

Stanford



Peter H. Hwang

Professor of Otolaryngology - Head & Neck Surgery (OHNS) and, by courtesy, of Neurosurgery at the Stanford University Medical Center

Otolaryngology - Head & Neck Surgery Divisions

CLINICAL OFFICES

- **Stanford Dept of Otolaryngology, Head and Neck Surgery**

801 Welch Rd

MC 5739

Stanford, CA 94305

Tel (650) 723-5281

Fax (650) 725-6685

Bio

BIO

Dr. Hwang completed his undergraduate degree at Stanford University, and his MD and otolaryngology residency at the University of California, San Francisco. After completing a fellowship in rhinology at the University of Pennsylvania, Dr. Hwang served as Director of Rhinology at Oregon Health & Science University. He returned to Stanford in 2005 to lead the Division of Rhinology and Endoscopic Skull Base Surgery and currently serves as Vice Chair of Clinical Affairs for the Department of Otolaryngology-Head & Neck Surgery. Dr. Hwang has served in leadership of the American Rhinologic Society for over a decade, most recently as President of the society. Dr. Hwang also serves as Associate Editor of the International Forum of Allergy and Rhinology and Associate Editor of the World Journal of Otolaryngology. He co-edited the textbook "Rhinology: Diseases of the Nose, Sinuses, & Skull Base," which was awarded the Benjamin Franklin Award for Scientific & Technical Book of the Year. Dr. Hwang teaches on the latest advances in endoscopic sinus and skull base surgery at many national and international venues. He also trains future academic leaders in rhinology through the Stanford fellowship in rhinology and endoscopic skull base surgery. His research interests include clinical outcomes of endoscopic skull base surgery; development of innovative medical devices for treating sinus disease; and novel topical therapies for chronic rhinosinusitis.

CLINICAL FOCUS

- Cancer > Head and Neck Cancer
- Endoscopic Sinus Surgery
- Endoscopic Skull Base Surgery
- Otolaryngology
- Otolaryngology - Head & Neck Surgery (Ear, Nose and Throat)

ACADEMIC APPOINTMENTS

- Professor - Med Center Line, Otolaryngology - Head & Neck Surgery Divisions
- Professor - Med Center Line (By courtesy), Neurosurgery

ADMINISTRATIVE APPOINTMENTS

- Vice Chair, Department of Otolaryngology-Head & Neck Surgery, (2018- present)

- Vice Chair of Clinical Affairs, Department of Otolaryngology-Head & Neck Surgery, (2015-2018)
- Chief, Division of Rhinology & Endoscopic Skull Base Surgery, Stanford School of Medicine, (2005- present)
- Co-Director, Fellowship in Rhinology & Endoscopic Skull Base Surgery, Stanford University, (2005-2015)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- President, American Rhinologic Society (2015 - 2016)
- President-Elect, American Rhinologic Society (2014 - 2015)
- Associate Editor, World Journal of Otolaryngology-Head & Neck Surgery (2015 - present)
- 1st Vice President, American Rhinologic Society (2013 - 2014)
- Associate Editor, International Forum of Allergy & Rhinology (2011 - present)

PROFESSIONAL EDUCATION

- Fellowship: University of Pennsylvania Dept of GME (1997) PA
- Residency: UCSF Otolaryngology Head and Neck Surgery Residency (1996) CA
- Internship: UCSF General Surgery Residency (1992) CA
- Medical Education: University of California at San Francisco School of Medicine (1991) CA
- Board Certification: Otolaryngology, American Board of Otolaryngology (1997)
- Fellowship, Univ. of Pennsylvania , Rhinology & Sinus Surgery (1997)
- Residency, UC San Francisco , Otolaryngology (1996)
- MD, UC San Francisco (1991)
- BS, Stanford University , Biology (1987)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

- Clinical outcomes in patients with chronic rhinosinusitis undergoing endoscopic sinus surgery
- Development of innovative medical devices for treatment of sinus disorders
- Founder of CORSICA, a national research registry for sinus cancer

