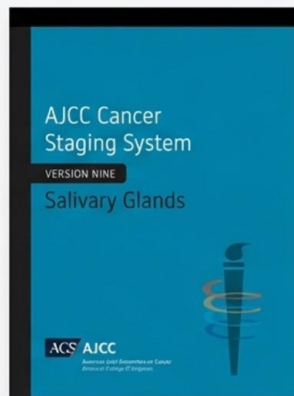


The AJCC 9th Edition Cancer Staging System: Salivary Glands

A Clinician's Guide to the Key Changes and Clinical Implications



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Key Evolutions in the 9th Edition for Salivary Glands

Expanded Scope

The system now officially includes both major and minor salivary glands, unifying the staging approach for all primary sites.

Simplified N Category

Streamlined classification eliminates N3. Staging now focuses on the number of nodes (1-3 vs. >3) and the presence of Extranodal Extension (ENE).

Refined T Category

Key definitions are clarified, including Extraparenchymal Extension (EPE) for T3 and specific criteria for bone invasion in T4, enhancing precision.

Revised Stage Groups

Prognostic groups are refined for better survival stratification. Stage IV is now reserved exclusively for M1 (distant metastasis) disease.

Updated Scope: Unifying Staging for Salivary Gland Cancers



+ Included Primary Sites

Major Salivary Glands: Parotid (C07.9), Submandibular (C08.0), Sublingual (C08.1)

Minor Salivary Glands: Now formally included, encompassing sites like the Palate (C05), Base of tongue (C01), and others.

- Histopathologic Types Removed from Protocol

- Squamous cell carcinoma (SCC)
- Neuroendocrine carcinoma
- Basosquamous cell carcinoma

Rationale: These types are typically not of salivary gland origin. For example, almost all SCC found in salivary glands metastasize from a skin primary.

Key Definition Spotlight

Extraparenchymal Extension (EPE)

Clinical or macroscopic evidence of invasion of soft tissues or nerve. *Microscopic evidence alone does not constitute T3.*

Definition of primary Tumor (T) (紅字增修處)

T Category	T Criteria
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma <i>in situ</i>
T1	Tumor ≤ 2 cm or smaller in greatest dimension without extraparenchymal extension*
T2	Tumor $>$ larger than 2 cm but \leq not larger than 4 cm in greatest dimension without extraparenchymal extension*
T3	<ul style="list-style-type: none">Tumor $>$ larger than 4 cm in greatest dimension and/or tumor having extraparenchymal extension*Gross extraparenchymal extension (for major salivary glands)*
T4	Tumor invades immediately and/or beyond adjacent structures Moderately advanced or very advanced disease

T4a

Tumor invades any immediately adjacent structures including:

- Skin
- Bone**
- Cartilage
- Solid organ parenchyma
- Esophagus
- Trachea
- Named nerve

**The following scenarios are not considered T category defining "bone invasion":

- 1) Destruction of intrinsic sinus bone in sinonasal primaries;
- 2) Erosion of cortical bone;
- 3) Primary intraosseous (central) salivary gland tumors.

Moderately advanced disease

~~Tumor invades skin, mandible, ear canal, and/or facial nerve~~

T4b

Tumor invades beyond any adjacent structures including:

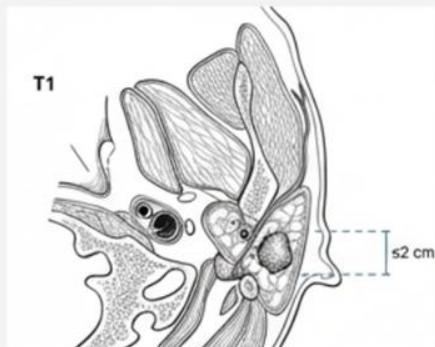
- Encasement of carotid artery
- Base of skull invasion (except nasopharynx)
- Spinal column invasion
- Intracranial invasion
- Orbital apex
- Prevertebral space
- Mediastinal structures
- Masticator space

Very advanced disease

~~Tumor invades skull base and/or pterygoid plates and/or encases carotid artery~~

