Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Choi JW, Kim SS, Kim EY, Heran M. Peripheral T-cell lymphoma in the neck: CT findings of lymph node involvement. *AJNR Am J Neuroradiol* 2006; 27(5):1079-1082.	13	27	Retrospective study to describe CT findings of lymph nodes of the neck involved in peripheral T-cell lymphomas (PTCL).	Nodal necrosis and ill-defined margin were seen in 11/27 (41%) and 19/27 (70%), respectively. Heterogeneous enhancement of enlarged lymph nodes was noted on CT images in 19/27 (70%) of patients. Homogeneous enhancement without ill-defined margin and/or nodal necrosis was only seen in 6/27 patients (22%).	3
2. Kim HJ, Lee HK, Seo JJ, et al. MR imaging of solitary fibrous tumors in the head and neck. *Korean J Radiol* 2005; 6(3):136-142.	14	6	Retrospective review to determine the MRI features of solitary fibrous tumor (SFT) in the intracranial and extra cranial head and neck regions.	SFT has nonspecific imaging features. Study recommends SFT in the differential diagnosis of masses involving the intracranial and extra cranial head and neck regions.	4
3. Kim ST, Kim HJ, Park SW, Baek CH, Byun HS, Kim YM. Nodular fasciitis in the head and neck: CT and MR imaging findings. *AJNR Am J Neuroradiol* 2005; 26(10):2617-2623.	14	7	Retrospective review to describe CT and MRI findings of nodular fasciitis occurring in the head and neck region.	Lesions appeared as a discrete mass on imaging, with range of 1.0 cm-4.6 cm in diameter (mean, 2.2 cm). Authors suggest nodular fasciitis should be included in differential diagnosis, when one sees a head and neck mass with a superficial location and moderate to marked enhancement on CT and MRI.	4
4. Lanka B, Turner M, Orton C, Carrington BM. Cross-sectional imaging in non-melanoma skin cancer of the head and neck. *Clin Radiol* 2005; 60(8):869-877.	9	33	Retrospective study. To compare MRI and CT findings with histopathology to determine accuracy of MRI or CT in detecting local recurrence in patients with neck non-melanoma skin cancers (NMSC).	Imaging accuracy for identifying recurrent tumor was 96% (24/25 patients). Authors conclude that cross-sectional is accurate in identifying tumor extent and local recurrence. Patient outcome is based on extent of disease and invasion of deeper structures.	2
5. Smith JL, 2nd, Hsu JM, Chang J. Predicting deep neck space abscess using computed tomography. *Am J Otolaryngol* 2006; 27(4):244-247.	10	32	Retrospective analysis to determine measures that could increase the PPV of CT in diagnosing deep neck space infections (DNSIs).	Although CT with contrast is useful in the diagnosis and management of DNSIs, the decision for surgical drainage of an abscess should be made clinically. A negative exploration rate of nearly 25% despite careful selection criteria should be expected.	2
6. Kataoka M, Ueda H, Koyama T, et al. Contrast-enhanced volumetric interpolated breath-hold examination compared with spin-echo T1-weighted imaging of head and neck tumors. *AJR* 2005; 184(1):313-319.	9	33 3 observers	Prospective study to compare volumetric interpolated breath-hold examination (VIBE) images with conventional post-contrast spin-echo T1-weighted images in the assessment of head and neck tumors (HNT).	• For quantitative assessment, no significant difference was detected between the two sequences. • For qualitative assessments, the degree of image degradation by artifacts was smaller for VIBE images than for spin-echo T1-weighted images (P=0.029). • Authors conclude that the post-contrast VIBE sequence is a good alternative to post-contrast spin-echo T1-weighted imaging.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

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7. Katsura K, Hayashi T. Non-neoplastic process after neck dissection demonstrated on enhanced CT in patients with head and neck cancer. *Dentomaxillofac Radiol* 2005; 34(5):297-303.	13	44 necks 39 had radical neck dissections, 8 had modified radical neck dissections	To examine post-therapeutic anatomical alterations and non-neoplastic processes demonstrated on enhanced CT in patients with head and neck cancer.	On enhanced CT, the densities of soft-tissues replacing the resected structures were homogeneous in 44 necks and showed no contrast enhancement in 39 necks. In 44/47 necks, lymphoedema (LE) was observed around the carotid artery at an early stage, and it converged into the space between internal carotid artery and external carotid artery gradually. In patients without postoperative radiotherapy (RT), LE was observed around the carotid artery in 17/23 necks at 3 months after neck dissection and disappeared rapidly thereafter. In patients with postoperative RT, LE increased until 3 months after RT and decreased slowly thereafter.	2
8. Petrou M, Mukherji SK. Extracranial head and neck neoplasms: role of imaging. *Cancer Treat Res* 2008; 143:93-117.	12	N/A	To review the role of imaging in the diagnosis and management of extracranial head and neck neoplasm.	CT is indicated for neoplasms below the level of the soft palate. MRI is useful for imaging the nasopharynx and soft palate and can be valuable for assessing skull base invasion and perineural spread. CT and MRI can provide complementary information. PET/CT is becoming popular in the imaging of neck and neck neoplasm–major strength is combination of anatomic and metabolic information. Role of PET/CT is expected to increase.	3
9. Thanos L, Mylona S, Kalioras V, Pomoni M, Batakis N. Potentially life-threatening neck abscesses: therapeutic management under CT-guided drainage. *Cardiovasc Intervent Radiol* 2005; 28(2):196-199.	10	15	To examine the usefulness of CT-guided drainage of potentially life-threatening neck abscesses.	Abscess was completely drained in 14 (93%) patients. Authors conclude CT-guided percutaneous drainage is fast, safe and highly effective low-cost method for the treatment of potentially life-threatening neck abscesses.	3
10. Isoda H, Imai M, Inagawa S, Miura K, Sakahara H. Magnetic resonance imaging findings of angiosarcoma of the scalp. *J Comput Assist Tomogr* 2005; 29(6):858-862.	14	8	To retrospectively examine MRI findings of angiosarcoma of the scalp.	MRI showed well-enhanced thickened scalp or tumors with prolonged T1 and T2 in all patients. Authors conclude that MRI was useful in determining extent of angiosarcoma of the scalp because it visualized the tumor invasion into surrounding structures that was impossible with a physical inspection.	4