CLINICAL TRIALS

- Identification and Characterization of Novel Proteins and Genes in Head and Neck Cancer, Recruiting
- Intranasal Bevacizumab for HHT-Related Epistaxis, Recruiting
- Perioperative Oral Steroids for Chronic Rhinosinusitis Without Polyps (CRSsNP), Recruiting
- Pain Control Following Sinus Surgery, Not Recruiting
- PVP-I Nasal Sprays and SARS-CoV-2 Nasopharyngeal Titers (for COVID-19), Not Recruiting

Teaching

STANFORD ADVISEES

Med Scholar Project Advisor

Arifeen Rahman

Publications

PUBLICATIONS

- **ACE2 localizes to the respiratory cilia and is not increased by ACE inhibitors or ARBs.** *Nature communications*
Lee, I. T., Nakayama, T., Wu, C., Goltsev, Y., Jiang, S., Gall, P. A., Liao, C., Shih, L., Schurch, C. M., McIlwain, D. R., Chu, P., Borchard, N. A., Zarabanda, et al
2020; 11 (1): 5453
- **Outcomes in Treatment of Rhinosinusitis in the Setting of Medication Induced Immunosuppression.** *American journal of rhinology & allergy*
Alapati, R., Nayak, J. V., Hwang, P. H., Patel, Z. M.
2020: 1945892420947932
- **In Reply: Precautions for Endoscopic Transnasal Skull Base Surgery During the COVID-19 Pandemic.** *Neurosurgery*
Patel, Z. M., Fernandez-Miranda, J., Hwang, P. H., Nayak, J. V., Dodd, R. L., Sajjadi, H., Jackler, R. K.
2020
- **Letter: Precautions for Endoscopic Transnasal Skull Base Surgery During the COVID-19 Pandemic.** *Neurosurgery*
Patel, Z. M., Fernandez-Miranda, J., Hwang, P. H., Nayak, J. V., Dodd, R., Sajjadi, H., Jackler, R. K.
2020
- **A multi-institutional review of outcomes in biopsy-proven chronic invasive fungal sinusitis.** *International forum of allergy & rhinology*
Humphreys, I. M., Wandell, G. M., Miller, C., Rathor, A., Schmidt, R. A., Turner, J. H., Hwang, P. H., Davis, G. E.
2020
- **Indications and Outcomes for Patients With Limited Symptoms Undergoing Endoscopic Sinus Surgery.** *American journal of rhinology & allergy*
Rahman, A. S., Hwang, P. H., Alapati, R., Lin, Y., Nayak, J. V., Patel, Z. M., Yan, C. H.
2020: 1945892420912159
- **Nasal Symptoms Following Laryngectomy: A Cross-sectional Analysis.** *American journal of rhinology & allergy*
Ayoub, N., Kearney, A., Sayyid, Z. N., Erickson-DiRenzo, E., Jeffrey, C., Hwang, P. H.
2020: 1945892420901631
- **Effect of Omega-3 Supplementation in Patients With Smell Dysfunction Following Endoscopic Sellar and Parasellar Tumor Resection: A Multicenter Prospective Randomized Controlled Trial.** *Neurosurgery*
Yan, C. H., Rathor, A., Krook, K., Ma, Y., Rotella, M. R., Dodd, R. L., Hwang, P. H., Nayak, J. V., Oyesiku, N. M., DelGaudio, J. M., Levy, J. M., Wise, J., Wise, et al
2020
- **Hemodynamic changes in patients undergoing office-based sinus procedures under local anesthesia.** *International forum of allergy & rhinology*
Chang, M. T., Jitaroon, K., Nguyen, T., Yan, C. H., Overdeest, J. B., Nayak, J. V., Hwang, P. H., Patel, Z. M.
2020; 10 (1): 114–20
- **Microbiotyping the Sinonasal Microbiome.** *Frontiers in cellular and infection microbiology*
Bassiouni, A., Paramasivan, S., Shiffer, A., Dillon, M. R., Cope, E. K., Cooksley, C., Ramezanzpour, M., Moraitis, S., Ali, M. J., Bleier, B. S., Callejas, C., Cornet, M. E., Douglas, et al
2020; 10: 137
- **The international sinonasal microbiome study (ISMS): a multi-centre, multi-national characterization of sinonasal bacterial ecology.** *Allergy*
Paramasivan, S., Bassiouni, A., Shiffer, A., Dillon, M. R., Cope, E. K., Cooksley, C., Ramezanzpour, M., Moraitis, S., Ali, M. J., Bleier, B., Callejas, C., Cornet, M. E., Douglas, et al
2020
- **The Effect of Endoscopic Sinus Surgery on Eustachian Tube Dysfunction Symptoms.** *Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery*
Chang, M. T., Hosseini, D. K., Song, S. H., Nayak, J. V., Patel, Z. M., Lee, J. Y., Hwang, P. H.
2020: 194599820917396
- **Application of holographic augmented reality for external approaches to the frontal sinus.** *International forum of allergy & rhinology*
Neves, C. A., Vaisbuch, Y., Leuze, C., McNab, J. A., Daniel, B., Blevins, N. H., Hwang, P. H.
2020

