



COLUMBIA UNIVERSITY

*College of Physicians
and Surgeons*



ColumbiaDoctors | *Surgery*

Dear Colleague,

As we enter summer, the research engine of the Department of Surgery is running at high speed and we have a very full newsletter. We hope you will attend our first Surgery Research Symposium on Friday June 9. Please see our program overview below for a list of our exciting presentations. I am co-directing this program with renowned pain researcher, Nigel Bunnett, PhD, and in this month's research letter we feature an extended interview Dr. Bunnett on the long-term clinical implications of his research on endosomal pain receptors. We present this along with his landmark paper, Neurokinin 1 Receptor Signaling in Endosomes Mediates Sustained Nociception and is a Viable Therapeutic Target for Prolonged Pain Relief in *Science Translational Medicine*.

This newsletter has proven to be a valuable resource so I hope you will continue to email Paul Kurlansky (pk2245@columbia.edu) or me (crs2@cumc.columbia.edu) with regular updates on your grants, publications, and presentations by the first of every month.

For easy reference, we now post all issues of this [newsletter](#) on the Center for Innovations and Outcomes Research website.

Remember, journal link may require subscriptions or a log-in through the Columbia library while PubMed links are accessible to all.

Craig R. Smith, MD, FACS

DEPARTMENT OF SURGERY INAUGURAL RESEARCH SYMPOSIUM

Friday, June 9, 2017

Our first annual Surgical Research Symposium provides an opportunity for residents, fellows and students to present their research to Department of Surgery faculty and our Visiting Professor, Dr. Christian Larsen, MD, DPHL, who serves as the Carlos and Marguerite Mason professor of transplantation at Columbia. Dr. Larsen was founding director of the Transplantation Emory Transplant Center and former surgeon-in-chief at Emory University School of Medicine and has made groundbreaking contributions

to transplant research. [More here.](#)

CONGRATULATIONS

Dr. Nigel Bunnett received the Research Mentor Award from the American Gastroenterological Association Institute on May 7, 2017 during Digestive Disease Week in Chicago, Illinois.

Dr. Rose Fu and co-authors received the *Excellence in Research Award* for their abstract “Breast Cancer Provider Discussion Law Helps Reverse Racial and Economic Disparity in Breast Reconstruction Rates in New York State: An Analysis of 42,137 Patients from the New York State Database.” This research was accepted for an oral presentation in the 2017 Owen H. Wangensteen Scientific Forum of the American College of Surgeons.

Dr. Henry Spotnitz (below) won the Biology Club Cup for his presentation, “Ultraviolet Laser Sleeve for LVAD Driveline Disinfection,” at the annual meeting of the Cardiac Surgery Biology Club of the American Association for Thoracic Surgery at the AATS meeting in Boston, April 29, 2017.



SPECIAL FEATURE

We are pleased to present an interview with Dr. Nigel Bunnett in coordination with the May 31, 2017 release of his landmark article in *Science Translational Medicine*: Neurokinin 1 Receptor Signaling in Endosomes Mediates Sustained Nociception and is a Viable Therapeutic Target for Prolonged Pain Relief. This interview covers the origins of pain and itching, the widespread clinical problems associated with both,

and an exploration of a new pathway that may lead to a new class of more effective palliative drugs, without problematic side effects.

[More here.](#)

CARDIAC SURGERY

Presentations

*American Association of Thoracic Surgery, Centennial Meeting
Boston, May 1-3, 2017*

Blackstone EH, Chang HL, Rajeswaran J, Parides MK, Ishwaran H, Li L, Ehrlinger J, Gelijns AC, Moskowitz AJ, Miller MA, Argenziano MA, DeRose JJ, Dagenais F, Ailawadi G, Smith PK, Acker MA, Mack MJ, O’Gara PT, Gillinov AM. Biatrial Maze procedure versus pulmonary vein isolation in the CTSN randomized trial of surgical ablation of atrial fibrillation during mitral valve surgery.

Fukuhara S, Tran, Han J, Takeda K, Naka Y, Takayama H. Posttransplant outcomes in patients on venoarterial extracorporeal membrane oxygenation: A comparison with population on continuous-flow left ventricular assist device support.

