



Late-Breaking Abstracts

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Presenting authors are listed in **bold** on each abstract. Abstract content appears as it was submitted; only titles have been edited for clarity and consistency.

Please note: This abstract will be presented at 8:45 AM in the Grand Ballroom during General Session I, which will be held from 7:00 AM to 10:50 AM on Monday, January 29.

Rates of Mitral Valve Repair or Replacement for Severe Ischemic Mitral Regurgitation in the United States: Defining the Real-World Impact of the NHLBI CTSN Trial on Clinical Practice

V. H. Thourani¹, S. Vemulapalli², M. A. Acker³, Y. J. Woo⁴, S. N. Zhang², J. S. Gammie⁵, A. C. Gelijns⁶, P. O'Gara⁷, G. Ailawadi⁸, M. R. Moon⁹, S. N. Jung², V. Badhwar¹⁰, D. H. Adams¹¹, R. M. Suri¹², S. F. Bolling¹³, A. M. Gillinov¹², R. E. Michler¹⁴, L. P. Perrault¹⁵, P. K. Smith¹⁶, D. J. Goldstein¹⁷, M. Argenziano¹⁸, J. E. Bavaria³, J. P. Jacobs¹⁹, M. A. Miller²⁰, R. D. Weisse²¹, M. J. Mack²²

¹Medstar Washington Hospital Center/Georgetown University, Washington, DC, ²Duke Clinical Research Institute, Durham, NC, ³University of Pennsylvania Medical Center, Philadelphia, ⁴Stanford University School of Medicine, CA, ⁵University of Maryland School of Medicine, Baltimore, ⁶Icahn School of Medicine at Mount Sinai, New York, NY, ⁷Brigham and Women's Hospital, Boston, MA, ⁸University of Virginia, Charlottesville, ⁹Washington University, St Louis, MO, ¹⁰West Virginia University, Morgantown, ¹¹Mount Sinai Medical Center, New York, NY, ¹²Cleveland Clinic, OH, ¹³University of Michigan Health System, Ann Arbor, ¹⁴Montefiore Medical Center/Albert Einstein College of Medicine, New York, ¹⁵Montreal Heart Institute, Canada, ¹⁶Duke University Medical Center, Durham, NC, ¹⁷Montefiore Medical Center, Bronx, NY, ¹⁸Columbia University College of Physicians and Surgeons, New York, NY, ¹⁹Johns Hopkins All Children's Hospital, St Petersburg, FL, ²⁰National Heart, Lung, and Blood Institute, Bethesda, MD, ²¹Toronto General Hospital, Canada, ²²The Heart Hospital Baylor Plano, TX

COMMERCIAL RELATIONSHIPS G. Ailawadi: Consultant/Advisory Board, Abbott, Cephea, Edwards Lifesciences, Medtronic; J. E. Bavaria: Research Grant, Abbott, Edwards Lifesciences, Medtronic, W. L. Gore & Assoc; J. S. Gammie: Ownership Interest, Edwards Lifesciences, Harpoon Medical; Consultant/Advisory Board, Harpoon Medical; A. M. Gillinov: Ownership Interest, Clear Catheter Systems; Research Grant, Abbott; Consultant/Advisory Board, Abbott, AtriCure, Clear Catheter Systems, CryoLife, Edwards Lifesciences, Medtronic; Speakers Bureau/Honoraria, AtriCure; D. J. Goldstein: Research Grant, Abbott; Consultant/Advisory Board, Ethicon; M. J. Mack: Research Grant, Abbott Vascular, Edwards Lifesciences, Medtronic; P. O'Gara: Consultant/Advisory

