UPMC LIFE CHANGING MEDICINE

The Pittsburgh Course:
Comprehensive Endoscopic Endonasal Surgery of the Skull Base

Pittsburgh, Pennsylvania

~ April 24-27, 2024 ~

Guest Faculty

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Zara M. Patel, MD

Course Directors

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Paul A. Gardner, MD
Eric W. Wang, MD
Georgios A. Zenonos, MD
Garret W. Choby, MD

Faculty

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Michael M. McDowell, MD

Sponsored by:
University of Pittsburgh School of Medicine
Department of Neurological Surgery
Department of Otolaryngology
Center for Continuing Education in the Health Sciences

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General Information

Course Overview

This 4-day course is a presentation of minimally invasive techniques for endoscopic endonasal surgery of the ventral skull base. Experts on the subject will present the anatomical and technical aspects of this procedure along with the risks, benefits and outcomes.

The course features an interactive live surgery demonstration using indocyanine green fluorescence endoscopy, fresh anatomical specimen dissection, lectures and panel discussions, 3D anatomy lectures, and case presentations. Participants will have an opportunity to enhance their knowledge and skills regarding endoscopic surgery of the ventral skull base.

Learning Objectives

Following completion of this course, participants should be able to:

- Describe the anatomic relationships between the ventral skull base, paranasal sinuses and orbit.
- Understand the indications, benefits and risks associated with endoscopic endonasal skull base surgery.
- Utilize endoscopic techniques to approach tumors in the anterior, middle and cranial fossae.

Target Audience

This course is designed for skull base teams (neurosurgeons, otolaryngologists, head and neck surgeons) and senior level residents who wish to learn and practice the technical skills needed to perform comprehensive endoscopic endonasal surgery of the ventral skull base.

Location (unless otherwise noted)

Lecture Room: **UPMC Eye & Ear Institute/Biomedical Science Tower**
203 Lothrop Street, 1st Floor, Room S-120

Lab: **University of Pittsburgh School of Medicine Anatomy Lab**
Scaife Hall West Wing: 7th Floor, Room 7788
3550 Terrace Street

Continuing Medical Education Credit

In support of improving patient care, the University of Pittsburgh is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

The University of Pittsburgh designates this live activity for a maximum of 31.25 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Other health care professionals will receive a certificate of attendance confirming the number of contact hours commensurate with the extent of participation in this activity.

To receive CME credit:

The UPMC Center for Continuing Education in the Health Sciences (CCEHS) Continuing Education Learning Portal (https://cce.upmc.com) is used to claim and track your continuing education credits. Certificates will be available to download and stored for future reference.

If you are a new user, click Register (upper right corner) to create an account. **The email address you listed on your registration form should be the same email you use when creating your account.** If you choose a different email, please notify the UPMC Center for Continuing Education by emailing ccehs_support@upmc.edu or https://cce.upmc.com/contact-us to update your records. Once your account has been created, return to login, complete the course evaluation and claim credit on the CCEHS Learning Portal, https://cce.upmc.com. The activity is accessible in your Pending Activities. Please allow up to 2 days before accessing.

Questions or problems? Please contact the UPMC Center for Continuing Education by emailing ccehs_support@upmc.edu or https://cce.upmc.com/contact-us

Audio/Video Recording and Photography Policy

The use of audio/video recording or photographic devices is **NOT** permitted at any time in the lecture room, anatomy lab or hospital.

Wi-Fi Network

Complimentary Wi-Fi is available. To connect:

1. View available wireless networks.
2. Connect to "**upmc-guest**"
3. Open your Web Browser, begin surfing!

Disclaimer Statement

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FACULTY LISTING

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Department of Neurological Surgery

WEDNESDAY, APRIL 24, 2024

7:15 AM REGISTRATION & BREAKFAST

7:30 AM Let's Get Started: Classification and Training (including lab training)
Carl Snyderman, MD, MBA

7:55 AM Navigating the Nose and Sinuses: Getting to the Skull Base
Garret Choby, MD

8:20 AM It All Starts at the Sella: Endoscopic Pituitary Surgery
Paul Gardner, MD

9:05 AM *ALL Transfer from Lecture Room to Lab*

9:15 AM Prosection for Lab Session 1 – Pituitary Surgery

10:15 AM Lab Session 1

Group A:	*Group B:*
Anatomical Dissection • Intranasal Landmarks • Middle Turbinates • Septal Mucosal Flap • Sphenoidotomy • Sella • Posterior Ethmoidectomy • Suprasellar/Transplanum Approach • Reconstruction: Inlay Biodesign, Overlay with Nasoseptal Flap	Prosection for Lab Sessions 3&4: Sagittal Plane *After Prosection, transfer from Lab to Lecture Room for:* 3D Surgical Anatomy Lectures Georgios Zenonos, MD • Anterior Skull Base • Sinonasal, Sellar and Parasellar Regions

12:45 PM *GROUP A: Transfer from Lab to Lecture Room*

1:00 PM LUNCH & LECTURE
Tools for Success: Equipment, Instruments and Set-Up for Endonasal Surgery
Eric Wang, MD

1:30 PM Plumbing Problems Big and Small: Reconstruction of Skull Base Defects
Carl Snyderman, MD, MBA

2:05 PM Up and Away: Transtuberculum and Transplanum Approaches
Paul Gardner, MD

WEDNESDAY, APRIL 24, 2024 (CONTINUED)

3:00 PM *GROUP B: Transfer from Lecture Room to Lab*

3:15 PM Lab Session 2

Group A:	*Group B:*
3D Surgical Anatomy Lectures Georgios Zenonos, MD • Anterior Skull Base • Sinonasal, Sellar and Parasellar Regions *After Lectures, transfer from Lecture Room to Lab for:* Prosection for Lab Sessions 3&4: Sagittal Plane	Anatomical Dissection • Intranasal Landmarks • Middle Turbinates • Septal Mucosal Flap • Sphenoidotomy • Sella • Posterior Ethmoidectomy • Suprasellar/Transplanum Approach • Reconstruction: Inlay Biodesign, Overlay with Nasoseptal Flap

