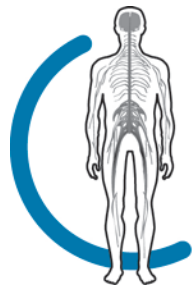


105TH ANNUAL SCIENTIFIC MEETING

JULY 20 - 21, 2018
The Hershey Hotel | Hershey, PA

Program

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PENNSYLVANIA
**Neurosurgical
Society**

105th Scientific Meeting
July 20-21, 2018
The Hotel Hershey | Hershey, PA

Physician Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Pennsylvania Medical Society and the Pennsylvania Neurosurgical Society. The Pennsylvania Medical Society is accredited by the ACCME to provide continuing medical education for physicians.

The Pennsylvania Medical Society designates this live activity for a maximum of 11.5 *AMA PRA Category 1 Credit(s)*TM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Overall Program Educational Goals:

At the conclusion of this program, participants will be able to:

- Apply risks and benefits of new technology, biomedical studies, best practice scenarios, and published guidelines to decisions regarding surgery procedures to achieve better patient outcomes.
- Implement strategies to help new residents acclimate to their environment, and transition from residency to practice.
- Utilize strategies to handle cases effectively outside of individual specialties.
- Create effective neurosurgical teams in order to achieve better surgical results and more efficient work environment.
- Apply strategies to improve the efficiency and culture of their practice congruent to their practice setting or stage of their career.
- Utilize current literature and publications for neurosurgical updates.

Nursing Credits

The Pennsylvania Neurosurgical Society and the University of Pittsburgh School of Nursing are collaborating to present this learning activity. Nurses completing this activity and the evaluation tool may be awarded a maximum of 13.25 nursing continuing education contact hours. The University of Pittsburgh School of Nursing is accredited as a provider of continuing nursing education from the American Nurses Credentialing Center's Commission on Accreditation.

PA Credits

AAPA accepts certificates of participation for educational activities certified for AMAPRA Category 1 Credit™ from organizations accredited by ACCME or a recognized state medical society. PAs may receive a maximum of 11.5 Category 1 credits for completing this activity.

Schedule of Events

Friday, July 20

- 7am-7:50am Continental Breakfast and Meet with Exhibitors
- 7:50-7:55am **Welcome and Intro of President**
Neil Malhotra, MD
PNS Program Chair
- 7:55-8:00am **Opening Remarks**
Paul Marcotte, MD
President, PNS
- 8:00 – 8:45 **High Impact Literature Update**
Nestor Tomycz, MD, *Functional Neurosurgery: High Impact Literature Update*
Michael Oh, MD, *High Impact Literature in Spine Surgery*
Ali Ozturk, MD, *High Impact Spine Literature*
- 8:45-9:30am **Addressing Physician Burnout & Stress**
Raymond Truex, MD
- 9:30-10:00am Break with Exhibitors
- 10:00-11:00am **Robotics in Neurological Surgery**
Chengyuan Wu, MD, *The Role of Robotics in Cranial Neurosurgery - Current Applications and Future Directions*
Don Whiting, MD, *My Experience with Robotic Spine Surgery*
- 11:00-11:30am **Washington Committee Update**
Clemens Schirmer, MD
- 11:30-12:30am Lunch
- 12:30-1:30pm **Vascular**
Brian Jankowitz, MD, *Discussion of Vascular Neurosurgery*
Robert Friedlander, MD, *High Definition Fiber Tracking New Surgical Tool*
- 1:30-1:45 pm **Annual Business Meeting**
Paul Marcotte, MD
President, PNS

1:45 pm – 2:15 pm **Enhancing Quality of Neurosurgical Care**
Zarina Ali, *Enhancing Quality of Neurosurgical Care: Enhanced Recovery After Surgery (ERAS) At Pennsylvania Hospital*
Matthew Piazza, MD, *Enhancing Neurosurgical Care: Increasing Compliance with Pre-operative Antibiotic Administration*