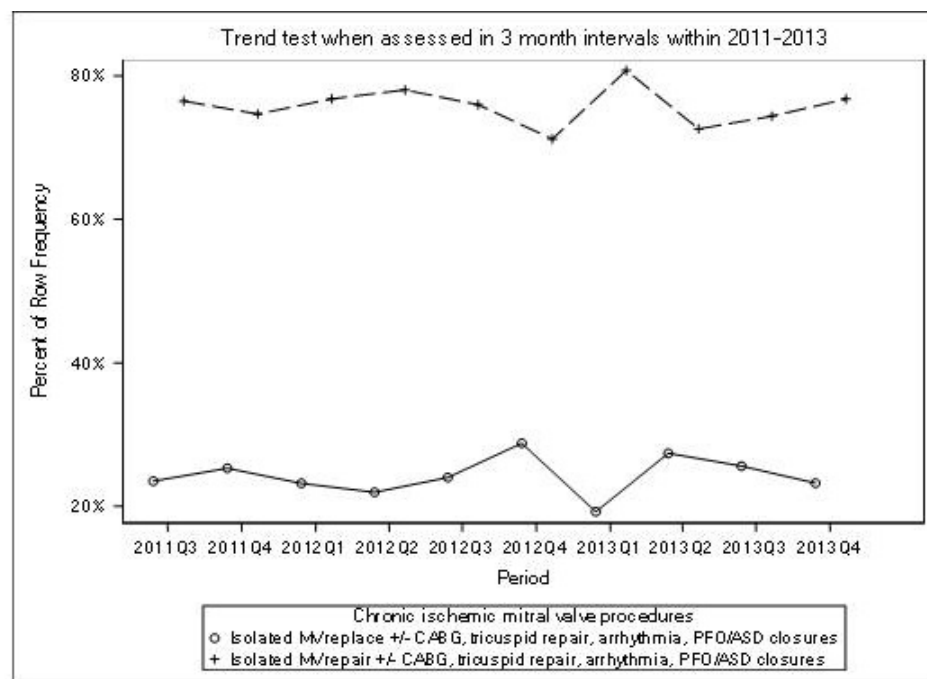
Purpose: The NHLBI CTSN trial, published in January 2014, randomized patients with severe ischemic mitral regurgitation (IMR) to either mitral valve (MV) repair or replacement. We sought to evaluate the impact of the CTSN trial on rates of MV repair or replacement for severe IMR and document 1-year clinical outcomes.