5:45 PM ADJOURNMENT

EVENING AT LEISURE *(For complete information about events, shopping areas, or restaurants in or near Oakland, please feel free to visit the following websites (http://www.pittsburghmagazine.com or http://www.visitpittsburgh.com/) or feel free to ask us for recommendations!)*

THURSDAY, APRIL 25, 2024

7:00 AM BREAKFAST

7:15 AM The New Workhorses: Transclival, Transodontoid Approaches
Paul Gardner, MD

8:00 AM Case Presentations & Live Surgery
Garret Choby, MD, Paul Gardner, MD, Carl Snyderman, MD, MBA, Eric Wang, MD, Georgios Zenonos, MD
Moderators
Juan Fernandez-Miranda, MD and Zara Patel, MD

12:00 PM LUNCH

1:00 PM *ALL Transfer from Lecture Room to Lab*

1:15 PM Lab Session 3

Group A:	*Group B:*
Prosection for Lab Sessions 5 & 6: Sagittal Plane *After Prosection, transfer from Lab to Lecture Room for:* Craniofacial Resection for Sinonasal Malignancy and Meningioma Eric Wang, MD Challenges and Considerations of Pediatric Endonasal Surgery Michael McDowell, MD	Anatomical Dissection • Anterior Ethmoidectomy • Medial Orbital Decompression • Optic Nerve Decompression • Ethmoid Artery Ligation • Frontal Sinusotomy (Draf 3 Procedure) • Craniofacial Resection

3:00 PM *GROUP B: Transfer from Lab to Lecture Room*

3:15 PM PANEL DISCUSSION: Behind the Scenes – Perioperative Care
Moderator: Garret Choby, MD
Panelists: All Faculty

THURSDAY, APRIL 25, 2024 (CONTINUED)

3:45 PM *GROUP A: Transfer from Lecture Room to Lab*

GROUP B:

Lecture – Craniofacial Resection for Sinonasal Malignancy and Meningioma
Eric Wang, MD

Lecture – Challenges and Considerations of Pediatric Endonasal Surgery
Michael McDowell, MD

4:00 PM Lab Session 4

Group A:	*Group B:*
Anatomical Dissection • Anterior Ethmoidectomy • Medial Orbital Decompression • Optic Nerve Decompression • Ethmoid Artery Ligation • Frontal Sinusotomy (Draf 3 Procedure) • Craniofacial Resection	*After Lecture, transfer from Lecture Room to Lab for:* Prosection for Lab Sessions 5 & 6: Sagittal Plane Juan Fernandez-Miranda, MD and Zara Patel, MD

5:45 PM AFTERNOON PROGRAM ADJOURNMENT

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EVENING PROGRAM *(Registrants Only Please)*

LOCATION: **Wyndham Pittsburgh University Center**
Schenley I-IV Ballrooms
100 Lytton Avenue
Pittsburgh (Oakland) PA 15213

6:30 PM Cocktail Reception

7:00 PM Dinner & Guest Faculty Lectures

7:30 PM The Impact of Smell on Human Interaction
Zara Patel, MD

8:00 PM Transcavernous Approach for Pituitary Adenomas: The Stanford Experience 2018-2023
Juan Fernandez-Miranda, MD

8:45 PM ADJOURNMENT

Friday, April 26, 2024

7:00 AM **Breakfast**

7:15 AM **Outside the Box: Coronal Plane Approaches**
Paul Gardner, MD

8:00 AM *ALL Transfer from Lecture Room to Lab*

8:15 AM **Prosection – Orbital Approaches**
S. Tonya Stefko, MD

8:45 AM **Lab Session 5**

Group A:	*Group B:*
Anatomical Dissection • Palatosphenoidal Artery and Vidian Nerve Identification • Pituitary Transposition • Transclival Approach (Extradural/Intradural) • Transodontoid Approach • Medial Transpetrous Approach • Cavernous Sinus Approaches	**Prosection for Lab Sessions 7 & 8: Coronal Plane Equipment Demonstrations** *After Prosections, transfer from Lab to Lecture Room for:* **3D Surgical Anatomy Lecture – Posterior Skull Base** Georgios Zenonos, MD

12:00 PM *ALL Transfer from Lab to Lecture Room*

12:15 PM **Lunch & Lecture**
Code Red: Carotid Artery Injury
Paul Gardner, MD

1:05 PM **Group Photo**

1:15 PM **GROUP A: 3D Surgical Anatomy Lecture – Posterior Skull Base**
Georgios Zenonos, MD

GROUP B: Transfer from Lecture Room to Lab

FRIDAY, APRIL 26, 2024 (CONTINUED)

1:30 PM Lab Session 6

Group A:	*Group B:*
After Lecture, transfer from Lecture Room to Lab for: Prosection for Lab Sessions 7 & 8: Coronal Plane Equipment Demonstrations	Anatomical Dissection • Palatosphenoidal Artery and Vidian Nerve Identification • Pituitary Transposition • Transclival Approach (Extradural/Intradural) • Transodontoid Approach • Medial Transpetrous Approach • Cavernous Sinus Approaches

4:45 PM ADJOURNMENT

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6:10 PM Transportation Departs Wyndham Pittsburgh University Center Hotel for The Carnegie Museum

6:30 PM Course Banquet
(Registrants Only Please)

LOCATION: **The Carnegie Museum of Natural History**
Cretaceous Seaway (Cocktails) and Foster Overlook (Dinner)
4400 Forbes Avenue, Oakland
https://carnegiemnh.org/