Neck Mass-Adenopathy
EVIDENCE TABLE

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11. Michaely HJ, Herrmann KA, Dietrich O, Reiser MF, Schoenberg SO. Quantitative and qualitative characterization of vascularization and hemodynamics in head and neck tumors with a 3D magnetic resonance time-resolved echo-shared angiographic technique (TREAT)--initial results. *Eur Radiol* 2007; 17(4):1101-1110.	10	16	Prospective study to characterize and quantify the vascularization and hemodynamic characteristics of HNT with a 3D-MR time-resolved echo-shared angiographic technique (TREAT) using the regular contrast agent bolus.	Characterization of tumor with TREAT was very good or good in 11/16 patients, and better with TREAT than with DSA in 3/6 cases. Authors conclude that TREAT will be a good supplementary diagnostic tool in the differential diagnosis of HNT.	2
12. Sadick M, Sadick H, Hormann K, Duber C, Diehl SJ. Cross-sectional imaging combined with 3D-MR angiography (3D-MRA): diagnostic tool for preoperative vascular assessment of head and neck tumors. *Onkologie* 2005; 28(10):477-481.	10	32	Prospective study to assess vascular involvement in patients with suspected head and neck cancer using 3D-MRA combined with cross-sectional imaging.	3/32 (9%) showed involvement of the arterial system. In 2/3 cases, MRA correctly predicted the arterial status, while in one case it gave a false negative result. 11/32 (34%) showed involvement of the venous system. 10 cases showed complete concordance between the findings of the MR venography and the intraoperative status, while in one case a false negative result was produced. 3D-MRA in combination with cross sectional imaging is recommended for the detection of vascular involvement.	2
13. Rumboldt Z, Al-Okaili R, Deveikis JP. Perfusion CT for head and neck tumors: pilot study. *AJNR Am J Neuroradiol* 2005; 26(5):1178-1185.	10	17 2 observers	Prospective study to evaluate the feasibility and reproducibility of perfusion CT after enhanced head and neck CT and differentiate benign from malignant processes.	Perfusion CT was not possible in four, and one was lost to follow-up. 5/12 had cancer, and 7 had benign processes. No significant inter-reader or intra-reader differences and no significant difference between various input vessels. Authors conclude that perfusion CT shows promise in distinguishing benign and malignant processes, mainly using mean transit time.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

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14. Chen B, Yin SK, Zhuang QX, Cheng YS. CT and MR imaging for detecting neoplastic invasion of esophageal inlet. *World J Gastroenterol* 2005; 11(3):377-381.	9	32 46 control group 2 observers	Retrospective study to determine the best CT or MRI criterion for detecting neoplastic invasion of esophageal inlet.	In control group, distance between the posterior aspect of cricoid cartilage and the anterior aspect of vertebra (d-CV) d-CV at the esophageal inlet level was 0.94+/-0.15 cm on axial CT and 0.91+/-0.18 cm on axial MRI, whereas in patient group, d-CV was 1.24+/-0.32 cm on CT and 1.31+/-0.36 cm on MRI. There was a statistical significance in d-CV between the two groups on CT and MRI modalities (P<0.01). D-CV >1.0 cm was the typical feature of neoplastic invasion of the esophageal inlet with 73% sensitivity, 83% specificity, 79% accuracy, 76% PPV, 80% NPV on CT and 84% sensitivity, 77% specificity, 80% accuracy, 70% PPV, 88% NPV on MRI respectively.	2
15. Hudgins PA, Kingdom TT, Weissler MC, Mukherji SK. Selective neck dissection: CT and MR imaging findings. *AJNR Am J Neuroradiol* 2005; 26(5):1174-1177.	13	27 patients CT: 26 patients MRI: 1 patient 2 observers	Retrospective review of CT and MRI findings in selective neck dissection.	27/28 necks had marked decrease in fat beneath the sternocleidomastoid muscle. The sternocleidomastoid muscle contour and size was asymmetric or flattened and atrophic in 16/28 necks. Atrophy of the infrahyoid strap muscles was seen in 8/28 necks. 6/28 had no detectable internal jugular vein, and it was presumably thrombosed. Submandibular gland was not present in 17/28 cases. Authors conclude that imaging findings after selective neck dissection are characteristic and reflect the type of surgery performed.	2
16. King AD, Ahuja AT, Yeung DK, et al. Malignant cervical lymphadenopathy: diagnostic accuracy of diffusion-weighted MR imaging. *Radiology* 2007; 245(3):806-813.	10	43 patients 43 nodes	Prospective study to determine the diagnostic accuracy of diffusion-weighted MRI for discrimination of malignant neck nodes.	Diffusion-weighted MRI shows significant differences among malignant nodes of squamous cell carcinoma (SCC), lymphoma, and nasopharyngeal carcinoma. Apparent diffusion coefficient (ADC) threshold values can help distinguish SCC from lymphoma.	2

Neck Mass-Adenopathy
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17. Schreyer AG, Scheibl K, Zorger N, et al. Detection rate and efficiency of lymph node assessment with axial and coronal image reading based on 16 row multislice CT of the neck. *Rofo* 2005; 177(10):1430-1435.	9	24 4 observers	Prospective blinded study to assess accuracy and efficiency of coronal reconstruction compared to axial reconstructions of a routinely performed CT scan exemplary in neck lymph node assessment performed on a 16 row multislice CT.	Detection rate for axial image interpretation was 36.1 % with 54.9 % in coronal reading. Assessing the submandibular lymph nodes (n=45) axial interpretation revealed 53.9% with 36.1% in coronal reading. Evaluation time for axial reading was in all but one reader significantly longer (mean 176 seconds) than in coronal reading (mean 129 seconds). Authors conclude coronal image reading improves the detection rate of cranio-caudal oriented structures. Axial reading remains necessary for assessing axially oriented structures like the submandibular region in the neck.	2
18. Sumi M, Kimura Y, Sumi T, Nakamura T. Diagnostic performance of MRI relative to CT for metastatic nodes of head and neck squamous cell carcinomas. *J Magn Reson Imaging* 2007; 26(6):1626-1633.	9	38 patients 70 metastatic and 52 reactive nodes 3 observers	Retrospective study to compare the value of MRI and CT for diagnosis of metastatic nodes of head and neck SCC.	For diagnosis of small metastatic nodes, MRI was better. It had sensitivity of 83%, specificity of 88%, and accuracy of 86%. For large metastatic nodes, the diagnostic abilities of MRI and CT were similar; MRI yielded 100% sensitivity, 98% specificity, and 99% accuracy. Authors conclude MRI is superior to CT in the diagnosis of metastatic nodes from head and neck SCC.	2
19. Bisdas S, Konstantinou GN, Lee PS, et al. Dynamic contrast-enhanced CT of head and neck tumors: perfusion measurements using a distributed-parameter tracer kinetic model. Initial results and comparison with deconvolution-based analysis. *Phys Med Biol* 2007; 52(20):6181-6196.	9	15	To evaluate the feasibility of a two-compartment distributed-parameter tracer kinetic model to generate functional images of several physiologic parameters from dynamic contrast-enhanced CT data obtained of patients with extracranial HNT and to compare the distributed-parameter functional images to those from deconvolution-based analysis.	The distributed-parameter model is feasible in the clinical routine and can be used interchangeably for measuring blood flow and vascular volume with the deconvolution-based approach.	3
20. Street E, Hadjiiski L, Sahiner B, et al. Automated volume analysis of head and neck lesions on CT scans using 3D level set segmentation. *Med Phys* 2007; 34(11):4399-4408.	10	23 patients 69 lesions 33 scans 3 observers	To examine the performance of a semiautomatic system for segmentation of a diverse set of lesions in head and neck CT scans. Contours from automatic segmentation were compared to both 2D and 3D gold standard contours.	Differences between the automatic and gold standard contours were larger than the interobserver differences, but the system performed comparably to the radiologists, achieving an average area intersection ratio of 85.4% compared to an average of 91.2% between two radiologists. The average absolute area error was 21.1% compared to 10.8%, and the average 2D distance was 1.38 mm compared to 0.84 mm between the radiologists. Automatic contours approximated many of the lesions very well.	2