2:15-3:15pm **Financing a Neurosurgery Department**
Sean Grady, MD, *Department Finances: No Margin, No Mission*
Neil Martin, MD, *Neurosurgery Department Financial Management*
Panelists:
Robert Rossenwasser, MD
Robert Friedlander, MD

3:15-3:30pm Break with Exhibitors

3:30-4:15 pm **Functional Neurosurgery Panel**
Speakers: Nestor Tomycz, MD, *Neurosurgery for Alzheimer's Disease: Old and New Approaches*
Isaac Chen, MD, *High frequency focused ultrasound (HIFU) for movement disorders*

4:15-5:30pm **The Future of Resident Education**
Robert Harbaugh, MD, *Neurosurgery Residency and Enfolded Fellowships*
Kevin Cockroft, MD, *ABNS Overview*
Panelists:
Michael Oh, MD,
Neil Martin, MD,
Robert Rosenwasser, MD,
Sean Grady, MD,
Robert Friedlander, MD

5:30-6:30pm Reception with Exhibitors

Saturday, July 21

7:00-8:00am Continental Breakfast

8:00-8:45am **High Impact Literature Update**
Kimberly Harbaugh, MD, *Literature Update: Peripheral Nerve*

Jody Leonardo, MD, *High Impact Literature Update*
Minimally Invasive Neurosurgery
Hydrocephalus/Intracranial Endoscopy
Kadir Erkmén, MD, *High impact literature Update -*

Vascular

Chris Farrell, MD, *The Future of Brain Tumor Therapy*
Searching for the 4th Modality

8:45-9:45am **Keynote:** *From Burnout to Balance: Epigenetics,*
Neuroplasticity and

Connectomics
Joseph Maroon, MD

9:45 -10:15am **On Call: What do I do with Cases outside my Specialty?**

Moderator: Kevin Judy, MD
Mark Kotapka, MD *To Have or Have Not? (On Call:*
When to transfer out?)
Brian Jankowitz, MD
Ashwini Sharan, MD

10:15-10:30am Break

10:30-11:30am **Oral Abstract Presentations**

10:30-10:40am
Complications of Robotic Assisted Spine Surgery
Daniel Myers, MD

10:40-10:50am
A Cost-Analysis of Postoperative Urinary Retention After
Elective Spine Surgery: Discrepancies Between the
Departments of Neurological and Orthopedic Surgery
Evan Fitchett

10:50-11:00am
Intraoperative Near-Infrared Imaging with Receptor-
Specific versus Passive Delivery of Contrast Agents in
Human Pituitary Adenomas Steve Cho

11:00-11:10am
Near-Infrared Fluorescence-Guided Stereotactic Biopsy
of High Grade Glioma
Carrie Li

11:10-11:20am

*Malignant Peripheral Nerve Sheath Tumor Treatment
with Targeted Pseudomonas Exotoxin*
Oliver Mrowczynski

11:20-11:30am

*Cost of Chiari I Malformation Surgery: Comparison of
treatment at Children's hospitals versus Non-Children's
hospitals*
Jessica Lane

11:30am-12:00pm **Neuro Oncology**

Scott Shepard, *Stereotactic Radiosurgery and Brain
Metastases: The Hot Button Issues*

12:00-12:15pm **Functional Neurosurgery Part II**

Ashwini Sharan

12:15pm

Awards Announced, CME over

Garden Terrace East

12:30 – 2:30pm **Resident Skills Session**

Garden Terrace West

12:30 – 3:00pm **PA & NP Breakout Sessions**

Moderator: Danielle Callahan

12:30-1:00 **RAPT**

Matthew Piazza, MD

1:00-1:30 **The Experience of Building the APP**

Diana Gardiner

1:30-2:00 **The Use of Vancomycin Powder in Cranial Surgery-
Decreasing Infections and Costs**

Kalil Abdullah, MD

2:00-2:30 **Penn Glioma Outcomes Project**

Stephen Miranda, MD

Thank you for your support...