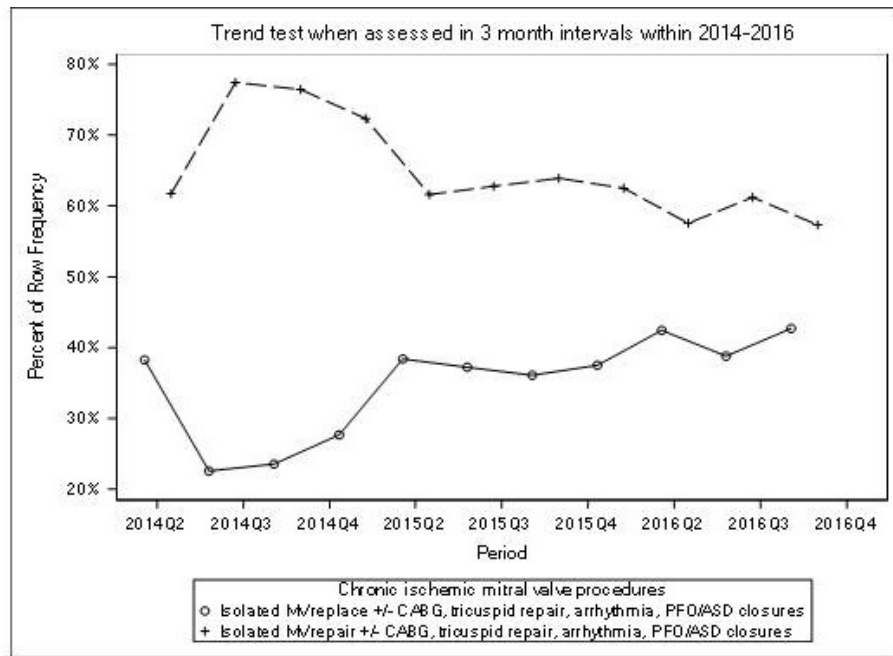
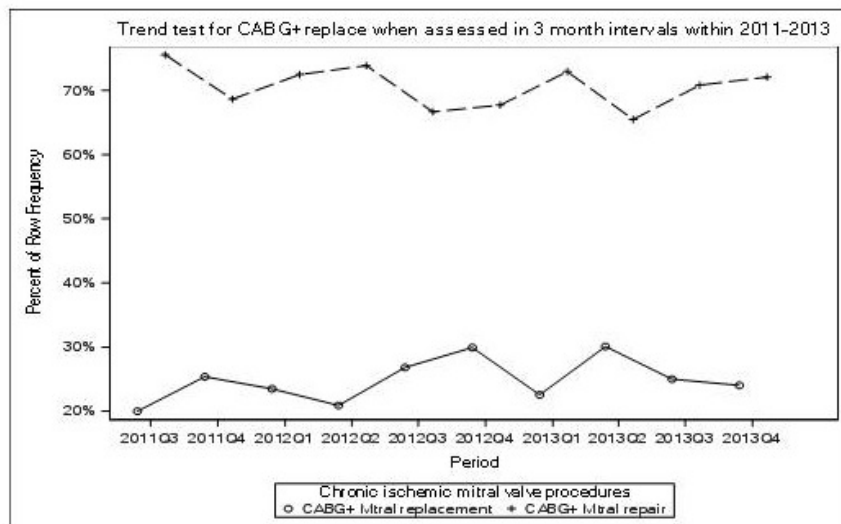
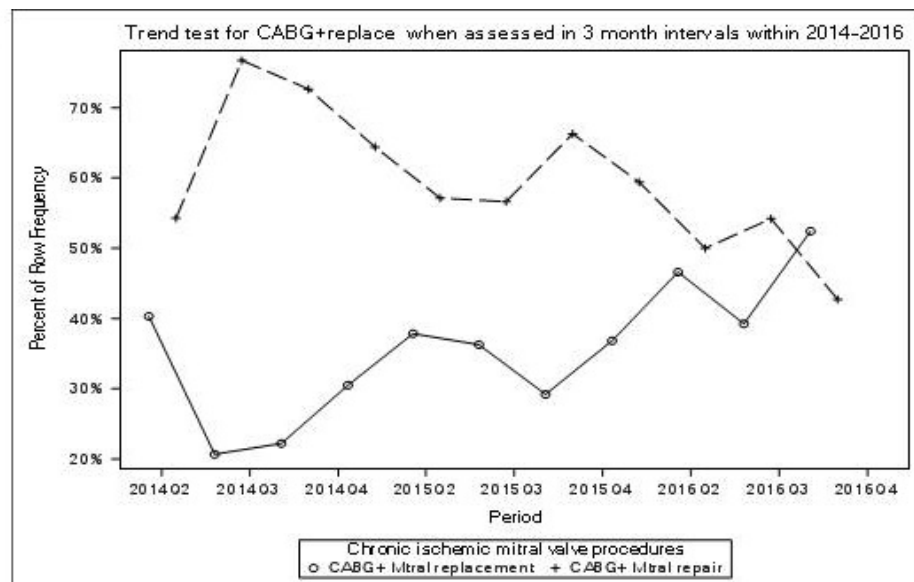
Methods: From 2011 through 2015, 4,440 patients in 1,131 STS ACSD participant sites underwent MV repair or replacement for severe IMR. Concomitant operations other than CABG, tricuspid surgery, atrial ablation/septal closure were excluded. Rates of MV repair vs. replacement were compared before and after CTSN trial publication inclusive of a 4-month interpretive blanking period. Risk-adjusted 1-year outcomes of mortality, stroke, and heart failure (HF) readmissions were compared through linkage to CMS claims. To adjust for the potential impact non-surgical cardiovascular care improvement over time, an instrumental variable analysis of HF undergoing CABG was applied before vs. after CTSN publication.