Neck Mass-Adenopathy
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21. Zima A, Carlos R, Gandhi D, Case I, Teknos T, Mukherji SK. Can pretreatment CT perfusion predict response of advanced squamous cell carcinoma of the upper aerodigestive tract treated with induction chemotherapy? *AJNR Am J Neuroradiol* 2007; 28(2):328-334.	10	17	Prospective study to assess if pretreatment evaluation of the primary site with quantitative CT perfusion measurements predicted response to induction chemotherapy and to create a prediction model to predict the response to induction chemotherapy in future patients.	Elevated values of blood volume (P=.004) and blood flow (P=.03) were significantly correlated with >50% reduction in tumor volume after chemotherapy. A prediction model based on tumor blood volume demonstrated 91.7% sensitivity and 80.0% specificity. Data imply that tumors with elevated blood volume and blood flow were statistically associated with response to induction chemotherapy.	2
22. Flor N, Sardanelli F, Soldi S, et al. Unknown internal carotid artery atherosclerotic stenoses detected with biphasic multidetector computed tomography for head and neck cancer. *Eur Radiol* 2006; 16(4):866-871.	10	52	To examine the possibility of detecting unknown internal carotid artery stenoses in patients undergoing biphasic MDCT for current or previous head and neck.	4 (7.7 %) of 52 patients had unknown severe internal carotid artery stenoses, 3 of them with relevant impact on therapy. Internal carotid artery stenoses should be carefully evaluated for atherosclerotic disease using biphasic MDCT for head and neck cancer.	2
23. Bartz BH, Case IC, Srinivasan A, Mukherji SK. Delayed MDCT imaging results in increased enhancement in patients with head and neck neoplasms. *J Comput Assist Tomogr* 2006; 30(6):972-974.	9	37	To assess the impact of performing delayed imaging compared with immediate imaging on tumor enhancement using MDCT.	Mean enhancement was 68.3 +/- 21.0 Hounsfield units (HU) and 91.4 +/- 27.4 HU (n=37) for immediate and delayed imaging groups, respectively. The mean difference between the initial and delayed enhancement was 23.1 HU (P<0.01). Delayed imaging technique led to a statistically significant increase in enhancement relative to immediate imaging.	2
24. Tseng YC, Hsu HL, Lee TH, Chen CJ. Venous reflux on carotid computed tomography angiography: relationship with left-arm injection. *J Comput Assist Tomogr* 2007; 31(3):360-364.	13	364 patients Right arm: 183 Left arm: 181	Prospective study to evaluate the relationship between image degradation due to the reflux of contrast agent into the major neck veins and use of a left-arm injection site during CTA of the carotid arteries.	Left-arm injection had a larger amount of refluxed contrast medium than with right-arm injection (P<0.001). Study concludes that normal compression of the left brachiocephalic vein due to a developmental decreased retrosternal space may degrade carotid CT angiograms because of reflux of contrast material into the cervical veins. This degradation can be avoided if right-arm injection is used.	2
25. Yoon DY, You SY, Choi CS, et al. Multi-detector row CT of the head and neck: comparison of different volumes of contrast material with and without a saline chaser. *Neuroradiology* 2006; 48(12):935-942.	8	120	Blinded prospective study to determine the effect of different volumes of contrast material with and without a saline chaser on tissue enhancement in MDCT of the head and neck.	The reduction of contrast material from 80 to 60 ml leads to insufficient enhancement of neck vessels. The benefit of a saline chaser technique is not obvious except for its ability to reduce perivenous artifacts.	1

Neck Mass-Adenopathy
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26. Buus S, Grau C, Munk OL, et al. Individual radiation response of parotid glands investigated by dynamic 11C-methionine PET. *Radiother Oncol* 2006; 78(3):262-269.	13	12	To investigate by dynamic 11C-methionine PET the individual radiation dose response relationship of parotid glands in head and neck cancer patients.	For each patient, voxel-values of K decreased with increasing radiation dose. Individual radiation dose response of parotid glands can be measured by dynamic 11C-methionine PET. The dose response analysis revealed a sigmoid relationship, a threshold radiation dose of 16 Gy, and a mean TD50 of 30 Gy.	3
27. Carranza-Pelegrina D, Lomena-Caballero F, Soler-Peter M, Berini-Aytes L, Gay-Escoda C. The diagnostic possibilities of positron emission tomography (PET): applications in oral and maxillofacial buccal oncology. *Med Oral Patol Oral Cir Bucal* 2005; 10(4):331-342.	12	N/A	To review literature on diagnostic possibilities of PET in oral oncology.	PET detects the intense accumulation of FDG produced in malignant tumors. Combination of CT or MRI with PET will help in the diagnosis and follow-up of oncologic pathology of head and neck.	3
28. Connell CA, Corry J, Milner AD, et al. Clinical impact of, and prognostic stratification by, F-18 FDG PET/CT in head and neck mucosal squamous cell carcinoma. *Head Neck* 2007; 29(11):986-995.	10	76 patients 100 PET/CT scans	Prospective study to determine the value of PET/CT over conventional assessment (clinical examination and CT/MRI imaging).	PET/CT led to a TNM classification alteration in 34% (12/35), a change in RT planning technique and/or dose in 29% (10/35), and altered treatment response assessment in 43% (13/30). A complete metabolic response was predictive of overall survival (P=.037). Results favor the use of PET/CT in the management paradigm of head and neck SCC.	2
29. Gedikbasi A, Gul A, Sargin A, Ceylan Y. Cystic hygroma and lymphangioma: associated findings, perinatal outcome and prognostic factors in live-born infants. *Arch Gynecol Obstet* 2007; 276(5):491-498.	13	57	To determine associated US findings, chromosome abnormalities and the prognostic factors of cystic hygromas in live-born infants.	Fetuses with cystic hygroma are at high-risk for adverse outcome. Prenatal diagnosis with invasive procedures is recommended. Axillary location of the hygroma and the depth of invasion had prognostic importance.	3
30. Rischin D, Hicks RJ, Fisher R, et al. Prognostic significance of [18F]-misonidazole positron emission tomography-detected tumor hypoxia in patients with advanced head and neck cancer randomly assigned to chemoradiation with or without tirapazamine: a substudy of Trans-Tasman Radiation Oncology Group Study 98.02. *J Clin Oncol* 2006; 24(13):2098-2104.	8	45 patients in sub-study	To determine association between tumor hypoxia, treatment regimen, and locoregional failure in patients with stage III or IV SCC of the head and neck randomly assigned to RT (70 Gy in 35 fractions over 7 weeks) plus either tirapazamine and cisplatin in weeks 1, 4, and 7 and tirapazamine alone in weeks 2 and 3 (TPZ/CIS) or cisplatin and infusional fluorouracil during weeks 6 and 7 (chemoboost).	Hypoxia on [18F]-misonidazole-PET imaging, in patients receiving a nontirapazamine-containing chemoradiotherapy regimen, is associated with a high-risk of locoregional failure.	1
31. Troost EG, Vogel WV, Merkx MA, et al. 18F-FLT PET does not discriminate between reactive and metastatic lymph nodes in primary head and neck cancer patients. *J Nucl Med* 2007; 48(5):726-735.	8	10 2 observers	To assess the value of 18F-FLT PET in determining the lymph node status in SCC of the head and neck, with pathology as the gold standard.	18F-FLT PET has 100 % sensitivity, 16.7 % specificity, 37.5 % PPV, and 100 % NPV. Low specificity of 18F-FLT PET makes it unsuitable for assessment of pretreatment lymph node status.	2