- **Acute Exacerbations in Recurrent Acute Rhinosinusitis: Differences in Quality of Life and Endoscopy.** *The Laryngoscope*
Beswick, D. M., Ayoub, N. F., Mace, J. C., Mowery, A., Hwang, P. H., Smith, T. L.
2019
- **Endoscopic Endonasal Surgery for Resection of Giant Craniopharyngioma in a Toddler-Multimodal Presurgical Planning, Surgical Technique, and Management of Complications: 2-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Fernandez-Miranda, J. C., Hwang, P., Grant, G.
2019
- **Clinical characteristics and prognostic factors of malignant tumors involving pterygopalatine fossa.** *Head & neck*
Woo, H., Hwang, P. H., Kaplan, M. J., Choby, G.
2019
- **Correlation between extent of sinus surgery, radiographic disease, and postoperative outcomes.** *Rhinology*
Ayoub, N., Walgama, E., Thamboo, A., Chitsuthipakorn, W., Patel, Z. M., Nayak, J. V., Hwang, P. H.
2019
- **Neutrophil Extracellular Traps Induce Tissue-Invasive Macrophages in Granulomatosis with Polyangiitis Dominated by Ear, Nose and Throat Manifestations**
Akiyama, M., Ibrahim, N., Zeisbrich, M., Hwang, P., Goronzy, J., Weyand, C.
WILEY.2019
- **Validation of a rhinologic virtual surgical simulator for performing a Draf 3 endoscopic frontal sinusotomy**
Won, T., Cho, S., Sung, M., Paek, S., Chan, S., Salisbury, K., Blevins, N. H., Vaisbuch, Y., Hwang, P.
WILEY.2019: 910–17
- **Nasopharyngeal Angiofibroma Staging with a Novel Nominal Basis: An 18-Year Study in a Tertiary Center** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Abdelwahab, M., Overdevest, J. B., Elmokadem, A., El-Sisi, H., El-Kholy, N., Zaki, H., Kamal, E., Khafagy, Y., Tawfik, A., Eldawoody, H., Hwang, P., Rakha, A.
2019; 161 (2): 352–61
- **ICAR: endoscopic skull-base surgery.** *International forum of allergy & rhinology*
Wang, E. W., Zanation, A. M., Gardner, P. A., Schwartz, T. H., Eloy, J. A., Adappa, N. D., Bettag, M., Bleier, B. S., Cappabianca, P., Carrau, R. L., Casiano, R. R., Cavallo, L. M., Ebert, et al
2019; 9 (S3): S145–S365
- **Workforce analysis of practicing rhinologists in the united states.** *The Laryngoscope*
Heineman, T. E., Ramakrishnan, V., Hwang, P. H., Suh, J. D.
2019
- **Outcomes of sinonasal inverted papilloma resection by surgical approach: an updated systematic review and meta-analysis**
Peng, R., Thamboo, A., Choby, G., Ma, Y., Zhou, B., Hwang, P. H.
WILEY.2019: 573–81
- **Topical Corticosteroid Pretreatment Mitigates Cellular Damage After Caustic Injury to the Nasal Upper Airway Epithelium** *AMERICAN JOURNAL OF RHINOLOGY & ALLERGY*
Huang, Z., Velasquez, N., Nguyen, A., Ye, T., Le, W., Bravo, D. T., Hwang, P. H., Zhou, B., Nayak, J.
2019; 33 (3): 277–85
- **Nasopharyngeal Angiofibroma Staging with a Novel Nominal Basis: An 18-Year Study in a Tertiary Center.** *Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery*
Abdelwahab, M., Overdevest, J. B., Elmokadem, A., El-Sisi, H., El-Kholy, N. A., Zaki, H., Kamal, E., Khafagy, Y., Tawfik, A., Eldawoody, H., Hwang, P., Rakha, A.
2019: 194599819842155
- **Microcurrent technology for rapid relief of sinus pain: a randomized, placebo-controlled, double-blinded clinical trial**
Maul, X. A., Borchard, N. A., Hwang, P. H., Nayak, J. V.
WILEY.2019: 352–56
- **Imaging predictors for malignant transformation of inverted papilloma**
Yan, C. H., Tong, C. L., Penta, M., Patel, V. S., Palmer, J. N., Adappa, N. D., Nayak, J. V., Hwang, P. H., Patel, Z. M.