Visualizing T1 & T2 Tumors: Confined Disease

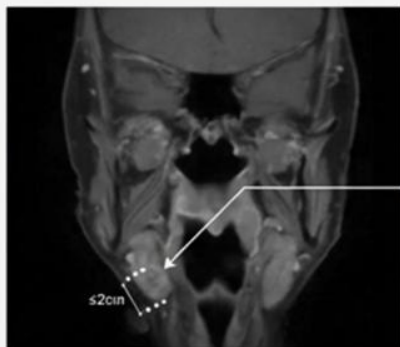
T1 (Tumor ≤ 2 cm without EPE)



Medical illustration, parotid gland



Axial MRI, parotid gland



Confined tumor,
 ≤ 2 cm

Coronal MRI, submandibular gland

T2 (Tumor > 2 cm but ≤ 4 cm without EPE)



Medical illustration, submandibular gland



Clinical photo, hard/soft palate



Tumor > 4 cm
without EPE

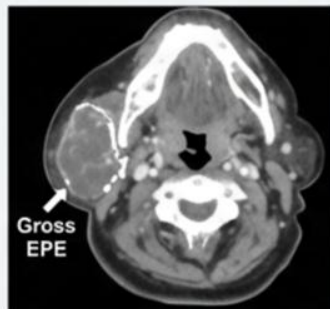
Coronal CT, submandibular gland

Visualizing T3 & T4 Tumors: Local Invasion and Extension

T3 (Tumor > 4 cm and/or Gross EPE)



Clinical photo, palpable T3 parotid mass, > 4 cm



Axial CECT, large heterogeneous tumor, > 4 cm with **Gross EPE**

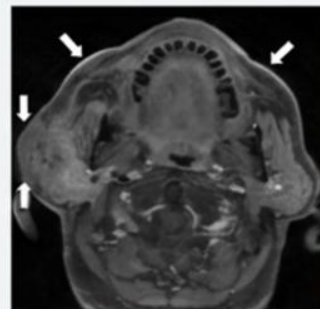


MRI, tumor with clear **EPE** into adjacent muscles

T4 (Invasion of Adjacent/Beyond Structures)

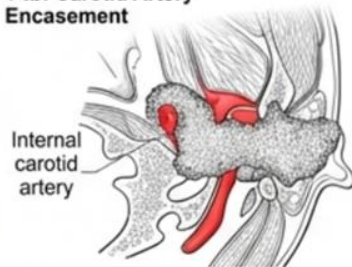


T4a: Skin Invasion & Facial Nerve Palsy



T4a: MRI, tumor extension to skin surface

T4b: Carotid Artery Encasement



T4b: Anatomical graphic, carotid artery encasement

Definition of Regional Lymph Node (N) Clinical N (cN) (紅字增修處)

N Category	N Criteria
NX	Regional lymph nodes cannot be assessed
N0	No tumor involvement of regional lymph node(s) metastasis
N1	Tumor involvement of 1-3 lymph node(s), without unequivocal imag and/or clinical extranodal extension Metastasis in a single ipsilateral lymph node, 3 cm or smaller in greatest dimension and ENE(-)
N2	Tumor involvement of > 3 lymph nodes OR Tumor involvement of any lymph node(s), with unequivocal imaging clinical extranodal extension Metastasis in a single ipsilateral node larger than 3 cm but not larger than 6 cm in greatest dimension and ENE(-) ; or metastases in multiple ipsilateral lymph nodes, none larger than 6 cm in greatest dimension and ENE(-) ; or in bilateral or contralateral lymph nodes, none larger than 6 cm in greatest dimension and ENE(-)
N2a	Metastasis in a single ipsilateral node larger than 3 cm but not larger than 6 cm in greatest dimension and ENE(-)
N2b	Metastases in multiple ipsilateral nodes, none larger than 6 cm in greatest dimension and ENE(-)
N2c	Metastases in bilateral or contralateral lymph nodes, none larger than 6 cm in greatest dimension and ENE(-)
N3	Metastasis in a lymph node larger than 6 cm in greatest dimension and ENE(-) ; or metastasis in any node(s) with clinically overt ENE(+)
N3a	Metastasis in a lymph node larger than 6 cm in greatest dimension and ENE(-)
N3b	Metastasis in any node(s) with clinically overt ENE(+)

Definition of Regional Lymph Node (N) Pathological N (pN) (紅字增修處)

