Hosokawa K, Yamatodani T and Mineta H (2014). Carcinoma of the external auditory canal: histological and treatment groups. B-ent 10(4):259-264.  4 Ito M, Hatano M and Yoshizaki T (2009). Prognostic factors for squamous cell carcinoma of the temporal bone: extensive bone involvement or extensive soft tissue involvement? Acta Otolaryngol 129(11):1313-1319.  5 Testa JR, Fukuda Y and Kowalski LP (1997). Prognostic factors in carcinoma of the external auditory canal. Arch Otolaryngol Head Neck Surg 123(7):720-724.  6 Pfreundner L, Schwager K, Willner J, Baier K, Bratengeier K, Brunner FX and Flentje M (1999). Carcinoma of the external auditory canal and middle ear. Int J Radiat Oncol Biol Phys 44(4):777-788.  7 Chee G, Mok P and Sim R (2000). Squamous cell carcinoma of the temporal bone: diagnosis, treatment and prognosis. Singapore Med J 41(9):441-446, 451.  8 Bacciu A, Clemente IA, Piccirillo E, Ferrari S and Sanna M (2013). Guidelines for treating temporal bone carcinoma based on long-term outcomes. Otol Neurotol 34(5):898-907.  9 Nakagawa T, Kumamoto Y, Natori Y, Shiratsuchi H, Toh S, Kakazu Y, Shibata S, Nakashima T and Komune S (2006). Squamous cell carcinoma of the external auditory canal and middle ear: an operation combined with preoperative chemoradiotherapy and a free surgical margin. Otol Neurotol 27(2):242-248; discussion 249.  10 Schwager K, Pfreundner L, Hoppe F, Baier G, Willner J and Baier K (2001). [Carcinoma of the external ear canal and middle ear as interdisciplinary challenge for ear surgery and radiotherapy]. Laryngorhinootologie 80(4):196-202.  11 Okado Y, Aoki M, Hamasaki M, Koga K, Sueta T, Shiratsuchi H, Oda Y, Nakagawa T and Nabeshima K (2015). Tumor budding and laminin5-gamma2 in squamous cell carcinoma of the external auditory canal are associated with shorter survival. Springerplus 4:814.  12 Li Y, Bai S, Carroll W, Dayan D, Dort JC, Heller K, Jour G, Lau H, Penner C, Prystowsky M, Rosenthal E, Schlecht NF, Smith RV, Urken M, Vered M, Wang B, Wenig B, Negassa A and Brandwein-Gensler M (2013). Validation of the risk model: high-risk classification and tumor pattern of invasion predict outcome for patients with low-stage oral cavity squamous cell carcinoma. Head Neck Pathol 7(3):211-223.  13 Brandwein-Gensler M, Teixeira MS, Lewis CM, Lee B, Rolnitzky L, Hille JJ, Genden E, Urken ML and Wang BY (2005). Oral squamous cell carcinoma: histologic risk assessment, but not margin status, is strongly predictive of local disease-free and overall survival. Am J Surg Pathol 29(2):167-178. | Invasion into any of these anatomical structures may be a clinical/surgical and/or imaging observation and/or histology finding(s). |
| Core | BONE/CARTILAGE INVASION | Single selection value list:  • Not identified  • Present   * Clinical observation and/or imaging * Histologic   • Cannot be assessed, specify | Bone and/or cartilage invasion may be a macroscopic feature, sometimes not seen on histology sections due to the nature of the clinical sampling performed. However, it is recommended that a histologic section through the involved bone should be performed to obtain histologic evidence of the extent of bone and/or cartilage involvement. In general, stage correlates with bone and/or cartilage invasion, with high stage patients more frequently showing bone invasion than low stage patients. Further, patients with bone and/or cartilage invasion will usually have a worse prognosis and require more extensive treatment than patients without bone invasion.1,2  **References**  1 Hashi N, Shirato H, Omatsu T, Kagei K, Nishioka T, Hashimoto S, Aoyama H, Fukuda S, Inuyama Y and Miyasaka K (2000). The role of radiotherapy in treating squamous cell carcinoma of the external auditory canal, especially in early stages of disease. Radiother Oncol 56(2):221-225.  2 Ito M, Hatano M and Yoshizaki T (2009). Prognostic factors for squamous cell carcinoma of the temporal bone: extensive bone involvement or extensive soft tissue involvement? Acta Otolaryngol 129(11):1313-1319. |  |