WILEY.2019: 777–82

- **Outcomes of sinonasal inverted papilloma resection by surgical approach: an updated systematic review and meta-analysis.** *International forum of allergy & rhinology*
Peng, R., Thamboo, A., Choby, G., Ma, Y., Zhou, B., Hwang, P. H.
2019
- **Topical Corticosteroid Pretreatment Mitigates Cellular Damage After Caustic Injury to the Nasal Upper Airway Epithelium.** *American journal of rhinology & allergy*
Huang, Z., Velasquez, N., Nguyen, A., Ye, T., Le, W., Bravo, D. T., Hwang, P. H., Zhou, B., Nayak, J. V.
2019: 1945892418823305
- **Neutrophil Extracellular Traps Induce Tissue-Invasive Monocytes in Granulomatosis With Polyangiitis.** *Frontiers in immunology*
Akiyama, M., Zeisbrich, M., Ibrahim, N., Ohtsuki, S., Berry, G. J., Hwang, P. H., Goronzy, J. J., Weyand, C. M.
2019; 10: 2617
- **Cryosurgical ablation for treatment of rhinitis: A prospective multicenter study.** *The Laryngoscope*
Chang, M. T., Song, S., Hwang, P. H.
2019
- **A call for mentorship in otolaryngology** *BRAZILIAN JOURNAL OF OTORHINOLARYNGOLOGY*
Hwang, P. H.
2019; 85 (1): 1–2
- **The effect of topical epinephrine 1:1000 with and without infiltration of 1% lidocaine with epinephrine 1:100,000 on endoscopic surgical field visualization: a double-blind randomized controlled study.** *International forum of allergy & rhinology*
Tangbumrungham, N., Hwang, P. H., Maul, X., Borchard, N. A., Dholakia, S. S., Patel, Z. M., Nayak, J. V., Choby, G.
2019
- **High-Efficiency, Selection-free Gene Repair in Airway Stem Cells from Cystic Fibrosis Patients Rescues CFTR Function in Differentiated Epithelia.** *Cell stem cell*
Vaidyanathan, S., Salahudeen, A. A., Sellers, Z. M., Bravo, D. T., Choi, S. S., Batish, A., Le, W., Baik, R., de la O, S., Kaushik, M. P., Galper, N., Lee, C. M., Teran, et al
2019
- **Validation of a rhinologic virtual surgical simulator for performing a Draf 3 endoscopic frontal sinusotomy.** *International forum of allergy & rhinology*
Won, T. B., Cho, S. W., Sung, M. W., Paek, S. H., Chan, S., Salisbury, K., Blevins, N. H., Vaisbuch, Y., Hwang, P.
2019
- **Role of inferior turbinate reduction in the quality of life of patients undergoing endoscopic sinus surgery for chronic rhinosinusitis.** *International forum of allergy & rhinology*
Soudry, E., Mace, J., Smith, T. L., Hwang, P. H.
2019
- **Transnasal endoscopic approach for pediatric skull base lesions: a case series.** *Journal of neurosurgery. Pediatrics*
Quon, J. L., Kim, L. H., Hwang, P. H., Patel, Z. M., Grant, G. A., Cheshier, S. H., Edwards, M. S.
2019: 1–12
- **Imaging predictors for malignant transformation of inverted papilloma.** *The Laryngoscope*
Yan, C. H., Tong, C. C., Penta, M., Patel, V. S., Palmer, J. N., Adappa, N. D., Nayak, J. V., Hwang, P. H., Patel, Z. M.
2018
- **A multi-institutional review of outcomes in biopsy-proven acute invasive fungal sinusitis**
Wandell, G. M., Miller, C., Rathor, A., Wai, T., Guyer, R. A., Schmidt, R. A., Turner, J. H., Hwang, P. H., Davis, G. E., Humphreys, I. M.
WILEY.2018: 1459–68
- **Precision medicine: why surgeons deviate from "appropriateness criteria" in the management of chronic rhinosinusitis and effects on outcomes**
Thamboo, A., Rathor, A., Borchard, N. A., Nayak, J. V., Hwang, P. H., Patel, Z. M.
WILEY.2018: 1389–94
- **A call for mentorship in otolaryngology.** *Brazilian journal of otorhinolaryngology*