Results: Prior to 1/2014, 550 patients (24.2%) underwent replacement and 1,721 (75.8%) repair. After 4/2014, 755 (34.8%) underwent replacement and 1,414 (65.2%) repair ($p < 0.0001$, Figures 1A-1B). For all patients, 1-year mortality was similar in the early group vs. later (17.6% vs. 17.8%, $p = 0.814$). HF readmission for all patients was lower in the later period [23.5% vs. 12.6%, $p < 0.001$; HR 0.53(0.38,0.75)]. Instrumental variable analysis confirmed this reduction was greater than could be attributed to HF care improvement alone ($p = 0.03$). Repair readmission was significantly lower in the later period (23.8% vs 10.2%), though this was not as substantial for replacement (23.4% vs. 16.6%). Increased CABG+replacement trend vs. CABG+repair was observed following CTSN publication ($p < 0.0001$, Figures 1C-1D). There was no difference in 1-year mortality between groups for CABG+MV surgery ($p = 0.214$); however, HF readmission was lower in the later period [21.7% vs. 12.9%, $p = 0.006$; HR 0.53(0.36,0.78)]. Early and 1-year mortality comparing repair/replacement in the early/late periods will be presented.

Conclusions: Following the NHLBI CTSN publication in January 2014, the rates of MV replacement for severe IMR increased significantly in the U.S. Though mortality in the later time period did not improve significantly, the rate of CHF readmission decreased. Continued long-term analysis of the optimal treatment of severe IMR is warranted.

A



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Monday, January 29

4:15 PM – 5:15 PM

Room 304

This Just In: Late-Breaking Research Results and Novel Ideas

Moderators: *Jehangir J. Appoo, Calgary, Canada, Ikenna C. Okereke, Galveston, TX, and James S. Tweddell, Cincinnati, OH*

COMMERCIAL RELATIONSHIPS J. J. Appoo: Consultant/Advisory Board, W. L. Gore & Assoc

4:15 PM

Characterizing the Transcriptional Signature of Growth in Late Fetal Aortic Valve Development

D. G. Gottlieb Sen¹, A. Halu², M. A. Razzaque³, J. M. Gorham⁴, J. G. Seidman⁴, C. E. Seidman⁴

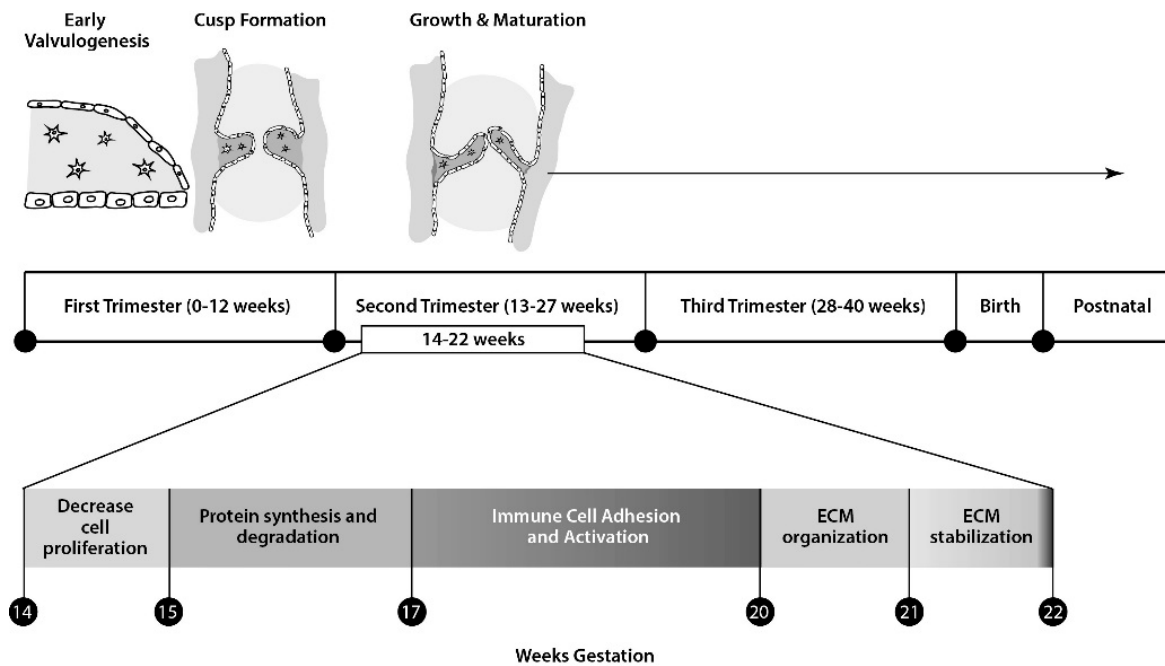
¹Children's Hospital New Orleans/LSU Health Sciences Center, LA, ²Brigham and Women's Hospital, Boston, MA, ³LSU Health Sciences Center, New Orleans, LA, ⁴Harvard Medical School, Boston, MA

