American Head & Neck Society
National Standardized Head & Neck Fellowship Curriculum
Goals & Objectives and Recommended Syllabus

Authored by the 2017-2018 AHNS Education Committee
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It is recommended that all Fellows use both the 7th and the 8th Edition of the AJCC Staging systems. In addition, we recommend that they use the current Guidelines of the National Comprehensive Cancer Network (NCCN) (which can be accessed at www.nccn.org.) and American Thyroid association guidelines in discussion and management of cases (https://www.thyroid.org/professionals/ata-professional-guidelines)

Head & Neck Anatomy – Recommended Reading

Anatomy of the Head and Neck. George H.Paff. 1973. W.B. Saunders Company.

Gun R, Durmus K, Kucur C, Carrau RL, Ozer E. Transoral surgical anatomy and clinical considerations of lateral oropharyngeal wall, parapharyngeal space, and tongue base. Otolaryngol Head Neck Surg. 2016 Mar;154(3):480-5.

Surgical Anatomy of the Head and Neck Hardcover. Azar N, et al. 2011. Editors: Janfaza P, Nadol Jr J, Galla RJ, Fabian RL, Montgomery WW.

Local Flaps in Facial Reconstruction Hardcover. Baker SR. 2014.

Netter's Advanced Head and Neck Flash Cards Cards. Norton NS. 2016.

Lim CM, Mehta V, Chai R, Pinheiro CN, Rath T, Snyderman C, Duvvuri U. Transoral anatomy of the tonsillar fossa and lateral pharyngeal wall: anatomic dissection with radiographic and clinical correlation. Laryngoscope. 2013 Dec;123(12):3021-5.

Stack BC Jr, Ferris RL, Goldenberg D, Haymart M, Shaha A, Sheth S, Sosa JA, Tufano RP; American Thyroid Association Surgical Affairs Committee. American Thyroid Association consensus review and statement regarding the anatomy, terminology, and rationale for lateral neck dissection in differentiated thyroid cancer. Thyroid. 2012 May;22(5):501-8.

Robbins KT, Shaha AR, Medina JE, Califano JA, Wolf GT, Ferlito A, Som PM, Day TA; Committee for Neck Dissection Classification, American Head and Neck Society.Consensus statement on the classification and terminology of neck dissection. Arch Otolaryngol Head Neck Surg. 2008 May;134(5):536-8.

Robotic head and neck surgery: an anatomical and surgical atlas. Goldenberg D. 2017.

Color Atlas of Head and Neck Surgery: A Step-by-Step Guide. Dubey SP, Molumi CP.

Atlas of Regional and Free Flaps for Head and Neck Reconstruction, 2nd Edition. Flap Harvest and Insetting. By Mark L. Urken, Mack L. Cheney, Keith E. Blackwell, Jeffrey R. Harris, Tessa A. Hadlock and Neal Futran.

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Cutaneous Malignancies

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate proficiency in the diagnosis, management and appropriate surveillance for patients with melanoma and non-melanoma skin cancer.**
Objective:	**By the end of the fellowship, the fellows can:**

1. List the function of the skin and diagram its histologic anatomy
    A. Outline the different histologic layers and their cellular make-up, especially as it pertains to the development of different types of cutaneous malignancies
2. Perform a thorough oncologic examination of head and neck, with emphasis on the skin and scalp exam as well as the associated at-risk lymphatic basins based on the location of the primary tumor
    A. Perform a relevant sensory and cranial nerve examination based on the location of the tumor
3. Develop a differential diagnosis for pigmented and non-pigmented skin lesions
4. Recognize the risk factors for developing melanoma and non-melanoma skin cancer
5. Identify basic cutaneous histopathology
    A. Recognize the spectrum between normal, dysplastic and invasive skin lesions based on histopathology
    B. Determine what immunohistochemical stains differentiate various skin lesions
6. Describe the typical presentation of different types of skin cancer and recognize signs and symptoms that suggest a more aggressive behavior
7. Stage different cutaneous malignancies accurately based on AJCC classification system
8. Plan a staging work up for malignant skin lesions based on NCCN guidelines
    A. Determine when additional testing such as MRI, temporal bone imaging, chest imaging is indicated
    B. Determine when it is appropriate to consider PET/CT imaging in cutaneous malignancies
    C. Determine when it is appropriate to perform sentinel node biopsy for regional staging of cutaneous malignancies
9. Describe clinical and pathological features that make skin cancers at higher risk for local recurrence or regional metastasis (particularly for basal cell carcinoma and squamous cell carcinoma)
10. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient
    A. Outline the treatment options: surgical, nonsurgical, palliative
    B. For surgical patients, determine when it is appropriate to consult additional services to assist with management (neuro-otology for aggressive periauricular/auricular lesions and/or those with complete facial paralysis, head and neck reconstructive surgeon, neurosurgery, if skull or skull base involvement is present)
11. Determine the appropriate surgical margins for primary tumor resection, based on stage for:
    A. Malignant melanoma
    B. SCC
    C. BCC

D. Merkel cell carcinoma
E. Dermatofibrosarcoma protuberans
F. Angiosarcoma

12. Cite the principles of Mohs Micrographic surgery as well as its indications and contraindications
13. Describe the indications for sentinel lymph node biopsy and/or elective neck dissection in N0 cutaneous squamous cell carcinoma
14. Determine when sentinel lymph node biopsy is indicated for cutaneous melanoma of the head and neck and Merkel cell carcinoma
15. Recognize when reconstruction is needed following resection of skin cancers
    A. Determine the best option for closure of small defects based on location and relaxed skin tension lines
    B. Outline the options for reconstruction: Allografts, skin grafts, local flaps, regional flaps (submental, supraclavicular, pectoralis, SCM, Occipital, lower island trapezius), and free flaps (ALT, forearm, rectus abdominus, latissimus)
    C. Recognize what defects and scenarios are appropriate for delayed reconstruction
    D. Recognize scalp defects that will require tissue expanders for reconstruction and formulate a plan for utilization of tissue expanders
16. Determine indications for a facial nerve drill-out and/or a lateral temporal bone resection
17. Perform core procedures in surgery on the skin of the head and neck, including design of local flap closures and sentinel lymph node biopsy, as defined by the curriculum, based on the attestation of the program director
18. Cite indications for adjuvant therapy following surgery for non-melanoma cancer, malignant melanoma and Merkel cell carcinoma based on staging, pathologic characteristics and operative findings
19. Summarize the current status of molecular testing of melanoma
20. Recognize common complications of following parotid surgery, neck surgery, and wide skin undermining
21. Plan appropriate course of action for treating surgical complications of skin cancer surgery
22. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable cutaneous lesions
23. Discuss indications for orbital exenteration in periocular cutaneous malignancies
24. State what non-surgical options are available to treat aggressive cutaneous malignancies
25. Utilize ancillary services such as nutrition and physical therapy appropriately in treatment planning and long term care of skin cancer patients
26. Formulate an evidence-based surveillance program for skin cancer and melanoma survivors based on established guidelines (such as NCCN)
27. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up
28. Discuss the available options and recommend appropriate systemic therapies, including immunotherapy
29. Recognize incurable diseases and plan appropriate palliative care
30. Describe the indications for a parotidectomy
31. Describe the indications for a neck dissection

32. If the facial nerve is involved and/or sacrificed, describe the options for reconstruction of the upper and lower divisions of the nerve.

Process:	**By the end of fellowship the fellows have participated in a minimum number of skin cancer resection and reconstruction procedures based on the following list:**

1. Wide local excision of facial skin cancers
2. Wide local excision of scalp skin cancers (+/- resection of outer table of calvarium)
3. Sentinel lymph node biopsy
4. Modified radical and/or radical lymphadenectomy
5. Local flap closure of facial skin defects
6. Split thickness skin grafting
7. Full thickness skin grafting
8. Parotidectomy for cutaneous malignancies

Recommended Reading:

Andrews, G. Primary resection of cutaneous malignancies of the head and neck. Operative Techniques in Otolaryngology-Head and Neck Surgery, Vol. 24, Issue 1, p9–12. Published in issue: March 2013

Neves, R.I. Selective sentinel lymph node dissection in head and neck cutaneous melanoma. Operative Techniques in Otolaryngology-Head and Neck Surgery, Vol. 24, Issue 1, p13–18. Published in issue: March 2013

Craig L. Cupp, Wayne F. Larrabee Jr., Reconstruction of the forehead and scalp. Operative Techniques in Otolaryngology-Head and Neck Surgery, Vol. 4, Issue 1, p11–17. Published in issue: March 1993

Treatment of the parotid gland in cutaneous melanoma – Operative Techniques in Otolaryngology - Head and Neck Surgery. Pytynia, Kristen, MD, MPH; Warso, Michael, MD.. Published December 1, 2008. Volume 19, Issue 4.

Basal Cell Carcinoma

Rubin AI, Chen EH, Ratner D. Basal Cell Carcinoma. N Engl J Med 2005;353:2262-2269.

Chistenson LK, Borrowman TA, Vachon CM, et al. Incidence of basal cell and squamous cell carcinomas in a population younger than 40 years. JAMA 2005; 294: 681-690.

Inhibition of the hedgehog pathway in advanced basal-cell carcinoma. Von Hoff DD, LoRusso PM, Rudin CM, Reddy JC, Yauch RL, Tibes R, Weiss GJ, Borad MJ, Hann CL, Brahmer JR, Mackey HM, Lum BL, Darbonne WC, Marsters JC Jr, de Sauvage FJ, Low JA. N Engl J Med. 2009 Sep 17;361 (12):1164-72.

Squamous Cell Carcinoma

Stratigos, A., et al. (2015). "Diagnosis and treatment of invasive squamous cell carcinoma of the skin: European consensus-based interdisciplinary guideline." European Journal of Cancer 51(14): 1989-2007.

Rogers HW, Weinstock MA, Harris AR et al. Incidence estimate of nonmelanoma skin cancer in the United States, 2006. Arch Dermatol 2010; 146: 283-287.

Schmults CD, Karia PS, Carter JB, Han J, Quereshi AA. Factors predictive of recurrence and death from cutaneous squamous cell carcinoma: a 10-year, single-institution cohort study. JAMA Dermatol 2013;149(5):541-547.

Jambusaria-Pahlajani A, Kanetsky PA, Karia PS, et al. Evaluation of AJCC tumor staging for cutaneous squamous cell carcinoma and a proposed alternative tumor staging system. JAMA Dermatol 2013;149(4):402-410.

Clayman GL, Lee J, Holsinger FC et al. Mortality risk from squamous cell skin cancer. Journal of clinical oncology 2005;23(4):759-765.

Sweeny L, Zimmerman T, Carroll WR, Schmalbach CE, Day KE, Rosenthal EL. Head and neck cutaneous squamous cell carcinoma requiring parotidectomy: prognostic indicators and treatment selection. Otolaryngol-Head Neck Surg 2014;150(4):610-617.

McDowell LJ, Tan T, Bressel M et al. Outcomes of cutaneous squamous cell carcinoma of the head and neck with parotid metastases. J Medical Imaging and Radiation Oncology; 2016: 1-9.

Brantsch KD, et al. Analysis of risk factors determining prognosis of cutaneous squamous-cell carcinoma: A prospective study. Lancet Oncol. 2008;9:713-20.

Rowe DE, Carroll RJ, Day CL. Prognostic factors for local recurrence, metastasis, and survival rates in squamous cell carcinoma of the skin, ear, and lip. J Am Acad Dermatol. 1992;26:976-990.

Goepfert H, et al. Perineural invasion in squamous cell skin carcinoma of the head and neck. Am J Surg. 1984;148:542-7

Moore BA, Weber RS, Prieto V, et al. Lymph node metastases from cutaneous squamous cell carcinoma of the head and neck. The Laryngoscope, 2005;115:1561-1567.

Ch'ng S, Maitra A, Allison RS, et al. Parotid and cervical nodal status predict prognosis for patients with head and neck metastatic cutaneous squamous cell carcinoma. J Surg Onc 2008;98:101-105

O'Brien CJ, McNeil EB, McMahon JD, et al. Significance of clinical stage, extent of surgery, and pathologic findings in metastatic cutaneous squamous carcinoma of the parotid gland. Head Neck. 2002; 24: 417-22

Jensen P, Hansen S, Moller B, et al. Skin cancer in kidney and heart transplant recipients and different long-term immunosuppressive therapy regimens. J Am Acad Dermatol. 1999; 40: 177-86.

Veness MJ, Morgan GJ, Palme CE, Gebski V. Surgery and adjuvant radiotherapy in patients with cutaneous head and neck squamous cell carcinoma metastatic to lymph nodes: combined treatment should be considered best practice. The Laryngoscope, 2005;115:870-875.

D'Souza J, Clark J. Management of the neck in metastatic cutaneous squamous cell carcinoma of the head and neck. Curr Opin Otolaryngol Head Neck Surg. 2011;19:99-105.

Durham AB, Lowe L, Malloy KM, McHugh JB, Bradford CR, Chubb H, Johnson TM, McLean SA. Sentinel lymph node biopsy for cutaneous squamous cell carcinoma on the head and neck. JAMA Otolaryngol Head Neck. 2016;142(12):1171-1176.

Ow TJ, Wang HR, McLellan B, Ciocon D, Amin B, Goldenberg D, Schmalbach CE; Education Committee of the American Head and Neck Society (AHNS). AHNS Series- Do you know your guidelines? Diagnosis and Management of Cutaneous Squamous Cell Carcinoma. *Head Neck*. 2016 Nov;38(11):1589-1595.

Ahmed M, Moore BA, Schmalbach CE. Utility of sentinel node biopsy in head & neck cutaneous squamous cell carcinoma: a systematic review. *Otolaryngol Head Neck Surg*. 2014;150(2):180-7.

Cutaneous Malignant Melanoma

Faris MB, Thompson JF, Cochran AJ, et al. Completion dissection or observation for sentinel-node metastasis in melanoma. N Engl J Med 2017;376:2211-2222.

Sladden MJ, Balch C, Barzilai DA, Berg D, Freiman A, Handiside T, Hollis S, Lens MB, Thompson JF. Surgical excision margins for primary cutaneous melanoma. Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD004835. DOI: 10.1002/14651858.CD004835.pub2.

Balch, C. M., et al.. Long-Term Results of a Prospective Surgical Trial Comparing 2 cm vs. 4 cm Excision Margins for 740 Patients With 1–4 mm Melanomas. Annals of Surgical Oncology 2001;8(2): 101-108.

Patel SG, Coit DG, Shaha AR, Brady MS, Boyle JO, Singh B, Shah JP, Kraus DH. Sentinel Lymph Node Biopsy for Cutaneous Head and Neck Melanomas. Arch Otolaryngol Head Neck Surg. 2002;128:285-291.

O'Brien CJ, Petersen-Schaefer K, Stevens GN, Bass PC, Tew P, Gebski VJ, Thompson JF, McCarthy WH. Adjuvant radiotherapy following neck dissection and parotidectomy for metastatic malignant melanoma. Head Neck 1997;19:589-594.

Autier P, Dore JF. Influence of sun exposures during childhood and during adulthood on melanoma risk. EPIMEL and EORTC Melanoma Cooperative Group. European Organization for Research and Treatment of Cancer. Int J Cancer. 1998; 77(4): 533-7.

Morton DL, Wen DR, Wong JH, Economou JS, Cagle LA, Storm FK, Foshag LJ, Cochran AJ. Technical details of intraoperative lymphatic mapping for early stage melanoma. Arch Surg. 1992; 127(4): 392-9.

Breslow A. Thickness, cross-sectional areas and depth of invasion in the prognosis of cutaneous melanoma. Ann Surg. 1970; 172(5): 902-8.

Morton DL, Thompson JF, Cochran AJ, Mozzillo N, Elashoff R, Essner R, Nieweg OE, Roses DF, Hoekstra HJ, Karakousis CP, Reintgen DS, Coventry BJ, Glass EC, Wang HJ; MSLT Group. Sentinel-node biopsy or nodal observation in melanoma. N Eng J Med. 2006; 355(13): 1307-17.

Morton DL, Thompson JF, Cochran AJ, Mozzillo N, Nieweg OE, Roses DF, Hoekstra HJ, Karakousis CP, Puleo CA, Coventry BJ, Kashani-Sabet M, Smither BM, Paul E, Kraybill WG, McKinnon JG, Wang HJ, ELashoff R, Faries MB, MSLT Group. Final trial report of sentinel-node biopsy versus nodal observation in melanoma. N Engl J Med. 2014; 370(7): 599-609.

Sentinel lymph node biopsy is accurate and prognostic in head and neck melanoma.Erman AB, Collar RM, Griffith KA, Lowe L, Sabel MS, Bichakjian CK, Wong SL, McLean SA, Rees RS, Johnson TM, Bradford CR. Cancer. 2012 Feb 15;118(4):1040-7.

Wide versus narrow excision margins for high-risk, primary cutaneous melanomas: long-term follow-up of survival in a randomised trial. Hayes AJ, Maynard L, Coombes G, Newton-Bishop J, Timmons M, Cook M, Theaker J, Bliss JM, Thomas JM; UK Melanoma Study Group.; British Association of Plastic, Reconstructive and Aesthetic Surgeons.; Scottish Cancer Therapy Network. Lancet Oncol. 2016 Feb;17(2):184-92.

Merkel Cell Carcinoma

Feng, H., et al.. Clonal integration of a polyomavirus in human Merkel cell carcinoma. Science 2008;319(5866): 1096-1100.

Schmalbach CE. Merkel Cell Carcinoma. In Weber R, Moore B eds. *Cutaneous Malignancy of the Head and Neck: A Multidisciplinary Approach.* San Diego, Ca: Plural Publishing Inc; 2011.

Five hundred patients with Merkel cell carcinoma evaluated at a single institution. Fields RC, Busam KJ, Chou JF, Panageas KS, Pulitzer MP, Allen PJ, Kraus DH, Brady MS, Coit DG. Ann Surg. 2011 Sep;254(3):465-73; discussion 473-5. doi: 10.1097/SLA.0b013e31822c5fc1. Erratum in: Ann Surg. 2012 Feb;255(2):404. PMID: 21865945

Recurrence after complete resection and selective use of adjuvant therapy for stage I through III Merkel cell carcinoma. Fields RC, Busam KJ, Chou JF, Panageas KS, Pulitzer MP, Allen PJ, Kraus DH, Brady MS, Coit DG. Cancer. 2012 Jul 1;118(13):3311-20. doi: 10.1002/cncr.26626. Epub 2011 Nov 9. PMID:22072529

Gershenwald JE, Scolyer RA, Hess KR, Sondak VK, Long GV, Ross MI, Lazar AJ, Faries MB, Kirkwood JM, McArthur GA, Haydu LE, Eggermont AMM, Flaherty KT, Balch CM, Thompson JF. Melanoma staging: Evidence-based changes in the American Joint Committee on Cancer eighth edition cancer staging manual. CA Cancer J Clin. 2017 Nov;67(6):472-492. doi: 10.3322/caac.21409. Epub 2017 Oct 13.

Faries, M. et al, Completion Dissection or Observation for Sentinel-Node Metastasis in Melanoma. N Engl J Med. 2017 Jun 8;376(23):2211-2222. doi: 10.1056/NEJMoa1613210.

Weber, J. et al, Adjuvant Nivolumab versus Ipilimumab in Resected Stage III or IV Melanoma. N Engl J Med. 2017 Nov 9;377(19):1824-1835. doi: 10.1056/NEJMoa1709030. Epub 2017 Sep 10.