The Pennsylvania Neurosurgical Society wishes to thank and acknowledge the following organizations for supporting our 104th Scientific Meeting:

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As of July 18, 2018

CME DISCLOSURE

In accordance with the Accreditation Council for Continuing Medical Education (ACCME) Standards, the following presenters of this course have indicated that they either do or do not have a relationship which, in the context of their presentation, could be perceived by some as a real or apparent conflict of interest, (e.g., ownership of stock, or honoraria or consulting fees). Those presenters having such relationships do not consider that it will influence their presentation.

Faculty Name	Company Name	Nature of Relationship
Kalil Abdullah, MD	Nothing to Disclose	
Zarina Ali, MD	Nothing to Disclose	
Carrie Andrews	Nothing to Disclose	
Christopher Berry, PA	Nothing to Disclose	
Love Buch	Nothing to Disclose	
Danielle Callahan, ACNP	Nothing to Disclose	
H. Isaac Chen, MD	Nothing to Disclose	
Kevin Cockroft, MD	Medtronics, Actuated Medical and Intersocietal Accreditation Commision	Consultant
Lekhaj Daggubati, MD	Nothing to Disclose	
Dupre Derrick	Nothing to Disclose	
Libby Dietrich	Nothing to Disclose	
Kadir Erkman, MD	Nothing to Disclose	
Christopher Farrell, MD	Nothing to Disclose	
David Fernandes Cabral	Nothing to Disclose	
Robert Friedlander, MD	Nothing to Disclose	
Diana Gardner, NP	Nothing to Disclose	
Sean Grady, MD	Nothing to Disclose	
Kimberly Harbaugh, MD	Nothing to Disclose	
Robert Harbaugh, MD	Nothing to Disclose	
Mark Iantosca, MD	Nothing to Disclose	
Brian Jankowitz, MD	Nothing to Disclose	
Kevin Judy, MD	Nothing to Disclose	
Mark Kotapka, MD	Nothing to Disclose	
Brandon Kujawski	Nothing to Disclose	
Dorian Kusyk, MD	Nothing to Disclose	
Jodi Leonardo, MD	Nothing to Disclose	
Neil Malhotra, MD	Depuy	Consultant
Dorian Mambelli	Nothing to Disclose	
Paul Marcotte, MD	Nothing to Disclose	
Joseph Maroon, MD	Impact Applications Inc.	Co-Founder and Board
Neil Martin, MD	Surgical theatre, NeuralAnalytics	Consultant, Equity
Michael McDowell, MD	Nothing to Disclose	
Stephen Miranda, MD	Nothing to Disclose	
Raj Nangunoori, MD	Nothing to Disclose	
Pawel Ochalski, MD	Nothing to Disclose	
Michael Oh, MD	Nothing to Disclose	
Ali Ozturk, MD	Depuy-Syntheses	Consultant
Matthew Piazza, MD	Nothing to Disclose	
Robert Rosenwasser, MD	Nothing to Disclose	
Clemens Schirmer, MD	NTI	Stock
Abraham Schlauderaff, MD	Nothing to Disclose	
Ashwini Sharan, MD	Cerebral Therapies, Neurotargetting, Neuspera	Owner
Scott Sheppard, MD	Nothing to Disclose	
Scott Simon, MD	Nothing to Disclose	
Shelly Timmons, MD, PhD	Nothing to Disclose	
Nestor Tomycz, MD	Medtronics	Consultant
Raymond Truex, MD	Nothing to Disclose	
Donald Whiting, MD	Nothing to Disclose	
Chengyuan Wu, MD	Janssen Pharmaceuticals, Medtronic, Inc., Nevro Corp.	Consultant, Spouse Employee
Chen Xu, MD	Nothing to Disclose	
Abstract Presenter Name	Company Name	Nature of