Neck Mass-Adenopathy
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32. Riegel AC, Berson AM, Destian S, et al. Variability of gross tumor volume delineation in head-and-neck cancer using CT and PET/CT fusion. *Int J Radiat Oncol Biol Phys* 2006; 65(3):726-732.	9	16 4 observers	To assess the need for gross tumor volume (GTV) delineation protocols in head-and-neck cancer using CT and PET/CT fusion imaging.	Significant differences in GTV delineation were found between multiple observers contouring on PET/CT fusion. The need for delineation protocol has been confirmed.	2
33. Madani I, Duthoy W, Derie C, et al. Positron emission tomography-guided, focal-dose escalation using intensity-modulated radiotherapy for head and neck cancer. *Int J Radiat Oncol Biol Phys* 2007; 68(1):126-135.	13	41	To assess the feasibility of IMRT using PET-guided dose escalation, and to determine the maximum tolerated dose in head and neck cancer.	For head and neck cancer, PET-guided dose escalation appears to be well-tolerated. The maximum tolerated dose was not reached at the investigated dose levels.	2
34. Jeong HS, Baek CH, Son YI, et al. Use of integrated 18F-FDG PET/CT to improve the accuracy of initial cervical nodal evaluation in patients with head and neck squamous cell carcinoma. *Head Neck* 2007; 29(3):203-210.	9	47	To examine the accuracy of performing cervical nodal evaluation using integrated FDG-PET/CT for SCC of the head and neck as compared with using PET and contrast-enhanced CT alone.	Combined PET/CT images provided additional information over PET for the anatomical localization and lesion characterization of 18 sites (19.8%) in 17 patients (36.2%). PET/CT also showed the best results among the three imaging modalities for the sensitivity, specificity, and accuracy (91.8%, 98.9%, and 97.1%, respectively) for predicting metastatic nodes on a level-by-level analysis, and PET/CT had a higher accuracy (85.1%) for the pathologic nodal classification over the clinical examinations (68.1%) or PET (70.2%). Authors conclude that combined PET/CT images are more accurate than the PET or contrast-enhanced CT images alone.	2

Neck Mass-Adenopathy
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35. Akoglu E, Dutipek M, Bekis R, Degirmenci B, Ada E, Guneri A. Assessment of cervical lymph node metastasis with different imaging methods in patients with head and neck squamous cell carcinoma. *J Otolaryngol* 2005; 34(6):384-394.	9	23 31 neck sides	Prospective clinical trial to determine the predictive value of CT, MRI, US, and SPECT for diagnosis of cervical node metastasis.	• CT had 77.7% sensitivity, 85.7% specificity, 91.3% PPV, 66.6% NPV, and 80.4% accuracy. • MRI had 59.2% sensitivity, 92.8% specificity, 94.1% PPV, 54.1% NPV, and 70.7% accuracy. • US had 81.4% sensitivity, 64.2% specificity, 81.4% PPV, 64.2% NPV and 75.6% accuracy. • SPECT had 55.5% sensitivity, 92.8% specificity, 93.7% PPV, 52.0% NPV, and 68.2% accuracy. • Both CT and US were superior to clinical examination. There was no statistically significant difference between US and CT. US was found to be superior to MRI and SPECT in detecting cervical node metastasis. CT was also superior to SPECT. • Authors conclude that none of the currently available imaging methods are reliable in evaluating the occult regional metastasis because their NPVs are low.	2
36. Brouwer J, Senft A, de Bree R, et al. Screening for distant metastases in patients with head and neck cancer: is there a role for (18)FDG-PET? *Oral Oncol* 2006; 42(3):275-280.	9	34	Observational cohort study to prospectively compare the role of whole body FDG-PET and chest CT to detect distant metastases and synchronous primary tumors.	Four patients had metastases or second primary tumors: CT and FDG-PET identified one patient with lung metastases and another with primary lung cancer. In addition, FDG-PET detected second primary tumors in two patients. The added value of whole body FDG-PET vs chest CT was to identify unknown malignancy in 6% of the patients. Confirmation of positive FDG-PET findings is possible and necessary.	3
37. Porceddu SV, Jarmolowski E, Hicks RJ, et al. Utility of positron emission tomography for the detection of disease in residual neck nodes after (chemo)radiotherapy in head and neck cancer. *Head Neck* 2005; 27(3):175-181.	10	39	To examine the value of FDG-PET for the detection of disease in residual neck nodes after (chemo) RT in head and neck cancer.	27 patients were observed for a median of 34 months. NPV of PET for viable disease in a residual anatomic abnormality was 97%. Authors recommend observing patients and not neck dissection for those who have achieved a complete response at the primary site but have a residual abnormality in the neck that is PET negative approximately 12 weeks after treatment.	3