- Hwang, P. H.
2018
- **Moving slowly but surely toward more precise rhinologic care** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Hwang, P. H.
2018; 8 (10): 1081–82
 - **Surgical Management of Nonallergic Rhinitis** *OTOLARYNGOLOGIC CLINICS OF NORTH AMERICA*
Yan, C. H., Hwang, P. H.
2018; 51 (5): 945–+
 - **Porcine small intestine submucosal grafts improve remucosalization and progenitor cell recruitment to sites of upper airway tissue remodeling** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Nayak, J. V., Rathor, A., Grayson, J. W., Bravo, D. T., Velasquez, N., Noel, J., Beswick, D. M., Riley, K. O., Patel, Z. M., Cho, D., Dodd, R. L., Thamboo, A., Choby, et al
2018; 8 (10): 1162–68
 - **Effect of Endoscopic Sinus Surgery on Bronchiectasis Patients With Chronic Rhinosinusitis** *AMERICAN JOURNAL OF RHINOLOGY & ALLERGY*
Kanjanaumporn, J., Hwang, P. H.
2018; 32 (5): 432–39
 - **Comparison of outcomes following culture-directed vs non-culture-directed antibiotics in treatment of acute exacerbations of chronic rhinosinusitis**
Yan, C. H., Tangbumrungham, N., Maul, X. A., Ma, Y., Nayak, J. V., Hwang, P. H., Patel, Z. M.
WILEY.2018: 1028–33
 - **Orbital Apex Lesions: A Diagnostic and Therapeutic Challenge** *JOURNAL OF NEUROLOGICAL SURGERY PART B-SKULL BASE*
Cho, S., Lee, W., Ma, D., Kim, J., Han, D., Kim, H., Kim, D., Kim, S., Khwarg, S., Kim, S., Paek, S., Rhee, C., Lee, et al
2018; 79 (4): 386–93
 - **Correlations Between Cystic Fibrosis Genotype and Sinus Disease Severity in Chronic Rhinosinusitis** *LARYNGOSCOPE*
Abuzeid, W. M., Song, C., Fastenberg, J. H., Fang, C. H., Ayoub, N., Jerschow, E., Mohabir, P. K., Hwang, P. H.
2018; 128 (8): 1752–58
 - **Precision medicine: why surgeons deviate from "appropriateness criteria" in the management of chronic rhinosinusitis and effects on outcomes.** *International forum of allergy & rhinology*
Thamboo, A., Rathor, A., Borchard, N. A., Nayak, J. V., Hwang, P. H., Patel, Z. M.
2018
 - **Computed tomography analysis of frontal cell prevalence according to the International Frontal Sinus Anatomy Classification** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Choby, G., Thamboo, A., Won, T., Kim, J., Shih, L., Hwang, P. H.
2018; 8 (7): 825–30
 - **Building the Evidence for Corticosteroid Irrigation Therapy in Chronic Rhinosinusitis** *JAMA OTOLARYNGOLOGY-HEAD & NECK SURGERY*
Hwang, P. H.
2018; 144 (7): 612–13
 - **Nasoseptal Flap Closure of the Eustachian Tube for Recalcitrant Cerebrospinal Fluid Rhinorrhea** *LARYNGOSCOPE*
Patel, V. S., Choby, G. W., Thamboo, A., Blevins, N. H., Hwang, P. H.
2018; 128 (7): 1523–26
 - **Surgical Management of Nonallergic Rhinitis.** *Otolaryngologic clinics of North America*
Yan, C. H., Hwang, P. H.
2018
 - **Building the Evidence for Corticosteroid Irrigation Therapy in Chronic Rhinosinusitis.** *JAMA otolaryngology-- head & neck surgery*
Hwang, P. H.
2018
 - **Porcine small intestine submucosal grafts improve remucosalization and progenitor cell recruitment to sites of upper airway tissue remodeling.** *International forum of allergy & rhinology*