		<u>Relationship</u>
Steve Cho	Nothing to Disclose	
Evan Fitchett	Nothing to Disclose	
Jessica Lane, MD	Nothing to Disclose	
Carrie Li	Nothing to disclose.	
Oliver Mrowczynski, PhD	Targepeutics Inc	Consultant
Daniel Myers, MD	Nothing to Disclose	

***Designates a Scientific Meeting program committee member/ **Designates a Scientific Meeting Program committee member and speaker**

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The Pennsylvania Neurosurgical Society (PNS) makes every effort to ensure that speakers are knowledgeable authorities in their fields. Seminar attendees are nevertheless advised that the statements and opinions expressed by seminar speakers are those of the speakers, not PNS. The speakers' statements and/or opinions should not be construed as PNS policy or recommendations, and PNS disclaims any liability or responsibility for the consequences of any actions taken in reliance upon those statements or opinions.

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Evaluation & Credit Claiming Information

Physicians

In order to receive CME credit, you must complete the online evaluation and submit an electronic attestation form. The online evaluation will be available for two weeks following the course. This evaluation is necessary in order to meet CME requirements established by the Pennsylvania Medical Society. If you did not provide an email address when you registered, please stop by the PNS registration desk to provide one. This information will not be shared with outside parties or companies and is for the sole use of CME evaluation purposes.

To complete the evaluation, type the following web address into your internet browser:

<http://cmetesting.pamedsoc.org/Testcraft/assess.aspx?aid=1989-PNSAM2018-PHYSICIAN&apass=PNSASM2017>

PAs

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To complete the evaluation, type the following web address into your internet browser:

<http://cmetesting.pamedsoc.org/Testcraft/assess.aspx?aid=1989-PNSAM2018-NONPHYSICI&apass=pnsnp2017>

Nurses

The Pennsylvania Neurosurgical Society and the University of Pittsburgh School of Nursing are collaborating to present this learning activity. Nurses completing this activity and the evaluation tool may be awarded a maximum of 13.25 nursing continuing education contact hours. The University of Pittsburgh School of Nursing is accredited as a provider of continuing nursing education from the American Nurses Credentialing Center's Commission on Accreditation.

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<http://cmetesting.pamedsoc.org/Testcraft/assess.aspx?aid=1989-PNS2018-NURSE&apass=pnsnurse2017>

2018 PNS Meeting Attendee List

Full Name	MD, DO, Other	Company	Primary Address	Primary City	Primary State/Prov . Code	Primary Zip/Postal Code
Abdullah, Kalil	MD	University of Pennsylvania	2038 Latimer St	Philadelphia	PA	19103
Al khalili, Yasir	MD	Drexel university	633 w Rittenhouse st B223	Philadelphia	PA	19144
Ali, Zarina	MD	University of Pennsylvania	740 Columbus Blvd, Unit 57	Philadelphia	PA	19147
Anderson, Brian	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Andrews, Carrie	Medical Student	Thomas Jefferson University	904 Pine Street Apt 2	Philadelphia	PA	19107
Argires, James	MD	James P Argires LLC	207 East Orange Street	Lancaster	PA	17602
Bailey, Robert	MD		117 W Clearfield Rd	Havertown	PA	19083
Bohan, Christian	Medical Student	Geisinger Commonwealth School of Medicine	304 Riverside Drive	Binghamton	NY	13905
Bratkowski, Maryellen	RN	UPMC Mercy	1350 Locust Street Suite 300	Pittsburgh	PA	15219
Brimley, Cameron	MD	Geisinger	52 Schoolhouse Road	Bloomsburg	PA	17815
Buch, Love	BS	University of Pennsylvania	Pennsylvania Hospital 235 S 8th St	Philadelphia	PA	19106
Bugarini, Alejandro	MD	Geisinger	534 Nicholas Ave	Danville	PA	17821
Burke, James	MD, PhD	ABSS	501 Howard Ave Bldg E-1	Altoona	PA	16601
Bursick, Daniel	MD	UPMC MERCY NEUROSURGERY	747 Valleyview Rd	pittsburgh	PA	15243
Callahan, Danielle	ACNP	Penn Medicine	339 Park Ave	Swarthmore	PA	19081
Chen, Han-Chiao Isaac	MD		3rd Floor, Silverstein Pavilion	Philadelphia	PA	19104
Cho, Steve	BS	PERELMAN SCHOOL OF MEDICINE	511 S 42nd Street 3R	PHILADELPHIA	PA	19104
Close, Richard	MD	Tower Health	P.O. Box 23	Limekiln	PA	19535