Purpose: In the second trimester of human fetal development, a tenfold increase in fetal size occurs; valves grow while retaining competent function. We sought to characterize patterns of transcription in normally growing human aortic valves during the second trimester with the long-range goal of identifying targets for intervention in hypoplastic valves.

Methods: Discarded human aortic valve samples were collected during the second trimester of gestation and dissected for optimal preservation of RNA. Two samples were collected per time point at 14, 15, 17, 20, 21 and 22 weeks gestation. RNA was extracted in Trizol and processed through an established pipeline for sequencing of cDNA libraries on the Illumina NextSeq 500. Data were normalized to the total number of reads per kilobase of exon per million. Results were analyzed using established bioinformatics algorithms to identify patterns of transcription, and individual gene expression changes, through the time course. P-values were corrected for multiple comparisons.

Results: We confirm the previous observation that late fetal valve development is characterized by a decrease in cell proliferation and an increase in extracellular matrix (ECM) production (Figure). Genes involved in early valvulogenesis have a role in late fetal valve development. We observed phases of transcriptional regulation over the time course, including a decrease in the machinery of cell proliferation between 14-15 weeks; negative regulation of cell proliferation, positive regulation of cell death and apoptosis were among the most upregulated biological processes. Subsequently, we observed a general increase in protein synthesis and degradation (15-17 weeks), then a phase of cell adhesion and adaptive immune regulation (17-20 weeks), then subsequent ECM organization and stabilization (20-22 weeks). Biological processes most upregulated between 20 and 21 weeks include extracellular matrix organization genes, ECM proteoglycans, integrin cell surface interactions, and ECM-receptor interactions. Established and novel developmental pathways were also identified through the time course.

Conclusions: We present unique and novel data characterizing human valve development after valve primordia are formed, focusing on key processes displayed by normal fetal aortic valves undergoing significant growth. Critical valve growth genes are potential targets for therapeutic intervention in congenital heart disease and have implications for regenerative medicine.



4:27 PM

Enhanced Recovery for Minimally Invasive Esophagectomy: Results From a Randomized Controlled Trial

L. Tan

Zhongshan Hospital, Shanghai, China

Purpose: Even when minimally invasive technique is applied, the surgical resection of esophageal cancer risks in complications and prolonged length of stay in hospital. In this randomized and controlled trial (ChiCTR—IOR-17010631), we aimed to assess whether an enhanced recovery after surgery (ERAS) protocol would benefit patients underwent esophagectomy.