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Salivary Gland

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate proficiency in the diagnosis, management and appropriate surveillance for patients with salivary gland cancer.**
Objective:	**By the end of the fellowship, the fellow can:**

1. Define the anatomy and distribution of the major and minor salivary glands
    A. Outline the glandular make-up of the different types of salivary tissue, as well as the anatomy of the fundamental salivary unit
    B. Define the innervation of the different major salivary glands
    C. Describe the anatomy of the parapharyngeal space to include types of tumors are present in the pre-styloid versus post-styloid space
2. Perform a thorough examination of the head and neck, with emphasis on the major salivary glands and surrounding structures
3. Identify the most common locations for the development of salivary gland tumors and recognize examination findings that suggest malignancy
    A. Recognize key relevant cranial nerve findings based on the location of the tumor
    B. Recall signs of primary cutaneous malignancy in patients with carcinomas of the parotid gland that can be metastatic
4. Express the relative distribution of benign versus malignant salivary gland tumors
    A. List the most common malignancies in the parotid, submandibular, sublingual and minor salivary glands as well as the overall most common salivary cancer
5. Outline the risk factors for developing certain salivary tumors (i.e. smoking for Warthin's tumors, Sjogren's disease for lymphoma, etc)
6. Define the difference from the reserve cell theory and multicellular theory of tumor development
7. Recognize the typical presentation of benign and malignant salivary tumors and certain signs and symptoms that might suggest a more aggressive behavior
8. Form a differential diagnosis for neck masses and salivary masses
9. Review the indications and limitations of fine needle aspiration and core needle biopsy for salivary gland masses
10. Plan a staging work up for malignant salivary lesions based on NCCN guidelines
11. Determine the need for additional imaging such as MRI, temporal bone imaging, chest imaging
    A. State when to consider PET/CT
12. Stage different salivary malignancies accurately based on AJCC classification system
13. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient based on the NCCN guidelines.
    A. For surgical patients, know when it is appropriate to consult additional services to assist with management (neuro-otology for aggressive parotid malignancies and/or those with complete facial paralysis, head and neck reconstructive surgeon, neurosurgery, if skull base involvement is present, maxillofacial prosthodontics, if palate resection is indicated)

14. Describe the indications and extent of dissection for elective lymphadenectomy in clinically node-negative salivary malignancies
15. Summarize the different approaches to identify and preserve the facial nerve during parotidectomy
16. Recognize when reconstruction is needed following resection of salivary gland cancers
    A. Discuss the options for reconstruction: allografts, autografts (fat graft and dermal fat graft), regional muscle/myofascial and fasciocutaneous flaps (Superficial Myoaponeurotic System (SMAS), digastric, submental, supraclavicular, pectoralis, sternocleidomastoid muscle, occipital, lower island trapezius), and free flaps (anterolateral thigh, radial forearm, rectus abdominus, and latissimus)
17. Determine when a facial nerve drill-out and/or a lateral temporal bone resection is indicated
18. Recognize the utility of frozen section and its limitations in salivary gland tumor management
19. Perform core procedures in surgery on the salivary glands as defined by the curriculum, based on the attestation of the program director
20. Define indications for adjuvant therapy following surgery for salivary gland cancer based on staging, pathologic characteristics, operative findings, and the NCCN guidelines
21. Diagram and counsel patients about the current status of molecular testing and potential targeted therapy for salivary gland cancers
22. Recognize and manage common complications following parotid and neck surgery
23. For purposes of preoperative patient counseling:
    A. Describe and discuss relative risks of transient and permanent facial nerve weakness following various extents of parotidectomy and for submandibular gland excision.
    B. Counsel patients regarding additional risks: Frey's syndrome, first bite phenomenon, cutaneous sensory loss, and salivary fistula
24. Plan and execute appropriate course of action for treating surgical complications of salivary procedures, including the range of techniques available for facial reanimation
25. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable salivary lesions
26. Discuss and select appropriately the existent non-surgical options to treat salivary gland cancers and the different types of radiotherapy modalities that can be used in these lesions
    A. Proton beam radiation for perineural spread and skull base involvement
    B. Neutron beam radiation for adenoid cystic carcinoma and unresectable tumors
    C. Role of chemotherapy in salivary gland cancer in accordance with NCCN guidelines
    D. Role and availability of clinical trials
27. Utilize ancillary services such as nutrition and speech therapy appropriately in treatment planning and long term care of salivary gland cancer patients
28. Formulate an evidence based surveillance program for salivary cancer survivors based on established guidelines (such as those by the NCCN)
29. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work-up algorithm

Process:	**By the end of fellowship the fellows have participated in a minimum number of salivary gland procedures based on the following list:**

1. Parotidectomy
    A. Superficial
    B. Deep/total
2. Submandibular gland excision (can be part of a level 1 neck dissection)
3. Transcervical approach to the parapharyngeal space and infratemporal fossa
4. Transmandibular approach to the infratemporal fossa (if applicable)
5. Modified radical and/or radical lymphadenectomy
6. Parotid bed reconstruction, any technique
7. Primary nerve repair
8. Cable graft nerve repair in facial nerve injuries
9. Sublingual gland excision and excision of ranula

Recommended Reading

Mydlarz, W.K; Agrawal, N. Transparotid and transcervical approaches for removal of deep lobe parotid gland and parapharyngeal space, Operative Techniques in Otolaryngology - Head and Neck Surgery. September 1, 2014. Volume 25, Issue 3. Pages 234-239. © 2014.

Sheahan, P. Transcervical approach for removal of benign parapharyngeal space tumors. Operative Techniques in Otolaryngology - Head and Neck Surgery.) September 1, 2014. Volume 25, Issue 3. Pages 227-233.

Mifsud MJ, Burton JN, Trotti AM, Padhya TA. Multidisciplinary Management of Salivary Gland Cancers. Cancer Control. 2016 Jul;23(3):242-8.

Lewis AG, Tong T, Maghami E. Diagnosis and Management of Malignant Salivary Gland Tumors of the Parotid Gland. *Otolaryngol Clin North Am* 49:343-80, 2016.

de Ridder M, Balm AJ, Smeele LE et al. An epidemiological evaluation of salivary gland cancer in the Netherlands (1989-2010). *Cancer Epidemiol* 39:14-20,2015 is the other one that provides a population based data.

Bradley PJ, McGurk M. Incidence of salivary gland neoplasms in a defined UK population. Br J Oral Maxillofac Surg. 2013 Jul;51(5):399-403. doi: 10.1016/j.bjoms.2012.10.002. Epub 2012 Oct 24.

Pan SY, de Groh M, Morrison H. A Case-Control Study of Risk Factors for Salivary Gland Cancer in Canada. J Cancer Epidemiol. 2017;2017:4909214. doi: 10.1155/2017/4909214. Epub 2017 Jan 4.

Douville NJ, Bradford CR. Comparison of ultrasound-guided core biopsy versus fine-needle aspiration biopsy in the evaluation of salivary gland lesions. Head Neck. 2013 Nov;35(11):1657-61. doi: 10.1002/hed.23193. Epub 2012 Oct 29.

Witt BL, Schmidt RL. Ultrasound-guided core needle biopsy of salivary gland lesions: a systematic review and meta-analysis. Laryngoscope. 2014 Mar;124(3):695-700.

Schmidt RL, Hunt JP, Hall BJ, Wilson AR, Layfield LJ. A systematic review and meta-analysis of the diagnostic accuracy of frozen section for parotid gland lesions. Am J Clin Pathol. 2011 Nov;136(5):729-38.

Spiro RH: Salivary Neoplasms: Overview of a 35-year experience with 2807 patients. Head Neck Surg 8: 177-184, 1986.

Deschler DG, Eisele DW. Surgery for Primary Malignant Parotid Neoplasms. Adv Otorhinolaryngol. 2016;78:83-94.

Mehta V, Nathan CA. Extracapsular Dissection Versus Superficial Parotidectomy for Benign Parotid Tumors. The Laryngoscope 2015 May;125:1039-1040.

Yoo SH, Roh JL, Kim SO, Cho KJ, Choi SH, Nam SY, Kim SY. Patterns and treatment of neck metastases in patients with salivary gland cancers. J Surg Oncol. 2015 Jun;111(8):1000-6. doi: 10.1002/jso.23914.

Wang YL, Li DS, Gan HL, Lu ZW, Li H, Zhu GP, et al. Predictive index for lymph node management of major salivary gland cancer. *Laryngoscope* 122:1497-506,2012.

Xiao CC, Zhan KY, White-Gilbertson SJ, Day TA. Predictors of Nodal Metastasis in Parotid Malignancies: A National Cancer Data Base Study of 22,653 Patients Otolaryngol Head Neck Surg 154:121-30, 2016
Douglas JG, Koh WJ, Austin-Seymour M, Laramore GE. Treatment of salivary gland neoplasms with fast neutron radiotherapy. Arch Otolaryngol Head Neck Surg. 2003 Sep;129(9):944-8.

Linton OR, Moore MG, Brigance JS, Summerlin DJ, McDonald MW. Proton therapy for head and neck adenoid cystic carcinoma: initial clinical outcomes. Head Neck. 2015 Jan;37(1):117-24.

Garden AS, Weber RS, Morrison WH, Ang KK, Peters LJ. The influence of positive margins and nerve invasion in adenoid cystic carcinoma of the head and neck treated with surgery and radiation. Int J Radiat Oncol Biol Phys 1995;32:619–626.

Tanvetyanon T, Qin D, Padhya T, et al. Outcomes of postoperative concurrent chemoradiotherapy for locally advanced major salivary gland carcinoma. Arch Otolaryngol Head Neck Surg 2009;135:687–692.

Hunt JL. An update on molecular diagnostics of squamous and salivary gland tumors of the head and neck. Arch Pathol Lab Med 2011; 135:602–609

Weber RS, Byers RM, Petit B, Wolf P, Ang K, Luna M. Submandibular gland tumors. Adverse histologic factors and therapeutic implications. Arch Otolaryngol Head Neck Surg. 1990 Sep;116(9):1055-60

Byrd SA, Spector ME, Carey TE, Bradford CR, McHugh JB. Predictors of recurrence and survival for head and neck mucoepidermoid carcinoma. Otolaryngol Head Neck Surg. 2013 Sep;149:402-8

Coca-Pelaz A, Rodrigo JP, Triantafyllou A, Hunt JL, Rinaldo A, Strojan P, Haigentz M Jr, Mendenhall WM, Takes RP, Vander Poorten V, Ferlito A. Salivary mucoepidermoid carcinoma revisited. Eur Arch Otorhinolaryngol. 2015 Apr;272:799-819.

Vander Poorten VL, Balm AJ, Hilgers FJ, Tan IB, Loftus-Coll BM, Keus RB, van Leeuwen FE, Hart AA.The development of a prognostic score for patients with parotid carcinoma. Cancer. 1999 May; 85:2057-67.

Terhaard, C. H. J., et al. (2004). "Salivary gland carcinoma: Independent prognostic factors for locoregional control, distant metastases, and overall survival: Results of the Dutch Head and Neck Oncology Cooperative Group." Head and Neck 26(8): 681-692.

Ruoboalho J,, et al. Complications after surgery for benign parotid gland neoplasms: A prospective cohort study. Head Neck 2017 Jan:39(1)170-6

Kim L, Byme PJ. Controversies in Contemporary Facial Reanimation. Facial Plast Surg Clin North Am. 2016 Aug;24(3):275-97

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Oral Cavity

Goal:	**By the end of fellowship, the fellows have reach proficiency level of knowledge, skills and attitudes in diagnosis, surgical management and surveillance of potentially malignant disorders and malignant oral cavity diseases.**
Objective:	**By the end of the fellowship, the fellows can:**

1. Describe the epidemiology of the oral cavity cancers based on different population and different subsites of the oral cavity.
2. List the major risk factors in development of oral cavity malignancies
3. Perform a thorough oncologic examination of oral cavity and neck
4. Differentiate between benign and malignant lesions of oral cavity
5. Formulate a diagnostic plan for lesions of oral cavity
6. Stage different oral cavity malignancies accurately based on AJCC classification system
7. Plan a staging work up for malignant lesions based on NCCN guidelines
8. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient
9. Describe the indications for elective neck dissection and sentinel node biopsy in oral cavity malignancies
10. Describe the different types of neck dissection and the difference in technique, structures sacrificed or preserved and levels dissected in elective and therapeutic neck dissections
11. Recognize the indications for addressing the mandible and maxilla in oral cavity lesions
12. Differentiate between lesions which require marginal, segmental or hemi mandibulectomy
13. Formulate an appropriate diagnostic work up to assess the need for segmental vs. marginal vs. hemi mandibulectomy
14. Plan appropriate reconstruction options for oral cavity defects
15. Recognize lesions and defects that might require free tissue transfer reconstruction
16. Perform core procedures in oral cavity as defined by the curriculum, based on the attestation of the program director
17. Recommend appropriate adjuvant radiotherapy based on pathologic characteristics and operative findings
18. Describe the indications for adding chemotherapy to adjuvant radiotherapy in oral cavity malignancies.
19. Recognize common complications of oral cavity procedures
    A. Orocutaneous fistula
    B. Flap failure
    C. Oral dysphagia
    D. Pathologic fractures of mandible
    E. Tethered tongue/dysarthria
    F. Tongue numbness
20. Plan appropriate course of action for treating surgical complications of oral cavity procedures.

21. Utilize ancillary services such as nutrition, physical therapy and speech therapy appropriately in treatment planning and long term care of oral cavity patients
22. Formulate an evidence based surveillance program for oral cavity cancer survivors based on established guidelines (such as NCCN)
23. Recognize the common signs and symptoms of recurrent disease and second primary cancers; plan an appropriate work up plan
24. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable oral cavity lesions
25. Discuss the importance of the depth of invasion and the elective neck dissection
26. Describe the different approaches to the oral cavity

Process:	**By the end of fellowship the fellows have participated in a minimum number of oral cavity procedures based on the following list:**

1. Glossectomy
2. Marginal mandibulectomy
3. Segmental mandibulectomy and composite resections
4. Mandibulotomy and mandibulotomy repair
5. Lip resection
6. Maxillectomy
7. Neck dissection for oral cavity procedures
8. Floor of mouth resection
9. Reconstruction of oral cavity defect (skin graft, locoregional flaps, free tissue transfer)

Recommended Reading

Atlas of Head and Neck Surgery. Philadelphia, Pa.: Saunders Elsevier; 2011. (2014). Atlas of Head and Neck Surgery. Philadelphia, Pa.: Saunders Elsevier; 2011.

Head and Neck Surgery and Oncology. (2012). Shah JP, Patel, SG

Gullane, P., Neligan, P., Novak, C. Management of the mandible in cancer of the oral cavity. Operative Techniques in Otolaryngology-Head and Neck Surgery, Vol. 15, Issue 4, p256–263.Published in issue: December 2004

Stucker, F., Lian, T. Management of cancer of the lip. Operative Techniques in Otolaryngology-Head and Neck Surgery, Vol. 15, Issue 4, p226–233. Published in issue: December 2004

Pittman, A.; Zender, C. Total maxillectomy. Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 21, Issue 3, September 2010, Pages 166-170.

Her-El, G. Medial maxillectomy via midfacial degloving approach. Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 10, Issue 2, June 1999, Pages 82-86.

Baredes, S., Cohen, E. The role of neck dissection in cancer of the oral cavity. Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 15, Issue 4, December 2004, Pages 264-268.

Shield, K. D., Ferlay, J., Jemal, A., Sankaranarayanan, R., Chaturvedi, A. K., Bray, F. and Soerjomataram, I. (2017), The global incidence of lip, oral cavity, and pharyngeal cancers by subsite in 2012. CA: A Cancer Journal for Clinicians, 67: 51–64. doi:10.3322/caac.21384

D'Cruz, A. K., Vaish, R., Kapre, N., Dandekar, M., Gupta, S., Hawaldar, R., et al. (2015). Elective versus Therapeutic Neck Dissection in Node-Negative Oral Cancer. *The New England Journal of Medicine*, *373*(6), 521–529. http://doi.org/10.1056/NEJMoa1506007

Shah, J. P., Candela, F. C., & Poddar, A. K. (1990). The patterns of cervical lymph node metastases from squamous carcinoma of the oral cavity. *Cancer*, *66*(1), 109–113. http://doi.org/10.1002/1097-0142(19900701)66:1<109::AID-CNCR2820660120>3.0.CO;2-A

Barttelbort, S. W., & Ariyan, S. (1993). Mandible preservation with oral cavity carcinoma: rim mandibulectomy versus sagittal mandibulectomy. *Ajs*, *166*(4), 411–415.

Shaw, R. J., Brown, J. S., Woolgar, J. A., Lowe, D., Rogers, S. N., & Vaughan, E. D. (2004). The influence of the pattern of mandibular invasion on recurrence and survival in oral squamous cell carcinoma. *Head & Neck*, *26*(10), 861–869. http://doi.org/10.1002/hed.20036

Tupchong, L., Scott, C. B., Blitzer, P. H., Marcial, V. A., Lowry, L. D., Jacobs, J. R., et al. (1991). Randomized study of preoperative versus postoperative radiation therapy in advanced head and neck carcinoma: long-term follow-up of RTOG study 73-03. *Radiation Oncology Biology*, *20*(1), 21–28.

Huang, S. H., Hwang, D., Lockwood, G., Goldstein, D. P., & O'Sullivan, B. (2009). Predictive value of tumor thickness for cervical lymph-node involvement in squamous cell carcinoma of the oral cavity. *Cancer*, *115*(7), 1489–1497. http://doi.org/10.1002/cncr.24161

Lawrence, M. S., Sougnez, C., Lichtenstein, L., Cibulskis, K., Lander, E., Gabriel, S. B., et al. (2015). Comprehensive genomic characterization of head and neck squamous cell carcinomas. *Nature*, *517*(7536), 576–582.

Medina, J. E., & Byers, R. M. (1989). Supraomohyoid neck dissection: Rationale, indications, and surgical technique. *Head & Neck*, *11*(2), 111–122. http://doi.org/10.1002/hed.2880110203

Givi, B., Eskander, A., Awad, M. I., Kong, Q., Montero, P. H., Palmer, F. L., et al. (2015). Impact of elective neck dissection on the outcome of oral squamous cell carcinomas arising in the maxillary alveolus and hard palate. *Head & Neck*, n/a–n/a. http://doi.org/10.1002/hed.24302

Schilling, C., Stoeckli, S. J., Haerle, S. K., Broglie, M. A., Huber, G. F., Sorensen, J. A., et al. (2015). Sentinel European Node Trial (SENT): 3-year results of sentinel node biopsy in oral cancer. *European Journal of Cancer (Oxford, England : 1990)*, *51*(18), 2777–2784http://doi.org/10.1016/j.ejca.2015.08.023

Kramer, S., et al. Combined radiation therapy and surgery in the management of advanced head and neck cancer: Final report of study 73–03 of the radiation therapy oncology group. Head & Neck Surgery 1987;10(1): 19-30.

Hirshberg, A., et al. Metastatic tumours to the oral cavity - Pathogenesis and analysis of 673 cases. Oral Oncology 2008;44(8): 743-752.

Fagan, J. J., et al. Perineural invasion in squamous cell carcinoma of the head and neck. Archives of Otolaryngology - Head and Neck Surgery 1998;124(6): 637-640.