Full Name	MD, DO, Other	Company	Primary Address	Primary City	Primary State/Prov. Code	Primary Zip/Postal Code
Cockroft, Kevin	MD	Penn State Health	30 Hope Drive Mail Code EC110	Hershey	PA	17033
Daggubati, Lekhaj	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Davanzo, Justin	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Dias, Mark	MD	Penn State Health Milton S. Hershey Medi	30 Hope Drive EC110	Hershey	PA	17033
Du, Lydia	BS	Northeast Ohio Medical University	4249 Pine Drive	Rootstown	OH	44272
Fagert, Van	CRNP	UPMC Mercy	1350 Locust Street Suite 300	Pittsburgh	PA	15219
Farrell, Christopher	MD	Thomas Jefferson University	909 Wlanut Street	Philadelphia	PA	19107
Fedora, Lisa	CRNP	Tower Health Neurosurgery	10 Beechtree Lane	Mountville	PA	17554
Fitchett, Evan	Medical Student	Thomas Jefferson University	728 South Street, Apt. D	Philadelphia	PA	19147
Fong, Reginald	MD	Geisinger	25 N Glenbrook St	Danville	PA	17821
Friedlander, Robert	MD, MA	UPMC	200 Lothrop St. B Wing, 4th Floor UMPC Presbyterian Hospital	Pittsburgh	PA	15213
Gardiner, Diana	NP	University of Pennsylvania Health System	1077 Piney Hollow Road	Newfield	NJ	08344
Grady, M. Sean	MD	University of Pennsylvania	3400 Spruce Street 3 Silverstein Building	Philadelphia	PA	19104
Guerriero, Emily	PA-C, MPAS	UPMC Neurological Surgery	200 Lothrop Street Suite B400	Pittsburgh	PA	15213
Hamilton, Troy	Physician Assistant		1214 Blake Court	York	PA	17408
Harbaugh, Robert	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033

Full Name	MD, DO, Other	Company	Primary Address	Primary City	Primary State/Prov . Code	Primary Zip/Postal Code
Harbaugh, Kimberly	MD	Penn State Health Milton S. Hershey Medi	30 Hope Drive EC110	Hershey	PA	17033
Holmes, Brian	MD	Parkway Neuroscience & Spine Institute	17 Western Maryland Parkway	Hagerstown	MD	21740
Iantosca, Mark	MD		30 Hope Drive EC110	Hershey	PA	17033
Jafrani, Ryan	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Jain, Abhi	Med student		301 race st	philadelphia	PA	21201
Jallo, Jack	MD	Thomas Jefferson Neurosurgery UPMC	2238 Mount Vernon Street	Philadelphia	PA	19130
Jankowitz, Brian	MD		1350 Locust Suite 300, MPOB	Pittsburgh	PA	15217
Jareczek, Frank	MD, PhD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Jho, Diana	MD	Penn State Hershey Medical Center	30 Hope Drive	Hershey	PA	17033
Keep, Marcus	MD	Maas Biolab	725 Indiana Ave	Lemoyne	PA	17043
Kotapka, Mark	MD	Einstein Healthcare Network	5401 Old York Rd Suite 400 Klein	Philadelphia	PA	19141
Krzeminski, Joseph	MD	Wellspan	7698 Scout Road	Felton	PA	17322
Kuhlengel, Keith	MD	Lancaster Neuroscience and Spine Associates	1671 Crooked Oak Dr	Lancaster	PA	17601
Lane, Jessica	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Leonardo, Jody	MD	Allegheny General Hospital - AHN	812 Grandview Ave apt 2B	pittsburgh	PA	15211
Li, Carrie	BS	Perelman School of Medicine University of Pennsylvania	2118 Spruce St.	Philadelphia	PA	19103
Malhotra, Neil	MD	Hospital of the University of Pennsylvania	3400 Spruce St 3 Silverstein	Philadelphia PA	PA	19038