Malaisrie SC, Hodson RW, McAndrew T, Davidson C, Swanson J, Hahn RT, Pibarot P, Jaber W, Quader N, Zajarias A, Svensson L, George I, Trento A, Thourani VH, Szeto WY, Dewey T, Smith CR, Leon MB, Webb JG. Outcomes after transcatheter and surgical aortic valve replacement in intermediate risk patients with preoperative mitral regurgitation: Analysis of PARTNER IIA randomized cohort.

Kalfa D, Belli E, Bacha E, Lambert V, di Carlo D, Kostolny M, Nosal M, Horer J, Salminen J, Rubay J, Yemets I, Hazekamp M, Maruszewski B, Sarris G, Berggren H, Lacour-Gayet F. Outcomes and prognostic factors for acquired pulmonary vein stenosis in the current era.

Nees SN, Flyer JN, Chelliah A, Dayton JD, Kalfa D, Chai PJ, Bacha EA, Anderson BR. Patients with anomalous aortic origin of the coronary artery remain at risk even after surgical repair.

Salna M, Chai PJ, Kalfa DM, Nakamura Y, Krishnamurthy, Najjar M, Shah A, Levasseur S, Anderson BR, Bacha EA. Outcomes of arterial switch operation in <2.5kg neonates: A 10-year study.

Takeda K, Garan AR, Topkara VK, Han J, Kurlansky P, Yuzefpolskaya M, Farr MA, Colombo PC, Naka Y, Takayama H. Ten-year experience with continuous-flow external ventricular assist device: Evolution and improving outcomes in the treatment of refractory cardiogenic shock.

Zwischenberger J, Gleason T, Argenziano M, Bavaria J, Kane L, Coselli J, Engelman R, Tanaka K, Awady A, Sekela M. Use of a novel hemoadsorption technology to reduce

plasma free hemoglobin during complex cardiac surgery: Results for the randomized controlled safety and feasibility REFRESH I trial.

*American College of Cardiology 66th Annual Scientific Sessions
Washington, DC, March 2017*

Brinkman M, Patel A, Chen CH, Nazif T, Khalique O, Liao M, Vahl T, George I, Codner P, Kouz R, Terre J, Jantz J, Leon M, Kodali S, Hahn R. Redefining the classification of severe, symptomatic aortic stenosis using flow and gradient measurements to predict outcomes post-transcatheter aortic valve replacement.

Chen CH, Brinkman M, Khalique OK, Nazif T, Vahl T, George I, Patel A, Codner P, Kouz R, Terre J, Jantz J, Liao M, Leon MB, Kodali SK, Hahn RT. High Baseline Valvuloarterial Impedance Portends Worse 1-Year Outcomes after Transcatheter Valve Replacement.

*Society of Thoracic Surgeons 53rd Annual Meeting
Houston, Texas, January, 2017*

Brevetti ER, George I, Hasting R, Spellman J. A Technique for Supra-Sternal Access for Aortic Valve Replacement.

Langer NB, van Boxtel B, Sorabella RA, Takayama H, Borger MA, Naka Y, Smith CR, George I, Argenziano M. Mitral valve repair versus replacement in patients with functional mitral regurgitation undergoing complex cardiac surgery.

*International Stroke Conference, American Heart Association
Houston, Texas, February 23, 2017*

Valenzuela IA, Klein B, Dunn L, Sorabella R, Han SM, Willey J, George I, Gutierrez J. Predictors of Stroke in Patients with Infective Endocarditis.

Publications

Fukuhara S, Ikegami H, Polanco AR, Song JJ, Han J, Takeda K, Kurlansky PA, Takayama H, Naka Y. Concomitant repair for mild aortic insufficiency and continuous-flow left ventricular assist devices. *Eur J Cardiothorac Surg.* 2017 May 23. doi: 10.1093/ejcts/ezx150. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Gerrah R, Haller SJ, George I. Mechanical Concepts Applied in Congenital Heart Disease and Cardiac Surgery. *Ann Thorac Surg.* 2017 Jun;103(6):2005-2014.