Van der Waal I. Potentially malignant disorders of the oral and oropharyngeal mucosa; present concepts of management. Oral Oncol. 2010;46-423-5.

Ribeiro KC, Kowalski LP, Latorre MR. Impact of comorbidity, symptoms, and patient's characteristics on the prognosois of oral carcinoas. Arch Otolaryngol Head neck Surg. 2000; 126:1079-85.

Gross ND, Patel SG, Carvalho AL et al. Nomogram for deciding adjuvant treatment after surgery for oral cavity squaous cell carcinoma. Head neck. 2008;30:1352-60.

Zanoni DK, Migliacci JC, Xu B, et al. A proposal to redefine close surgical margins in squamous cell carcinoma of the oral tongue. JAMA Otolaryngol Head Neck Surg. 2017; 143:555-60.

Maxwell JH, Thompson LD, Brandwein-Gensler MS, Weiss BG, Canis M, Purgina B, Prabhu AV, Lai C, Shuai Y, Carroll WR, Morlandt A, Duvvuri U, Kim S, Johnson JT, Ferris RL, Seethala R, Chiosea SI. Early Oral Tongue Squamous Cell Carcinoma: Sampling of Margins From Tumor Bed and Worse Local Control. JAMA Otolaryngol Head Neck Surg. 2015 Dec;141(12):1104-10. doi: 10.1001/jamaoto.2015.1351.

Namin AW, Bruggers SD, Panuganti BA, Christopher KM, Walker RJ, Varvares MA. Efficacy of bone marrow cytologic evaluations in detecting occult cancellous invasion. *Laryngoscope.* 2015;125(5):E173-179.

Varvares MA, Poti S, Kenyon B, Christopher K, Walker RJ. Surgical margins and primary site resection in achieving local control in oral cancer resections. *The Laryngoscope.* 2015;125(10):2298-2307.

Fakhry C, et al. Head and Neck Squamous Cell Cancers in the United States Are Rare and the Risk Now Is Higher Among White Individuals Compared With Black Individuals. Cancer. 2018.

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Nasopharynx

Goal:	**By the end of the fellowship the trainees are proficient in diagnosis, principles of treatment, surveillance and management of complications of nasopharynx cancers.**
Objectives:	**By the end of the fellowship, the trainee will be able to:**

1. Describe the epidemiology of the nasopharyngeal cancer and discuss the role of EBV.
2. Identify high risk population for nasopharyngeal carcinoma.
3. Recognize signs and symptoms of early stage and advanced stage nasopharyngeal cancer.
4. Formulate a diagnostic plan for diagnosis of suspected nasopharynx lesion:
    a. Perform in office flexible nasopharyngoscopy.
    b. Recognize suspicious lesion and recommend biopsy (in office or operative) in appropriate cases.
    c. Formulate a comprehensive plan for assessment of cervical lymphadenopathy that include investigation of nasopharynx.
5. Recommend an appropriate, evidence based staging plan for newly diagnosed disease.
    a. Recommend MRI in appropriate cases
    b. Recommend PET Scan in appropriate cases
6. Stage nasopharyngeal disease based on the current AJCC staging system.
7. Recommend evidence based course of treatment based on the stage and current guidelines (NCCN)
8. Formulate a comprehensive plan for surveillance of nasopharyngeal cancers.
    a. Discuss the role of EBV titers in surveillance.
9. Recognize common complications of treatment and formulate an appropriate investigative and therapeutic plan:
    a. Osteoradionecrosis
    b. Eustachian tube dysfunction
    c. Hypothyroidism
10. Recognize suspicious signs of recurrence and formulate an appropriate plan for confirmation or ruling out of recurrence. Specifically discuss the role of:
    a. Advanced imaging (MRI, PET)
    b. Biopsy
11. Identify cases that could benefit from salvage surgery
12. Discuss findings of very advanced, surgically non-curable recurrent disease in imaging.

Recommended Reading **(** ***indicates mandatory; others are recommended)***

Lin, J.-C., Wang, W.-Y., Chen, K. Y., Wei, Y.-H., Liang, W.-M., Jan, J.-S., & Jiang, R.-S. (2004). Quantification of plasma Epstein-Barr virus DNA in patients with advanced nasopharyngeal carcinoma. *The New England Journal of Medicine*, *350*(24), 2461–2470. http://doi.org/10.1056/NEJMoa032260

Chan KCA, Woo JKS, King A, Zee BCY, Lam WKJ, et al. Analysis of Plasma Epstein-Barr Virus DNA to Screen for Nasopharyngeal Cancer. New Eng J Med. 2017;377:513-522.

Al-Sarraf, M., LeBlanc, M., Giri, P. G., Fu, K. K., Cooper, J., Vuong, T., et al. (1998). Chemoradiotherapy versus radiotherapy in patients with advanced nasopharyngeal cancer: phase III randomized Intergroup study 0099. *Journal of Clinical Oncology : Official Journal of the American Society of Clinical Oncology*, *16*(4), 1310–1317. http://doi.org/10.1200/jco.1998.16.4.1310

Lee, A. W. M., Fee, W. E., Ng, W. T., & Chan, L. K. (2012). Nasopharyngeal carcinoma: salvage of local recurrence. *Oral Oncology*, *48*(9), 768–774. http://doi.org/10.1016/j.oraloncology.2012.02.017

Wei, W. I., Chan, J. Y. W., Ng, R. W.-M., & Ho, W. K. (2010). Surgical salvage of persistent or recurrent nasopharyngeal carcinoma with maxillary swing approach - Critical appraisal after 2 decades. *Head & Neck*, *33*(7), 969–975. http://doi.org/10.1002/hed.21558

Kam, M. K. M., Leung, S.-F., Zee, B., Chau, R. M. C., Suen, J. J. S., Mo, F., et al. (2007). Prospective Randomized Study of Intensity-Modulated Radiotherapy on Salivary Gland Function in Early-Stage Nasopharyngeal Carcinoma Patients. *Journal of Clinical Oncology : Official Journal of the American Society of Clinical Oncology*, *25*(31), 4873–4879. http://doi.org/10.1200/JCO.2007.11.5501

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Oropharynx

Goal:	**By the end of fellowship, the fellows have reach proficiency level of knowledge, skills and attitudes in diagnosis, surgical management and surveillance of oropharynx malignancies.**
Objective:	**By the end of the fellowship, the fellows can:**

1. Describe the epidemiology of oropharynx squamous cell carcinoma.
2. List the major risk factors in development of HPV-positive and HPV-negative squamous cell carcinoma.
3. Describe role of HPV in oropharynx cancer and understand
    A. Risk factors for HPV related cancer
    B. Immunization for HPV
    C. Behaviors that are likely to transmit HPV
4. Compare and contrast the clinical presentation of HPV-positive and HPV-negative squamous cell carcinoma
5. Compare and contrast the relative prognosis for patients with HPV-negative OPC and HPV-positive OPC with or without a history of tobacco abuse
6. Perform a thorough oncologic examination of the oropharynx
7. Differentiate between benign and malignant lesions of oropharynx
8. Formulate a diagnostic plan for evaluation and staging of oropharynx lesions
    A. Understand strategies for managing the unknown primary with suspected oropharynx primary site
9. Stage oropharyngeal tumors based on the most current AJCC staging system for HPV-positive and HPV-negative oropharynx cancer
10. Plan a staging work up for malignant oropharynx cancer based on NCCN guidelines
11. Formulate a treatment plan for various oropharynx malignancies (e.g., HPV+ and HPV- squamous cell carcinoma, mucoepidermoid carcinoma, etc.) based on the characteristics of the disease, staging and by taking into account the specific needs of the patient
    A. Describe transoral approaches to the oropharynx, such as transoral laser microsurgery (TLM) and transoral robotic surgery (TORS)
        1) Describe and list the inside out anatomy required for safe surgery using these approaches
        2) Discuss limitations of each approach:
            a. Tumor factors (e.g., involvement of medial pterygoid or mandible, tumor that would require sacrifice of both lingual arteries, tumor contiguous with neck disease, tumor abutting carotid artery, degree of soft palate involvement, etc.)
            b. Exposure factors (e.g., trismus, OSA, narrow mandible/maxilla, etc.)
            c. Anatomical limitations (e.g., retropharyngeal carotid)
        3) Discuss potential complications of transoral surgery and plan how to manage them
            a. Prevention by ligation of vessels at the time of neck dissection (lingual, facial, superior thyroid)

b. Management of airway in case of acute post-op bleed

12. Discuss management of neck disease in oropharynx cancer
    A. Describe typical patterns of metastasis
    B. Discuss issues in management of advanced neck disease: skin involvement, carotid involvement
    C. Discuss management of retropharyngeal (Rouviere's) nodes
13. Describe the different types of neck dissection and the differences in technique, structures sacrificed or preserved and level dissected
14. Plan appropriate reconstruction for oropharynx defects
15. Recognize lesions and defects that might require free tissue transfer reconstruction
16. Perform core procedures in the oropharynx as defined by the curriculum, based on the attestation of the program director
17. Recommend appropriate evidence-based adjuvant treatments based on pathologic characteristics and operative findings
18. Describe the indications for adding chemotherapy to adjuvant external beam radiation in oropharynx malignancies
19. Utilize ancillary services such as nutrition and speech therapy appropriately in treatment planning and long term care of oropharynx cancer patients
20. Discuss the principles of IMRT for treatment of oropharynx cancer
    a. List the common types of radiation therapy (IMRT, IMPT)
    b. Discuss the typical doses for primary and adjuvant radiation therapy
    c. Describe the common radiated fields: primary tumor bed, ipsilateral and contralateral neck and retropharyngeal nodes
21. List open approaches to the oropharynx, describe potential complications and how to manage them
    A. Mandible split: median and lateral
    B. Transhyoid
    C. Composite resection of retromolar trigone and mandible for tumors that extend to mandible
22. Recognize the indications for addressing the mandible in oropharynx lesions and formulate an appropriate diagnostic work up to assess the need for segmental mandibulectomy
23. Plan appropriate course of action for treating surgical complications of oropharynx procedures (e.g., bleeding, fistula, aspiration, etc.)
24. Describe functional issues that may arise from oropharynx cancer treatment and ways to treat or prevent these
    A. Trismus
    B. Hypernasality and velopharyngeal insufficiency (VPI)
    C. Cricopharyngeus dysfunction/stricture
    D. Late dysphagia and aspiration following primary CRT
25. Describe late complications of primary CRT for treatment of oropharynx cancer
26. Compare and contrast immunohistochemistry (IHC) for p16 with in situ hybridization (ISH) for HPV DNA

27. Compare and contrast cisplatin versus cetuximab with regard to limitations and typical toxicities when used to treat oropharynx cancer
28. Formulate an evidence based surveillance program for oropharynx cancer survivors based on established guidelines (such as NCCN)
29. Recognize the common signs and symptoms of recurrent oropharynx cancer and plan an appropriate work up
30. Discuss and recommend appropriate management of distant metastatic disease for both HPV+ and HPV- oropharynx squamous cell carcinoma.
31. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable oropharynx lesions
32. Discuss the concept of de-escalation of therapy and the status of ongoing clinical trials to evaluate the safety and efficacy of different de-escalation protocols in management of HPV-positive OPC

Process:	**By the end of fellowship the fellows have participated in a minimum number of oropharynx procedures based on the following list:**

1. Open approaches to oropharynx including mandibulotomy and mandibulotomy repair
2. Transoral approaches for resection of oropharynx malignancies (TLM or TORS)
3. Segmental mandibulectomy and composite resections
4. Neck dissection procedures for oropharynx cancer
5. Reconstruction of oropharynx defects (locoregional flaps, free tissue transfer)

Recommended Reading

Lim YC, Koo BS, Lee JS, Lim JY, Choi EC. Distributions of cervical lymph node metastases in oropharyngeal carcinoma: therapeutic implications for the N0 neck. Laryngoscope. 006;116(7):1148-52 DOI: 10.1097/01.mlg.0000217543.40027.1d

Candela FC, Kothari K, Shah JP. Patterns of cervical node metastases from squamous carcinoma of the oropharynx and hypopharynx. Head Neck. 1990;12(3):197–203.

Weinstein et al. Understanding contraindications for transoral robotic surgery (TORS) for oropharyngeal cancer. European Archives of Oto-Rhino-Laryngology. 2015;272(7): 1551–1552

O'Sullivan B, Huang SH, Su J, Garden AS, Sturgis EM, Dahlstrom K, et al. Development and validation of a staging system for HPV-related oropharyngeal cancer by the International Collaboration on Oropharyngeal cancer Network for Staging (ICON-S): a multicentre cohort study. Lancet Oncol. 2016;17(4):440–51.

Iyer NG, Dogan S, Palmer F, Rahmati R, Nixon IJ, Lee N, et al. Detailed analysis of clinicopathologic factors demonstrate distinct difference in outcome and prognostic factors between surgically treated HPV-positive and negative oropharyngeal cancer. Ann Surg Oncol. 2015;22(13):4411–21.

de Almeida JR, Park RC, Genden EM. Reconstruction of transoral robotic surgery defects: principles and techniques. J Reconstr Microsurg. 2012;28(7):465–72.

Selber JC. Transoral robotic reconstruction of oropharyngeal defects: a case series. Plast Reconstr Surg. 2010;126(6):1978–87.

Ang KK, Harris J, Wheeler R, Weber R, Rosenthal DI, Nguyen-Tan PF, et al. Human papillomavirus and survival of patients with oropharyngeal cancer. N Engl J Med. 2010;363(1):24–35.

Sinha P, Lewis Jr JS, Piccirillo JF, Kallogjeri D, Haughey BH. Extracapsular spread and adjuvant therapy in human papillomavirus-related, p16-positive oropharyngeal carcinoma. Cancer. 2012;118(14):3519–30.

Maxwell JH, Mehta V, Wang H, Cunningham D, Duvvuri U, Kim S, et al. Quality of life in head & neck cancer patients: impact of HPV and primary treatment modality. Laryngoscope. 2014;124(7):1592-7.

Gildener-Leapman N, Kim J, Abberbock S, Choby GW, Mandal R, Duvvuri U, et al. Utility of up-front transoral robotic surgery in tailoring adjuvant therapy. Head Neck. 2016;38:1201–7.

Chin RI, Spencer CR, DeWees T, Hwang MY, Patel P, Sinha P, et al. Reevaluation of postoperative radiation dose in the management of human papillomavirus-positive oropharyngeal cancer. Head Neck. 2016;38:1643–9.

Asher SA, White HN, Kejner AE, Rosenthal EL, Carroll WR, Magnuson JS. Hemorrhage after transoral robotic-assisted surgery. Otolaryngol Head Neck Surg: Off J Am Acad Otolaryngol Head Neck Surg. 2013;149(1):112–7.

Mandal R, Duvvuri U, Ferris RL, Kaffenberger TM, Choby GW, Kim S. Analysis of post-transoral robotic-assisted surgery hemorrhage: frequency, outcomes, and prevention. Head Neck. 2016;38(1):E776–82. doi: 10.1002/hed.24101. Epub 2015 Jul 15.

Pollei TR, Hinni ML, Moore EJ, Hayden RE, Olsen KD, Casler JD, et al. Analysis of postoperative bleeding and risk factors in transoral surgery of the oropharynx. JAMA Otolaryngol Head Neck Surg. 2013;139(11):1212–8.

Gross et al. Level IIB Lymph Node Metastasis in Oropharyngeal Squamous Cell Carcinoma. Laryngoscope 2013;123:2700–2705.

Chung et al. Pattern of cervical lymph node metastasis in tonsil cancer: Predictive factor analysis of contralateral and retropharyngeal lymph node metastasis. Oral Oncology 2011;47:758–762.

Gross et al. Impact of Retropharyngeal Lymph Node Metastasis in Head and Neck Squamous Cell Carcinoma. Arch Otolaryngol Head Neck Surg. 2004;130:169-173.

Dirix et al. Prognostic Influence of Retropharyngeal Lymph Node Metastasis in Squamous Cell Carcinoma of the oropharynx. Int. J. Radiation Oncology Biol. Phys. 2006;65(3):739–744. doi:10.1016/j.ijrobp.2006.02.027

Moore EJ and Hinni ML Transoral Laser Microsurgery and Robotic-Assisted Surgery for Oropharynx Cancer Including Human Papillomavirus Related Cancer. Int J Radiation Oncol Biol Phys 2013;85(5):1163-1167.

Roden, D. F., et al. Triple-modality treatment in patients with advanced stage tonsil cancer. Cancer 2017;123(17): 3269-3276.

Gun, R., et al. Transoral surgical anatomy and clinical considerations of lateral oropharyngeal wall, parapharyngeal space, and tongue base. Otolaryngol Head Neck Surg 2016;154(3):480-485.

Gun R., et al. Surgical anatomy of the oropharynx and supraglottic larynx for transoral robotic surgery. J Surg Oncol 2015;112(7): 690-696.

Holsinger, F.C., Laccourreye, O.; Weber, R. Surgical approaches for cancer of the oropharynx. Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 16, Issue 1, March 2005, Pages 40-48

Van Abel, K.M., Moore, E. Surgical management of the base of tongue. Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 24, Issue 2, June 2013, Pages 74-85.

Mandapathil M, Duvvuri U, Güldner C, Teymoortash A, Lawson G, Werner JA. Transoral surgery for oropharyngeal tumors using the Medrobotics(®) Flex(®) System - a case report. Int J Surg Case Rep. 2015;10:173-5. doi: 10.1016/j.ijscr.2015.03.030. Epub 2015 Mar 18.

Blanchard P, Garden AS, Gunn GB, Rosenthal DI, Morrison WH, Hernandez M, Crutison J, Lee JJ, Ye R, Fuller CD, Mohamed AS, Hutcheson KA, Holliday EB, Thaker NG, Sturgis EM, Kies MS, Zhu XR, Mohan R, Frank SJ. Intensity-modulated proton beam therapy (IMPT) versus intensity-modulated photon therapy (IMRT) for patients with oropharynx cancer - A case matched analysis. Radiother Oncol. 2016 Jul;120(1):48-55. Epub 2016 Jun 21.

Phan J, Sio TT, Nguyen TP, Takiar V, Gunn GB, Garden AS, Rosenthal DI, Fuller CD, Morrison WH, Beadle B, Ma D, Zafereo ME, Hutcheson KA, Kupferman ME, William WN Jr, Frank SJ. Reirradiation of Head and Neck Cancers With Proton Therapy: Outcomes and Analyses. Int J Radiat Oncol Biol Phys. 2016 Sep 1;96(1):30-41.

Zafereo ME, Hanasono MM, Rosenthal DI, Sturgis EM, Lewin JS, Roberts DB, Weber RS. The role of salvage surgery in patients with recurrent squamous cell carcinoma of the oropharynx. Cancer. 09 Dec 15;115(24):5723-33.