9:30 PM Transportation Departs The Carnegie Museum for Wyndham Pittsburgh University Center Hotel

SATURDAY, APRIL 27, 2024

8:00 AM **BREAKFAST**

8:15 AM **Transpterygoid Approach: Gateway to the Coronal Plane**
Eric Wang, MD

9:00 AM *GROUP A: Transfer from Lecture Room to Lab*

GROUP B: **3D Surgical Anatomy Lecture – Cavernous Sinus and Middle Fossa**
Juan Fernandez-Miranda, MD

9:15 AM **Lab Session 7**

Group A:	*Group B:*
Anatomical Dissection • Antrostomy • Sphenopalatine Artery Ligation • Middle Cranial Fossa Approaches: Transpterygoid • Cavernous Sinus • Meckel's Cave • Infratemporal Skull Base	*After Lecture, transfer from Lecture Room to Lab for:* Prosection: Alternative Reconstructive Flaps: Pericranial Flap, Inferior Turbinate Wall Flap Equipment Demonstrations

11:15 AM *ALL TRANSFER FROM LAB TO LECTURE ROOM*

11:30 AM **LUNCH & PANEL DISCUSSION**
Putting it all Together: Case-Based Discussion and Q&A
Moderators: Juan Fernandez-Miranda, MD and Zara Patel, MD
Panelists: All Faculty

12:30 PM GROUP A: **3D Surgical Anatomy Lecture – Cavernous Sinus and Middle Fossa**
Juan Fernandez-Miranda, MD

GROUP B: Transfer from Lecture Room to Lab

SATURDAY, APRIL 27, 2024 (CONTINUED)

12:45 PM Lab Session 8

Group A:	*Group B:*
After Lecture, transfer from Lecture Room to Lab for: Prosection: Alternative Reconstructive Flaps: Pericranial Flap, Inferior Turbinate Wall Flap Equipment Demonstrations	Anatomical Dissection • Antrostomy • Sphenopalatine Artery Ligation • Middle Cranial Fossa Approaches: Transpterygoid • Cavernous Sinus • Meckel's Cave • Infratemporal Skull Base
2:45 PM Disaster Plan: ICA Injury Simulation Exercise Faculty	

3:00 PM COURSE ADJOURNMENT

ANATOMICAL DISSECTION SCHEDULE

Wednesday, April 24, 2024: Lab Sessions 1 & 2

1. **Intraoperative navigational device**. Familiarize yourself with the function of the image guidance system.

2. Identify the following **intranasal landmarks**: inferior turbinate, middle turbinate, superior turbinate, middle meatus, hiatus semilunaris, uncinate process, bulla ethmoidalis, sphenoid rostrum, sphenoid ostium, olfactory sulcus.

3. Resect the **middle turbinates**.

4. Elevate a **septal mucosal flap** on one side. It should be pedicled on the ipsilateral posterior nasal artery. Displace the flap into the nasopharynx during the other procedures.

5. **Endonasal approaches for pituitary surgery**. Transect the posterior nasal septum and expose the sphenoid rostrum. Remove rostrum and open sphenoid air cells. Enlarge the opening maximally in all directions. Resect the posterior edge of the nasal septum to enhance bilateral exposure. Identify sphenoid sinus landmarks: planum sphenoidale, optic canal, lateral optic-carotid recess, carotid canal, medial optic-carotid recess, sella, clival recess. Remove sphenoid septations and note relationship to carotid canal.

6. **Pituitary**. Open the sella to the margins of the cavernous sinus in all directions. Remove sphenoid rostrum inferiorly and note how it improves access to the sella.

7. **Posterior ethmoidectomy**. Skeletonize the posterior medial orbit and ethmoid roof by removing the posterior ethmoid air cells. Identify the increased visualization and exposure to the sphenoid planum.

8. **Suprasellar/transplanum approach**. Thin and remove the bone of the planum sphenoidale. Thin and remove the bone of the "tuberculum strut" bilaterally. Open the suprasellar dura and identify the optic chiasm, infundibulum, and ICA. Identify the superior hypophyseal artery.

ANATOMICAL DISSECTION SCHEDULE

Thursday, April 25, 2024: Lab Sessions 3 & 4

1. **Anterior ethmoidectomy**. Open the bulla ethmoidalis and remove anterior ethmoid air cells in an anterior to posterior direction. Identify the lamina papyracea. Expose the nasofrontal recess and identify the anterior ethmoid artery. Repeat the ethmoidectomy on the opposite side.

2. **Medial orbital decompression**. Make an opening in the lamina papyracea and remove the medial orbital wall from the fovea ethmoidalis superiorly to the orbital floor and as far posteriorly as the anterior wall of the sphenoid sinus.

3. **Optic nerve decompression**. Decompress the orbital apex and follow the optic canal posteriorly. Use the drill to thin the bone over the optic nerve without exposing the carotid artery.

4. **Anterior and posterior ethmoid artery ligation**. Elevate the periorbita along the skull base and identify the anterior and posterior ethmoid arteries.

5. **Frontal sinusotomy (Draf procedure).** Perform a Draf Type 3 procedure. Resect the anterior nasal septum superiorly, anterior to the middle turbinates. Remove the floor of the frontal sinuses across the midline and anterior to the crista galli.

6. **Anterior craniofacial resection**. Resect the superior attachment of the nasal septum from the crista galli to the sphenoid. Resect attachments of middle turbinates. Thin and remove bone of anterior cranial base from ethmoid roof laterally and to planum sphenoidale posteriorly. Drill out crista galli. Incise dura bilaterally and then transect falx attachment anteriorly. Reflect dura posteriorly and identify olfactory bulbs. Elevate olfactory tracts and transect nerves posteriorly. Identify the interhemispheric fissures, frontopolar vessels, and anterior communicating artery.