| Core | PERINEURAL INVASION | Single selection value list:  • Not identified  • Present  • Cannot be assessed, specify | If the biopsy is very small with only tumour included, it may be prudent to use “cannot be assessed” in order to alert the clinician that perineural invasion cannot be reliably excluded in the sampled material. Patients who manifest perineural invasion, especially if it is identified in large or named nerves (such as lesser petrosal nerve, tympanic nerve), have a worse clinical outcome, irrespective of the tumour type or tumour grade.1,2  **References**  1 Chee G, Mok P and Sim R (2000). Squamous cell carcinoma of the temporal bone: diagnosis, treatment and prognosis. Singapore Med J 41(9):441-446, 451.  2 Higgins TS and Antonio SA (2010). The role of facial palsy in staging squamous cell carcinoma of the temporal bone and external auditory canal: a comparative survival analysis. Otol Neurotol 31(9):1473-1479. |  |
| Core | LYMPHOVASCULAR INVASION | Single selection value list:  • Not identified  • Present  • Cannot be assessed, specify | By inference, lymphovascular invasion is thought to be associated with a worse clinical outcome. However, in ear and temporal bone tumours, this finding has not been independently evaluated in prospective or prognostic studies. |  |
| Core | MARGIN STATUS | Single selection value list/text/numeric:  • Involved by invasive carcinoma   * Specify margin(s), if possible   • Not involved by invasive carcinoma   * Distance from tumour from closest margin \_\_\_ mm * Distance not assessable * Specify closest margin, if possible * Skin * Soft tissue * Bone * Parotid gland   • Cannot be assessed, specify | The best overall outcomes for tumours of ear and temporal bone are achieved when margins are negative. In general, mucosal/epithelial margins are reported, but bone and soft tissue margins carry similar prognostic value, and thus should also be reported, especially as the deep margins (bone and soft tissue) are often more clinically significant than superficial margins (skin). Tumours which are meticulously debulked have the best long term outcome.1-9  **References**  1 Knegt PP, Ah-See KW, Meeuwis CA, van der Velden LA, Kerrebijn JD and De Boer MF (2002). Squamous carcinoma of the external auditory canal: a different approach. Clin Otolaryngol Allied Sci 27(3):183-187.  2 Chang CH, Shu MT, Lee JC, Leu YS, Chen YC and Lee KS (2009). Treatments and outcomes of malignant tumors of external auditory canal. Am J Otolaryngol 30(1):44-48.  3 Nakagawa T, Kumamoto Y, Natori Y, Shiratsuchi H, Toh S, Kakazu Y, Shibata S, Nakashima T and Komune S (2006). Squamous cell carcinoma of the external auditory canal and middle ear: an operation combined with preoperative chemoradiotherapy and a free surgical margin. Otol Neurotol 27(2):242-248; discussion 249.  4 Nyrop M and Grontved A (2002). Cancer of the external auditory canal. Arch Otolaryngol Head Neck Surg 128(7):834-837.  5 Schwager K, Pfreundner L, Hoppe F, Baier G, Willner J and Baier K (2001). [Carcinoma of the external ear canal and middle ear as interdisciplinary challenge for ear surgery and radiotherapy]. Laryngorhinootologie 80(4):196-202.  6 Testa JR, Fukuda Y and Kowalski LP (1997). Prognostic factors in carcinoma of the external auditory canal. Arch Otolaryngol Head Neck Surg 123(7):720-724.  7 Shen W, Sakamoto N and Yang L (2014). Prognostic models to predict overall and cause-specific survival for patients with middle ear cancer: a population-based analysis. BMC Cancer 14:554.  8 Pfreundner L, Schwager K, Willner J, Baier K, Bratengeier K, Brunner FX and Flentje M (1999). Carcinoma of the external auditory canal and middle ear. Int J Radiat Oncol Biol Phys 44(4):777-788.  9 Yin M, Ishikawa K, Honda K, Arakawa T, Harabuchi Y, Nagabashi T, Fukuda S, Taira A, Himi T, Nakamura N, Tanaka K, Ichinohe M, Shinkawa H, Nakada Y, Sato H, Shiga K, Kobayashi T, Watanabe T, Aoyagi M, Ogawa H and Omori K (2006). Analysis of 95 cases of squamous cell carcinoma of the external and middle ear. Auris Nasus Larynx 33(3):251-257. |  |