Methods: Esophageal cancer patients underwent minimally invasive esophagectomy (MIE) were prospectively enrolled and randomly assigned to the group with ERAS (ERAS+) or without ERAS (ERAS-). The ERAS protocol, including pre-operative preparation, intra-operative fluid infusion management and post-operative early oral intake and mobilization, was devised and implemented with the support of a dedicated interdisciplinary team. Clinical features were collected and compared. The primary outcome was the morbidity of complications. The secondary outcomes were the duration of postoperative hospitalization, cost of hospitalization and readmission rate within 30 days of discharge. In addition, we also evaluated potential relevant clinical factors of successful ERAS application.

Results: Between March 2015 and January 2016, 110 patients (ERAS+:54 and ERAS-: 56) were included in the study. No statistically significant differences were found in terms of postoperative adverse events (ERAS+: 18 vs ERAS-: 23, $p=0.401$), cardiovascular complication (ERAS+: 3 vs ERAS-: 2, $p=0.676$), anastomotic leakage (ERAS+: 5 vs ERAS-: 10, $p=0.189$), Clavien-Dindo complication severity scores ($p=0.5$) and cost of hospitalization (median ERAS+: ¥85089 vs ERAS-: ¥83158, $p=0.77$). The length of post-operative stay was shorter in ERAS+ (median length: 9 versus 10 days, average length: 12.5 versus 19.4 days), but it was not significantly different ($p=0.248$). Notably, the ERAS+ showed significantly decreased pulmonary complication (ERAS+: 8 vs ERAS-: 19, $p=0.02$). No readmission within 30 days occurred in this study. The failure rate of our ERAS protocol was 27.8%. There was no association between failure ERAS and clinical factors including age, sex, BMI, ASA grade, application of neoadjuvant therapy and tumor stage.

Conclusions: From our study, the introduction of ERAS to MIE could result in a reduction in pulmonary complications. However, its application did not reduce overall postoperative adverse events, duration of postoperative hospitalization and total cost of hospitalization. Further study based on larger population would be required to confirm these findings.

Table 1 Major differences between ERAS+ and ERAS- group		
	ERAS+ Group	ERAS- Group
Preoperation	Fasting for 6 hours (solids) and 2 hours (clear fluids) Oral intake of 10% glucose fluid (8-10ml/kg) 2-6 hours ahead of surgery	Fasting for 10 hours (solids) and 4 hours (clear fluids)
Intraoperation	Goal directed fluid regimen Placement of nasojunal tube, chest drain and mediastinal drain	Conventional fluid regimen Placement of nasogastric tube, nasojunal tube, chest drain and mediastinal drain
Postoperation	Removal of chest drain (if <200 mL/24 h) Oral intake resumed on POD 4 after contrast swallow test ruling out anastomotic leakage Early and progressive mobilization (eg. sitting out in chair on POD 1, assisted walk on POD 2)	Removal of chest drain (if <100 mL/24 h) Oral intake resumed on POD 7 after contrast swallow test ruling out anastomotic leakage

4:39 PM

Surgeon-Specific Performance Monitoring System for Cardiovascular Surgery

D. N. Gu, Z. Z. Zheng, D. N. Li, X. N. Zhang, W. N. Zhao

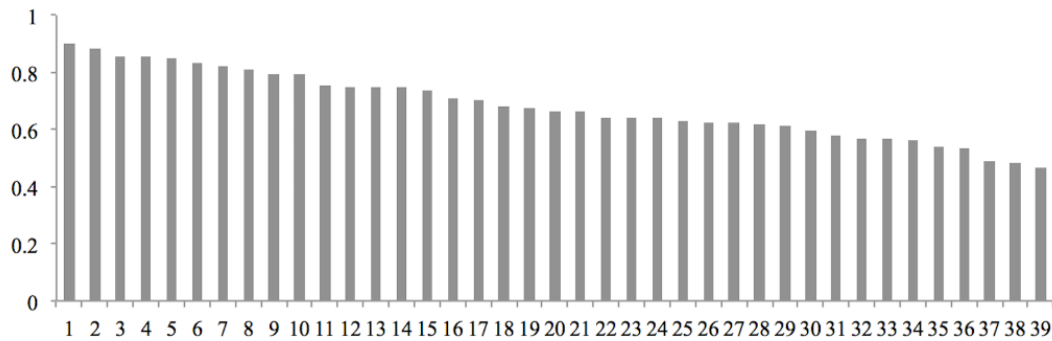
National Center for Cardiovascular Diseases, Fuwai Hospital, Beijing, China