ANATOMICAL DISSECTION SCHEDULE

Friday, April 26, 2024: Lab Sessions 5 & 6

1. **Palatosphenoidal artery and vidian nerve identification**. At the floor of the sphenoid sinus, identify the palatosphenoidal artery as it exits the pterygopalatine fossa and enters the nasopharynx. The vertical process of the palatine bone covering the palatosphenoidal artery should be removed. At this level, dissect laterally until you identify the vidian canal.

2. **Pituitary transposition**. Lift up the pituitary gland and drill out the posterior clinoids.

3. **Transclival approach (extradural).** Remove the bone of the clivus to expose the dura from the sella to the lower clivus.

4. **Transclival approach (intradural).** Open the dura to expose the vertebral and basilar arteries.

5. **Transodontoid approach**. Remove the soft tissues between the Eustachian tubes to the level of the soft palate. Remove cortical bone of the clivus from the sphenoid floor to the foramen magnum. Remove the lower edge of the clivus (foramen magnum). Expose the ring of C1 and remove the central portion. Drill out the dens down to the level of the body of C2.

6. **Reconstruction with mucosal flap**. Position mucosal flap in different areas of the skull base to see limits of reach and surface area of reconstruction.

7. **Medial petrous apex**. Drill the bone medial and deep to the ICA at the level of the clival recess. Open air cells of the petrous apex. Identify the course of the 6th cranial nerve.

ANATOMICAL DISSECTION SCHEDULE

Saturday, April 27, 2024: Lab Sessions 7 & 8

1. Perform a middle meatal **antrostomy** on each side. Remove the uncinate process and enlarge the opening posteriorly and inferiorly. Make sure that you preserve the sphenopalatine arteries.

2. **Sphenopalatine artery ligation**. Expose the sphenopalatine and posterior nasal arteries and transect them.

3. **Transpterygoid approach**. Transect the sphenopalatine and posterior nasal arteries and open the pterygopalatine space. Elevate the soft tissue to expose the bone of the base of the pterygoids. Identify the vidian artery and nerve.

4. Exposure of **petrous ICA**. Drill the bone inferior and medial to the vidian artery and follow the vidian artery to the 2nd genu of the internal carotid artery.

5. **Middle cranial fossa approach (suprapetrous).** Identify V2 and drill the bone between V2 and the vidian artery to expose the petrous ICA. Open Meckel's cave lateral to the vertical segment of the ICA.

6. **Lateral cavernous sinus**. Dissect superior to Meckel's cave, lateral to the ICA. Identify the contents of the cavernous sinus.

7. **Infratemporal skull base**. Identify the medial and lateral pterygoid plates inferior to the base of the pterygoids. Follow the lateral pterygoid plate to foramen ovale and identify V3. Resect the medial portion of the Eustachian tube. Open the space between the pterygoid plates and dissect the medial and lateral pterygoid muscles. Follow the Eustachian tube along the skull base and identify the ICA where it enters the skull base.

8. **Infrapetrous approach**. Transect V3 and drill the bone along the inferior aspect of the petrous bone to expose the petrous ICA.

9. **[your name here] approach**. Discover a new approach to the cranial base and put your name on it.

DISCLOSURES

All individuals in a position to control the content of this education activity have disclosed all financial relationships with any companies whose primary business is producing, marketing, selling, re-selling, or distributing health care products used by or on patients. All of the relevant financial relationships for the individuals listed below have been mitigated.

The following relevant financial relationships were disclosed:

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RECENT PUBLICATIONS

Peer-Reviewed (from 2020-present)

1. Rowan NR, Valappil B, Chen J, Wang EW, Gardner PA, Snyderman CH. Prospective characterization of postoperative nasal deformities in patients undergoing endoscopic endonasal skull-base surgery. Int Forum Allergy Rhinol. 2020 Feb;10:256-264.

2. Goldschmidt E, Schneck M, Gau DM, Carey L, Rassmusen J, Ferreyro B, Ajler P, Snyderman C, Wang E, Fernandez-Miranda J, Gardner PA. Effect of oxidized cellulose on human respiratory mucosa and submucosa and its implications for endoscopic skull-base approaches. Int Forum Allergy Rhinol. 2020 Mar;10(3):282-288.

3. McDowell MM, Zenonos G, Wang E, Snyderman C, Gardner P. Management of arterial injuries in endoscopic endonasal approaches. Neurosurg Focus Video. 2020 Apr;2(2):V4.

4. Goldschmidt E, Lavigne P, Snyderman C, Gardner PA. Endoscopic endonasal approach for clipping of a PICA aneurysm. Neurosurg Focus Video. 2020 Apr;2(2):V14.

5. Cardenas Ruiz-Valdepenas E, Kaen A, Gonzalez-Martinez E, Gardner PA, Wang, EW, Snyderman CH, Fernandez-Miranda JC. Endoscopic endonasal superomedial orbitectomy: how far is safe and possible? Laryngoscope. 2020 May;130:1151-1157.

6. Lavigne P, Vega MB, Ahmed OH, Gardner PA, Snyderman CH, Wang EW. Lateral nasal wall flap for endoscopic reconstruction of the skull base: anatomical study and clinical series. Int Forum Allergy Rhinol. 2020 May;10(5):673-678.

7. Kashiwazaki R, Turner MT, Geltzeiler M, Fernandez-Miranda JC, Gardner PA, Snyderman CH, Wang EW. The endoscopic endonasal approach for sinonasal and nasopharyngeal adenoid cystic carcinoma. Laryngoscope. 2020 Jun;130:1414-1421.

8. Wang WH, Lieber S, Lan MY, Wang EW, Fernandez-Miranda JC, Snyderman CH, Gardner PA. Nasopharyngeal muscle patch for the management of internal carotid artery injury in endoscopic endonasal surgery. J Neurosurg. 2020 Nov;133(5):1382-1387.