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Larynx

Goal:	**By the end of fellowship, the fellow should be proficient in the diagnosis, management and surveillance of patients with cancer of the larynx.**
Objective:	**By the end of the fellowship, the fellow can:**

1. Define the anatomic subsites of the larynx and the associated tumor characteristics to include metastatic spread, at risk nodal basins, and disease free/overall survival rates
2. Describe the epidemiology of laryngeal squamous cell carcinoma
3. Perform an appropriate history for a patient presenting with throat complaints such as dysphagia, throat pain or otalgia, dysphonia, and/or dyspnea
4. Perform a thorough oncologic examination of the larynx – via flexible nasolaryngoscope with and without stroboscopy, and operative endoscopy
5. Formulate a diagnostic plan for benign and malignant lesions of the larynx
6. Plan a staging work up for malignant laryngeal lesions based on NCCN guidelines
7. Stage laryngeal malignancies accurately based on AJCC classification system
8. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient
    A. Describe the different open partial laryngectomy procedures and what tumor and patient characteristics would impact this decision (prior therapy, underlying lung disease, tumor extent, prior surgery, etc)
    B. Describe the different endoscopic approaches to laryngeal tumors (Transoral laser microsurgery, including fundamentals of laser surgery/laser safety, Transoral robotic surgery)
    C. Discuss and compare the oncologic outcomes of surgical versus non-surgical treatment approaches for both early and advanced laryngeal malignancies
9. Discuss and compare the functional outcomes of surgical versus non-surgical treatment approaches for both early and advanced laryngeal malignancies
10. Recognize the patterns of spread of laryngeal tumors and the implications on surgical treatment planning (including lymphatic drainage and regional metastatic potential for the various subsites and degrees of tumor progression)
11. Describe the rationale for upfront total laryngectomy versus organ preservation approaches for treatment of stage III/IV advanced laryngeal cancer
12. Interpret clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable laryngeal lesions
13. Recommend an appropriate surgical approach, when applicable, for excision of laryngeal tumors
    A. Intraoperative airway management options
    B. Postoperative airway plan
14. Plan appropriate reconstruction for laryngeal resection defects including those that require vascularized regional or free tissue transfer reconstruction
15. List the options for voice rehabilitation following total laryngectomy

16. Perform core procedures in larynx as defined by the curriculum, based on the attestation of the program director
17. Recommend appropriate adjuvant treatments based on pathologic characteristics and operative findings
18. Recognize common complications of laryngeal procedures
19. Plan appropriate course of action for treating surgical complications of laryngeal surgery, including salivary fistula management, airway considerations, and swallowing dysfunction
20. Utilize ancillary services such as nutrition and speech therapy appropriately in treatment planning and long term care of laryngeal cancer patients
21. Formulate an evidence based surveillance program for laryngeal cancer survivors based on established guidelines (such as NCCN)
22. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up
23. Describe the reconstructive options of the pharynx following total laryngectomy, partial or total pharyngectomy

Process:	**By the end of fellowship, the fellows have participated in a minimum number of laryngeal subsite procedures based on the following list:**

Open Procedures:

1. Partial laryngectomies
    A. Open: vertical hemilaryngectomy, supraglottic laryngectomy, supracricoid laryngectomy)
    B. Transoral: Robotic; laser
2. Total laryngectomy with or without partial pharyngectomy
3. Total laryngopharyngectomy
4. Total laryngectomy with total glossectomy
5. Neck dissection for laryngeal tumors
6. Direct laryngoscopy with biopsy
7. Tracheoesophageal puncture procedure with or without cricopharyngeal myotomy
8. Zenker's diverticulum repair (endoscopic; open).
9. Endoscopic Zenker's diverticulum repair

Recommended Reading

<u>Advanced Laryngeal cancer</u>:

Induction chemotherapy plus radiation compared with surgery plus radiation in patients with advanced laryngeal cancer. The Department of Veterans Affairs Laryngeal Cancer Study Group. N Engl J Med. 1991 Jun 13;324(24):1685-90

Forastiere AA, Goepfert H, Maor M, et al. Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer. N Engl J Med. 2003 Nov 27;349(22):2091-8.

Weber RS, Berkey BA, Forastiere AA, et al. Outcome of salvage total laryngectomy following organ preservation therapy: the Radiation Therapy Oncology Group trial 91-11. Arch Otolaryngol Head Neck Surg. 2003 Jan;129(1):44-9.

Hoffman HT, Porter K, Karnell LH, et al. Laryngeal cancer in the United States: changes in demographics, patterns of care, and survival. Laryngoscope. 2006 Sep;116(9 Pt 2 Suppl 111):1-13.

Paleri, V., et al. (2014). "Vascularized tissue to reduce fistula following salvage total laryngectomy: a systematic review." Laryngoscope 124(8): 1848-1853.

Hinni, M. L., et al. (2007). "Transoral laser microsurgery for advanced laryngeal cancer." Arch Otolaryngol Head Neck Surg 133(12): 1198-1204.

Glottic Cancer:

Steiner W. Results of curative laser microsurgery of laryngeal carcinomas. Am J Otolaryngol. 1993 Mar-Apr;14(2):116-21.

Mendenhall WM, Werning JW, Hinerman RW, Amdur RJ, Villaret DB. Management of T1-T2 glottic carcinomas. Cancer. 2004 May;100(9):1786–92.

Supraglottic Cancer:

Sessions DG, Lenox J, Spector GJ. Supraglottic laryngeal cancer: analysis of treatment results. Laryngoscope. 2005 Aug;115(8):1402-10.

Ambrosch P, Kron M, Steiner W. Carbon dioxide laser microsurgery for early supraglottic carcinoma. Ann Otol Rhinol Laryngol. 1998 Aug;107(8):680–8.

Laccourreye O, Laccourreye L, Muscatello L, et al. Local failure after supracricoid partial laryngectomy: symptoms, management, and outcome. Laryngoscope. 1998 Mar;108(3):339–44

Rehabilitation:

Singer MI, Blom ED. An endoscopic technique for restoration of voice after laryngectomy. Ann Otol Rhinol Laryngol. 1980; 89:529-533.

Contemporary Reviews:

Yoo J, Lacchetti C, et al. Role of endolaryngeal surgery (with or without laser) versus radiotherapy in the management of early (T1) glottic cancer: A systematic review. Head Neck. 2013; 36(12):1807-1819.

Ambrosch, P. and A. Fazel (2011). "[Functional organ preservation in laryngeal and hypopharyngeal cancer]." Laryngorhinootologie 90 Suppl 1: S83-109.

American Society of Clinical Oncology clinical practice guideline for the use of larynx-preservation strategies in the treatment of laryngeal cancer. J Clin Oncol. 2006 Aug 1;24(22):3693-704.

Silver CE, Beitler JJ, Shaha AR, Rinaldo A, Ferlito A. Current trends in initial management of laryngeal cancer: the declining use of open surgery. Eur Arch Otorhinolaryngol. 2009 Sep;266(9):1333–52.

Gourin CG, Conger BT, Sheils WC, Bilodeau PA, Coleman TA, Porubsky ES. The Effect of Treatment on Survival in Patients with Advanced Laryngeal Carcinoma. The Laryngoscope 2009;119:1312-7.

Tufano, R. Open supraglottic laryngectomy, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 14, Issue 1, March 2003, Pages 22-26.

Tucker, H.M. Total laryngectomy: Technique, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 1, Issue 1, March 1990, Pages 42-44

Martinez-Vidal, J., Herranz, J. Anterior frontal vertical partial laryngectomy, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 4, Issue 4, December 1993, Pages 271-274.

Weissbrod, P., Merati, A. Open surgery for Zenker's diverticulum, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 23, Issue 2, June 2012, Pages 137-143. Open surgery for Zenker's diverticulum,

McGinn, J., Endoscopic approach to cricopharyngeal hypertonicity and hypopharyngeal diverticulum, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 27, Issue 2, June 2016, Pages 67-73

Sandulache VC, Vandelaar LJ, Skinner HD, Cata J, Hutcheson K, Fuller CD, Phan J, Siddiqui Z, Lai SY, Weber RS, Zafereo ME. Salvage total laryngectomy after external-beam radiotherapy: A 20-year experience. Head Neck. 2016 Apr;38 Suppl 1:E1962-8. doi: 10.1002/hed.24355. Epub 2016 Feb 16.

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Tracheal Disease

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate proficiency in the diagnosis and management for patients with tracheal neoplasms or stenosis.**
Objective:	**By the end of the fellowship, the fellow can:**

1. Describe the anatomy of the cervical and thoracic trachea and immediately surrounding structures
    A. Outline the blood supply of the trachea
    B. Identify the relative location of surrounding structures including the recurrent laryngeal nerves, the cervical and thoracic esophagus, the innominate artery, the thyroid gland, and larynx
2. Recognize the typical presentation history of different tracheal pathologies and aspects that are important in their history
    A. History of prior intubation or tracheostomy
    B. History of systemic inflammatory or autoimmune disease
    C. Recognize the importance of any smoking history or history of prior thyroid cancer diagnosis
3. Develop a differential diagnosis for stenosis of the trachea and subglottis
4. Develop a differential diagnosis for a tracheal tumor
    A. List the most common benign tumors.
    B. List the most common malignant tumors.
5. Describe the appropriate initial office evaluation of tracheal pathology
6. Formulate an appropriate plan for imaging and laboratory work up for patients with tracheal pathology
7. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable tracheal lesions and to develop a treatment plan for benign tracheal diseases
8. Stage tracheal tumors accurately based on TNM staging system for tracheal malignancies
9. Outline indications for when to consult additional services including thoracic surgery, pulmonology, rheumatology, and radiation or medical oncology
10. Outline a plan for airway management in individuals who may require a diagnostic bronchoscopy and/or surgical intervention of the trachea
    A. Describe the indications for jet ventilation and its contraindication.
    B. Describe intermittent apnea use in appropriate cases.
    C. Describe the potential advantages and disadvantages of tracheostomy in patients with tracheal pathology
11. Outline options for surgical management of:
    A. Narrow segment tracheal stenosis
        i. Options for endoscopic management
            1. Utilized appropraite adjuncts at the time of dilation (steroid injection, cryotherapy, mitomycin C)
            2. Describe and plan appropriate cautuions during use of CO2 laser.
        ii. Compare advantages of dilation versus segmental resection and repair

B. Long segment tracheal stenosis
C. Cervical tracheal tumors
D. Thoracic tracheal tumors
E. Thyroid tumors invading into the trachea
    i. Discuss indications for laryngectomy versus tracheal resection and reconstruction

12. Describe the basis fundamentals of tracheal surgery

    A. Dissection techniques to avoid disruption of vascularity
    B. Techniques to minimize stenosis following segmental tracheal resection and re-anastomosis
    C. Options for mobilization of the trachea

        i. Anterior tracheal dissection
        ii. Suprahyoid release
        iii. Infrahyoid release
        iv. Release of the inferior pulmonary ligament
        v. Bronchial re-implantation

13. List and describe the different types of tracheal stents, tracheostomy tube options, and T-tubes that can be used as well as their indications and advantages and disadvantages

14. Formulate an appropriate plan for peri-operative management following a segmental tracheal repair

    A. Use of Grillo sutures
    B. Nasogastric tube to minimize laryngeal elevation with swallowing
    C. Voice rest

15. Perform core procedures in surgery on the trachea, including open tracheostomy and rigid and flexible bronchoscopy, including removal of an airway foreign body

16. Recognize common complications of following tracheal surgery and describe how to manage:

    A. Tracheostomy tube dislodgement or occlusion
    B. Low volume hemoptysis
    C. High volume hemoptysis
    D. Tracheal granulation tissue
    E. Recurrent tracheal stenosis

17. Plan appropriate course of action for treating surgical complications of tracheal surgery.

18. State what non-surgical options there are to treat inflammatory tracheal lesions as well as tracheal malignancies

19. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up plan.

Process:	**By the end of fellowship, the fellows have participated in a minimum number of tracheal procedures based on the following list:**

1. Rigid bronchoscopy with or without biopsy or foreign body removal
2. Flexible bronchoscopy
3. Open tracheostomy
4. Tracheal resection and re-anastomosis

Recommended Reading

Bhattacharyya, N. Contemporary staging and prognosis for primary tracheal malignancies: a population-based analysis. Otolaryngol Head Neck Surg. 2004;131(5):639-642.

Grillo HC. Surgery of the Trachea and Bronchi. 2004, BC Decker, Inc.; London, UK.

Dedo HH. Surgery of the Larynx and Trachea. 1990, BC Decker, Inc.; Philadelphia, PA.

Grillo HC, Mathisen DJ. Primary tracheal tumors: Treatment and results. Ann Thoracic Surgery;49:69-77.

Moziak DE, Todd TRJ, Keshavjee SH, et al. Adenoid cystic carcinoma of the airway: Thirty-two year experience. J Thoracic Cardiovasc Surg 1996;112:1522-1532.

Gaissert HA, Grillo HC, Shadmehr MB, Wright CD, Gokhale M, Wain JC Mathisen DJ. Uncommon primary tracheal tumors. Ann Thorac Surg. 2006;82(1):268-272.

Honings J, Stephen AE, Marres HA, Gaissert HA. The management of thyroid carcinoma invading the larynx or trachea. Laryngoscope 2010;120(4):682-9.

Gaissert HA, Grillo HC, Shadmehr BM, Wright CD, Gokhale M, Wain JC, Mathisen DJ. Laryngotracheoplastic resection for primary tumors of the proximal airway. J Thorac Cardiovasc Surg. 2005;129(5):1006-9.

Ashiku SK, Kuzucu A, Grillo HC, Wright CD, Wain JC, Lo B, Mathisen DJ. Idiopathic laryngotracheal stenosis: Effective definitive treatment with laryngotracheal resection. J Thorac Cardiovasc Surg. 2004;127(1):99-107.

Wang H, Wright CD, Wain JC, Ott HC, Mathisen DJ. Idiopathic Subglottic Stenosis: Factors Affecting Outcome After Single-Stage Repair. Ann Thorac Surg. 2015;100(5):1804-11.

Gadkaree SK, Pandian V, Best S, Motz KM, Allen C, Kim Y, Akst L, Hillel AT. Laryngotracheal Stenosis: Risk Factors for Tracheostomy Dependence and Dilation Interval. Otolaryngol Head Neck Surg. 2017;156(2):321-8.

Lewis S, Earley M, Rosenfeld R, Silverman J. Systematic review for surgical treatment of adult and adolescent laryngotracheal stenosis. Laryngoscope. 2017;127(1):191-8.

Lorenz RR. Adult laryngotracheal stenosis: etiologies and surgical management. Curr Opin Otolaryngol Head Neck Surg. 2003;11(6):467-72.

Halum SL, Ting JY, Plowman EK, Belafsky PC, Harbarger CF, Postma GN, Pitman MJ, LaMonica D, Moscatello A, Khosla S, Cauley CE, Maronian NC, Melki S, Wick C, Sinacori JT, White Z, Younes A, Ekborn DC, Sardesai MG, Merati AL. A multi-institutional analysis of tracheotomy complications. Laryngoscope. 2012;122(1):38-45.

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Hypopharynx

Goal:	**By the end of fellowship, the fellow will reach proficiency in fund of knowledge, as well as skills and attitudes in diagnosis, surgical management and surveillance of malignant hypopharyngeal diseases.**
Objective:	**By the end of the fellowship, the fellow can:**

1. Perform an appropriate history for a patient presenting with throat complaints such as dysphagia, throat pain or otalgia, dysphonia, and/or dyspnea
2. Perform a thorough oncologic examination of the larynx and pharynx via flexible nasolaryngoscope with and without stroboscopy, and operative endoscopy
3. Formulate a diagnostic plan for benign and malignant lesions of the hypopharynx
    A. At the time of endoscopy with biopsy, the fellow should recognize what areas to evaluate specific to the primary tumor and nodal disease (mobility of the larynx to assess for involvement of prevertebral fascia, extension to the cervical esophagus, extension below the level of the thoracic inlet, nodal disease)
    B. Discuss the role of different imaging modalities (i.e. PET/CT scan, MRI with gadolinium, CT scan w/contrast) for treatment planning of hypopharyngeal carcinoma and select the appropriate modality.
4. Plan a staging work-up for malignant hypopharyngeal lesions based on NCCN guidelines
5. Stage hypopharyngeal malignancies accurately based on AJCC classification system
6. Formulate a treatment plan for patients with hypopharyngeal cancer based on the characteristics of the disease and specific needs of the patient
7. Outline the functional outcomes of surgical versus non-surgical treatment approaches for both early and advanced hypopharyngeal malignancies
8. Describe the patterns of spread of hypopharyngeal tumors and the implications on surgical treatment planning (including submucosal spread, skip lesions, lymphatic drainage)
9. Recommend an appropriate surgical approach, when applicable, for excision of hypopharyngeal tumors
10. Discuss the role of transoral robotic surgery in the management of early staged hypopharyngeal carcinoma and recommend TORS in appropriate cases
11. Plan appropriate reconstruction for hypopharyngeal defects including those that require vascularized tissue transfer reconstruction. Select pedicled flaps versus free flaps versus gastric pull-up based on the defect and patient characteristics
12. Perform core procedures in hypopharynx as defined by the curriculum, based on the attestation of the program director
13. Discuss the role of total laryngectomy for both oncologic and functional purposes when planning hypopharyngeal resection
14. Describe the different options for voice rehabilitation following total laryngopharyngectomy (or laryngopharyngoesophagectomy) with reconstruction and how these might differ from patients who had a total laryngectomy alone
15. Recommend appropriate adjuvant treatments based on pathologic characteristics and operative findings

16. Recognize common complications of hypopharyngeal procedures
17. Plan appropriate course of action for treating surgical complications of hypopharyngeal surgery, including salivary fistula and pharyngoesophageal stenosis management
18. Utilize ancillary services such as nutrition and speech therapy appropriately in treatment planning and long term care of hypopharyngeal cancer patients
19. Formulate an evidence based surveillance program for hypopharyngeal cancer survivors based on established guidelines (such as NCCN)
20. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up
21. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable hypopharyngeal lesions

Process:	**By the end of fellowship, the fellows have participated in a minimum number of hypopharyngeal subsite procedures based on the following list:**

1. Partial pharyngectomy (lateral pharyngotomy, transhyoid, transoral robotic or TLM approach)
2. Total laryngectomy with partial pharyngectomy
3. Total laryngopharyngectomy
4. Neck dissection for hypopharyngeal tumors

By the end of fellowship, the fellows have familiarity with hypopharyngeal site procedures based on the following list:

1. Hypopharyngeal reconstruction with free or pedicled flaps
2. Cervical esophagectomy or total esophagectomy with gastric pull-up procedure or visceral interposition

Recommended Reading

Primary Sources:

Lefebvre JL, Chevalier D, Luboinski B, et al. Larynx preservation in pyriform sinus cancer: preliminary results of a European Organization for Research and Treatment of Cancer phase III trial. EORTC Head and Neck Cancer Cooperative Group. J Natl Cancer Inst. 1996 Jul 3; 88(13):890-9.

Lefebvre JL, Andry G, Chevalier D, et al, Laryngeal preservation with induction chemotherapy for hypopharyngeal squamous cell carcinoma: 10-year results of EORTC trial 24891. Ann Oncol. 2012 Oct;23(10):2708-14.

Harrison DF, Thompson AE. Pharyngolaryngoesophagectomy with pharyngogastric anastomosis for cancer of the hypopharynx: review of 101 operations. Head Neck Surg 1986; 8:418-428.

Frank JL, Garb JL, Kay S, et al. Postoperative radiotherapy improves survival in squamous cell carcinoma of the hypopharynx. *Am J Surg*. 1994 Nov. 168(5):476-80.