Purpose: There is an increasing emphasis on measuring and improving the performance of individual cardiovascular surgeons. However, quality monitoring system, which matches the requirements of surgeon-specific quality measurement and reporting, is still not well established. This study reported an systematic, mobile-based, multiprocedure, multidimensional system for composite measure and automatic reporting of individual surgeon performance for cardiovascular surgery.

Methods: This study included surgeons who performed at least one cardiovascular surgery in a single center in Beijing, China. Surgical and outcomes data was automatically derived and updated from structured electronic health records (EHRs). End points included risk adjusted in-hospital mortality and morbidity, blood transfusion, mean duration of postoperative hospital stay, and mean hospital cost. Each surgeon's composite score was calculated using the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method. Surgeons who performed same type of surgeries were ranked and classified into lower, intermediate, and higher quartiles. The results were automatically reported through mobile-based platform to the client-applications of surgeons.

Results: A total of 60 surgeons, who achieved 12606 cardiac surgeries from Jan 1, 2015 to Dec 30, 2015, were included in the analysis. EHR-derived data provided accurate, comprehensive, and real-time information on surgical quality without extra efforts. Surgeons' composite scores were calculated and presented as the Euclidean distance, which was the relative distance to the defined best performance. The relative closeness of each surgeon's CABG performance to the best performance ranged from 0.46 to 0.90, which suggested significant variations among surgical performance in this single center. After the classification of surgeons' performance, rate of in-hospital mortality and morbidity in the lower, intermediate, and higher quartiles were 1.8%, 2.8%, and 3.1% respectively. The quality report for each surgeon displayed individual data in comparison with the average level, and was renewed and sent to surgeons' mobile client applications weekly. This interactive application was widely accepted and used, which enable surgeons to easily get access to their performance reports at anytime and anywhere.

Conclusions: We have developed a surgeon-specific quality monitoring system based on a well-established cycle of informatized data collection, data analysis, and feedback. This system will facilitate quality reporting, peer comparison, and gaps identification for surgeons, and strengthen the effect of quality improvement initiatives. This example will also be a reference to future works.



Performance of surgeons ranked in accordance with their Euclidean distances

Observed Rates by Quartiles of Ranking

	Low (~25%)	Intermediate (25%~75%)	High (75%~)
Surgeons—No.	10	20	9
Operations—No.	860	2074	995
Operative mortality and morbidity—No. (%)	18 (1.8)	(58) 2.8	(27) 3.1
Free of blood utility—No. (%)	753 (75.7)	1386 (66.8)	481 (55.9)
Duration of postoperative hospital stay—days	8.4±3.3	7.9±3.1	7.2±2.4
Hospital cost—thousand yuan	94.3±31.6	85.8±24.4	82.6±26.0

4:51 PM

A Clinical Trial of Near-Infrared Fluorescence Guided Surgery to Improve Identification of Macroscopic Residual Disease During Pleurectomy and Decortication

J. Predina, A. D. Newton, C. J. Corbett, L. Frenzel Sulyok, M. H. Shin, T. M. Busch, E. W. Alley, J. C. Kucharczuk, S. Singhal