| Non-Core | COEXISTENT PATHOLOGY | Multi selection value list (select all that apply):  • None identified  OR  • Chronic otitis media  • Cholesteatoma  • Osteomyelitis (acute, chronic)  • Other, specify | Management may be complicated by coexistent pathology. Patient with otitis media generally show a poor survival,1 but if there is acute or chronic osteomyelitis, options for radiation and chemotherapy may be limited.2,3  **References**  1 Nakagawa T, Kumamoto Y, Natori Y, Shiratsuchi H, Toh S, Kakazu Y, Shibata S, Nakashima T and Komune S (2006). Squamous cell carcinoma of the external auditory canal and middle ear: an operation combined with preoperative chemoradiotherapy and a free surgical margin. Otol Neurotol 27(2):242-248; discussion 249.  2 Lim LH, Goh YH, Chan YM, Chong VF and Low WK (2000). Malignancy of the temporal bone and external auditory canal. Otolaryngol Head Neck Surg 122(6):882-886.  3 Wang J, Xie B and Dai C (2015). Clinical Characteristics and Management of External Auditory Canal Squamous Cell Carcinoma in Post-Irradiated Nasopharyngeal Carcinoma Patients. Otol Neurotol 36(6):1081-1088. |  |
| Non-Core | ANCILLARY STUDIES | Single selection value list:  • Not performed  • Performed, specify | In most patients, further studies are not required for the diagnosis. However, additional molecular testing may be of benefit, especially in syndrome associated, bilateral, or uncommon tumour presentations. It is true that in most patients, “further studies” are not required. However, not infrequently adjuct immunohisotochemistry (IHC) is required to differentiate among tumour types especially in limited sampling, frequently affected by distortional changes that alter the “typical” histology, rendering the case problematic to diagnose without IHC. Ancillary tests rarely may be required to identify the primary site of metastatic disease. |  |
| Core | PATHOLOGICAL STAGING  TNM descriptors | Choose if applicable:  • m - multiple primary tumours  • r - recurrent  • y - post-therapy | There is no standardised staging system for this anatomic site, although it has been suggested by several groups. However, staging is still of value in standardizing therapy for these various unusual tumours. The T staging is most significant for squamous cell carcinoma and for salivary gland-type tumours, particularly of the external auditory canal and middle ear.1-8  Pathological staging has not been well developed for inner ear tumours, such as endolymphatic sac tumour, where clinical staging may be more appropriate.9 In inner ear cases, it is probably more important to make certain that a clinical (c-stage) is accurately determined, than necessarily being definitive about a pathological (p-stage). The studies used as a guide are retrospective where the patient outcomes were not available, primarily used as a guide for therapy rather than prognosis.  Overall, there is a poor prognosis when lymph node metastases are identified, correlating to advanced stage, whether in the cervical lymph nodes or those of the parotid gland parenchyma.6,7,10-13  It is important with parotid gland lesions to interpret direction extension as part of the pT stage, being careful to interpret direct extension “into” a lymph node separately from metastasis “to” a lymph node that shows extracapsular extension. Tumour associated lymphoid proliferation is an important distinction to make, as this is a reaction to the neoplasm rather than representing a true lymph node (subcapsular sinus, lymph node capsule, sinus histiocytosis, and medullary zone). Metastases to an intraparotid lymph node that shows extranodal extension is associated with a worse outcome when compared to patient with extranodal extension in cervical lymph nodes only of cutaneous squamous cell carcinoma.14,15  **References**  1 Shen W, Sakamoto N and Yang L (2014). Prognostic models to predict overall and cause-specific survival for patients with middle ear cancer: a population-based analysis. BMC Cancer 14:554.  