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38. Hafidh MA, Lacy PD, Hughes JP, Duffy G, Timon CV. Evaluation of the impact of addition of PET to CT and MR scanning in the staging of patients with head and neck carcinomas. *Eur Arch Otorhinolaryngol* 2006; 263(9):853-859.	9	48	Prospective study to assess the impact of adding PET to CT and MRI in the staging of patients with head and neck carcinomas.	40 (89%) of primary tumors (45) were identified by CT. MRI and PET both identified 41 primary tumors (91%). CT and MRI each correctly staged pN0 necks in 10 of 12 patients (83%) whereas; PET alone had a lower true negative rate of 8/12 patients (67%). PET correctly staged the N+ necks in 14/20 patients (70%) vs 12/20 (60%) for MRI, and 8/20 (40%) for CT alone. None of the three methods was able to identify the tumor site in the three patients with unknown primaries. Study concludes that although PET has a higher sensitivity in detecting nodal disease, it has only slightly improved the classification of N+ necks. The findings of this study cast doubt on the merit of routine addition of PET to the current investigative protocols for patients with head and neck carcinomas.	2
39. Schwartz DL, Ford E, Rajendran J, et al. FDG-PET/CT imaging for preradiotherapy staging of head-and-neck squamous cell carcinoma. *Int J Radiat Oncol Biol Phys* 2005; 61(1):129-136.	9	63	Prospective study to examine role of registered FDG-PET/CT for pre-RT staging of the neck.	• FDG-PET/CT detected 17/17 heminecks and 26/27 nodal zones histologically positive by dissection (100% and 96% sensitivity, respectively). • The nodal level staging sensitivity and specificity for FDG-PET/CT was 96% (26/27) and 98.5% (68/69), respectively. • FDG-PET/CT correctly detected nodal disease in 2 patients considered to have node-negative disease by CT alone. • Agreement between the imaging results and pathology findings was stronger for FDG-PET/CT (kappa 0.95, 95% CI 0.82-0.99) than for CT alone (kappa 0.81, 95% CI 0.63-0.91; P=0.06 by two-sided McNemar's testing). • Study findings suggest that FDG-PET/CT is superior to CT alone for geographic localization of diseased neck node levels.	2
40. Ahuja AT, King AD, Kew J, King W, Metreweli C. Head and neck lipomas: sonographic appearance. *AJNR Am J Neuroradiol* 1998; 19(3):505-508.	13	25	To describe US features of head and neck lipomas.	Lipomas were well-defined (88%), compressible (100%), elliptical masses with the longest diameter parallel to the skin surface. Compared with adjacent muscle, 76% of all lipomas were hyperechoic, 8% isoechoic, and 16% hypoechoic.	3

Neck Mass-Adenopathy
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41. King AD, Ahuja AT, King W, Metreweli C. Sonography of peripheral nerve tumors of the neck. *AJR* 1997; 169(6):1695-1698.	14	8	To describe US features of peripheral nerve tumors (PNTs) in the neck and determine features useful in differentiating PNTs from lymph nodes.	PNTs have features that should help in correct diagnosis. Features helpful in differentiating PNTs from lymph nodes include a solitary, oval, hypoechoic mass with posterior enhancement and absence of an echogenic hilum.	4
42. Ahuja AT, Richards P, Wong KT, Yuen EH, King AD. Accuracy of high-resolution sonography compared with magnetic resonance imaging in the diagnosis of head and neck venous vascular malformations. *Clin Radiol* 2003; 58(11):869-875.	10	30	Retrospective study to determine the accuracy of US in the diagnosis of head and neck venous vascular malformations (VVMs) and whether it can delineate their full extent. MRI was used as the gold standard.	US was comparable with MRI in 53% (16/30) and inferior to MRI in 47% (14/30) in defining full extent of malformations. US failed to detect deeper extent, intra-osseous involvement and other clinically occult VVMs. US with high-resolution transducers can diagnose head and neck VVMs in 90% of cases.	3
43. Wong KT, Lee YY, King AD, Ahuja AT. Imaging of cystic or cyst-like neck masses. *Clin Radiol* 2008; 63(6):613-622.	12	N/A	Review imaging of cystic or cyst-like neck tumors.	US is the preferred method for imaging neck tumors. MRI or CT provides supplementary information for large deep-seated lesions.	4
44. Yang WT, Ahuja A, Metreweli C. Sonographic features of head and neck hemangiomas and vascular malformations: review of 23 patients. *J Ultrasound Med* 1997; 16(1):39-44.	13	23	To describe US features of head and neck hemangiomas and vascular malformations.	Common US features were a well-defined hypoechoic mass lesion with heterogeneous echotexture and presence of cystic and sinusoidal spaces within and the occasional phleboliths. Color Doppler imaging showed flow in 12/13 lesions.	3
45. van den Brekel MW. US-guided fine-needle aspiration cytology of neck nodes in patients with N0 disease. *Radiology* 1996; 201(2):580-581.	15 (opinion letter)	N/A	Comment on the article by Takes et al on the accuracy of US-guided fine-needle aspiration biopsy of neck nodes.	Importance is given to the need of knowing the accuracy of any imaging technique used in the subpopulation with N0 disease, van den Brekel also believes range in sensitivity of 67%-90% in this study will become larger and clinically important.	4
46. van den Brekel MW, Reitsma LC, Quak JJ, et al. Sonographically guided aspiration cytology of neck nodes for selection of treatment and follow-up in patients with N0 head and neck cancer. *AJNR Am J Neuroradiol* 1999; 20(9):1727-1731.	13	77	Retrospective study to assess the role of US guided aspiration cytology for the selection of treatment and follow-up in patients with clinically negative neck (N0) head and neck cancer.	The risk of missing occult metastases was 18% with US guided aspiration cytology. US guided aspiration is an effective for following up on the status of the neck after transoral tumor excision, and recommended for use at frequent intervals if no elective neck treatment is performed.	2
47. Ahuja A, Ying M. Sonography of neck lymph nodes. Part II: abnormal lymph nodes. *Clin Radiol* 2003; 58(5):359-366.	12	N/A	Review US features (grey scale and Doppler) that help distinguish between the causes of neck lymphadenopathy.	Helpful grey-scale features are size, shape, internal architecture, intranodal necrosis, absence of hilar structure and calcification and those for Doppler are distribution of vascularity and intranodal resistance.	4
48. Ahuja AT, Ying M, Ho SY, et al. Ultrasound of malignant cervical lymph nodes. *Cancer Imaging* 2008; 8:48-56.	12	N/A	Review evaluation of malignant cervical lymph nodes with US.	Power Doppler US evaluates the vascular pattern of nodes and helps identify the malignant nodes.	4

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
49. Ying M, Ahuja A, Brook F. Accuracy of sonographic vascular features in differentiating different causes of cervical lymphadenopathy. *Ultrasound Med Biol* 2004; 30(4):441-447.	10	270	Retrospective review to assess the accuracy of US vascular features in differentiating different causes of cervical lymphadenopathy.	Vascular pattern with sensitivity of 88% for metastases and 67% for lymphoma was more useful. Resistance index (RI) with 0.8 cut-off value was more accurate in distinguishing metastases (RI >0.8) from lymphoma (RI <0.8), with an accuracy of 65% and 75%, respectively. Displacement of vascularity was helpful to differentiate tuberculous nodes (accuracy: 67%) from reactive and lymphomatous nodes (accuracy: 100% and 95%, respectively), while PI with 1.5 cut-off helped the differentiation between tuberculosis (PI <1.5) and metastases (PI >1.5), with an 77% accuracy in both diseases. Doppler US is a valuable addition in the US evaluation of cervical lymphadenopathy.	2
50. Ertl-Wagner BB, Bruening R, Blume J, et al. Relative value of sliding-thin-slab multiplanar reformations and sliding-thin-slab maximum intensity projections as reformatting techniques in multisection CT angiography of the cervicocranial vessels. *AJNR Am J Neuroradiol* 2006; 27(1):107-113.	9	10 3 observers	To examine the image quality and vascular delineation of multisection CT angiography of the cervicocranial vessels with sliding-thin-slab maximum intensity projections and multiplanar reformations.	Sliding-thin-slab maximum intensity projections reformations were significantly superior to sliding-thin-slab multiplanar reformations in the delineation of all extracranial and intracranial arteries and arterial segments and in the delineation of the cavernous sinus and the internal cerebral veins (P<.05). Authors recommend sliding-thin-slab maximum intensity projections as the primary reformatting technique in multisection CT angiography of the cervicocranial vessels in addition to viewing the source images.	2
51. Tanaka T, Morimoto Y, Takano H, et al. Three-dimensional identification of hemangiomas and feeding arteries in the head and neck region using combined phase-contrast MR angiography and fast asymmetric spin-echo sequences. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005; 100(5):609-613.	14	3	To evaluate a proposed technique for the 3D detection of hemangiomas and feeding arteries in the head and neck using phase-contrast MRA plus fast asymmetric spin-echo sequences.	In all patients, the 3D presence of the hemangiomas and the feeding arteries were well defined in images created by the proposed technique.	4