Zelefsky MJ, Kraus DH, Pfister DG, et al. Combined chemotherapy and radiotherapy versus surgery and postoperative radiotherapy for advanced hypopharyngeal cancer. *Head Neck*. 1996 Sep-Oct. 18(5):405-11.

Steiner W, Ambrosch P, Hess CF, et al. Organ preservation by transoral laser microsurgery in piriform sinus carcinoma. *Otolaryngol Head Neck Surg*. 2001 Jan. 124(1):58-67.

Garden AS, Morrison WH, Clayman GL, et al. Early squamous cell carcinoma of the hypopharynx: outcomes of treatment with radiation alone to the primary disease. *Head Neck*. 1996 Jul-Aug. 18(4):317-22.

Clark JR, Gilbert R, Irish J, et al. Morbidity after flap reconstruction of hypopharyngeal defects. Laryngoscope 2006; 116: 173–181.

Newman JR, Connolly TM, Illing EA, Kilgore ML, Locher JL, Carroll WR. Survival trends in hypopharyngeal cancer: a population-based review. Laryngoscope. 2015 Mar;125(3):624-9. doi: 10.1002/lary.24915. Epub 2014 Sep 15.

Wilson DD, Crandley EF, Sim A, Stelow EB, Majithia N, Shonka DC Jr, Jameson MJ, Levine PA, Read PW. Prognostic significance of p16 and its relationship with human papillomavirus in pharyngeal squamous cell carcinomas. JAMA Otolaryngology Head Neck Surg. 2014 Jul;140(7):647-53.

Buckley, J. G. and MacLennan, K. (2000), Cervical node metastases in laryngeal and hypopharyngeal cancer: A prospective analysis of prevalence and distribution. Head Neck, 22: 380–385.

Contemporary Reviews:

Gourin CG, Terris DJ. Carcinoma of the hypopharynx. Surg Oncol Clin N Am. 2004 Jan;13(1):81-98.

Takes RP, Strojan P, Silver CE, et al. Current trends in initial management of hypopharyngeal cancer: the declining use of open surgery. Head Neck. 2012 Feb;34(2):270-81.

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Skull Base

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate a fundamental level of knowledge regarding the evaluation and management of patients with neoplasms of the skull base, cranium, and adjacent areas and master basic diagnostic and surgical skills as it relates to the evaluation and management of skull base tumors.**
Objective:	**By the end of the fellowship, the fellows can:**

1. List the risk factors for developing certain sinonasal malignancies and common presenting symptoms of such tumors
2. Describe the biologic behavior of benign sinonasal and skull base lesions
3. Describe the biologic behavior and natural history of malignant sinonasal and skull base neoplasms
4. Perform a comprehensive history and physical examination for a patient with a suspected sinonasal or skull base neoplasm
    A. Elicit history of prior surgery or trauma
    B. Evaluate for loss of cranial nerve function
5. Outline an appropriate plan for additional work-up for skull base lesions including what imaging and/or laboratory tests should be performed
    A. Interpret radiographs to identify anatomical landmarks and develop differential diagnosis
    B. Interpret tests and laboratory studies:
        1) Cerebrospinal fluid
        2) Pituitary function
        3) Visual fields
6. Stage sinonasal tumors accurately based on AJCC classification or other relevant classification systems
7. Develop a treatment algorithm for malignant sinonasal neoplasms
8. Discuss the role of non-surgical therapy as well as adjuvant radiation and chemotherapy
9. Identify key anatomical landmarks of the sinonasal cavity and skull base
10. Identify the neurovascular anatomy of the sinuses, skull base and orbit
11. Describe the anatomy of the scalp layers and reconstructive flaps
12. Describe the sequence of steps for craniofacial resection of the anterior cranial base
13. Describe and discuss the concepts of craniofacial disassembly (osteotomies) for access to the anterior and lateral skull base
14. Compare different approaches to the skull base
15. Recognize the potential need for consulting serves to include neurosurgery, ophthalmology, and neuro-otology in treatment planning
16. Perform core procedures in skull base surgery as defined by the curriculum, based on the attestation of the program director
    A. Demonstrate ability to perform surgical procedures (surgical simulation):

1) External frontal sinusotomy
2) Pericranial scalp flap
3) Temporalis muscle transposition
4) Orbital exenteration
5) Medial maxillectomy (external and endonasal approaches)
6) Nasoseptal flap

17. Provide postoperative care in hospital

    A. Recognize and manage neurological complications

        1) Describe management of postoperative cerebrospinal fluid leak
        2) Identification of signs and symptoms of increased intracranial pressure that could be caused by pneumocephalus and/or intracranial hemorrhage
        3) Perform appropriate diagnostic tests

18. Provide postoperative care in clinic

    A. Remove nasal packing and splints
    B. Debride nasal crusting
    C. Assess for cerebrospinal fluid leak

19. Develop a plan for disease surveillance and survivorship for patients with skull base lesions using established guidelines (such as the NCCN)

Recommended Reading

Barnes L (ed). *Surgical Pathology of the Head and Neck, 3rd Ed*. Informa Healthcare, New York, 2009.

Harvey RJ, Snyderman C (eds). Neurorhinology: common pathologies. *Otolaryngol Clin North Am*. 2011 Aug;44(4):845-1028.

Harvey RJ, Snyderman C (eds). Neurorhinology: complex lesions. *Otolaryngol Clin North Am*. 2011 Oct;44(5):1029-1234.

Snyderman CH, Gardner PA (eds). *Master Techniques in Otolaryngology – Skull Base Surgery Volume*. Wolters Kluwer, Philadelphia, 2015.

Myers JN, Hanna EYN, Myers EN. *Cancer of the Head & Neck, 5th Edition.* Wolters Kluwer, Philadelphia, 2016.

Donald PJ. *Surgery of the Skull Base*. Lippincott - Raven, Philadelphia, New York, 1998.

Eloy JA, Setzen M, Liu JK (eds). Sinonasal and ventral skull base malignancies. *Otolaryngol Clin North Am*. 2017 Apr;50(2):205-504.

Myers EN, Snyderman CH (eds). *Operative Otolaryngology-Head & Neck Surgery, 3rd Edition: Cranial Base Section*. Elsevier, Philadelphia, 2018.

Lund VJ, Stammberger H, Nicolai P, Castelnuovo P, Beal T, Beham A, Bernal-Sprekelsen M, Braun H, Cappabianca P, Carrau R, Cavallo L, Clarici G, Draf W, Esposito F, Fernandez-Miranda J, Fokkens W, Gardner P, Gellner V, Hellquist H, Hermann P, Hosemann W, Howard D, Jones N, Jorissen M, Kassam A, Kelly D, Kurschel-Lackner S, Leong S, McLaughlin N, Maroldi R, Minovi A, Mokry M, Onerci M, Ong YK, Prevedello D, Saleh H, Sehti DS, Simmen D, Snyderman C, Solares A, Spittle M, Stamm A, Tomazic P, Trimarchi M, Unger F, Wormald PJ, Zanation A; European Rhinologic Society Advisory Board on Endoscopic Techniques in the Management of Nose, Paranasal Sinus and Skull Base Tumours. European position paper on endoscopic management of tumours of the nose, paranasal sinuses and skull base. Rhinol Suppl. 2010 Jun 1;22:1-143. PMID: 20502772

Ganly I, Patel SG, Singh B, Kraus DH, Bridger PG, Cantu G, Cheesman A, De Sa G, Donald P, Fliss DM, Gullane P, Janecka I, Kamata SE, Kowalski LP, Levine PA, Medina Dos Santos LR, Pradhan S, Schramm V, Snyderman C, Wei WI, Shah JP. Craniofacial resection for malignant paranasal sinus tumors: Report of an International Collaborative Study. Head Neck. 2005 Jul;27(7):575-84.

Resto, VA, Chan AW, Deschler DG, Lin DT. Extent of surgery in the management of locally advanced sinonasal malignancies. Head Neck 2008;30(2):222-9.

Kassam AB, Thomas A, Carrau R, Snyderman CH, Vescan A, Prevedello D, Mintz A, Gardner P. Endoscopic Reconstruction of the Cranial Base Using Pedicled Nasoseptal Flap. Operative Neurosurgery 2008;63; 44-53.

Carrau RL, Segas J, Nuss DW, et al. Squamous cell carcinoma of the sinonasal tract invading the orbit. Laryngoscope. 1999;109:230-5.

Hernberg S, Westerholm P, Schultz-Larsen K, et al. Nasal and sinonasal cancer. Connection with occupational exposures in Denmark, Finland and Sweden. Scand J Work Environ Health. 1983;9:315-26.

Harvey RJ, Nalavenkata S, Sacks R, Adappa ND, Palmer JN, Purkey MT, Schlosser RJ, Snyderman C, Wang EW, Woodworth BA, Smee R, Havas T, Gallagher R. Survival outcomes for stage-matched endoscopic and open resection of olfactory neuroblastoma. Head Neck. 2017 Dec;39(12):2425-2432. doi: 10.1002/hed.24912. Epub 2017 Sep 25.

Parhiscar, A., Har-El, G. Obliteration of the frontal sinus with the pericranial flap, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 15, Issue 1, March 2004, pages 50-52.

Poetker, D., Loehrl, T., Toohill, R. External medial maxillectomy, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 21, Issue 2, June 2010, Pages 107-110.

Cunningham, K., Welch, K. Endoscopic medial maxillectomy, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 21, Issue 2, June 2010, Pages 111-116.

Har-El, G. Medial maxillectomy via midfacial degloving approach, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 10, Issue 2, June 1999, Pages 82-86.

Schaefer, S. Endoscopic frontal sinusotomy, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 1, Issue 2, June 1990, Pages 128-130.

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Head and Neck Paragangliomas

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate proficiency in the evaluation and management of patients with head and neck paragangliomas.**
Objective:	**By the end of the fellowship, the fellow can:**

1. List the most common head and neck paragangliomas and describe the relevant epidemiology of these tumors
2. Discuss the frequency of tumors that are malignant and bilateral
3. Describe the histologic make up of paragangliomas and how to determine if a paraganglioma is benign or malignant
4. Perform a thorough history and physical examination of head and neck
    A. List the risk factors for developing paragangliomas
    B. Elicit aspects of the history that may raise suspicion for a secretory tumor
    C. Perform a detailed family history and identify familial syndromes that may be related to head and neck paragangliomas
    D. Perform a relevant cranial nerve examination based on the location of the tumor
    E. Evaluate for other tumors and/or associated lymphadenopathy
    F. Perform fiberoptic laryngoscopy to assess for vocal fold mobility and laryngeal sensation
5. Choose the appropriate imaging work-up to complete evaluation of the primary tumor and to assess for multifocal tumors
6. Establish an appropriate differential diagnosis for vascular tumors of the head and neck
7. Select the appropriate tests to evaluate candidacy for carotid resection and vascular reconstruction
    A. What is the false negative rate of this test? (10% stroke risk even following a successful balloon occlusion test)
    B. What are options for vascular reconstruction and what additional tests may be needed (saphenous vein mapping)
8. Select the necessary tests to evaluate for secreting tumors in patients with a concerning history
9. Cite the different staging systems used to classify carotid body and jugular foramen/tympanic paragangliomas
10. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient
    A. What are the treatment options: observation, surgical, external beam radiation, stereotactic radiosurgery, and palliation
    B. For surgical patients, know when it is appropriate to consult additional services to assist with management [neuro-otology for tumors involving the temporal bone or lateral skull base, vascular surgery, neurosurgery (if skull base involvement is present), speech and swallowing therapy]
11. Describe the options for surgical approaches for carotid body, jugular foramen, tympanic, and vagal paragangliomas

12. Discuss points relevant to providing informed consent for such surgeries
13. Determine an appropriate surveillance regimen for individuals being managed with observation and what would be an indication to consider treatment
14. Recall the different genetic syndromes that may be associated with head and neck paragangliomas and when a genetics consult is indicated
    A. What is the frequency of genetic mutations in these tumors?
    B. What is the most common family of genes that are affected in patients with head and neck paragangliomas
15. Recognize the significance of bilateral tumors and how that impacts treatment decision planning and patient counseling
16. Perform core surgical procedures on neck paragangliomas as defined by the curriculum, based on the attestation of the program director
17. Recognize indications for adjuvant therapy following surgery for head and neck paragangliomas based on pathologic characteristics and operative findings
18. Recognize common complications head and neck paraganglioma surgery
19. Plan appropriate course of action for treating surgical complications of head and neck paraganglioma procedures
20. Utilize ancillary services such as speech therapy appropriately in treatment planning and long term care of patients suffering from head and neck paragangliomas
21. Formulate an evidence based surveillance program for head and neck paraganglioma survivors
22. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up

Process:	**By the end of fellowship the fellows have participated in a minimum number of surgical approaches/procedures based on the following list:**

1. Transcervical approach to the parapharyngeal space and infratemporal fossa
2. Transmandibular approach to the infratemporal fossa
3. Preauricular approach to the jugular foramen (with or without associated mastoidectomy)
4. Resection of head and neck paraganglioma

Recommended reading for head and neck paragangliomas

Wasserman PG, Savargaonkar P. Paragangliomas: classification, pathology, and differential diagnosis. *Otolaryngol Clin North Am*. 2001;34:845-62

Moore MG, Netterville JL, Mendenhall WM, Isaacson B, Nussenbaum B. Head and neck paragangliomas: an update on evaluation and management. Otolaryngol Head Neck Surg. 2016 Apr;154(4):597-605.

Shamblin WR, ReMine WH, Sheps SG, Harrison EGJ. Carotid body tumor (chemodectoma). Clinicopathologic analysis of ninety cases. *Am J Surg*. 1971;122:732-739.

Lim JY, Kim J, Kim SH, et al. Surgical treatment of carotid body paragangliomas: outcomes and complications according to the shamblin classification. *Clin Exp Otorhinolaryngol*. 2010;3:91-95.

Halpern VJ, Cohen JR. Management of the carotid artery in paraganglioma surgery. *Otolaryngol Clin North Am*. 2001;34:983-91.

Arts HA, Fagan PA. Vagal body tumors. Otolaryngol Head Neck Surg. 1991;105:78-85.

Netterville JL, Reilly KM, Robertson D, Reiber ME, Armstrong WB, Childs P. Carotid body tumors: a review of 30 patients with 46 tumors. *Laryngoscope*. 1995;105:115-126.

Litle VR, Reilly LM, Ramos TK. Preoperative embolization of carotid body tumors: when is it appropriate? *Ann Vasc Surg*. 1996;10:464-468.

Sniezek JC, Netterville JL, Sabri AN. Vagal paragangliomas. Otolaryngol Clin North Am. 2001;34:925-39.

Carlson ML, Sweeney AD, Wanna GB, Netterville JL, Haynes DS. Natural history of glomus jugulare: a review of 16 tumors managed with primary observation. Otolaryngol Head Neck Surg. 2015;152:98-105.

Wanna GB, Sweeney AD, Haynes DS, Carlson ML. Contemporary Management of Jugular Paragangliomas. Otolaryngol Clin North Am. 2015;48(2):331-341.

Chun SG, Nedzi LA, Choe KS, et al. A retrospective analysis of tumor volumetric responses to five-fraction stereotactic radiotherapy for paragangliomas of the head and neck (glomus tumors). *Stereotact Funct Neurosurg*. 2014;92:153-159.

Sugawara Y, Kikuchi T, Ueda T, et al. Usefulness of brain SPECT to evaluate brain tolerance and hemodynamic changes during temporary balloon occlusion test and after permanent carotid occlusion. *J Nucl Med*. 2002;43:1616-1623.

Linskey ME, Jungreis CA, Yonas H, et al. Stroke risk after abrupt internal carotid artery sacrifice: accuracy of preoperative assessment with balloon test occlusion and stable xenon-enhanced CT. *Am J Neuroradiol*. 1994;15:829-843.

Power AH, Bower TC, Kasperbauer J, et al. Impact of preoperative embolization on outcomes of carotid body tumor resections. *J Vasc Surg*. 2012;56:979-989.

Langerman A, Athavale SM, Rangarajan SV, Sinard RJ, Netterville JL. Natural history of cervical paragangliomas: outcomes of observation of 43 patients. *Arch Otolaryngol Head Neck Surg*. 2012;138:341-345.

Hinerman RW, Amdur RJ, Morris CG, Kirwan J, Mendenhall WM. Definitive radiotherapy in the management of paragangliomas arising in the head and neck: a 35-year experience. *Head Neck*. 2008;30:1431-1438.

Sager O, Dincoglan F, Beyzadeoglu, M. Stereotactic radiosurgery of glomus jugulare tumors: current concepts, recent advances and future perspectives. *CNS Oncol*. 2015;4:105-114.

Gimenez-Roqueplo AP, Dahia PL, Robledo M. An update on the genetics of paraganglioma, pheochromocytoma, and associated hereditary syndromes. *Horm Metab Res*. 2012;44:328-333.

Gur I, Katz S. Baroreceptor failure syndrome after bilateral carotid body tumor surgery. *Ann Vasc Surg*. 2010;24:1138.

Myssiorek, D., Persky, M. Treatment of carotid paraganglioma, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 27, Issue 1, March 2016, Pages 30-35.

Gleeson, M. Jugular paragangliomas—Resection techniques, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 27, Issue 1, March 2016, pages 20-24.

Khan, M., Myssiorek, D., Goldenberg, D. Surgical management of vagal paraganglioma, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 27, Issue 1, March 2016, Pages 25-29.

Banuchi, V., Kraus, D. The infratemporal fossa approach to the lateral skull base and parapharynx, Operative Techniques in Otolaryngology-Head and Neck Surgery, Volume 25, Issue 3, September 2014, Pages 254-258.