[Journal link](#)

[PubMed](#)

Ji R, Akashi H, Drosatos K, Liao X, Jiang H, Kennel PJ, Brunjes DL, Castellero E, Zhang X, Deng LY, Homma S, George I, Takayama H, Naka Y, Goldberg IJ, Schulze PC. Increased de novo ceramid synthesis and accumulation of ceramides in failing myocardium. *JCI Insight* 2017;4:2(9). pii: 82922. doi: 10.1172/jci.insight.82922. [Epub

ahead of print]

[Journal link](#)

[PubMed link](#)

George I, Guglielmetti LC, Bettinger N, Moss A, Wang C, Kheysin N, Hahn R, Kodali S, Leon M, Bapat V, Borger MA, Williams M, Smith C, Khalique OK. Aortic Valve Annular Sizing: Intraoperative Assessment Versus Preoperative Multidetector Computed Tomography. *Circ Cardiovasc Imaging*. 2017 May;10(5). pii: e005968. doi: 10.1161/CIRCIMAGING.116.005968.

[Journal link](#)

[PubMed link](#)

Bettinger N, Khalique OK, Krepp JM, Hamid NB, Bae DJ, Pulerwitz TC, Liao M, Hahn RT, Vahl TP, Nazif TM, George I, Leon MB, Einstein AJ, Kodali SK. Practical determination of aortic valve calcium volume score on contrast-enhanced computed tomography prior to transcatheter aortic valve replacement and impact on paravalvular regurgitation: Elucidating optimal threshold cutoffs. *J Cardiovasc Comput Tomogr*. 2017 Apr 22. pii: S1934-5925(17)30107-7. doi: 10.1016/j.jcct.2017.04.009. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Blanke P, Pibarot P, Hahn R, Weissman N, Kodali S, Thourani V, Parvataneni R, Dvir D, Naoum C, Nørgaard BL, Douglas P, Jaber W, Khalique OK, Jilaihawi H, Mack M, Smith C, Leon M, Webb J, Leipsic J. Computed Tomography-Based Oversizing Degrees and Incidence of Paravalvular Regurgitation of a New Generation Transcatheter Heart Valve. *JACC Cardiovasc Interv*. 2017 Apr 24;10(8):810-820. doi: 10.1016/j.jcin.2017.02.021.

[Journal link](#)

[PubMed link](#)

Paradis JM, White JM, Généreux P, Urena M, Doshi D, Nazif T, Hahn R, George I, Khalique O, Harjai K, Lasalle L, Labbé BM, DeLarochellière R, Doyle D, Dumont É, Mohammadi S, Leon MB, Rodés-Cabau J, Kodali S. Impact of Coronary Artery Disease Severity Assessed With the SYNTAX Score on Outcomes Following Transcatheter Aortic Valve Replacement. *J Am Heart Assoc*. 2017 Feb 20;6(2). pii: e005070. doi: 10.1161/JAHA.116.005070.

[Journal link](#)

[PubMed link](#)

Langer NB, Hamid NB, Nazif TM, Khalique OK, Vahl TP, White J, Terre J, Hastings R, Leung D, Hahn RT, Leon M, Kodali S, George I. Injuries to the Aorta, Aortic Annulus, and Left Ventricle During Transcatheter Aortic Valve Replacement: Management and Outcomes. *Circ Cardiovasc Interv*. 2017 Jan;10(1). pii: e004735. doi:

10.1161/CIRCINTERVENTIONS.116.004735.

[Journal link](#)

[PubMed link](#)

Khalique OK, Hamid NB, White JM, Bae DJ, Kodali SK, Nazif TM, Vahl TP, Paradis JM, George I, Leon MB, Hahn RT. Impact of Methodologic Differences in Three-Dimensional Echocardiographic Measurements of the Aortic Annulus Compared with Computed Tomographic Angiography Before Transcatheter Aortic Valve Replacement. *J Am Soc Echocardiogr.* 2017 Apr;30(4):414-421. doi: 10.1016/j.echo.2016.10.012. Epub 2016 Dec 6.

[Journal link](#)

[PubMed link](#)

Kalfa D. Pulmonary vasodilator therapy in the Fontan circulation: A world of uncertainties. *J Thorac Cardiovasc Surg.* 2017 Jun;153(6):1466-1467.