2 Mazzoni A, Danesi G and Zanoletti E (2014). Primary squamous cell carcinoma of the external auditory canal: surgical treatment and long-term outcomes. Acta Otorhinolaryngol Ital 34(2):129-137.  3 Pfreundner L, Schwager K, Willner J, Baier K, Bratengeier K, Brunner FX and Flentje M (1999). Carcinoma of the external auditory canal and middle ear. Int J Radiat Oncol Biol Phys 44(4):777-788.  4 Xia S, Yan S, Zhang M, Cheng Y, Noel J, Chong V and Shen W (2015). Radiological Findings of Malignant Tumors of External Auditory Canal: A Cross-Sectional Study Between Squamous Cell Carcinoma and Adenocarcinoma. Medicine (Baltimore) 94(35):e1452.  5 Yin M, Ishikawa K, Honda K, Arakawa T, Harabuchi Y, Nagabashi T, Fukuda S, Taira A, Himi T, Nakamura N, Tanaka K, Ichinohe M, Shinkawa H, Nakada Y, Sato H, Shiga K, Kobayashi T, Watanabe T, Aoyagi M, Ogawa H and Omori K (2006). Analysis of 95 cases of squamous cell carcinoma of the external and middle ear. Auris Nasus Larynx 33(3):251-257.  6 Stell PM and McCormick MS (1985). Carcinoma of the external auditory meatus and middle ear. Prognostic factors and a suggested staging system. J Laryngol Otol 99(9):847-850.  7 Moody SA, Hirsch BE and Myers EN (2000). Squamous cell carcinoma of the external auditory canal: an evaluation of a staging system. Am J Otol 21(4):582-588.  8 Testa JR, Fukuda Y and Kowalski LP (1997). Prognostic factors in carcinoma of the external auditory canal. Arch Otolaryngol Head Neck Surg 123(7):720-724.  9 Bambakidis NC, Megerian CA and Ratcheson RA (2004). Differential grading of endolymphatic sac tumor extension by virtue of von Hippel-Lindau disease status. Otol Neurotol 25(5):773-781.  10 Nakagawa T, Kumamoto Y, Natori Y, Shiratsuchi H, Toh S, Kakazu Y, Shibata S, Nakashima T and Komune S (2006). Squamous cell carcinoma of the external auditory canal and middle ear: an operation combined with preoperative chemoradiotherapy and a free surgical margin. Otol Neurotol 27(2):242-248; discussion 249.  11 Bacciu A, Clemente IA, Piccirillo E, Ferrari S and Sanna M (2013). Guidelines for treating temporal bone carcinoma based on long-term outcomes. Otol Neurotol 34(5):898-907.  12 Gillespie MB, Francis HW, Chee N and Eisele DW (2001). Squamous cell carcinoma of the temporal bone: a radiographic-pathologic correlation. Arch Otolaryngol Head Neck Surg 127(7):803-807.  13 Hashi N, Shirato H, Omatsu T, Kagei K, Nishioka T, Hashimoto S, Aoyama H, Fukuda S, Inuyama Y and Miyasaka K (2000). The role of radiotherapy in treating squamous cell carcinoma of the external auditory canal, especially in early stages of disease. Radiother Oncol 56(2):221-225.  14 Kelder W, Ebrahimi A, Forest VI, Gao K, Murali R and Clark JR (2012). Cutaneous head and neck squamous cell carcinoma with regional metastases: the prognostic importance of soft tissue metastases and extranodal spread. Ann Surg Oncol 19(1):274-279.  15 Clark JR, Rumcheva P and Veness MJ (2012). Analysis and comparison of the 7th edition American Joint Committee on Cancer (AJCC) nodal staging system for metastatic cutaneous squamous cell carcinoma of the head and neck. Ann Surg Oncol 19(13):4252-4258. |  |
| Core | Primary tumour (pT) | Single selection value list:  • Not applicable  • T1 Tumour limited to the EAC without bony erosion or evidence of soft tissue involvement  • T2 Tumour with limited EAC bone erosion (not full  thickness) or limited (<0.5 cm) soft tissue involvement  • T3 Tumour eroding the osseous EAC (full thickness) with limited (<0.5 cm) soft tissue involvement, or tumour involving the middle ear and/or mastoid  • T4 Tumour eroding the cochlea, petrous apex, medial wall of the middle ear, carotid canal, jugular foramen, or dura, or with extensive soft tissue involvement (>0.5 cm), such as involvement of TMJ or styloid process, or evidence of facial paresis |  | Note that the results of lymph node/neck dissection are derived from a separate dataset. |

**Figures**

Figure 1. Diagram of ear and temporal bone anatomic landmarks