- Nayak, J. V., Rathor, A., Grayson, J. W., Bravo, D. T., Velasquez, N., Noel, J., Beswick, D. M., Riley, K. O., Patel, Z. M., Cho, D., Dodd, R. L., Thamboo, A., Choby, et al
2018
- **Nose blowing after endoscopic sinus surgery does not adversely affect outcomes** *LARYNGOSCOPE*
Ayoub, N., Chitsuthipakorn, W., Nayak, J. V., Patel, Z. M., Hwang, P. H.
2018; 128 (6): 1268–73
 - **Comparison of outcomes following culture-directed vs non-culture-directed antibiotics in treatment of acute exacerbations of chronic rhinosinusitis.** *International forum of allergy & rhinology*
Yan, C. H., Tangbumrungtham, N., Maul, X. A., Ma, Y., Nayak, J. V., Hwang, P. H., Patel, Z. M.
2018
 - **Risk Stratification for Postoperative Venous Thromboembolism after Endoscopic Sinus Surgery** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Beswick, D. M., Vaezeafshar, R., Ma, Y., Hwang, P. H., Nayak, J. V., Patel, Z. M.
2018; 158 (4): 767–73
 - **Computed tomography analysis of frontal cell prevalence according to the International Frontal Sinus Anatomy Classification.** *International forum of allergy & rhinology*
Choby, G., Thamboo, A., Won, T., Kim, J., Shih, L. C., Hwang, P. H.
2018
 - **Evolution of the endoscopic modified Lothrop procedure: A systematic review and meta-analysis.** *The Laryngoscope*
Shih, L., Patel, V. S., Choby, G. W., Nakayama, T., Hwang, P. H.
2018; 128 (2): 317–26
 - **Evolution of the Endoscopic Modified Lothrop Procedure: A Systematic Review and Meta-Analysis** *LARYNGOSCOPE*
Shih, L., Patel, V. S., Choby, G. W., Nakayama, T., Hwang, P. H.
2018; 128 (2): 317–26
 - **International Consensus Statement on Allergy and Rhinology: Allergic Rhinitis** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Wise, S. K., Lin, S. Y., Toskala, E., Orlandi, R. R., Akdis, C. A., Alt, J. A., Azar, A., Baroody, F. M., Bachert, C., Canonica, G., Chacko, T., Cingi, C., Ciprandi, et al
2018; 8 (2): 108–352
 - **Early experience with a patient-specific virtual surgical simulation for rehearsal of endoscopic skull-base surgery** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Won, T., Hwang, P., Lim, J., Cho, S., Paek, S., Losorelli, S., Vaisbuch, Y., Chan, S., Salisbury, K., Blevins, N. H.
2018; 8 (1): 54–63
 - **Sinonasal debridement versus no debridement for the postoperative care of patients undergoing endoscopic sinus surgery** *COCHRANE DATABASE OF SYSTEMATIC REVIEWS*
Tzelnick, S., Alkan, U., Leshno, M., Hwang, P., Soudry, E.
2018: CD011988
 - **Outcomes After Endoscopic Endonasal Resection of Craniopharyngiomas in the Pediatric Population** *WORLD NEUROSURGERY*
Patel, V. S., Thamboo, A., Quon, J., Nayak, J. V., Hwang, P. H., Edwards, M., Patel, Z. M.
2017; 108: 6–14
 - **Comparison of surgical outcomes between patients with unilateral and bilateral chronic rhinosinusitis**
Beswick, D. M., Mace, J. C., Chowdhury, N. I., Alt, J. A., Hwang, P. H., DeConde, A. S., Smith, T. L.
WILEY.2017: 1162–69
 - **Evidence for altered levels of IgD in the nasal airway mucosa of patients with chronic rhinosinusitis** *JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY*
Min, J., Nayak, J. V., Hulse, K. E., Stevens, W. W., Raju, P. A., Huang, J. H., Suh, L. A., Van Roey, G. A., Norton, J. E., Carter, R. G., Price, C. E., Weibman, A. R., Rashan, et al
2017; 140 (6): 1562–+
 - **Nasoseptal flap closure of the eustachian tube for recalcitrant cerebrospinal fluid rhinorrhea.** *The Laryngoscope*
Patel, V. S., Choby, G. W., Thamboo, A., Blevins, N. H., Hwang, P. H.