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Neck

Goal:	**By the end of fellowship, the fellows have reach proficiency level of knowledge, skills and attitudes in diagnosis, surgical management and surveillance of the neck in patients with unknown primary, thyroid, cutaneous, salivary gland and mucosal upper aerodigestive tract malignancies.**
Objective:	**By the end of the fellowship, the fellows can:**

1. Describe the anatomy of the neck echelons using radiological and surgical landmarks
2. Describe the biologic cascade of events involved in the development of a cervical lymph node metastasis
3. Develop an evidence-based algorithm for the management of a neck mass including differential diagnosis, investigations and when a surgical resection for diagnosis may be required
4. Perform a thorough neck examination
5. Stage the neck for unknown primary/oropharynx cancers clinically and pathologically based on the current AJCC classification system
6. Describe nodal staging for other head and neck cancers based on the AJCC classification system
7. Recognize the indications for PET-CT, to include sensitivity and specificity in the assessment of a cancer of unknown primary, and the importance of the timing of the scan
8. Upon performing an excisional lymph node biopsy, develop an algorithm for the use of frozen section pathology and how this might impact the remainder of the procedure
9. Develop a thorough understanding of the incidence of cervical lymph node metastasis by primary tumor site and size
    A. Oral cavity
        1) oral tongue
        2) floor of mouth
        3) maxillary alveolus and hard palate
        4) buccal mucosa
    B. Oropharynx
        1) tonsillar fossa
        2) base of tongue
        3) soft palate
        4) pharyngeal wall
    C. Nasopharynx
    D. Hypopharynx
    E. Larynx
        1) supraglottis
        2) glottis
    F. Major salivary glands
    G. Thyroid
    H. Cutaneous
10. Describe the different types of neck dissection and the difference in technique, structures sacrificed or preserved and level dissected

A. Selective
B. Modified Radical
C. Radical

11. Describe the drainage patterns of different tumors sites to include cutaneous, oral cavity, nasopharynx, oropharynx, hypopharynx, and larynx
12. Recognize when bilateral metastases are a concern and recommend appropriate treatment
13. Recognize when the parotid bed is an at risk nodal basin warranting parotidectomy in conjunction with a formal neck dissection
14. Discuss when a central neck dissection is indicated for thyroid cancer
15. Discuss when a lateral neck dissection is indicated for thyroid cancer and which levels should be dissected and select appropriate neck treatment
16. Describe nodal staging for thyroid cancers based on the AJCC classification system
17. Describe and list the indications for neck dissection and levels of dissections for salivary gland malignancies
18. Describe and list the indications for neck dissection and levels of dissections for non-melanoma cutaneous malignancies of the head and neck (including lip)
19. Develop an understanding of the indications, risks and benefits of sentinel lymph node biopsy and completion lymphadenectomy in the management of head and neck melanoma with specific reference to:
    A. MSLT 1
    B. MSLT 2
20. Describe the current indications for adjuvant treatment based on pathologic nodal staging and operative findings and recommend appropriate adjuvant treatment
21. Recognize neck defects requiring regional and free flap reconstruction
    A. auriculectomy/parotidectomy
    B. radical neck dissection
    C. salvage neck
22. Consent a patient for neck dissection with appropriate recognition of associated risks and complications
23. Recognize and manage common complications of neck dissection
24. Recognize the common signs and symptoms of recurrent regional disease and plan an appropriate work up
25. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable adenopathy

Process:	**By the end of fellowship the fellows have participated in a minimum number of neck procedures based on the following list:**

1. Open Neck Biopsy
2. Selective Neck Dissection (Supraomohyoid I-III; with and without level IIb)
3. Selective Neck Dissection (Lateral II-IV; with and without level IIb)

4. Selective Neck Dissection (Posterolateral II-V) with dissection of CN XI in the posterior triangle
5. Posterior lateral neck dissection (to include suboccipital and retroauricular nodes)
6. Modified Radical Neck Dissection (Types I, II, III)
7. Radical Neck Dissection (familiarity with sacrifice of CN XI, SCM, IJV)
8. Sentinel Lymph Node Biopsy

Recommended Reading

Martin H, Del Valle B, Ehrlich H, et al.: Neck dissection. Cancer 1951; 4: 441–499

Robbins KT, Medina JE, Wolfe GT, et al.: Standardizing neck dissection terminology. Official report of the Academy's Committee for Head and Neck Surgery and Oncology. Arch Otolaryngol Head Neck Surg 1991; 117: 601–605.

Robbins KT, Clayman G, Levine PA, et al.: Neck dissection classification update: Revisions proposed by the American Head and Neck Society and the American Academy of Otolaryngology-Head and Neck Surgery. Arch Otolaryngol Head Neck Surg 2002; 128: 751–758.

Byers, R. M., et al. Rationale for elective modified neck dissection. Head & Neck Surgery 1988;10(3): 160-167.

Byers, R. M. Modified neck dissection. A study of 967 cases from 1970 to 1980. The American Journal of Surgery 1985;150(4): 414-421.

D'Cruz, A. K., Vaish, R., Kapre, N., Dandekar, M., Gupta, S., Hawaldar, R., et al. Elective versus Therapeutic Neck Dissection in Node-Negative Oral Cancer. *The New England Journal of Medicine* 2015;*373*(6), 521–529.

Crile G. Landmark article: Excision of cancer of the head and neck with special reference to the plan of dissection based on one hundred and thirty-two operations. JAMA 1987;258:3286-3293. (historical interest)

Shah, J. P. Patterns of cervical lymph node metastasis from squamous carcinomas of the upper aerodigestive tract. Am J Surg 1990;160(4): 405-409.

Shah, J. P., Candela, F. C., & Poddar, A. K. The patterns of cervical lymph node metastases from squamous carcinoma of the oral cavity. *Cancer* 1990;*66*(1), 109–113.

Huang, S. H., Hwang, D., Lockwood, G., Goldstein, D. P., & O'Sullivan, B. (2009). Predictive value of tumor thickness for cervical lymph-node involvement in squamous cell carcinoma of the oral cavity. *Cancer*, *115*(7), 1489–1497.

Givi B, Eskander A, Awad MI, Kong Q, Montero PH, Palmer FL, Xu W, De Almeida JR, Lee N, O'Sullivan B, Irish JC, Gilbert R, Ganly I, Patel SG, Goldstein DP, Morris LG. Impact of elective neck dissection on the outcome of oral squamous cell carcinomas arising in the maxillary alveolus and hard palate. Head Neck. 2016 Apr;38 Suppl 1:E1688-94.

Xu JJ, Yu E, McMullen C, Pasternak J, Brierley J, Tsang R, Zhang H, Eskander A, Rotstein L, Sawka AM, Gilbert R, Irish J, Gullane P, Brown D, de Almeida JR, Goldstein DP. Patterns of regional recurrence in papillary thyroid cancer patients with lateral neck metastases undergoing neck dissection. J Otolaryngol Head Neck Surg. 2017 May 31;46(1):43.

Eskander A, Merdad M, Freeman JL, Witterick IJ. Pattern of spread to the lateral neck in metastatic well-differentiated thyroid cancer: a systematic review and meta-analysis. Thyroid. 2013 May;23(5):583-92. doi: 10.1089/thy.2012.0493.

Faries MB, Thompson JF, Cochran AJ, Andtbacka RH, Mozzillo N, Zager JS, Jahkola T, Bowles TL, Testori A, Beitsch PD, Hoekstra HJ, Moncrieff M, Ingvar C, Wouters MWJM, Sabel MS, Levine EA, Agnese D, Henderson M, Dummer R, Rossi CR, Neves RI, Trocha SD, Wright F, Byrd DR, Matter M, Hsueh E, MacKenzie-Ross A, Johnson DB, Terheyden P, Berger AC, Huston TL, Wayne JD, Smithers BM, Neuman HB, Schneebaum S, Gershenwald JE, Ariyan CE, Desai DC, Jacobs L, McMasters KM, Gesierich A, Hersey P, Bines SD, Kane JM, Barth RJ, McKinnon G, Farma JM, Schultz E, Vidal-Sicart S, Hoefer RA, Lewis JM, Scheri R, Kelley MC, Nieweg

OE, Noyes RD, Hoon DSB, Wang HJ, Elashoff DA, Elashoff RM. Completion Dissection or Observation for Sentinel-Node Metastasis in Melanoma. N Engl J Med. 2017 Jun 8;376(23):2211-2222.

Morton DL, Thompson JF, Cochran AJ, Mozzillo N, Elashoff R, Essner R, Nieweg OE, Roses DF, Hoekstra HJ, Karakousis CP, Reintgen DS, Coventry BJ, Glass EC, Wang HJ; MSLT Group. Sentinel-node biopsy or nodal observation in melanoma. N Engl J Med. 2006 Sep 28;355(13):1307-17. Erratum in: N Engl J Med. 2006 Nov 2;355(18):1944.

Morton DL, Thompson JF, Cochran AJ, Mozzillo N, Nieweg OE, Roses DF, Hoekstra HJ, Karakousis CP, Puleo CA, Coventry BJ, Kashani-Sabet M, Smithers BM, Paul E, Kraybill WG, McKinnon JG, Wang HJ, Elashoff R, Faries MB; MSLT Group. Final trial report of sentinel-node biopsy versus nodal observation in melanoma. N Engl J Med. 2014 Feb 13;370(7):599-609.

Mehta V, Johnson P, Tassler A, Kim S, Ferris RL, Nance M, Johnson JT, Duvvuri U. A new paradigm for the diagnosis and management of unknown primary tumors of the head and neck: a role for transoral robotic surgery. Laryngoscope. 2013 Jan;123(1):146-51. doi: 10.1002/lary.23562. Epub 2012 Nov 14.

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Thyroid

Goal:	**By the end of fellowship, the fellows have attained a proficient level of knowledge, skills and attitudes in diagnosis, surgical management and surveillance of benign and malignant diseases of the thyroid gland**
Objectives:	**After completing directed reading and educational activities in head and neck fellowship, the trainee will be able to:**

1. Outline the embryology and anatomy of the thyroid and parathyroid glands
    A. Describe the histologic appearance of normal thyroid tissue and the components of a thyroid follicle
    B. Recognize the relationship of critical adjacent structures such as the recurrent and superior laryngeal nerves, as well as the relationship with the superior and inferior parathyroid glands
    C. Predict when a non-recurrent laryngeal nerve may occur
2. Perform a complete history of a patient with suspected thyroid disease
    A. Hyper and hypothyroid symptoms
    B. Impact on voice and swallowing and/or dyspnea and hemoptysis
    C. Describe the epidemiology of benign and malignant diseases of the thyroid gland.
    D. List the risk factors for thyroid nodules and thyroid cancer including a history of prior neck surgery or radiation
    E. Family history of thyroid cancer or multiple endocrine neoplasia
3. Perform a thorough oncologic examination of head and neck, with emphasis on the thyroid gland, the at-risk lymph node basins and the surrounding laryngotracheal complex
    A. Perform fiberoptic laryngoscopy
4. Outline the initial next steps in evaluating patients with thyroid nodules based on the ATA Guidelines
    A. Laboratory work-up
    B. Ultrasound
        1) Describe the ultrasonographic risk stratification of a thyroid nodule and indications for fine needle aspiration
    C. Describe the Bethesda Classification for the cytologic interpretations of thyroid lesions
    D. Indications for molecular testing of indeterminate thyroid FNA specimens
5. Form a differential diagnosis of thyroid lesions based on the findings of this initial work up
6. Formulate non-surgical and surgical treatment options for a benign thyroid nodule
7. Recognize the typical presentation of benign or malignant thyroid tumors and certain signs and symptoms that might suggest a more aggressive behavior
    A. Understand how your approach may differ for rapidly growing thyroid lesions
    B. Outline an approach to airway management in individuals with suspected anaplastic thyroid cancer
8. Stage different thyroid malignancies accurately based on AJCC classification system

9. Recognize when to consider additional work up
    A. Indications for CT of the chest, MRI and/or PET CT
    B. Panendoscopy
10. Formulate a treatment plan based on the characteristics of the disease and specific needs of the patient
    A. What are the treatment options: surgical, nonsurgical, palliation
    B. For surgical patients, plan appropriately to consult additional services to assist with management (Thoracic surgery for significant substernal involvement, tracheal involvement and/or esophageal involvement)
    C. Develop a plan for a pregnant patient with a newly diagnosed well differentiated thyroid cancer
    D. Outline a treatment algorithm for a patient with MEN 2a or 2b without evidence of a thyroid lesion
11. List the indications for elective neck dissection in N0 thyroid malignancies and how this might differ based on primary disease pathology
12. Outline an appropriate management strategy for patients with N+ disease
13. Outline the risks of primary and revision surgery for thyroid malignancies
14. Discuss the benefits and limitations of recurrent laryngeal nerve monitoring
15. Describe and perform the different approaches to identify and preserve the recurrent and superior laryngeal nerve during central neck surgery
    A. Recognize when to consider resection of an involved recurrent laryngeal nerve
    B. Outline an approach to rehabilitation of a patient needing recurrent nerve resection or suffering from a nerve injury
        1) Primary repair
        2) Cable graft
        3) Ansa to distal nerve repair
        4) Secondary approaches to vocal fold paresis and paralysis
16. Incorporate endocrinology in the multidisciplinary care of benign and malignant thyroid diseases
17. Perform core procedures in surgery on the thyroid gland as defined by the curriculum, based on the attestation of the program director
18. Identify the classic histopathologic findings for papillary thyroid cancer, follicular thyroid cancer, medullary thyroid cancer, anaplastic thyroid cancer, and thyroid lymphoma
19. Discuss indications for adjuvant therapy following surgery for thyroid cancer based on staging, pathologic characteristics, operative findings, and post-surgical imaging (radioactive iodine scan) and recommend adjuvant treatments when appropriate
    A. When is RAI indicated
    B. When to consider external beam radiation therapy
    C. What options exist for recurrent and metastatic disease
        1) Additional surgery
        2) Additional RAI
        3) Tyrosine kinase inhibitors
20. Describe and discuss the current status of molecular testing of thyroid cancers
21. Recognize common complications of following thyroid and lateral neck surgery

22. Plan appropriate course of action for treating surgical complications of thyroid procedures
23. Analyze clinical findings and radiologic studies appropriately to distinguish surgically resectable from unresectable thyroid lesions
24. Discuss and recommend non-surgical options in the treatment of thyroid cancers
25. Utilize ancillary services such as nutrition and speech therapy appropriately in treatment planning and long term care of thyroid cancer patients
26. Formulate an evidence based surveillance program for thyroid cancer survivors based on established guidelines (such as NCCN)
    A. Appropriately use these tests in surveillance:
        1) TSH, Tg, Anti-Tg Ab
        2) Neck ultrasound
        3) When to consider chest imaging and/or PET/CT (for non-avid well differentiated thyroid cancer or for medullary and anaplastic thyroid cancer)
27. Recognize the common signs and symptoms of recurrent disease and plan an appropriate work up plan

Process:	**By the end of fellowship the fellows have participated in a minimum number of thyroid procedures based on the following list:**

1. Thyroidectomy, lobectomy and total
2. Central neck dissection
3. Lateral neck dissection
4. Upper aerodigestive tract resection as a part of ablative procedure for thyroid cancer
5. Laryngotracheal reconstruction
6. Parathyroid autotransplantation
7. Goiter surgery – transcervical and transsternal
8. Intraoperative nerve monitoring

Recommended Reading

Randolph, G. (2013). *Surgery of the thyroid and parathyroid glands* (2nd ed.). Philadelphia, PA: Saunders/Elsevier.

Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, Pacini F, Randolph GW, Sawka AM, Schlumberger M, Schuff KG, Sherman SI, Sosa JA, Steward DL, Tuttle RM, Wartofsky L. 2015 **American Thyroid** Association Management Guidelines for Adult Patients with **Thyroid** Nodules and Differentiated **Thyroid** Cancer: The **American Thyroid** Association Guidelines Task Force on **Thyroid** Nodules and Differentiated **Thyroid** Cancer.

Alexander EK, Pearce EN, Brent GA, Brown RS, Chen H, Dosiou C, Grobman WA, Laurberg P, Lazarus JH, Mandel SJ, Peeters RP, Sullivan S. 2017 Guidelines of the **American Thyroid** Association for the Diagnosis and Management of **Thyroid** Disease During Pregnancy and the Postpartum. **Thyroid**. 2017 Mar;27(3):315-389. doi: 10.1089/thy.2016.0457.

Witt RL. Outcome of **thyroid** gene expression classifier testing in clinical practice. Laryngoscope. 2016 Feb;126(2):524-7. doi: 10.1002/lary.25607. Epub 2015 Sep 7.

Wells SA Jr, Asa SL, Dralle H, Elisei R, Evans DB, Gagel RF, Lee N, Machens A, Moley JF, Pacini F, Raue F, Frank-Raue K, Robinson B, Rosenthal MS, Santoro M, Schlumberger M, Shah M, Waguespack SG. Revised American Thyroid Association guidelines for the management of medullary thyroid carcinoma. American Thyroid Association Guidelines Task Force on Medullary Thyroid Carcinoma. Thyroid. 2015 Jun;25(6):567-610. doi: 10.1089/thy.2014.0335. Review.

Smallridge RC, Ain KB, Asa SL, Bible KC, Brierley JD, Burman KD, Kebebew E, Lee NY, Nikiforov YE, Rosenthal MS, Shah MH, Shaha AR, Tuttle RM. American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. American Thyroid Association Anaplastic Thyroid Cancer Guidelines Taskforce. Thyroid. 2012 Nov;22(11):1104-39. doi: 10.1089/thy.2012.0302.

Chen, AY et al. American Thyroid Association Statement on Optimal Surgical Management of Goiter Thyroid. February 2014, 24(2): 181-189.

Francis GL, Waguespack SG, Bauer AJ, Angelos P, Benvenga S, Cerutti JM, Dinauer CA, Hamilton J, Hay ID, Luster M, Parisi MT, Rachmiel M, Thompson GB, Yamashita S. Management Guidelines for Children with Thyroid Nodules and Differentiated Thyroid Cancer. American Thyroid Association Guidelines Task Force. Thyroid. 2015 Jul;25(7):716-59. doi: 10.1089/thy.2014.0460. Review.

Tracy ET, Roman SA. Current management of pediatric thyroid disease and differentiated thyroid cancer. Curr Opin Oncol. 2016 Jan;28(1):37-42. doi: 10.1097/CCO.0000000000000250. Review.

Tufano RP, Clayman G, Heller KS, Inabnet WB, Kebebew E, Shaha A, Steward DL, Tuttle RM. Management of recurrent/persistent nodal disease in patients with differentiated thyroid cancer: a critical review of the risks and benefits of surgical intervention versus active surveillance. American Thyroid Association Surgical Affairs Committee Writing Task Force. Thyroid. 2015 Jan;25(1):15-27. doi: 10.1089/thy.2014.0098.

Randolph GW, Kamani D. Intraoperative electrophysiologic monitoring of the recurrent laryngeal nerve during thyroid and parathyroid surgery: Experience with 1,381 nerves at risk. Laryngoscope. 2017 Jan;127(1):280-286. doi: 10.1002/lary.26166. Epub 2016 Jul 8.

Liddy W, Barber SR, Cinquepalmi M, Lin BM, Patricio S, Kyriazidis N, Bellotti C, Kamani D, Mahamad S, Dralle H, Schneider R, Dionigi G, Barczynski M, Wu CW, Chiang FY, Randolph G. The electrophysiology of thyroid surgery: electrophysiologic and muscular responses with stimulation of the vagus nerve, recurrent laryngeal nerve, and external branch of the superior laryngeal nerve. Laryngoscope. 2017 Mar;127(3):764-771. doi: 10.1002/lary.26147. Epub 2016 Jul 4.

Ross, DS et al. American Thyroid Association Guidelines for Diagnosis and Management of Hyperthyroidism and Other Causes of Thyrotoxicosis. Thyroid. 2016 Oct;26(10):1343-1421.

Kiess AP, Agrawal N, Brierley JD, Duvvuri U, Ferris RL, Genden E, Wong RJ, Tuttle RM, Lee NY, Randolph GW. External-beam radiotherapy for differentiated thyroid cancer locoregional control: A statement of the American Head and Neck Society. Head Neck. 2016 Apr;38(4):493-8. doi: 10.1002/hed.24357. Epub 2015 Dec 30.

Cancer Genome Atlas Research, N. Integrated genomic characterization of papillary thyroid carcinoma. *Cell, 2014;159*(3), 676-690. doi:10.1016/j.cell.2014.09.050

Davies, L., & Welch, H. G. Increasing incidence of thyroid cancer in the United States, 1973-2002. *JAMA 2006;295*(18), 2164-2167. doi:10.1001/jama.295.18.2164

Cibas, E. S., & Ali, S. Z. The Bethesda System for Reporting Thyroid Cytopathology. *Thyroid 2009;19*(11), 1159-1165. doi:10.1089/thy.2009.0274

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Parathyroid

Goal: At the completion of the fellowship experience, the trainee should demonstrate proficiency in the diagnosis, management and appropriate surveillance for patients with primary, secondary and tertiary hyperparathyroidism.