Full Name	MD, DO, Other	Company	Primary Address	Primary City	Primary State/Prov . Code	Primary Zip/Postal Code
Marcotte, Paul	MD	Hospital of the University of Pennsylvania	3400 Spruce Street 3rd Fl Silverstein	Philadelphia	PA	19104
Maroon, Joseph	MD	University of Pittsburgh Medical Center	200 Lothrop Street Suite C-500	Pittsburgh	PA	15213
Mau, Christine	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Maurer, Rob	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
McDowell, Michael	MD	UPMC	1020 Progress Street M714	Pittsburgh	PA	15212
McInerney, James	MD	Milton S. Hershey Penn State Health Medical Center	30 Hope Drive	Hershey	PA	17033
Mrowczynski, Oliver	PhD	Penn State Hershey	72 University Manor East	Hershey	PA	17033
Myers, Daniel	MD	Allegheny General Hospital	420 E north Ave Suite 302	Pittsburgh	PA	15212
Ochalski, Pawel	MD	WellSpan Health	228 St. Charles Way	York	PA	17402
O'Connor, Thomas		APEX MEDICAL INC	APEX MEDICAL INC. 105 QUAKER LANE	MALVERN	PA	19355
Oh, Michael	MD	Allegheny General Hospital - AHN	106 Miller Drive	Wexford	PA	15090
Ozturk, Ali	MD	University of Pennsylvania	254 Biddulph Rd	Wayne	PA	19087
Padmanaban, Varun	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Park, Haejoe	MD	Penn State Health	30 Hope Drive Mail Code EC110	Hershey	PA	17033
Patel, Neel	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Payne, Christopher	MD	AGH -AHN	420 E North Ave	Pittsburgh	PA	15212

Full Name	MD, DO, Other	Company	Primary Address	Primary City	Primary State/Prov. Code	Primary Zip/Postal Code
Payne, Russell	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Piazza, Matthew	MD	University of Pennsylvania	2020 Walnut Street APT 21B	Philadelphia	PA	19103
Prasad, Srinivas	MD	Thomas JeffersonNeurosurgery	265 Cheswold Lane	Haverford	PA	19041
Reiter, G. Timothy	MD	Penn State Health Milton S. Hershey Medi	30 Hope Drive EC110	Hershey	PA	17033
Richter, Bertram	MD	AGH - AHN	420 E North Ave	Pittsburgh	PA	15212
Rosenwasser, Robert	MD	Thomas Jefferson University	909 Walnut Street	Philadelphia	PA	19107
Sather, Michael	MD	Milton S. Hershey Penn State Health Medical Center	30 Hope Drive	Hershey	PA	17033
Schirmer, Clemens	MD	Geisinger Health System	449 Ice Harvest Dr.	Mountain Top	PA	18707
Schlauderaff, Abe	MD	Penn State Health	30 Hope Drive EC110	Hershey	PA	17033
Semroc, Suzan	PA-C	UPMC Mercy	1350 Locust Street Suite 300	Pittsburgh	PA	15219
Sharan, Ashwini	MD	Thomas Jefferson University	909 Walnut Street	Philadelphia	PA	19107
Siddiqi, Tariq	MD,FACS	Virtua	900 sheppard rd	Voorhees	NJ	08043
Simon, Alyssa	PA-C	UPMC	1751 Waterford Court	Pittsburgh	PA	15241
Simon, Scott	MD	Penn State Health	30 Hope Drive	Hershey	PA	17033
Specht, Charles	M.D.	Penn State-Hershey Medical Center	105 Dobbs Lane	Hummelstown	PA	17036
Sublett, Jesna	MD	Geisinger Health System	100 N Acad Ave	Danville	PA	17821
Timmons, Shelly	MD, PhD	Penn State Hershey	30 Hope Drive Mail Code EC110	Hershey	PA	17033