2017

- **Biocompatibility and pharmacokinetics of fluticasone-eluting sinus implant in a rabbit model** *AMERICAN JOURNAL OF RHINOLOGY & ALLERGY*
Patel, V. S., Walgama, E., Psaltis, A., Lavigne, F., Pletcher, S. D., Hwang, P. H.
2017; 31 (6): 382–88
- **Efficacy of endoscopic sinus surgery for chronic rhinosinusitis following primary radiotherapy and concurrent chemotherapy for nasopharyngeal carcinoma** *INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY*
Ayoub, N., Walgama, E., Thamboo, A., Nayak, J. V., Hwang, P. H.
2017; 7 (11): 1045–51
- **Cryosurgical posterior nasal tissue ablation for the treatment of rhinitis**
Hwang, P. H., Lin, B., Weiss, R., Atkins, J., Johnson, J.
WILEY.2017: 952–56
- **Radioanatomic Study of the Greater Palatine Canal Relevant to Endoscopic Endonasal Surgical Landmarks** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Ayoub, N., Thamboo, A., Hwang, P. H., Walgama, E. S.
2017; 157 (4): 731–36
- **Pediatric Chronic Rhinosinusitis Management in Rhinologists and Pediatric Otolaryngologists** *ANNALS OF OTOLOGY RHINOLOGY AND LARYNGOLOGY*
Beswick, D. M., Messner, A. H., Hwang, P. H.
2017; 126 (9): 634–39
- **Cavernous Sinus Involvement by Pituitary Adenomas: Clinical Implications and Outcomes of Endoscopic Endonasal Resection** *JOURNAL OF NEUROLOGICAL SURGERY PART B-SKULL BASE*
Ajlan, A., Achrol, A. S., Albakr, A., Feroze, A. H., Westbroek, E. M., Hwang, P., Harsh, G. R.
2017; 78 (3): 273–81
- **Emerging Roles of Coblation in Rhinology and Skull Base Surgery.** *Otolaryngologic clinics of North America*
Choby, G. W., Hwang, P. H.
2017; 50 (3): 599-606
- **Central Serous Chorioretinopathy after Endoscopic Sinus Surgery** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Woo, H., Hwang, P. H.
2017; 156 (4): 772–73
- **Selective expansion of human regulatory T cells in nasal polyps, and not adjacent tissue microenvironments, in individual patients exposed to steroids.** *Clinical immunology*
Edward, J. A., Sanyal, M., Le, W., Soudry, E., Ramakrishnan, V. R., Bravo, D. T., Nguyen, A. L., Zarabanda, D., Kingdom, T. T., Hwang, P. H., Garrison Fathman, C., Nayak, J. V.
2017; 179: 66-76
- **Impact of endoscopic sinus surgery on otologic symptoms associated with chronic rhinosinusitis.** *World journal of otorhinolaryngology - head and neck surgery*
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