9. McDowell MM, Zwagerman NT, Wang EW, Snyderman CH, Tyler-Kabara EC, Gardner PA. Long-term outcomes in the treatment of pediatric skull base chordomas in the endoscopic endonasal era. J Neurosurg Pediatr. 2020 Nov 20;27(2):170-179.

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11. Algattas H, Setty P, Goldschmidt E, Wang EW, Tyler-Kabara EC, Snyderman CH, Gardner PA. Endoscopic endonasal approach for craniopharyngiomas with intraventricular extension: case series, long-term outcomes and review. World Neurosurg. 2020 Dec;144:e447-e459.

12. Snyderman CH, Wang EW, Zenonos GA, Gardner PA. Reconstruction after endoscopic surgery for skull base malignancies. J Neurooncol. 2020 Dec;150(3):463-468.

13. Anania Y, Venteicher AS, Wang EW, Zenonos GA, Snyderman CH, Gardner PA. Facing a feared situation: endoscopic endonasal approach for petroclival lesions with internal carotid artery encasement: 2-dimensional operative video. Oper Neurosurg (Hagerstown). 2020 Dec;19(6):E602-E603.

14. Forner D, Hueniken K, Yoannidis T, Witterick I, Monteiro E, Zadeh G, Gullane P, Snyderman C, Wang E, Gardner P, Valappil B, Fliss DM, Ringel B, Gil Z, Na'ara S, Ooi EH, Goldstein DP, Muhanna N, Gentili F, de Almeida JR. Psychometric testing of the Skull Base Inventory health-related quality of life questionnaire in a multi-institutional study of patients undergoing open and endoscopic surgery. Qual Life Res. 2021 Jan;30(1):293-301.

15. Snyderman CH, Gardner PA, Wang EW, Fernandez-Miranda JC, Valappil B. Experience with the endoscopic contralateral transmaxillary approach to the petroclival skull base. Laryngoscope. 2021 Feb;131(2):294-298.

16. Venteicher AS, McDowell MM, Goldschmidt E, Wang EW, Snyderman CH, Gardner PA. A preoperative risk classifier that predicts tumor progression in patients with cranial base chondrosarcomas. J Neurosurg. 2021 Feb;134(2):457-465.

17. Whelan RL, McDowell M, Chou C, Medsinge A, Lee J, Gardner PA, Snyderman CH, Stefko ST, Wang EW. Can ophthalmologic examination predict abducens nerve recovery after endoscopic skull base surgery? Laryngoscope. 2021 Mar;131(3):513-517.

18. Senthamarai Siddharthan YP, Bata A, Anetakis K, Crammond DJ, Balzer JR, Snyderman C, Gardner P, Thirumala PD. Role of intraoperative neurophysiologic monitoring in internal carotid artery injury during endoscopic endonasal skull base surgery. World Neurosurg. 2021 Apr;148:e43-e57.

19. Algattas HN, Wang EW, Zenonos GA, Snyderman CH, Gardner PA. Endoscopic endonasal surgery for anterior cranial fossa meningiomas. J Neurosurg Sci. 2021 Apr;65(2):118-132.

20. Chou CT, Valappil B, Mattos JL, Snyderman CH, Gardner PA, Fernandez-Miranda JC, Wang EW. The effect of nasoseptal flap elevation on post-operative olfaction and sinonasal quality of life: a prospective double-blinded randomized controlled trial. Am J Rhinol Allergy. 2021 May;35(3):353-360.

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UPMC ENDOSCOPIC ENDONASAL SURGERY EQUIPMENT & INSTRUMENT SETS

PUH STRYKER SPINE/EEA DRILL

DESCRIPTION	CATALOG	QTY	CNT1	CNT2	CNT3
X-LONG ANGLED	Stryker 5407-120-482	1			
PI DRIVE PLUS (BLACK MOTOR)	Stryker 5407-300-000	1			
ELITE 14CM STRAIGHT	Stryker 5407-120-480	1			
LONG ANGLED	Stryker 5407-120-472	1			
Total		**4**			

IG NASAL POINTERS - PUH

Printed: 05/21/2019 09:54
Revised: 01/22/2014 10:41

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
NASAL POINTER	1						Stryker	6001-020-000
Total Instrument Count	1							

NEURO ICG CAMERA&LIGHT CORD

Printed: 06/25/2020 16:26
Revised: 11/08/2019 08:38

Preferred Sterilization Method: Sterrad 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
STORZ LIGHT CORD	1						Storz	495 ND
SPIES ICG CAMERA (IMAGE HD)	1						Storz	H3-Z FI TH102
Total Instrument Count	2							

NEURO ENDOSCOPES - PUH

Printed: 06/25/2020 16:26
Revised: 09/17/2019 11:42

Preferred Sterilization Method: STERRAD/V-PRO1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
0* ICG SCOPE	1						Storz	28164 AC
45 DEGREE SCOPE	1						Karl Storz	7230FVA
30 DEGREE SCOPE	1						Karl Storz	7230BA
70 DEGREE SCOPE	1						Karl Storz	7230CVA
Total Instrument Count	4							

PISTOL GRIP BIPOLAR - PUH

Printed: 05/21/2019 09:50
Revised: 12/27/2012 10:03

Preferred Sterilization Method: Sterrad 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
GRAY CORD	1						Karl Storz	26176LA
BLACK HANDLE	2						Karl Storz	26184HM
COLLAR	2						Karl Storz	28164HSS
INSERTS								
SIDE WINDER	1						Karl Storz	28164FGL
STRAIGHT	1						Karl Storz	26184PTS
UP TOE ANGLED	1						Karl Storz	28164F6M
Total Instrument Count	8							