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
52. Scholbach T, Scholbach J, Krombach GA, Gagel B, Maneschi P, Di Martino E. New method of dynamic color doppler signal quantification in metastatic lymph nodes compared to direct polarographic measurements of tissue oxygenation. *Int J Cancer* 2005; 114(6):957-962.	9	24 patients examined with color duplex US 17 patients with polarography	To examine role of a new method of dynamic color Doppler signal quantification in metastatic lymph nodes compared to direct polarographic measurements of tissue oxygenation.	Percentage of nodal fraction with <10 mm Hg oxygen saturation was significantly inversely correlated with lymph node perfusion (r=0.551; P=0.021). Nodes with a perfusion of <0.05 cm/sec flow velocity showed significantly larger hypoxic areas (P=0.006).The new method allows a noninvasive and quantitative assessment of tumor and metastatic lymph node perfusion by means of commonly available US equipment.	2
53. Baghi M, Mack MG, Hambek M, et al. Usefulness of MRI volumetric evaluation in patients with squamous cell cancer of the head and neck treated with neoadjuvant chemotherapy. *Head Neck* 2007; 29(2):104-108.	9	50	To evaluate the value of tumor volumetry on MRI as predictive of response to treatment with induction chemotherapy, and compare results with endoscopy	45 (90%) patients showed a tumor downstaging after chemotherapy. 14 (28%) patients showed a complete histologic remission, 31 (62%) patients showed a partial remission. Study recommends MRI tumor volume as a useful parameter to predict the response to neoadjuvant chemotherapy in SCC of the head and neck.	2
54. Lin D, Glastonbury CM, Rafaelian O, Eisele DW, Wang SJ. Management of advanced nodal disease following chemoradiation for head and neck squamous cell carcinoma: role of magnetic resonance imaging. *J Otolaryngol* 2007; 36(6):350-356.	10	38	Retrospective chart review to determine the role of MRI to predict persistent nodal disease in head and neck cancer treated with chemoradiation.	16 patients had MRI findings suggestive of persistent nodal disease. 22 patients had no evidence of nodal disease on post-treatment MRI. Authors conclude that concomitant chemoradiation is effective for the treatment of advanced nodal disease in selected patients. Patients without MRI evidence of persistent nodal disease following chemoradiation who were observed had a low incidence (9%) of eventual neck recurrence, whereas those with evidence of persistent nodes on MRI had a 19% likelihood of residual pathologic neck disease. More research is needed.	3
55. Semiz Oysu A, Ayanoglu E, Kodalli N, Oysu C, Uneri C, Erzen C. Dynamic contrast-enhanced MRI in the differentiation of posttreatment fibrosis from recurrent carcinoma of the head and neck. *Clin Imaging* 2005; 29(5):307-312.	10	26	To examine the value of dynamic contrast-enhanced MRI in the differentiation of post-treatment fibrosis from recurrent carcinoma, by comparing the dynamic contrast-enhancement characteristics of the lesions.	11 patients were tumor-positive and 15 were tumor-negative group. Lesion enhancement ratios were significantly different (P<.05) between the two groups. Authors conclude that dynamic contrast-enhanced MRI may be a valuable modality in the differentiation of recurrent tumor from post-treatment fibrotic changes of the head and neck.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
56. Srinivasan A, Dvorak R, Perni K, Rohrer S, Mukherji SK. Differentiation of benign and malignant pathology in the head and neck using 3T apparent diffusion coefficient values: early experience. *AJNR Am J Neuroradiol* 2008; 29(1):40-44.	10	33	Retrospective study to examine differences in ADC values between benign and malignant head and neck lesions at 3T field strength imaging.	Results indicate statistically significant difference (P=.004) between the mean ADC values (in 10(-3) mm(2)/s) in the benign and malignant lesions (1.505 +/- 0.487; 95% CI, 1.305-1.706, and 1.071 +/- 0.293; 95% CI, 0.864-1.277, respectively). There were 2 malignant lesions with ADC >1.3 x 10(-3) mm(2)/s and 5 benign lesions with ADC <1.3 x 10(-3) mm(2)/s.	3
57. Srinivasan A, Dvorak R, Rohrer S, Mukherji SK. Initial experience of 3-tesla apparent diffusion coefficient values in characterizing squamous cell carcinomas of the head and neck. *Acta Radiol* 2008; 49(9):1079-1084.	10	10 normal patients 10 have head and neck cancer	To determine usefulness of 3T ADC values in characterizing SCC of the head and neck.	Mean ADC value measured in the SCC of the head and neck was 1.101 (+/-0.214) x 10(-3) mm(2)/s. The tumor ADC values were not significantly different from ADC values of parotid and submandibular glands (P=0.057 and 0.14, respectively). Authors conclude that 3T ADC values show potential for distinguishing SCC of the head and neck from normal extracranial head and neck structures.	2
58. Tomura N, Omachi K, Sakuma I, et al. Dynamic contrast-enhanced magnetic resonance imaging in radiotherapeutic efficacy in the head and neck tumors. *Am J Otolaryngol* 2005; 26(3):163-167.	13	27	Prospective study to identify correlations between pathology and dynamic contrast-enhanced MRI and assess the usefulness of this technique in the evaluation of radiation response for head and neck cancer.	Histologically, 18 tumors were classified as grade II (presence of viable tumor cells), 4 were grade III (nonviable tumor cells), and 5 were grade IV (no tumor cells). Although the mean +/- SD of ratio of maximum slope of increase (MSIR) in patients with histological grade II or III was 7.4 +/- 7.9, MSIR in patients with grade IV was 1.8 +/- 0.73, representing a significant difference (P<.05). Every patient with grade IV displayed an MSIR of 2.5 or less, although 5/22 patients with grade II or III had an MSIR of 2.5 or less. Authors conclude that MSI quantitatively reflects response to RT for head and neck cancer.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
59. Hansen EK, Bucci MK, Quivey JM, Weinberg V, Xia P. Repeat CT imaging and replanning during the course of IMRT for head-and-neck cancer. *Int J Radiat Oncol Biol Phys* 2006; 64(2):355-362.	13	13	Retrospective chart review to determine the dosimetric effects of repeat CT imaging and replanning during the course of IMRT on both normal tissues and target volumes.	When comparing replanning to not replanning, the hybrid IMRT plans (without replanning) showed reduced doses to target volumes and increased doses to critical structures. The doses to 95% of the planning target volumes of the gross tumor volume (PTVGTV) and the clinical target volume (PTVCTV) were reduced in 92% of patients, by 0.8-6.3 Gy (P=0.02) and 0.2-7.4 Gy (P=0.003), respectively. The maximum dose (Dmax) to the spinal cord increased in all patients (range, 0.2-15.4 Gy; P=0.003) and the brainstem Dmax increased in 85% of patients without replanning (range, 0.6-8.1 Gy; P=0.007). Authors conclude that repeat CT imaging and replanning is important in identifying dosimetric changes and ensuring adequate doses to target volumes and safe doses to normal tissues.	3
60. Liauw SL, Mancuso AA, Amdur RJ, et al. Postradiotherapy neck dissection for lymph node-positive head and neck cancer: the use of computed tomography to manage the neck. *J Clin Oncol* 2006; 24(9):1421-1427.	13	550	Retrospective review to determine how to use node response on CT to indicate the need for neck dissection.	133 (24%) of 550 were treated with chemotherapy. 341 (62%) had planned post-RT neck dissection. Physical examination and contrast-enhanced CT were performed 30 days after completion of RT. CT images were reviewed in 211 patients for lymph node size and presence of a focal abnormality. Radiographic complete response (rCR) was defined as the absence of any large (>1.5 cm) or focally abnormal lymph node. Correlation of response with neck dissection pathology showed NPV of 77% for complete clinical response and 94% for rCR. In 32 patients with rCR who did not undergo post-RT neck dissection, the 5-year ultimate neck control rate (100%) and cause-specific survival rate (72%) were not significantly different from the rates of patients with a negative post-RT neck dissection. Authors conclude that patients with rCR 4 weeks after RT can be spared from a post-RT neck dissection regardless of initial node stage.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
61. Abdel Razek AA, Kandeel AY, Soliman N, et al. Role of diffusion-weighted echo-planar MR imaging in differentiation of residual or recurrent head and neck tumors and posttreatment changes. *AJNR Am J Neuroradiol* 2007; 28(6):1146-1152.	10	32	Prospective study to determine whether diffusion-weighted MRI can be used in differentiating residual or recurrent HNT from postoperative or post-RT changes.	Adequate diffusion-weighted MRI and ADC maps were obtained in 30 patients (93.8%). The mean ADC value of residual or recurrent lesions (1.17 +/- 0.33 x 10(-3) mm(2)/s) was less than that of post-therapeutic changes (2.07 +/- 0.25 x 10(-3) mm(2)/s), and the difference was statistically significant (P<.001). When an ADC value of 1.30 x 10(-3) mm(2)/s was used as a threshold value for differentiation, the best results were obtained with an accuracy of 87%, sensitivity of 84%, specificity of 90%, PPV of 94%, and NPV of 76%.	2
62. Baghi M, Mack MG, Hambek M, et al. The efficacy of MRI with ultrasmall superparamagnetic iron oxide particles (USPIO) in head and neck cancers. *Anticancer Res* 2005; 25(5):3665-3670.	9	28	To evaluate the diagnostic accuracy of ultrasmall superparamagnetic iron oxide (USPIO)-enhanced MRI compared to plain MRI in patients with a clinical N+ neck using histology as a gold standard.	USPIO MRI detected 28 metastases (sensitivity 82.3%) and 329 non-metastatic lymph nodes (specificity 100%). Regarding lymph node size, USPIO MRI was correct in all patients who underwent surgery. One lymph node with microinfiltration of tumor cells was detected by USPIO MRI. Study confirms the usefulness of MRI with USPIO in patients with head and neck cancer.	2
63. Baghi M, Mack MG, Wagenblast J, et al. Iron oxide particle-enhanced magnetic resonance imaging for detection of benign lymph nodes in the head and neck: how reliable are the results? *Anticancer Res* 2007; 27(5B):3571-3575.	9	17	To evaluate the accuracy of USPIO-enhanced MRI in patients with head and neck cancer and enlarged lymph nodes compared with current staging examinations using histology as a gold standard.	On a patient basis, USPIO-enhanced MRI showed a higher specificity and diagnostic accuracy (94%) compared with non-enhanced MRI (53%).	2
64. Curvo-Semedo L, Diniz M, Migueis J, et al. USPIO-enhanced magnetic resonance imaging for nodal staging in patients with head and neck cancer. *J Magn Reson Imaging* 2006; 24(1):123-131.	9	20 patients 63 nodes	Prospective study to determine the accuracy of USPIO-enhanced MRI for nodal staging in patients with head and neck cancer.	24 metastatic and 30 non-metastatic nodes were diagnosed with ferumoxtran-10-enhanced, yielding a sensitivity of 96%, a specificity of 78.9%, PPV of 75%, and NPV of 96.8%, compared to 64%, 78.9%, 66.6%, and 76.9%, respectively, for non-enhanced MRI. Accuracy of ferumoxtran-10-enhanced MRI was 85.7%. The gradient-echo T2-weighted sequence was the most accurate to detect signal loss in nonmetastatic nodes. Authors conclude that USPIO-enhanced MRI is useful for nodal staging.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
65. Maeda M, Kato H, Sakuma H, Maier SE, Takeda K. Usefulness of the apparent diffusion coefficient in line scan diffusion-weighted imaging for distinguishing between squamous cell carcinomas and malignant lymphomas of the head and neck. *AJNR Am J Neuroradiol* 2005; 26(5):1186-1192.	10	39 patients with SCC 14 patients with lymphoma	Prospective study to determine usefulness of ADC in line scan diffusion-weighted imaging for distinguishing between SCC and malignant lymphomas of the head and neck.	Mean ADC values were 0.96 +/- 0.11 x 10(-3) mm(2)/s for SCC and 0.65 +/- 0.09 x 10(-3) mm(2)/s for lymphoma; the difference was significant (P<.001). All but one of the patients with lymphoma had ADC values lower than the lowest ADC (0.76 x 10(-3) mm(2)/s) in patients with SCC. When an ADC of 0.76 x 10(-3) mm(2)/s was used to distinguish between SCC and lymphoma, accuracy was 98% (52/53 lesions). Authors recommend ADC values for distinguishing between SCC and lymphoma in the head and neck.	2
66. Yu Q, Yang J, Wang P, Shi H, Luo J. Preliminary assessment of benign maxillofacial and neck lesions with in vivo single-voxel 1H magnetic resonance spectroscopy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007; 104(2):264-270.	10	55 lesions	To assess the potential roles of in vivo single-voxel hydrogen 1 (1H) MR spectroscopy in differentiation of benign maxillofacial and neck lesions.	In the maxillofacial and neck regions, in vivo 1H MR spectroscopy might provide information in differentiating fluid-filled lesions from solid lesions. Most neurogenic tumors, Warthin tumors, sarcoidosis, and sinus histiocytosis were detected with Cho signals.	2
67. Gandhi D, Falen S, McCartney W, et al. Value of 2-[18F]-fluoro-2-deoxy-D-glucose imaging with dual-head gamma camera in coincidence mode: comparison with computed tomography/magnetic resonance imaging in patients with suspected recurrent head and neck cancers. *J Comput Assist Tomogr* 2005; 29(4):513-519.	9	29	Single center prospective study to assess the value of dual-head gamma-camera (DHGC) imaging in the coincidence mode using FDG in differentiating recurrent tumor from post-treatment changes in previously treated head and neck cancer. 24 patients had CT, and 5 patients had MRI.	Sensitivity, specificity, PPV, NPV, and accuracy of CT/MRI in the detection of recurrent cancer were 76.5%, 58.3%, 72.2%, 63.6%, and 69%, respectively. The sensitivity (100%), NPV (100%), and accuracy (82.8%) of DHGC imaging in the coincidence mode were superior to that of CT/MRI. DHGC imaging in the coincidence mode had a specificity (58.3%) and PPV (77.3%) comparable to those of CT/MRI. Authors recommend modified PET with DHGC imaging in the coincidence mode.	2
68. Gourin CG, Williams HT, Seabolt WN, Herdman AV, Howington JW, Terris DJ. Utility of positron emission tomography-computed tomography in identification of residual nodal disease after chemoradiation for advanced head and neck cancer. *Laryngoscope* 2006; 116(5):705-710.	10	17	Retrospective cohort study to determine the value of PET/CT in identifying patients with occult nodal disease after chemoradiation.	PET/CT had sensitivity of 40% and specificity of 25%. There was no correlation between PET/CT findings and histologic findings (P=.26) or between standardized uptake value and size of viable tumor (P=.67).	3