[Journal link](#)

[PubMed link](#)

Kurlansky P. Saphenous vein graft patency and fountain of youth. *J Thorac Cardiovasc Surg.* 2017 Apr 4. pii: S0022-5223(17)30631-1. doi: 10.1016/j.jtcvs.2017.03.112. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Popma JJ, Reardon MJ, Khabbaz K, Harrison JK, Hughes GC, Kodali S, George I, Deeb GM, Chetcuti S, Kipperman R, Brown J, Qiao H, Slater J, Williams MR. Early Clinical Outcomes After Transcatheter Aortic Valve Replacement Using a Novel Self-Expanding Bioprosthesis in Patients With Severe Aortic Stenosis Who Are Suboptimal for Surgery: Results of the Evolut R U.S. Study. *JACC Cardiovasc Interv.* 2017 Feb 13;10(3):268-275.

[Journal link](#)

[PubMed link](#)

Stephens EH, Han J, Ginns J, Rosenbaum M, Chai P, Bacha E, Kalfa D. Outcomes and Prognostic Factors for Adult Patients With Congenital Heart Disease Undergoing Primary or Reoperative Systemic Atrioventricular Valve Surgery. *World J Pediatr Congenit Heart Surg.* 2017 May;8(3):346-353.

[Journal link](#)

[PubMed link](#)

Welch D, Randers-Pehrson G, Spotnitz HM, Brenner DJ. Unlaminated GAFchromic EBT3 film for ultraviolet radiation monitoring. *Radiat Prot Dosimetry* 2017 1-6. doi: 10.1093/rpd/ncx016.

[Journal link](#)

[PubMed link](#)

CIOR (CENTER FOR INNOVATION AND OUTCOMES RESEARCH)

Presentations

*International Society for Pharmacoeconomics and Outcomes Research (ISPOR)
22nd Annual International Meeting
Boston MA, May 20-24, 2017*

Borra S, Cao Y, Wang L, Baser O. Assessing the economic burden and 30-day readmission rates among patients with urinary tract infection in the US Veterans Health Administration population.

Borra S, Cao Y, Wang L, Baser O. Assessing the economic burden and 30-day readmission rates among patients with pneumonia in the US Veterans Health Administration population.

Borra S, Cao Y, Wang L, Baser O. Assessing the economic burden and 30-day readmission rates among patients with clostridium difficile infection in the US Veterans Health Administration population.

Lin Y, Ogbomo A, Wang Y, Xie L, Yuce H, Baser O. A descriptive analysis of the health care utilization and costs of patients diagnosed with myelodysplastic syndrome in the US Medicare population.

Ogbomo A, Lin Y, Wang Y, Xie L, Yuce H, Baser O. A descriptive analysis of the health care utilization and costs of patients diagnosed with lymphoma in the US Medicare population.

Vaidya N, Tan H, Xie L, Wang Y, Baser O. Evaluating the economic burden and health care utilization of rheumatoid arthritis patients in the US Department of Defense population.

Xie L, Vaidya N, Wang Y, Tan H, Baser O. Evaluating the economic burden and health care utilization of prostate cancer patients in the US Department of Defense population.

Du J, Xie L, Keshishian A, Zhang Q, Yuce H, Baser O. Assessing the hospital readmission and mortality rates among elderly patients with chronic obstructive pulmonary disease.

Xie L, Zhang Q, Baser O, McGuire M. Examining the health care resource use and economic costs associated with acute myeloid leukemia among Medicare patients.

*American Thoracic Society (ATS) International Conference 2017
Washington, DC, May 19-24, 2017*

Ganapathy V, Xie L, Keshishian A, Zhang Q, Baser O. Continuing care with nebulized bronchodilators after hospital discharge and impact on readmissions: Analysis of Medicare COPD beneficiaries receiving arformoterol vs nebulized short-acting agents.

Publications

Keshishian A, Boytsov N, Burge R, Krohn K, Lombard L, Zhang X, Xie L, Baser O. Examining the treatment gap and risk of subsequent fractures among females with a fragility fracture in the US Medicare population. *Osteoporos Int*. 2017 May 23. doi: 10.1007/s00198-017-4072-6. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Bent-Ennakhil N, Coste F, Xie L, Aigbogun MS, Wang Y, Kariburyo F, Hartry A, Baser O, Neumann P, Fillit H. A Real-world Analysis of Treatment Patterns for Cholinesterase Inhibitors and Memantine among Newly-diagnosed Alzheimer's Disease Patients. *Neurol Ther*. 2017 May 15. doi: 10.1007/s40120-017-0067-7. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

GI/ENDOCRINE

Presentations

Digestive Diseases Week 2017
Chicago, IL, May 6-10, 2017

YongYan Cui, Lauren G. Khanna, Anjali Saqi, John Crapanzano, James M. Mitchell, Beth Schrope, Frank G. Gress, Michael D. Kluger, Tamas Gonda, Amrita Sethi, John A. Chabot, John M. Ponerros, Su1334 Eus-Fna in Surgically Proven Pancreatic Neuroendocrine Tumors: A Large Single Center Experience.