NEURO FRAZIER SUCTIONS - PUH

Printed: 05/21/2019 09:52
Revised: 03/01/2013 10:37

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
FRAZIER SHORT 7 FR. (CODMAN 70-1079)	2						V Mueller	NL1906
FRAZIER LONG 7 FR. (CODMAN 70-1087)	2						V Mueller	NL1905
FRAZIER SHORT 9 FR. (CODMAN 70-1080)	2						V Mueller	NL1900-9
FRAZIER SHORT 11 FR. (CODMAN 70-1081)	2						V Mueller	NL1900-11
FRAZIER LONG 11 FR. (CODMAN 70-1089)	2						V Mueller	NL1907
#9 FRAZIER SUCTION - LONG (CODMAN 70-1088)	2						V Mueller	NL1906
Total Instrument Count	12							

FUKUSHIMA SUCTIONS - PUH

Printed: 05/21/2019 09:53
Revised: 12/27/2012 12:22

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
SHORT SUCTIONS								
TAPERED SUCTION 4FR.	2						NO MANUFACTURER PROVIDED	LI-M004
TAPERED SUCTION 6FR.	2						NO MANUFACTURER PROVIDED	LI-M006
TAPERED SUCTION 8FR.	2						NO MANUFACTURER PROVIDED	LI-M008
TAPERED SUCTION 9FR.	2						NO MANUFACTURER PROVIDED	LI-M009
MEDIUM SUCTIONS								
TAPERED SUCTION 4FR.	2						V Mueller	NL1955-004
TAPERED SUCTION 6FR.	2						V Mueller	NL1955-006
TAPERED SUCTION 8FR.	2						V Mueller	NL1955-008
TAPERED SUCTION 9FR.	2						V Mueller	NL1955-009
LONG SUCTIONS								
TAPERED SUCTION 4FR.	2						V Mueller	NL1956-004
TAPERED SUCTION 6FR.	2						V Mueller	NL1956-006
TAPERED SUCTION 8FR.	2						V Mueller	NL1956-008
TAPERED SUCTION 9FR.	2						V Mueller	NL1956-009
Total Instrument Count	24							

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PUH NEURO PROTOTYPE SINUS TRAY

DESCRIPTION	CATALOG	QTY	CNT1	CNT2	CNT3
TOP SHELF					
LARGE PITUITARY (STORZ 455500 B)	Karl Storz RH551657	1			
DECKER MICRO RONGEUR, STRAIGHT - 6"	Symmetry 53-4000	2			
SINUS STRAIGHT SCISSORS	Karl Storz 449201	1			
SINUS SCISSOR --RIGHT	Karl Storz 449202	1			
SINUS LEFT CURVED SCISSOR	Karl Storz 449203	1			
REVERSE PUNCH (BACKBITER)	Karl Storz 459016	1			
STRAIGHT NASAL CUTTING FORCEP (THRU CUT)	Karl Storz 451020	1			
THRUCUT 45* LONG	Karl Storz 451520	1			
STRUMPEL VOSS FORCEP STRAIGHT	Karl Storz 456101	1			
STRUMPEL VOSS FORCEP UP	Karl Storz 456121	1			
ETHMOID LONG STRAIGHT (STORZ 456001B)	Karl Storz 456021	1			
ETHMOID LONG UP 45* (STORZ 456500B)	Karl Storz 456521	1			
ETHMOID 90* (STORZ 456801B)	Karl Storz 456801b	1			
FORCEPS BLAKESLEY RHINOFORCE STRAIGHT	Karl Storz 456003B	1			
FRONTAL SINUS GIRAFFE	Karl Storz 456511B	1			
KURZE SCISSORS RD. BARREL - STRAIGHT	Karl Storz 28164MZB	1			
KURZE SCISSORS RD. BARREL - RIGHT	Karl Storz 28164MZC	1			
KURZE SCISSORS RD. BARREL - LEFT	Karl Storz 28164MZD	1			
LURZE SCISSORSRD. BARREL - 45 DEGREE	Karl Storz 28164MZE	1			
ROTATABLE SCISSOR	Karl Storz 663327 (28164SAD)	1			
MINI THRUCUT STRAIGHT LONG	Karl Storz 663251	1			
MINI THRUCUT LEFT LONG	Karl Storz 663255	1			
MICRO THRUCUT - LEFT	Karl Storz 663256	1			
MINI THRUCUT 45 DEGREE UP LONG	Karl Storz 663257	1			
CUP FORCEP STRAIGHT	Karl Storz 663202	1			
CUP FORCEPS - RIGHT	Karl Storz 663205	1			
CUP FORCEPS - LEFT	Karl Storz 663206	1			
CUP FORCEP - 45 DEGREE	Karl Storz 663207	1			
Subtotal for TOP SHELF		**29**			
MIDDLE SHELF					
RETRACTABLE KNIFE	Karl Storz 28164A	1			
MALLEABLE SUCTION	Karl Storz 663818	1			
MALLEABLE FRAZIER SUCTION	Karl Storz 649183	1			
"J" CURETTE CLOSED	Karl Storz 628712	1			
ANTRUM CURETTE FORWARD SMALL	Karl Storz 629703	1			
ELEVATOR FREER SUCTION 7.75IN	Storz 474001	1			
BALL PROBE DOUBLE ENDED	Karl Storz 629820	1			
COTTLE ELEVATOR	V Mueller (Jarit 400-277) RH980	1			
OLIVE TIP SUCTION --LARGE	Karl Storz 586240	2			

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PUH NEURO PROTOTYPE SINUS TRAY

DESCRIPTION	CATALOG	QTY	CNT1	CNT2	CNT3
OLIVE TIP SUCTION	Karl Storz 586030	2			
#8 BLACK SUCTION	KLS Martin 18-523-18	1			
#10 BLACK SUCTION	KLS Martin 18-523-20	1			
Subtotal for MIDDLE SHELF		14			
BOTTOM SHELF					
#1 ANGLED KERRISON	Karl Storz 662121	1			
#2 ANGLED KERRISON	Karl Storz 662122	1			
#3 ANGLED KERRISON	Karl Storz 662123	1			
90 DEGREE UP KERRISON	Karl Storz 662102	1			
90 DEGREE DOWN KERRISON	Karl Storz 662112	1			
Subtotal for BOTTOM SHELF		5			
Total		48			