N Category	N Criteria
NX	Regional lymph nodes cannot be assessed
N0	No tumor involvement of regional lymph node(s) metastasis
N1	Tumor involvement of 1-3 lymph node(s), without definitive pathological extranodal extension Metastasis in a single ipsilateral lymph node, 3 cm or smaller in greatest dimension and ENE(-)
N2	Tumor involvement of > 3 lymph nodes OR Tumor involvement of any lymph node(s), with definitive pathological extranodal extension Metastasis in a single ipsilateral lymph node, 3 cm or smaller in greatest dimension and ENE(+); or larger than 3 cm but not larger than 6 cm in greatest dimension and ENE(-); or metastases in multiple ipsilateral lymph nodes, none larger than 6 cm in greatest dimension and ENE(-); or in bilateral or contralateral lymph node(s), none larger than 6 cm in greatest dimension and ENE(-)
N2a	Metastasis in single ipsilateral node 3 cm or smaller in greatest dimension and ENE(+); or a single ipsilateral node larger than 3 cm but not larger than 6 cm in greatest dimension and ENE(-)
N2b	Metastases in multiple ipsilateral nodes, none larger than 6 cm in greatest dimension, and ENE(-)
N2c	Metastases in bilateral or contralateral lymph nodes, none larger than 6 cm in greatest dimension, and ENE(-)
N3	Metastasis in a lymph node larger than 6 cm in greatest dimension and ENE(-); or metastasis in a single ipsilateral node larger than 3 cm in greatest dimension and ENE(+); or multiple ipsilateral, contralateral, or bilateral nodes, any with ENE(+); or a single contralateral node of any size and ENE(+)
N3a	Metastasis in a lymph node larger than 6 cm in greatest dimension and ENE(-)
N3b	Metastasis in a single ipsilateral node larger than 3 cm in greatest dimension and ENE(+); or multiple ipsilateral, contralateral, or bilateral nodes any with ENE(+); or a single contralateral node of any size and ENE(+)

The Regional Lymph Nodes (N): A Simplified, Evidence-Based Approach

Core Change: Elimination of the N3 category and replacement of laterality with lymph node number.

Clinical (cN) Staging	Pathological (pN) Staging
NX: Cannot be assessed	NX: Cannot be assessed
N0: No regional node metastasis	N0: No regional node metastasis
N1: 1-3 lymph nodes involved, without unequivocal ENE	N1: 1-3 lymph nodes involved, without definitive pENE
N2: > 3 nodes involved OR any node with unequivocal clinical/imaging ENE	N2: > 3 nodes involved OR any node with definitive pENE

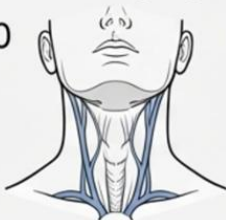
Key Definition Spotlight

Extranodal Extension (ENE): “A critical prognostic factor now integrated directly into the N2 definition. Defined clinically (unequivocal imaging-detected ENE) or pathologically (definitive pENE).”