Valerie Gausman, Pujan Kandel, Priscilla A. van Riet, Maria Moris Felgueroso, Maia Kayal, John M. Ponerros, Amrita Sethi, Frank G. Gress, Beth Schrope, Lyndon Luk, Elizabeth Hecht, Marco J. Bruno, Djuna Cahen, Michael B. Wallace, Tamas A. Gonda, Mo1304: Predictors of Progression Among Low Risk IPMNs in a Large Multicenter Surveillance Cohort Study.

Society of Surgery of the Alimentary Tract 58th Annual Meeting
Chicago, IL, May 6-9, 2017

Michael D. Kluger, M.F. Rashid, Beth Schrope, John A. Chabot. After Modern-Era Neoadjuvant Therapy Without Regression of Arterial Encasement in Locally Advanced Non-Metastatic Pancreatic Cancer.

*Annual Pancreas Club Meeting
San Diego, CA, May 5-6, 2017*

Michael D Kluger, Farzan Rashid, Beth A Schrope, John A Chabot. Comparison of Distal Pancreatectomy Operations at a High Volume Pancreatic Surgery Program.

Publications

Najjar M, Taylor A, Agrawal S, Fojo T, Merkler AE, Rosenblum MK, Lennihan L, Kluger MD. Anti-Hu paraneoplastic brainstem encephalitis caused by a pancreatic neuroendocrine tumor presenting with central hypoventilation. *J Clin Neurosci*. 2017 Jun; 40:72-73.

[Journal link](#)

Rutkoski, J, Schrope, B, Lee, B, Survival Following Gastro-Left Ventricular Fistula in a Patient Post Roux-en-Y Gastric Bypass, *Ann Thorac Surg* 2017;103:e51-3.

[Journal link](#)

[PubMed link](#)

Book Chapters

Schrope, B, "Management of Acute and Chronic Pancreatitis: Focus on Surgical Management," chapter in: *Evidence-Based Practices in Gastrointestinal, Colorectal and Hepatobiliary Surgery*, Ed. b by G Nondakumar, Jaypee Publishing, 2017.

[Journal link](#)

PEDIATRIC SURGERY

Presentations

*27th Annual Meeting of the Society of Black Academic Surgeons
Chicago, IL, April 27-29, 2017*

Cherease Street, BS, Shunpei Okochi, MD, Sunjay M. Barton, BS, Debarshi Banerjee, PhD, Robyn D. Gartrell, MD, Yan Lu, MD, Darrell J. Yamashiro, MD, PhD, Eileen P. Connolly, MD, PhD, Angela Kadenhe-Chiweshe, MD Combined high dose radiation therapy and checkpoint blockade inhibits tumor growth and potentiates immune cell infiltrate in a syngeneic murine model of neuroblastoma.

*American Association of Thoracic Surgery Centennial
Boston, MA, 2017*

Shieh HF, Smithers CJ, Hamilton TE, Zurakowski D, Visner GA, Manfredi MA, Jennings RW, Baird CW. Descending Aortopexy and Posterior Tracheopexy for Severe Tracheomalacia and Left Mainstem Bronchomalacia.

48th Annual Meeting American Pediatric Surgical Association

May 4-7, 2017, Hollywood, FL

Graham CD, Shieh HF, Karabas M, Zurakowski D, Hansen A, Fauza DO. Hydrostatic Intraluminal Esophageal Stretch: Prototype Fabrication and Initial Safety Testing in a Large Animal Model.

Lynnnch L, Schapiro D, Shek J, Breitfeller E, Zitsman JL, Byrne EJ. Weight Loss Surgery Decreases Idiopathic Intracranial Hypertension in 9 year old Female with Pseudo Tumor Cerebri and BMI >99%ile for Sex and Age.