2018 PNS Exhibitor List

Company	Full Name	Work Address	Work City	Work State/Prov. Code	Work Zip/Postal Code	Work Phone
Arbor Pharmaceuticals, LLC	Deacon, Kimberly	6 Concourse Parkway Suite 1800	Atlanta	GA	30328	678-334-2420
	Hesse, Jessica					
Brainlab	Whitley, Scott	400 N Michigan Ave Suite 1200	Chicago	IL	60611	1-800-784-7700
Cerenovus	Orsini, Chris		West Chester	PA		610-719-6873
	Turgeon, CJ					
DePuy Synthes Spine	Brown, Ryan Costanzo, Mike					
Integra	Kuhlman, Jerry Johnson, Steve	311 Enterprise Drive	Plainsboro	NJ	08536	8009974868
	Mohr, Lynne					
K2M	Kelly, Dan Sweeny, Teddy					
KLS Martin	Pedano, Leslie Bauer, Leigh					
	Dillman, Bob	1800 Pyramid Place	Memphis	TN	38132	1-800-364-4245
Medtronic	Cox, Luke Diehl, Robert Kurcharski, Michael					
	Murphy, Sean Brown, Travis					
	Hohl, Andy Mulcahy, John Lexer, Todd					
Olympus	Kwiatk, Tom	3500 Corporate Parkway	Center Valley	PA	18034	800-773-4301
	Liu, Yichen Wilcox, Tony					
	Schwartz, Daniel	120 Terry Drive	Newtown	PA	18940	215-579-9600
Orbus Therapeutics, Inc.	Aysola, Kartik	2749 E. Bayshore Road, Suite 105	Palo Alto	CA	94303-3233	650-656-9427
OssDsign	Marchesi, Jim	Virdings Allé 2	Uppsala, Sweden	CA	SE-75450	011-46-18 55 39 93
Paradigm Spine, LLC	Tate, Tara	505 Park Ave. 14th Floor	New York	NY	78758	212-367-7274
	Langhorst, Kim					
Penumbra, Inc.	Becker, Ron DLin, Craig					
SI-BONE, Inc.	McShane, Thomas	3055 Olin Ave Ste 2200	San Jose	CA	95128	408-207-0700
	Tierney, Matt Perestock, Ryan					
Stryker	Warchal, Gabrielle Manley, Tom	47900 bayside parkway	fremont	CA	94538	6102469877
SurgicalOne, Inc.	Stewart, Jim	23030 E. Industrial Drive	Saint Clair Shores	MI	48080	586-775-3300
	Kirit, Steven					
Synaptive Medical Inc.	Bell, Keith	800 - 555 Richmond Street West	Toronto	TN	M5V 3B1	647-925-3435
	Krieger, Zack					
Zeiss	Schleyer, Brad					
Ziehm Imaging	Rice, Allison	6280 Hazeltine National Dr.	Orlando	FL	32822	4076158560
	Neville, Chris					
Zimmer Biomet	McCarthy, Justin					
	Moore, Michael	324 West Main St	Trappe	PA	19426	717-991-7902
	Brown, Steven	324 West Main St	Trappe	PA	19426	717-991-7902
	Trupkovich, Matt	1520 Tradeport Dr.	Jacksonville	FL	32218	904-741-8522
	DuPont, Robert	324 West Main St	Trappe	PA	19426	717-991-7902
	Condrige, Jeff DiMino, Drew					
	Finnell, Devin	301 Interlocken Parkway	Broomfield	CO	80021	512-344-3333