Last Definition Rev.:	1UPMC-ACCT\fiscjl	3/4/2024 01:03:25 PM
CS		
Printed	1UPMC-ACCT\fiscjl	4/2/2024 11:30:52 AM
Scrub		
Circulator		
Room #		

NEURO EEA TRAY - PUH

Printed: 06/25/2020 16:27
Revised: 06/17/2020 08:48

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
BOTTOM PAN LEFT TO RIGHT								
ADSON WITH TEETH (CODMAN 30-1186)	2						V Mueller	NL1400
GOLDTOP BAYONET FORCEPS - CUSHING CLASSIC PLUS TISSUE FORCEPS (CODMAN 36-6007)	2						V Mueller	NL1464
GERALD FORCEP 1X2 TEETH	2						V Mueller	NL1440
#8 BLACK SUCTION	1						KLS Martin	18-523-18
#10 BLACK SUCTION	1						KLS Martin	18-523-20
FRAZIER SUCTION 7FR	2						V Mueller	NL1900
#9 FRAZIER SUCTION - SHORT (CODMAN 70-1080)	2						V Mueller	NL1900-9
#11 FRAZIER SUCTION - SHORT (CODMAN 70-1081)	2						V Mueller	NL1900-11
SECOND ROW								
SMALL WEITLANER 5 1/2 IN - SHARP	1						V Mueller	SU3110
THIRD - ROW								
2" NASAL SPECULUM (SMALL) (CODMAN 79-7011)	1						V Mueller	RH102
ARMY/NAVY RETRACTOR	2						Codman	SU3660 - 1
FOURTH ROW								
DECKER MICRO BIOPSY FORCEP (CODMAN 53-4000)	1						V Mueller	NL6250
SELLA PUNCH 1MM BITE (CODMAN 80-1344)	1						V Mueller	VM81-1271
2MM KERRISON (CODMAN 80-1340)	1						V Mueller	NL3785-165
PAPER BAG								
#3 SAFETY KNIFE HANDLE	1						BARD-PARKER	374030
#3 KNIFE HANDLE (CODMAN 11-5530)	1						V Mueller	SU1403-001
#7 KNIFE HANDLE (CODMAN 11-5534)	1						V Mueller	SU1407
FREER ELEVATOR	1						V Mueller	RH750
COTTLE ELEVATOR	1						V Mueller	RH980
MCELVEEN DISSECTOR	1						Bausch & Lomb	N1706
DISSECTOR DOWN (STUBBY) (CODMAN 80-1316)	1						V Mueller	NL3853-003
DISSECTOR UP (STUBBY) (CODMAN 80-1315)	1						V Mueller	NL3785-136
STRING								
MOSQUITO CURVED (CODMAN 30-4517)	4						V Mueller	SU2702
CRILE ARTERY FORCEPS 5-1/2" STR	4						V Mueller	SU2730
KELLY FORCEP 6 1/2" (CODMAN 32-4071)	1						V Mueller	SU2760
ALLIS 6IN (CODMAN 32-7000)	4						V Mueller	SU4054
KOCHER FORCEP CURVED 6 1/4" (32-4110)	2						V Mueller	SU2800
SAROT NEEDLEHOLDER (CODMAN 36-3020)	2						V Mueller	CH2416

NEURO EEA TRAY - PUH

Printed: 06/25/2020 16:27
Revised: 06/17/2020 08:48

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
RYDER NEEDLE HOLDER (CODMAN 36-3012)	1						Mueller	CH2508
REGULAR NEEDLE HOLDER (CODMAN 36-2016)	1						Mueller	SU16060
METZENBAUM SCISSOR (STILLE 817-18)	1						Mueller	MO1600-S
MAYO SCISSOR STR (CODMAN 36-5051)	1						Mueller	SU1804
MAYO SCISSOR CVD (CODMAN 36-5061)	1						Mueller	SU1814
TENOTOMY SCISSOR (PILLING 640280)	1						Mueller	CH5675
PREP STICKS (CODMAN 36-6036)	3						Mueller	GL650
ADJUSTABLE HEMOCLIP APPLIER	1						Medtronic	MCEN21R
Total Instrument Count	56							

KLS MARTIN PITTSBURGH DISSECTORS - PUH

Printed: 05/21/2019 09:50
Revised: 06/18/2013 14:34

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
#1 MODIFIED SACHS DISSECTOR MEDIUM STRAIGHT	1						KLS Martin	07-005-01-07
#2 MODIFIED SACHS DISSECTOR LARGE STRAIGHT	1						KLS Martin	07-005-02-07
#3 MODIFIED FISCH DISSECTOR RIGHT STRAIGHT	1						KLS Martin	07-005-03-07
#4 MODIFIED FISCH DISSECTOR LEFT STRAIGHT	1						KLS Martin	07-005-04-07
#5 HOOK WITH BALL DISSECTOR STRAIGHT	1						KLS Martin	07-005-05-07
#6 CURETTE BLUNT 90° UP DISSECTOR STRAIGHT	1						KLS Martin	07-005-06-07
#7 MODIFIED COTTLE DISSECTOR STRAIGHT, MEDIUM	1						KLS Martin	07-005-07-07
#8 MODIFIED COTTLE DISSECTOR STRAIGHT, LARGE	1						KLS Martin	07-005-08-07
#9 MODIFIED RHOTON (ROSEN) DISSECTOR STRAIGHT SMALL	1						KLS Martin	07-005-09-07
#10 MODIFIED RHOTON (ROSEN) DISSECTOR STRAIGHT LARGE	1						KLS Martin	07-005-10-07
DISSECTOR HANDLE	4						KLS Martin	07-005-20-07
Total Instrument Count	14							