Objective: By the end of the fellowship the graduate is able to:

1. Describe the embryologic origin and development of the superior and inferior parathyroid glands and detail their anatomic relationship to the recurrent laryngeal nerve
2. Describe how embryology influences the location of the superior and inferior parathyroid glands including common ectopic (and supernumerary) locations
3. Describe the physiologic cycle of PTH production, half-life and explain its clinical significance
4. Describe the role of PTH and its physiologic actions on the various organ systems specifically bones, kidneys and intestinal system
5. Describe the mechanisms behind calcium and phosphate homeostasis, and the role of Vitamin D
6. Identify the histopathologic differences between normal parathyroid gland, carcinoma, adenoma and hyperplasia
7. Perform a complete history and physical exam of a patient with hyperparathyroidism
    A. symptoms including bone pain, fatigue etc
    B. family history, including MEN syndrome
    C. medication history including diuretics
    D. renal calculi and calcinosis
    E. prior neck/parathyroid surgery
    F. rule in/out MEN syndrome, referral for genetic counseling/testing when indicated
    G. perform flexible laryngoscopy
8. Plan a diagnostic workup for patients presenting with suspected primary hyperparathyroidism
    A. Preoperative PTH and calcium levels
    B. Role of dexa scan
    C. Role of 24-hr urinary calcium and creatinine, rule out FHH
    D. Vitamin D levels
9. Discuss in detail the scope and limitations/sensitivity and specificity of the radiologic investigations available for localization and select the appropriate study based on patient and disease characteristics
    A. Ultrasound (surgeon vs radiologist-performed)
    B. Tc99 Sestamibi and SPECT/CT fusion
    C. MRI
    D. 4-D CT
10. List the indications for surgery in patients with hyperparathyroidism (symptomatic and asymptomatic) and formulate an appropriate surgical plan based on national guidelines
11. Appropriately treat Vitamin D deficiency
12. Discuss the role of intraoperative recurrent laryngeal nerve monitoring
13. Discuss how to utilize intraoperative PTH monitoring as a measure of success of surgery

14. Discuss the surgical management of solitary adenoma vs four gland hyperplasia, and identify which patients are candidates for a minimally invasive/unilateral approach
15. Discuss the role of parathyroid auto-transplantation and cryopreservation and perform these procedures in appropriate patients
16. Identify secondary hyperparathyroidism patients appropriately and plan treatment accordingly
17. Identify patients with tertiary hyperparathyroidism/ESRD who are candidates for parathyroid surgery and formulate an appropriate surgical plan with regards to the extent of surgery
18. Counsel patients regarding the possibility of surgical failure and the need for reoperation in the future
19. Formulate an appropriate work up in patients who are candidates for re-operative parathyroid surgery including:
    A. Review and discussion of prior operative reports and previous pathology
    B. Select appropriate imaging modalities
    C. Discuss the role of invasive techniques such as selective venous sampling and arteriography
    D. Utilize Intraoperative FNA, PTH wash and frozen section control
    E. Select lateral vs central approach
    F. Discuss radio-guided parathyroid surgery and offer this technique in appropriate cases
20. Discuss the aggressive nature of parathyroid carcinoma and its surgical management
21. Recognize the clinical signs suspicious for diagnosis of parathyroid carcinoma
22. Describe the setup and instruments required for endoscopic parathyroid surgery
23. Discuss and recommend non-surgical options available to patients who are not surgical candidates or who elect to defer surgery
    A. Bisphosphonates
    B. Calcimimetics
    C. Ethanol ablation
24. Recognize the importance of multimodality management of parathyroid disease and establish working relationship with endocrinologist in management of parathyroid disease

Recommended Reading

Wilhelm, S. M., Wang, T. S., Ruan, D. T., Lee, J. A., Asa, S. L., Duh, Q. Y., . . . Carty, S. E. (2016). The American Association of Endocrine Surgeons Guidelines for Definitive Management of Primary Hyperparathyroidism. *JAMA Surg, 151*(10), 959-968. doi:10.1001/jamasurg.2016.2310

Bilezikian, J. P., Brandi, M. L., Eastell, R., Silverberg, S. J., Udelsman, R., Marcocci, C., & Potts, J. T., Jr. (2014). Guidelines for the management of asymptomatic primary hyperparathyroidism: summary statement from the Fourth International Workshop. *J Clin Endocrinol Metab, 99*(10), 3561-3569. doi:10.1210/jc.2014-1413.

Babwah F, Buch HN. Normocalcaemic primary hyperparathyroidism: a pragmatic approach, J Clin Pathol. 2018 Apr;71(4):291-297. doi: 10.1136/jclinpath-2017-204455. Epub 2018 Feb 3. PMID: 29437827.

Bilezikian JP, Bandeira L, Khan A, Cusano NE. Hyperparathyroidism. Lancet. 2018 Jan 13;391(10116):168-178. doi: 10.1016/S0140-6736(17)31430-7. Epub 2017 Sep 17. PMID: 28923463.

Stephen AE, Mannstadt M, Hodin RA. Indications for Surgical Management of Hyperparathyroidism: A Review. JAMA Surg. 2017 Sep 1;152(9):878-882. doi: 10.1001/jamasurg.2017.1721. PMID: 28658490.

Yamada T, Ikuno M, Shinjo Y, Hiroishi A, Matsushita S, Morimoto T, Kumano R, Yagihashi K, Katabami T. Selective venous sampling for primary hyperparathyroidism: how to perform an examination and interpret the results with reference to thyroid vein anatomy. Jpn J Radiol. 2017 Aug;35(8):409-416. doi: 10.1007/s11604-017-0658-3. Epub 2017 Jun 21. PMID: 28639211.

Liu ME, Qiu NC, Zha SL, Du ZP, Wang YF, Wang Q, Chen Q, Cen XX, Jiang Y, Luo Q, Shan CX, Qiu M. To assess the effects of parathyroidectomy (TPTX versus TPTX+AT) for Secondary Hyperparathyroidism in chronic renal failure: A Systematic Review and Meta-Analysis. Int J Surg. 2017 Aug;44:353-362. doi: 10.1016/ j.ijsu. 2017.06.029. Epub 2017 Jun 17. PMID: 28634117.

Sethi N, England RJA. Parathyroid surgery: from inception to the modern day. Br J Hosp Med (Lond). 2017 Jun 2;78(6):333-337. doi: 10.12968/hmed.2017.78.6.333. PMID: 28614027.

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Microvascular Reconstruction

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate understanding of the functional and cosmetic consequences of the full array of soft tissue and bony defects of the head and neck. The fellow should be able to identify defects that are appropriate for advanced reconstructive procedures with an aim to collaborate with head and neck reconstructive surgeons for joint care of patients.**
Objectives:	**After completing directed reading and educational activities in head and neck fellowship, the trainee will be able to:**

General Reconstructive Principles:

1. Anticipate surgical defects based on pre-operative physical exam and imaging characteristics
2. Describe and discuss general reconstructive goals for head and neck defects, including functional restoration, durability, optimal aesthetics, limited donor site morbidity, and quality of life enhancement
3. Indicate how these goals are impacted by various reconstructive approaches
4. Recognize the importance of patient-specific goals in the process of reconstructive planning
5. Describe the reconstructive ladder for the following defects:
    A. Oral cavity
        1) Hemiglossectomy
        2) Floor of mouth defect without bone resection
        3) Total/subtotal glossectomy
        4) Anterior mandible resection
        5) Lateral mandible resection
        6) Through and through resection (mandible resection with associated mucosal and skin defects)
        7) Subtotal lip defects
    B. Oropharyngeal
    C. Total laryngectomy
    D. Laryngopharyngectomy
    E. Infrastructure maxillectomy
    F. Total maxillectomy including orbital floor, with orbit preservation
    G. Total maxillectomy with orbital exenteration
    H. Resection of anterior skull base
    I. Total parotidectomy defect with or without facial nerve resection
6. Outline necessary pre-operative evaluations needed to assess candidacy for certain free flap donor sites
    A. Allen's test
    B. Lower extremity MRA/CTA or Doppler evaluation for 3-vessel run off
    C. Assessment of foot neurovascular status
7. Discuss the relative importance of nutrition in reconstruction; identify methods to optimize nutrition prior to advanced reconstructive surgery
8. Describe the angiosome concept and and discuss how it impacts flap selection and design
9. Prepare various recipient vessels (including internal mammary vessels)

10. Perform accurate, efficient and durable microvascular anastomoses; design pedicle geometry to maximize flap survival. Have the ability to perform hand-sewn venous anastomosis including end-to-side orientation
11. List signs of vascular (arterial and/or venous) compromise after flap reconstruction; describe methods for flap monitoring and recall the pros, cons, and practical utility of each approach
12. Explain the concept of ischemia-reperfusion injury and understand the relevance to reconstruction with microvascular free tissue transfer
13. Describe the methods of antithrombotic prophylaxis; explain the physiology of each approach and its utility after microvascular free tissue transfer
14. Outline the indications and methodology for leech therapy; describe the medical implications (e.g., blood loss, infection, etc.) and appropriate management
15. List the complications of various reconstructive approaches and describe the appropriate management strategy for each
16. Formulate a plan to manage flap failure including initial approach to revascularization and subsequent secondary reconstructive approaches for unsalvageable flaps
17. Develop an appropriate plan for functional rehabilitation for both donor and recipient sites after reconstructive surgery

Fasciocutaneous, myocutaneous, and enteric flaps:

1. Catalogue the available soft tissue armamentarium with respect to:
    A. Flap soft tissue characteristics such as bulk, pliability and epithelial lining
    B. Pedicle length
    C. Donor site morbidity
    D. Availability of a source for nerve grafting
    E. Simultaneous two-team harvest
    F. Free versus pedicled flap opportunities
2. Assess the soft tissue needs (bulk, epithelial surfaces, and shape) for various defects of the head and neck including:
    A. Floor of mouth defects
    B. Oral tongue defects: partial glossectomy, hemiglossectomy, near-total glossectomy, and total glossectomy
    C. Buccal and retromolar trigone defects
    D. Palate defects
    E. Pharyngeal defects (partial and total)
    F. Complex skin and soft tissue defects of head and neck, including lip, chin, orbit, parotid bed, scalp, and nasal defects
    G. Skull base defects
3. Choose optimal flap(s) for each of the aforementioned defects such that function and/or cosmesis is maximized.
4. Define the surgical anatomy and relevant vascular and neuronal elements of the soft tissue reconstructive armamentarium.
5. Master the elevation and preparation of the following free fasciocutaneous or myocutaneous flaps:
    A. Radial forearm
    B. Anterolateral thigh

C. Rectus abdominus
D. Latissimus dorsi
E. Parascapular
F. Lateral arm
G. Temporoparietal fascia
H. Ulnar forearm

6. Select an enteric flap for total pharyngeal reconstruction when appropriate; in particular, consider gastro-omental or jejunal flaps for high risk total pharyngeal defects
7. Evaluate patients for eligibility for various soft tissue flaps, considering comorbidities, donor site implications and functional status
8. Recommend when a local or pedicled flap is an appropriate alternative to free tissue
9. Reach proficiency level in harvest and preparation of the major regional pedicled flaps: pectoralis major, latissimus dorsi, supraclavicular, submental island, sternocleidomastoid and deltopectoral flaps
10. Diagnose an unsafe recipient wound for free tissue transfer and outline techniques to stabilize and maximize wound healing (initial decontamination and wound packing, introduce vascularized tissue, divert fistulae, advanced wound care/dressings)
11. Formulate a plan to manage partial and total soft tissue flap failure with respect to long term function
12. Implement speech, swallowing and donor site rehabilitation strategies for each defect and flap type

Osteocutaneous flaps:

1. Perform appropriate examination of head and neck defects/potential defects and flap donor sites
2. Describe a logical methodology for donor site selection based on:
    A. tissue needs for defect reconstruction
    B. optimal functional outcome
    C. donor site morbidity profile
    D. patient medical history and comorbidities
    E. patient lifestyle concerns
3. Define the anatomy and relevant vascular and neuronal elements of fibula, scapula, iliac crest, and radial forearm osteocutaneous free flaps
4. Recognize the advantages and disadvantages of the different osteocutaneous free flaps; identify the quality and quantity of bone from each and its functional capacity (e.g., likelihood of osseointegration, ability to bear implants for dental rehabilitation, etc.)
5. Demonstrate effective and efficient harvesting and inset techniques for osteocutaneous free flaps
6. Review the concepts of bone healing and its relationship to load and stress
7. Develop effective plans for reconstruction of mandible and midface bony defects; describe the process for and utility of pre-operative three-dimensional modeling and custom plate design
8. Discuss methods to reduce complications, including plate or bone fracture or extrusion
9. Formulate a plan to manage partial and total flap failure
10. Recall alternatives to osteocutaneous free flaps when their use is not medically appropriate

11. Discuss the process of and options for dental rehabilitation; recognize the advantages and disadvantages of primary vs. secondary osseointegrated implant placement\
12. Discuss the role and limitations of computer image modeling and cutting guides in fibular free flap reconstruction
13. Recognize the sign and symptoms of plate failure and Osteoradionecrosis and and formulate a plan for management.

Process: At the completion of the fellowship experience, the trainee should have participated in 25 major head and neck surgeries requiring free flap reconstruction:

The trainee should have detailed knowledge of the harvest techniques for the following:

Pedicled flaps:

- pectoralis major
- latissimus dorsi
- sternocleidomastoid
- supraclavicular
- submental

Free flaps:

- radial forearm
- anterolateral thigh
- fibula
- scapula
- latissimus dorsi

Site-based reconstructions: During the course of their training, the fellow should receive exposure to at least 2 free flap reconstructions of the following sites:

- oral cavity (soft tissue)
- oral cavity (bone)
- pharynx
- midface (soft tissue)
- midface (bone)
- face/neck/scalp
- parotid/ear

Recommended Reading for Head & Neck Reconstruction & Microvascular Surgery

Atlas of Regional and Free Flap for Head and Neck Reconstruction: Flap Harvest and Inset. Mark L. Urken and Mack L. Cheney.

Multidisciplinary Head and Neck Reconstruction: A Defect-Oriented Approach. Mark L. Urken.

Microsurgical Reconstruction of the Head and Neck. Peter C. Neligan and Fu-Chan Wei.

Reconstruction of the Head and Neck: A Defect-Oriented Approach. Eric M. Genden.

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Ethics

Goal:	**At the completion of the fellowship experience, the trainee should demonstrate proficiency in clinical, professional and research ethics.**
Objective:	**By the end of the fellowship, the fellows can:**

Philosophical Basis for Medical Ethics

1. Define autonomy, paternalism, shared decision making, directive counsel, abandonment, personhood
2. Describe and critique different ethical frameworks:
    A. Principlism v. casuistry
    B. Virtue Ethics
    C. Deontology (Duty-based ethics, fiduciary)
    D. Consequentialism
    E. Narrative inquiry
    F. Justice theory

Clinical Ethics

1. Contrast the terms competence and capacity
    A. List the elements required to determine medical decision-making capacity
    B. Understand the importance of making wishes known and the possibility of loss of capacity
2. Recognize the ethical and legal guidelines governing privacy and confidentiality
    A. HIPAA
    B. Hippocratic Oath
    C. Institutional regulation thereof
3. Prepare for advance care planning
    A. Demonstrate the ability to introduce advance care planning in the outpatient setting
    B. Differentiate various forms of advance directive documents, e.g. directive to physicians, medical power of attorney, DNAR (in-patient v. out-patient)
    C. Describe how to implement an advance directive in clinical care
    D. Know the legal ramifications of advance care documentation
4. Differentiate the levels of surrogate decision making including advance directive, legal guardian, medical (durable) power of attorney, health care agent, next of kin, surrogate of highest priority, best interest standard (as compared to patient preference and substituted judgment)
    A. Understand management options for the unbefriended adult
5. Prepare for and effectively share the delivery of difficult information (breaking bad news), active listening, engagement
6. Interpret patient-centric, goal-oriented risks and benefits for individual patient decisions
7. Define the doctrine of double effect and explain how it is applied in the contexts of pain management and proportional palliative sedation
8. Employ basic and advanced techniques of facilitating medical decision making

A. Motivational interviewing; shared decision making; risk stratification; outcomes and discharge destination prognostication

9. Use evidence-based decision-making for emergency airway management
10. Contrast palliative medicine and hospice care
    A. Practice meticulous symptom management for all patients with head and neck cancer from early to advanced, from survivorship to end of life care.
    B. Cooperate with specialists from palliative medicine and other relevant specialties to provide optimal care for individual patients and their caregivers
    C. Describe the evolving role of artificial nutrition and hydration from diagnosis of head and neck cancer to cachexia in advanced head and neck cancer
        1) Distinguish eating/drinking, from artificial nutrition/hydration from a legal, philosophical, and ethical perspective
    D. Define existential suffering and how it interferes with quality of life; distinguish pain v. suffering
11. Appraise critically the arguments for and against physician aid in dying in the context of advanced head & neck cancer

Professional Ethics

1. Demonstrate integrity, honesty and professional boundaries
    A. Explore the necessary traits and virtues of a physician, e.g. tolerance, moral courage, self-reflection, empathy, truth telling, integrity, humility, etc.
    B. Explain the importance of cultural competence
    C. Select strategies for identifying and controlling for unconscious bias
    D. Critically appraise the role of social media in defining or dissolving boundaries
2. Choose appropriate methods of error disclosure and understand the evidence and ethics thereof
3. Recommend resources for the impaired physician and reporting requirements
4. Manage billing and compliance and appreciate ethical components considering legal and regulatory precedent
5. Describe conflicts of interest and commitment
    A. Financial, intellectual, leadership
6. Discuss the role of industry in the development and control of biomedical advances
    A. Exemplify responsible and fair interaction with industry
    B. Relate inherent limitations of direct-to-consumer marketing
7. Recognize the challenges of scarce resource allocation and rationing
    A. Evaluate the impact of national policy on healthcare at the micro and macro levels
    B. Contextualize marginalized populations and disparities in cancer treatment
8. Apply sound educational and ethical principles to trainee supervision
9. Recognize the signs of burnout and select coping strategies for self-care

Research Ethics

10. Demonstrate protection of human subjects as stipulated in the Belmont Report, and the Common rule
11. Complete informed consent for research

12. Describe basic IRB regulations and processes
13. Understand fundamental ethical differences between clinical care versus research, duties to patient v. research participants (fiduciary v. protective)
14. Describe the concept of the therapeutic misconception

Process: By the end of fellowship, the fellows have participated in a minimum number of:

1. Family meetings to discuss treatment options, possible outcomes, caregiving responsibilities
2. Advance care planning discussions, including execution of advance directives, physician orders for life sustaining treatment, Do Not Attempt Resuscitation Orders (both inpatient and out of hospital DNAR)
3. Determinations of appropriate surrogate decision maker for patients, including for patients without an identified surrogate
4. Management of complex symptoms with multimodality pain medication considering both the benefits and the risks of opioids
5. Discuss and observe the process of withdrawal of technology to allow natural death
6. Obtain informed consent for clinical trials
7. Participate in completion of an IRB application for human subjects research, completion of the CITI course or equivalent, or attend a session dedicated to core reading

Recommended Reading

American Society of Bioethics and Humanities (2014), *Code of Ethics and Professional Responsibilities for Healthcare Ethics Consultants*. Glenview, IL: Clinical Ethics Consultation Affairs Committee.