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
69. Lee JC, Kim JS, Lee JH, et al. F-18 FDG-PET as a routine surveillance tool for the detection of recurrent head and neck squamous cell carcinoma. *Oral Oncol* 2007; 43(7):686-692.	10	159	Retrospective study to determine the value of FDG-PET as a routine surveillance tool for the detection of recurrent head and neck cancer.	Overall sensitivity and NPV of PET scans for were 92.5% and 94.8%, compared with 55.0% and 76.9% for conventional evaluation methods. In 156 routine scans, the diagnostic sensitivity, specificity, and NPV for locoregional recurrence were 90%, 91% and 97%, respectively, and the values for distant metastases and second primary cancers were 100%, 97% and 100%, respectively.	2
70. Nam SY, Lee SW, Im KC, et al. Early evaluation of the response to radiotherapy of patients with squamous cell carcinoma of the head and neck using 18FDG-PET. *Oral Oncol* 2005; 41(4):390-395.	10	24	Prospective study to evaluate the efficacy of FDG-PET in early discrimination of response to definitive RT in patients with SCC of the head and neck.	Overall sensitivity of FDG-PET was 100%, specificity was 87%. FDG-PET is effective in evaluating the response to radiation in patients with SCC of the head and neck.	2
71. Perie S, Hugentobler A, Susini B, et al. Impact of FDG-PET to detect recurrence of head and neck squamous cell carcinoma. *Otolaryngol Head Neck Surg* 2007; 137(4):647-653.	10	70	Prospective study to evaluate the impact of FDG-PET in the management of recurrence of advanced head and neck SCC during the first year after treatment.	FDG-PET had a therapeutic impact in 8/43 in group A patients, and in 16/27 of group B patients; the overall rate was 34%. This change was pertinent in 5/8 and 14/16 cases, respectively. Overall pertinence rate of decisions was 90% vs 70% without FDG-PET. Authors conclude that FDG-PET had a significant overall therapeutic impact and that systematic FDG-PET had a significantly lesser impact in comparison with FDG-PET motivated by clinical suspicion.	2
72. Shintani SA, Foote RL, Lowe VJ, Brown PD, Garces YI, Kasperbauer JL. Utility of PET/CT imaging performed early after surgical resection in the adjuvant treatment planning for head and neck cancer. *Int J Radiat Oncol Biol Phys* 2008; 70(2):322-329.	10	91 patients 62 squamous cell and 29 non-squamous cell cancers	Prospective cohort study to determine the value of PET/CT performed early after surgical resection and before postoperative adjuvant radiation therapy.	24 patients (26.4%) had biopsy of suspicious sites. 11 (45.8%) biopsies were positive for cancer. PET/CT changed patient management in a relatively large proportion of patients.	2