PUH LAZIC MICRO INSTRUMENTS (D-LINE ENDOSCOPIC SET) 1

DESCRIPTION	CATALOG	QTY	CNT1	CNT2	CNT3
LAZIC (MICRO FORCEP) BLACK	LAZIC 46.813.01	1			
LAZIC (MICRO PITUITARY CUP BLUNT)BLACK	LAZIC 46.856.01	1			
LAZIC (MICRO SCISSOR ,SHARP 45°)BLACK	LAZIC 46.835.02	1			
LAZIC (MICRO NEEDLEHOLDER CURVED)BLACK	LAZIC 46.815.02	1			
LAZIC (MICRO SCISSOR SHARP CURVED)BLACK	LAZIC 46.811.02	1			
LAZIC (MICRO FORCEP) GOLD	LAZIC 46.813.03	1			
LAZIC (MICRO PITUITARY CUP BLUNT) GOLD	LAZIC 46.856.03	1			
LAZIC (MICRO SCISSOR,SHARP 45°ANGLED) GOLD	LAZIC 46.835.04	1			
LAZIC (MICRO SCISSOR,SHARP CURVED) GOLD	LAZIC 46.811.04	1			
Total		9			

PUH ENDO PENS (RED/SILVER) GREEN TAPE

DESCRIPTION	CATALOG	QTY	CNT1	CNT2	CNT3
ENDO PEN	Sutter 700987S LEFT BITING	1			
ENDO PEN	Sutter 700953S SIDEWINDER	1			
ENDO PEN	Sutter 700991S STRIAGHT TIP	1			
Total		**3**			

ENDO PENS (RED/SILVER) GREEN TAPE

Printed: 06/25/2020 16:21
Revised: 01/03/2020 07:15

Preferred Sterilization Method: Steam 1

Comments / Instructions:

Item Description	Std Qty	Actual Qty	1st	2nd	Add	Final	Manufacturer	Catalog
ENDO PEN	1						SUTTER	700986S
ENDO PEN	1						SUTTER	700958S
ENDO PEN	1						SUTTER	700957S
ENDO PEN	1						SUTTER	700987S
Total Instrument Count	4							

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http://www.neurosurgery.pitt.edu/

http://www.skullbasecongress.com

UPMC
Global Care

UPMC Global Care: Bridging Patient Care Partnerships Around the World

What is UPMC Global Care?

UPMC firmly believes that patients should have access to quality health care close to home whenever possible. However, medical treatment is not always possible in their home country. To serve medical needs of this nature, UPMC created the Global Care program.

The vision of UPMC Global Care is to offer an innovative service model for international patients that coordinates the care plan before the patient's arrival, provides superior quality care and clinical monitoring while in Pittsburgh, and enables the seamless transition of care, with regular follow-ups after discharge.

Our key differentiator is our total commitment to a service-oriented approach and our emphasis on an excellent and satisfying experience, not only for the patients and their families, but also for their referring physicians and financial sponsors. Referring physicians can communicate directly with our clinical experts at UPMC regarding treatment plan, discharge instructions, and follow-up care upon their patient's return home.

Last year, 22,000 patients traveled from around the world to access our top-rated care.

The Global Care program serves patients through clinical expertise, telemedicine consultations, and health care treatment at a number of facilities in the United States, Ireland, and Italy.

At UPMC, patients can expect:

- Timely responses to inquiries for care, with initial response occurring within one business day
- One point of access for pre-arrival, care delivery, and post-discharge communication
- A single price and single invoice for all services provided.

Why Choose UPMC Global Care?

Patients that receive treatment at UPMC, and their families have unique needs due to cultural barriers and the complexity of the health care system in the United States. To create the most comfortable atmosphere possible, hospitality teams provide a variety of services for each patient, including:

Clinical Care

Clinical care coordinators actively collaborate with physicians and treatment teams to create a comprehensive health plan and monitor the health of patients during treatment. Our physicians establish relationships with referring physicians throughout the care process and in an on-going capacity to ensure safe discharge and continuity of care upon patient's return home.

Patient Hospitality

Multilingual hospitality coordinators serve as cultural liaisons for patients and their families. They provide a single point of contact for each patient and serve to meet all non-medical needs, including communication, travel, housing, dietary, religious, and recreational needs.

Housing and Recreational Services

Hospitality coordinators will review local accommodation options and ensure patients and their families receive safe, convenient housing. For patients requiring extended stay in Pittsburgh, Hospitality coordinators will also assist patients to arrange local cell phone service and open bank accounts. Voted the "Most Livable City in the United States", Pittsburgh has many dining, cultural, shopping, and entertainment options to help patients relax and make the most of their visit.

Patient Financial Coordinators

Patient financial coordinators provide patients with a clear explanation of payment for services at UPMC and assist patients with communicating with insurance companies, sponsoring organizations, or embassy offices.

Visa and Travel Assistance

Medical acceptance letters will be provided for patients and their traveling companions to facilitate their visa application process and in-country interview at their respective US Consulate.

Patient Escort and Navigation

Our multilingual interpreters accompany patients and their companions to their medical appointments to alleviate the stress of having to find their way around the hospital, to facilitate patient registration, and to ensure culturally-sensitive communication with their healthcare provider.

Connect with UPMC Global Care | Find out more about UPMC's programs and services at UPMCGlobalCare.com.

UPMC LIFE CHANGING MEDICINE

Previously referred to as University of Pittsburgh Medical Center, UPMC is an integrated global health enterprise, and is affiliated with the University of Pittsburgh. To learn more about us, please visit **UPMC.com.**

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