American Society of Bioethics and Humanities (2011), *Core Competencies for Healthcare Ethics Consultation*. 2nd ed. Glenview, IL: Core Competencies Task Force.

Appelbaum, P.S. Assessment of Patients' Competence to Consent to Treatment. *N Engl J Med* 2007;*357*, 1824-40.

Back, A.L., Arnold, R.M. Dealing with Conflict in Caring for the Seriously Ill, "It Was Just Out of the Question." *JAMA* 2005;*293*(11), 1374-1381.

Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP. SPIKES: A six-step protocol for delivering bad news: application to the patient with cancer.Oncologist. 2000;5(4):302-11.

Biffl WL, Spain DA, Reitsma AM, Minter RM, Upperman J, Wilson M, Adams R, Goldman EB, Angelos P, Krummel T, Greenfield LJ; Society of University Surgeons Surgical Innovations Project Team. Responsible development and application of surgical innovations: a position statement of the Society of University Surgeons. J Am Coll Surg. 2008 Jun;206(6):1204-9.

Bosslet, GT, Pope, TM, Rubenfeld, GD, Lo, B, Truog, RD…White, DB. An Official ATS/AACN/ACCP/ESICM/SCCM Policy Statement: Responding to Requests for Potentially Inappropriate Treatments in Intensive Care Units. *American Journal of Respiratory and Critical Care Medicine 2015;191*(11), 1318-1330.

Brett, Allan S., and Paul Jersild. Inappropriate treatment near the end of life: Conflict between religious convictions and clinical judgment. *Archives of Internal Medicine* 2003;*163*(14), 1645-1649.

Brody H, Hermer LD, Scott LD, Grumbles LL, Kutac JE, McCammon SD. Artificial nutrition and hydration: the evolution of ethics, evidence, and policy. J Gen Intern Med. 2011 Sep;26(9):1053-8.

Cassell EJ. The nature of suffering and the goals of medicine. NEJM 1982;306(11):639-45.

Charon R. Narrative and medicine. NEJM. 2004;350(9):862-4.

Conley J. Ethics in otolaryngology. Acta Otolaryngol. 1981;91(5-6):369-74.

Coulehan, JL, Platt, FW, Egener, B, Frankel, Lin, CT, Lown, B, Salazar, WH. "Let Me See If I Have This Right…": Words That Help Build Empathy. *Annals of Internal Medicine* 2001;*135*(3), 221-227.

Diehl, M, Hay, EL, Chui, H. Personal Risk and Resilience Factors in the Context of Daily Stress, *Annu Rev Gerontol Geriatr.* 2012;*32*(1), 251–274.

Diekema, DS. Revisiting the Best Interest Standard: Uses and Misuses. *Journal of Clinical Ethics 2011;22*(2), 128-33.

Eves, MM, Esplin, BS. "She Just Doesn't Know Him Like We Do": Illuminating Complexities in Surrogate Decision-Making. *Journal of Clinical Ethics 2015;26*(4), 350-354.

Edelstein, LM, et al. Communication and Conflict Management Training for Clinical Bioethics Committees. *HEC Forum* 2009;*21*(4), 341-49.

Emanuel EJ, Wendler D, Grady C. What makes clinical research ethical? JAMA 2000;283(20):2701-11.

Epner DE, Baile WF. Patient-centered care: the key to cultural competence. Ann Oncol. 2012;23 Suppl 3:33-42.

Epstein, EG and Hamric, AB. Moral Distress, Moral Residue, and the Crescendo Effect. *Journal of Clinical Ethics*, Winter 2009;330-42.

Foxwell KR, Scott SE. Coping together and apart: exploring how patients and their caregivers manage terminal head and neck cancer. J Psychosoc Oncol. 2011;29(3):308-26.

Grady, C. Enduring and Emerging Challenges of Informed Consent. *N Engl J Med 2015;372*(9), 855-862.

Haas, B et al. "It's Parallel Universes": An Analysis of Communication between Surgeons and Intensivists. *Critical Care Medicine 2015;43*(10), 2147-2154.

Hinshaw DB, Pawlik T, Mosenthal AC, Civetta JM, Hallenbeck J. When do we stop, and how do we do it? Medical futility and withdrawal of care. J Am Coll Surg. 2003 Apr;196(4):621-51.

Joffe S, Miller F. Bench to bedside: mapping the moral terrain of clinical research. Hastings Cent Rep. 2008;38(2):30–42. doi: 10.1353/hcr.2008.0019

Kon et al. Defining Futile and Potentially Inappropriate Interventions: A Policy Statement From the Society of Critical Care Medicine Ethics Committee. Critical Care Medicine 2016;44: 1769-1774.

Pope, TM. Making Medical Decisions for Patients without Surrogates, *N Engl J Med 2013;369*:1976-78.

Peabody FW. The care of the patient. JAMA 1927;88(12):877-82.

Schenck DP. Ethical considerations in the treatment of head and neck cancer. Cancer Control. 2002;9(5):410-9.

Shuman AG, Fins JJ, Prince ME. Improving end-of-life care for head and neck cancer patients. Expert Rev Anticancer Ther. 2012;12(3):335-43.

Sulmasy DP. Appearance and morality: ethics and otolaryngology-head and neck surgery. Otolaryngol Head Neck Surg. 2002 Jan;126(1):4-7.

Sulmasy, DP, Snyder, L. Substituted Interests and Best Judgments: An Integrated Model of Surrogate Decision Making. *JAMA* 2010;*304*(17), 1946-1947.

Thurston, A. The Unreasonable Patient. *JAMA 2016;315*(7), 657-658.

White DB, Curtis JR, Wolf LE, Prendergast TJ, Taichman DB, Kuniyoshi G, et al. Life Support for Patients without a Surrogate Decision Maker: Who Decides? *Ann Intern Med* 2007;*147*, 34-40.

Wicclair, MR, White, DB. Surgeons, Intensivists, and Discretion to Refuse Requested Treatments. *Hastings Center Report* 2014;*44*(5), 33-42.

Venkat A. The threshold moment: ethical tensions surrounding decision making on tracheostomy for patients in the intensive care unit. J Clin Ethics. 2013;24(2):135-43.

Recommended Books

Aulisio, MP, Arnold, RM, Youngner, SJ (2003). *Ethics Consultation: From Theory to Practice.* Baltimore, MD: Johns Hopkins University Press.

Beauchamp, TL, Childress, JF. (2001). *Principles of Biomedical Ethics* (5th ed.) New York, NY: Oxford University Press.

Dubler, NN, Liebman, CB. (2004). *Bioethics Mediation: A Guide to Shaping Shared Solutions*. New York, NY: United Hospital Fund of New York.

Fins JJ. *A Palliative Ethic of Care: Clinical Wisdom at Life's End*. Jones and Bartlett Publishers, 2006.

Ford, PJ, Dudzinski, DM. (2008). *Complex Ethics Consultation: Cases that Haunt Us*. New York, NY: Cambridge University Press.

Johnsen, AR, Siegler, M, Winslade, WJ (2006). *Clinical Ethics: A Practical Approach to Ethical Decisions in Clinical Medicine* (6th ed.) New York, NY: McGraw-Hill.

Lo, B. (2009) *Resolving Ethical Dilemmas: A Guide for Clinicians* (4th ed.) Philadelphia, PA: Wolters Kluwer Lippincott Williams & Wilkins.

Springer, Elise. (2013). *Communicating Moral Concern: An Ethics of Critical Responsiveness.* Cambridge, MA: Massachusetts Institute of Technology.

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Basic Science

Goal:	**By the end of the fellowship, the trainee is proficient in Fundamentals of Cancer Biology / Immunology in head and neck oncology**
Objectives:	**After completing directed reading and educational activities in head and neck fellowship, the trainee will be able to:**

Cancer Biology

1. DEFINE the hallmarks of cancer
2. DISCUSS the major genomic alterations and known & hypothesized functional impact of such alterations in malignancies of the head and neck
3. DESCRIBE the mechanism of action of approved chemotherapeutic and molecular targeted agents used to treat head and neck malignancies
4. LIST and DESCRIBE different molecular and genetic tests used in the diagnosis and workup for head and neck malignancies
5. EXPLAIN how molecular and genetic testing for thyroid nodules was developed and the utility of these tests in the workup of thyroid nodules
6. APPLY molecular and genetic tests for the diagnosis and workup of head and neck malignancies and
7. AVOID unnecessary utilization of such tests

Cancer Immunology

1. DESCRIBE the mediators and process of both passive and active immunity
2. SUMMARIZE the process of antigen presentation and T-Cell responses
3. OUTLINE the process of immune evasion during tumorigenesis
4. EXPLAIN the mechanism of action of immune checkpoint inhibitors

Process

1. Dedicated Reading - The trainee will critically read, summarize, and interpret selected fundamental materials (see reading list)
2. Mentorship – The fellowship program should designate basic/translational scientists/collaborators that will interact regularly with the trainee in various capacities
3. Journal club sessions – a proportion of journal club sessions should focus on cancer biology/immunology. Trainees should learn to critically review basic/translational research and discuss implications or potential applications of such research
4. Attend Institutional/Regional/National meetings and attend dedicated sessions to cancer biology/immunology

Recommended Reading

Cancer Biology

Hanahan, D., & Weinberg, R. A. The hallmarks of cancer. Cell, 2000;100(1), 57-70.

Hanahan D, Weinberg RA. Hallmarks of cancer: the next generation. Cell. 2011 Mar 4;144(5):646-74. doi: 10.1016/j.cell.2011.02.013.

Puram SV, Tirosh I, Parikh AS, Patel AP, Yizhak K, Gillespie S, Rodman C, Luo CL, Mroz EA, Emerick KS, Deschler DG, Varvares MA, Mylvaganam R, Rozenblatt-Rosen O, Rocco JW, Faquin WC, Lin DT, Regev A, Bernstein BE. Single-Cell Transcriptomic Analysis of Primary and Metastatic Tumor Ecosystems in Head and Neck Cancer. Cell. 2017 Nov 30. pii: S0092-8674(17)31270-9. doi: 10.1016/j.cell.2017.10.044.

Liu B, Mitani Y, Rao X, Zafereo M, Zhang J, Zhang J, Futreal PA, Lozano G, El-Naggar AK. Spatio-Temporal Genomic Heterogeneity, Phylogeny, and Metastatic Evolution in Salivary Adenoid Cystic Carcinoma. J Natl Cancer Inst. 2017 Oct 1;109(10). doi: 10.1093/jnci/djx033.

Comprehensive genomic characterization of head and neck squamous cell carcinomas. Nature 2015;517(7536), 576-582. doi:10.1038/nature14129

Integrated genomic characterization of papillary thyroid carcinoma. Cell 2014;159(3), 676-690. doi:10.1016/j.cell.2014.09.050

Nikiforov, Y. E., Carty, S. E., Chiosea, S. I., Coyne, C., Duvvuri, U., Ferris, R. L., . . . Nikiforova, M. N. Impact of the Multi-Gene ThyroSeq Next-Generation Sequencing Assay on Cancer Diagnosis in Thyroid Nodules with Atypia of Undetermined Significance/Follicular Lesion of Undetermined Significance Cytology. Thyroid 2015;25(11), 1217-1223. doi:10.1089/thy.2015.0305

Fagin, J. A., & Wells, S. A., Jr. Biologic and Clinical Perspectives on Thyroid Cancer. N Engl J Med 2016; 375(11), 1054-1067. doi:10.1056/NEJMra1501993

Feldman, Rebecca, et al. "Molecular profiling of head and neck squamous cell carcinoma." *Head Neck* 2016;38.S1.

Chau, Nicole G., et al. "Incorporation of next-generation sequencing into routine clinical care to direct treatment of head and neck squamous cell carcinoma." *Clinical cancer research* 22.12 (2016): 2939-2949.

Cancer Immunology

Ferris, R. L., Blumenschein, G., Jr., Fayette, J., Guigay, J., et al. Nivolumab for Recurrent Squamous-Cell Carcinoma of the Head and Neck. N Engl J Med 2016. doi:10.1056/NEJMoa1602252

Chow, L. Q., Haddad, R., Gupta, S., Mahipal, A., et al. Antitumor Activity of Pembrolizumab in Biomarker-Unselected Patients With Recurrent and/or Metastatic Head and Neck Squamous Cell Carcinoma: Results From the Phase Ib KEYNOTE-012 Expansion Cohort. J Clin Oncol 2016. doi:10.1200/jco.2016.68.1478

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Clinical Research

Goal:	**By the end of the fellowship the trainee is proficient in Fundamentals of Clinical Research Design & Fundamentals of Statistical Analysis**
Objectives:	**After completing directed reading and educational activities in head and neck fellowship, the trainee will be able to:**

Fundamentals of Clinical Research Design

1. STATE the differences in the objectives and design of clinical trials:
    A. Phase I
    B. Phase II
    C. Phase III
2. SUMMARIZE core ethical standards in human subjects research
3. DEVELOP a clinical research project
4. EXPLAIN the process of IRB review and factors under consideration when a protocol is reviewed
5. OUTLINE the process when opening multi-institutional and/or cooperative group trials
6. RECOGNIZE financial considerations when conducting a clinical trials and LIST various funding options
7. DESCRIBE how to develop a biorepository and how surgeons can play a key role in quality tissue and data acquisition.

Fundamentals of Statistical Analysis

1. Cite the application for the different observational study designs:
    A. Case report/case series
    B. Case-control studies
    C. Cohort studies
2. Define the indications for a systematic review and how this research strategy differs from a literature review
3. Define how a meta-analysis differs from a systematic review
4. Recite the advantages and disadvantages of a randomized controlled trial
5. DEFINE Type I and Type II Error.
6. STATE the definition of a “p” value and a confidence interval
7. INTERPRET common statistical analyses to include:
    A. Descriptive statistics – basic parametric and non-parametric tests
    B. Student’s t-test
    C. Chi-Square test/Fisher’s exact testing
    D. Kaplan Meier Survival Analysis and interpret the Log Rank Test
    E. Univariate analysis
    F. Multivariable regression models
        1) Linear regression

2) Logistic regression
3) Cox regression

8. List various types of research bias

Process:	**By the end of fellowship the fellows have participated in the following list of research educational opportunities:**

1. Dedicated didactic instruction (eg. lectures, journal club, etc.) focused on topics above
2. Identification of a clinical research mentor: fellows should identify surgeons/medical oncologists/radiation oncologists with clinical research and clinical trial experience
3. Complete a research project to include generation of a hypothesis, development of study design/methodology, submission of an IRB if appropriate, data collection, statistical analysis, and manuscript development
4. Attend an IRB / PRMC meeting (encouraged but not mandatory)
5. Attend at least one national meeting (AHNS, AAO-HNS, ASCO, etc.)

Recommended Reading **(** ***** ***indicates mandatory; others are recommended)***

******Interpreting Statistics in Medical Literature: A Vade Mecum for Surgeons. Guller U, DeLong ER. J Am Coll Surg. 2004; 1998: 441-458.

******A practical guide to understanding Kaplan-Meier curves. Rich JT, Neely JG, Paniello RC, Voelker CC, Nussenbaum B, Wang EW. Otolaryngol Head Neck Surg. 2010 Sep;143(3):331-6.

******A practical guide to understanding systematic reviews and meta-analyses. Neely JG, Magit AE, Rich JT, Voelker CC, Wang EW, Paniello RC, Nussenbaum B, Bradley JP. Otolaryngol Head Neck Surg. 2010 Jan;142(1):6-14.

******A practical guide for understanding confidence intervals and P values. Wang EW, Ghogomu N, Voelker CC, Rich JT, Paniello RC, Nussenbaum B, Karni RJ, Neely JG. Otolaryngol Head Neck Surg. 2009 Jun;140(6):794-9.

******Tutorials in clinical research: VII. Understanding comparative statistics (contrast)--part B: application of T-test, Mann-Whitney U, and chi-square. Neely JG, Hartman JM, Forsen JW Jr, Wallace MS. Laryngoscope. 2003 Oct;113(10):1719-25.

******Tutorials in clinical research: part VII. Understanding comparative statistics (contrast)--part A: general concepts of statistical significance. Neely JG, Hartman JM, Forsen JW Jr, Wallace MS; Clinical Research Working Group. Laryngoscope. 2003 Sep;113(9):1534-40.

Lang, T. A. and M. Secic (2006). How to report statistics in medicine : annotated guidelines for authors, editors, and reviewers. New York, American College of Physicians.

Cohort Studies. Alexander LK, Lopes B, Ricchetti-Masterson K, Yeatts KB. Eric Notebook, 2nd Ed. UNC CH Dept. of Epidemiology. http://sph.unc.edu/nciph/eric. Access: 15MAR2017.

Practical guide to understanding Comparative Effectiveness Research (CER).Neely JG, Sharon JD, Graboyes EM, Paniello RC, Nussenbaum B, Grindler DJ, Dassopoulos T; Department of Otolaryngology-Head and Neck Surgery Washington School of Medicine, Saint Louis, Missouri. Otolaryngol Head Neck Surg. 2013 Dec;149(6):804-12.

Practical guide to understanding multivariable analyses: Part A. Neely JG, Paniello RC, Lieu JE, Voelker CC, Grindler DJ, Sequeira SM, Nussenbaum B. Otolaryngol Head Neck Surg. 2013 Feb;148(2):185-90.

Practical guide to understanding multivariable analyses, Part B: conjunctive consolidation.Neely JG, Lieu JE, Sequeira SM, Graboyes E, Paniello RC, Nussenbaum B, Grindler DJ, Voelker CC. Otolaryngol Head Neck Surg. 2013 Mar;148(3):359-65

A practical guide to surveys and questionnaires. Slattery EL, Voelker CC, Nussenbaum B, Rich JT, Paniello RC, Neely JG. Otolaryngol Head Neck Surg. 2011 Jun;144(6):831-7.

Practical guide to efficient analysis and diagramming articles. Neely JG, Karni RJ, Wang EW, Rich JT, Paniello RC, Voelker CC, Nussenbaum B. Otolaryngol Head Neck Surg. 2009 Jan;140(1):4-8.

Practical guide to understanding the value of case reports. Neely JG, Karni RJ, Nussenbaum B, Paniello RC, Fraley PL, Wang EW, Rich JT. Otolaryngol Head Neck Surg. 2008 Mar;138(3):261-4.

A practical guide to understanding outcomes research. Stewart MG, Neely JG, Paniello RC, Fraley PL, Karni RJ, Nussenbaum B. Otolaryngol Head Neck Surg. 2007 Nov;137(5):700-6.

Practical guides to understanding sample size and minimal clinically important difference (MCID). Neely JG, Karni RJ, Engel SH, Fraley PL, Nussenbaum B, Paniello RC. Otolaryngol Head Neck Surg. 2007 Jan;136(1):14-8

Tutorials in clinical research, part VI: descriptive statistics. Neely JG, Stewart MG, Hartman JM, Forsen JW Jr, Wallace MS. Laryngoscope. 2002 Jul;112(7 Pt 1):1249-55.

Tutorials in clinical research: part V: outcomes research. Stewart MG, Neely JG, Hartman JM, Wallace MS, Forsen JW Jr. Laryngoscope. 2002 Feb;112(2):248-54.

Tutorials in clinical research: part IV: recognizing and controlling bias. Hartman JM, Forsen JW Jr, Wallace MS, Neely JG. Laryngoscope. 2002 Jan;112(1):23-31.

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