Neck Mass-Adenopathy
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
73. Yao M, Luo P, Hoffman HT, et al. Pathology and FDG PET correlation of residual lymph nodes in head and neck cancer after radiation treatment. *Am J Clin Oncol* 2007; 30(3):264-270.	10	23 patients had neck dissection	To determine if post-RT FDG-PET can predict the pathology status of residual cervical lymph nodes in patients undergoing definitive RT for head and neck SCC.	Pathology correlated strongly with the post-RT FDG-PET studies. All patients with a negative post-RT FDG-PET and those with a maximum standardized uptake value (SUV) <3.0 in the post-RT FDG-PET were found to be free from residual viable tumor. For SUVmax of <3.0 as the criterion for a negative FDG-PET study, the sensitivity, specificity, PPV, and NPV were 100%, 84.2%, 62.5%, and 100%, respectively. Authors conclude that a negative post-RT FDG-PET is very predictive of negative pathology in the residual lymph node after definitive RT for advanced head and neck SCC.	3
74. Kim SY, Lee SW, Nam SY, et al. The Feasibility of 18F-FDG PET scans 1 month after completing radiotherapy of squamous cell carcinoma of the head and neck. *J Nucl Med* 2007; 48(3):373-378.	10	97	Prospective study to evaluate the value of FDG-PET scans 1 month after completing RT of SCC of the head and neck.	Sensitivity of FDG-PET was 88%, specificity was 95%, and overall diagnostic accuracy was 94.9%. Results show FDG-PET might be a valuable imaging method for evaluating the response to RT in patients with SCC of the head and neck.	2
75. American College of Radiology. *Manual on Contrast Media*. Available at: http://www.acr.org/SecondaryMainMenuCategories/quality_safety/contrast_manual.aspx	15	N/A	Guidance document on contrast media to assist radiologists in recognizing and managing risks associated with the use of contrast media.	N/A	3

Evidence Table Key

Study Type Key

Numbers 1-7 are for studies of therapies while numbers 8-15 are used to describe studies of diagnostics.

1. Randomized Controlled Trial — Treatment
2. Controlled Trial
3. Observation Study
    a. Cohort
    b. Cross-sectional
    c. Case-control
4. Clinical Series
5. Case reviews
6. Anecdotes
7. Reviews
8. Randomized Controlled Trial — Diagnostic
9. Comparative Assessment
10. Clinical Assessment
11. Quantitative Review
12. Qualitative Review
13. Descriptive Study
14. Case Report
15. Other (Described in text)

Strength of Evidence Key

- Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.
- Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.
- Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.
- Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.