Okochi S, Bain JM, Street C, Shakoor A, Streltsova S, Aspelund G, Cheung EW, Middlesworth W. Outcomes of continuous electroencephalographic monitoring on pediatric extracorporeal membrane oxygenation patients.

Okachi S, Street C, Barton SM, Banerjee D, Gartrell RD, Lu Y, Yamashiro DJ, Connolloy EP, Kadenhe-Chiweshe A. Sustained inhibition of tumor growth by combined high dose radiation and checkpoint blockage in a syngeneic mouse model of high-risk neuroblastoma.

Shieh HF, Ahmed A, Tracy SA, Zurakowski D, Fauza DO. Fetal Bone Marrow Homing of Donor Mesenchymal Stem Cells after Transamniotic Stem Cell Therapy (TRASCET).

Shieh HF, Smithers CJ, Hamilton TE, Zurakowski D, Visner GA, Manfredi MA, Baird CW, Jennings RW. Posterior Tracheopexy for Severe Tracheomalacia Associated with Esophageal Atresia (EA): Primary Treatment at the Time of Initial EA Repair Versus Secondary Treatment.

Publications

Feng C, Graham CD, Shieh HF, Brazzo JA 3rd, Connors JP, Rohrer L, Papadakis A, Zurakowski D, Fauza DO. Transamniotic stem cell therapy (TRASCET) in a leporine model of gastroschisis. *J Pediatr Surg*. 2017 Jan;52(1):30-34. doi: 10.1016/j.jpedsurg.2016.10.016. Epub 2016 Oct 26.

[Journal link](#)

[PubMed link](#)

Graham CD, Shieh HF, Brazzo JA 3rd, Zurakowski D, Fauza DO. Donor mesenchymal stem cells home to maternal wounds after transamniotic stem cell therapy (TRASCET) in a rodent model. *J Pediatr Surg*. 2017 Mar 18. pii: S0022-3468(17)30176-8. doi: 10.1016/j.jpedsurg.2017.03.027. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Shieh HF, Jennings RW. Three-dimensional printing of external airway splints for tracheomalacia. *J Thorac Dis* 2017; 9(3): 414-6.

[Journal link](#)

[PubMed link](#)

Shieh HF, Barnewolt CE, Wilson JM, Zurakowski D, Connolly SA, Estroff JA,

Zaliecckas J, Smithers CJ, Buchmiller TL. Percent predicted lung volume changes on fetal magnetic resonance imaging throughout gestation in congenital diaphragmatic hernia. *J Pediatr Surg.* 2017 Mar 16. pii: S0022-3468(17)30162-8. doi: 10.1016/j.jpedsurg.2017.03.013. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Shieh HF, Smithers CJ, Hamilton TE, Zurakowski D, Rhein LM, Manfredi MA, Baird CW, Jennings RW. Posterior tracheopexy for severe tracheomalacia. *J Pediatr Surg.* 2017 Mar 18. pii: S0022-3468(17)30167-7. doi: 10.1016/j.jpedsurg.2017.03.018. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Shieh HF, Graham CD, Brazzo JA 3rd, Zurakowski D, Fauza DO. Comparisons of human amniotic mesenchymal stem cell viability in FDA-approved collagen-based scaffolds: Implications for engineered diaphragmatic replacement. *J Pediatr Surg.* 2017 Mar 16. pii: S0022-3468(17)30173-2. doi: 10.1016/j.jpedsurg.2017.03.024. [Epub ahead of print]

[Journal link](#)

[PubMed link](#)

Shieh HF, Wilson JM, Sheils CA, Smithers CJ, Kharasch VS, Becker RE, Studley M, Morash D, Buchmiller TL. Does the ex utero intrapartum treatment to extracorporeal membrane oxygenation procedure change morbidity outcomes for high-risk congenital diaphragmatic hernia survivors? *J Pediatr Surg.* 2017 Jan;52(1):22-25

[Journal link](#)

[PubMed link](#)

PLASTIC SURGERY

Presentations

*18th annual meeting of the American Society of Breast Surgeons
Las Vegas, Nevada, April 2017*

Ascherman J. Novel approaches to breast reconstruction.