N staging

Clinical Staging

cN0



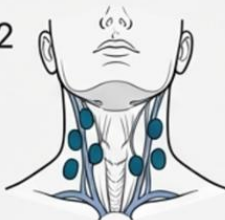
No positive lymph nodes

cN1



1-3 lymph nodes, no cENE

cN2



>3 lymph nodes

OR



Any nodes with cENE

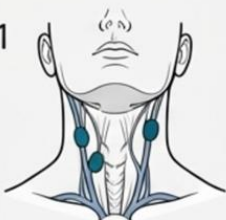
Pathological Staging

pN0



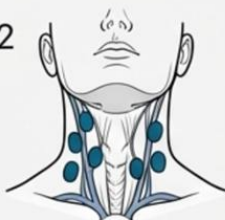
No positive lymph nodes

pN1



1-3 lymph nodes, no pENE

pN2



>3 lymph nodes

OR



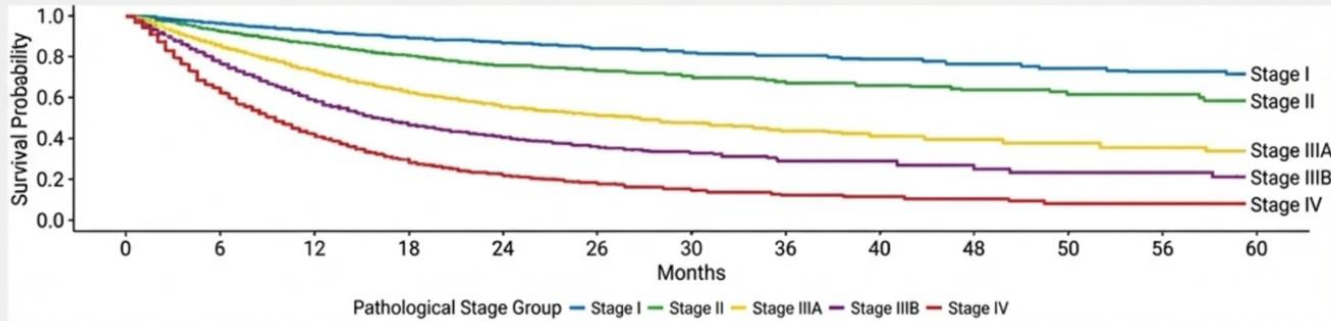
Any nodes with pENE

New AJCC Prognostic Stage Groups

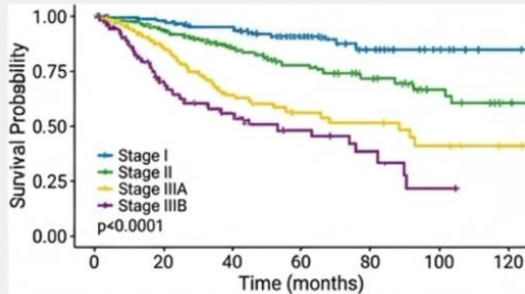
Stage	T	N	M
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
IIIA	T1-T2	N1	M0
	T3-T4	N0	M0
IIIB	T1-T2	N2	M0
	T3-T4	N1-N2	M0
Stage IV	Any T	Any N	M1

Improved Prognostic Stratification in the 9th Edition

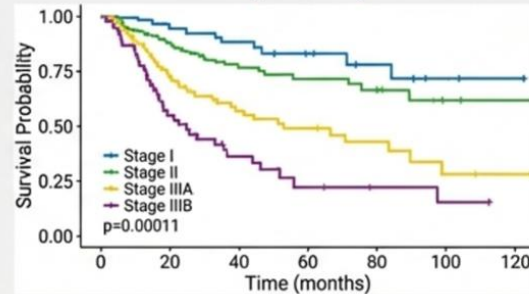
Overall Survival (OS) in Major Salivary Gland Carcinomas (NCDB; n=8,401)



OS in Minor Salivary Gland Carcinomas – Low Risk (MSKCC; n=444)



OS in Minor Salivary Gland Carcinomas – High Risk (MSKCC)



Additional Factors Impacting Treatment and Prognosis

- **Prognostic Tumor Characteristics**
 - Skin Invasion
 - Facial Nerve Dysfunction
 - Perineural Invasion
 - Lymphatic/Vascular Invasion
- **Predictive Factors**
 - Salivary Duct Carcinoma
 - Secretory Carcinoma
 - Adenoid Cystic Carcinoma
- **Non-Tumor Factors**
 - Age
 - Comorbidity
 - Pain

Recommended Clinical Staging Workup

Diagnostic Workup	Description	Specific Contribution
Clinical Exam	Physical exam of head, neck, cranial nerves	T1-T4, N1-N2, M1
Endoscopy	Exam of entire upper aerodigestive tract	T1-T4
Imaging		
MRI head and neck	Orbit to suprasternal notch; preferred for primary	T1-T4, N1-N2
CT head and neck	Orbit to carina	T1-T4, N1-N2
PET-CT	Whole body	T1-T4, N1-N2, M1
CT chest	Chest and upper abdomen	M1
Laboratory Studies		
Confirmatory molecular	Confirm salivary histology type	None

Cancers Not Staged Using This System

Tumor Type	Origin	Should use
Cutaneous Squamous Cell Carcinoma	Skin	Cutaneous SCC TNM
Basal Cell Carcinoma	Skin	Cutaneous BCC TNM
Mucosal Squamous Cell Carcinoma	Upper aerodigestive mucosa	H&N mucosal TNM
Neuroendocrine Carcinoma	Neuroendocrine cells	Lung-style NEC staging or specific site TNM
Lymphoma	Lymphoid tissue	Ann Arbor / Lugano
Soft Tissue Sarcoma	Mesenchymal tissue	Soft Tissue Sarcoma staging

Summary

- Key change
 - Unified System
 - Simplified & Prognostic N Staging
 - Clear Prognosis