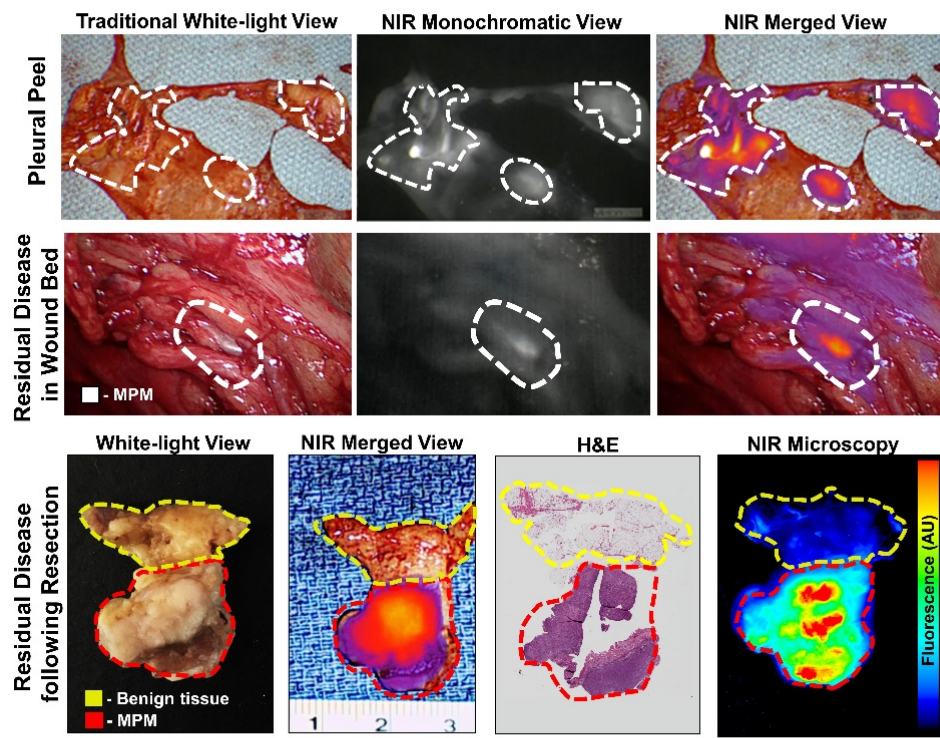
University of Pennsylvania School of Medicine, Philadelphia

Purpose: Macroscopic complete resection can provide a select group of malignant pleural mesothelioma (MPM) patients improved survival. During resection, differentiating residual tumor from inflammation or scar can be challenging. In this trial we evaluate the ability of near-infrared (NIR) intraoperative imaging using indocyanine-green (ICG) to improve detection of residual macroscopic disease.

Methods: Twenty subjects with confirmed MPM were enrolled in an open-label clinical trial of NIR intraoperative imaging (NCT02280954). Twenty-four hours prior to pleurectomy and decortication, patients received intravenous ICG (5mg/kg). Patients then underwent standard-of-care pleurectomy and decortication. Following what was felt to be macroscopic complete resection, the hemithorax was evaluated with NIR imaging to assess for residual disease deposits. When possible, additional fluorescent lesions were resected. All specimens identified during the standard-of-care resection and with NIR imaging underwent histopathologic profiling and correlative microscopic fluorescent tomographic evaluation. A tumor-to-background fluorescence ratio (TBR) greater than 2.0 was considered fluorescent.

Results: ICG infusion was well tolerated, with only two patients (10.0%) experiencing transient drug related toxicity (IV-site pain and nausea). The addition of NIR imaging added a mean of 8 minutes (range, 5-13 minutes) to case duration. Of the 202-resected specimens submitted for evaluation, ICG accumulated within 148 of 148 (100%) of resected mesothelioma specimens, with a mean TBR of 3.1 (SD, 2.2-4.8). The mean TBR of benign tissues was 2.2 (SD, 1.4-2.4), which was significantly lower than within malignant specimens ($p=0.001$). NIR imaging identified occult macroscopic residual disease in 14 of 20 subjects (70%). A mean of 4.0 resectable residual deposits per patient (range, 1-11 deposits/patient) with mean size of 0.3cm (range 0.1-1.5cm) were identified. Occult macroscopic lesions were generally identified in areas of significant pleural stripping where acute inflammation and blood shielded them from traditional visual identification and palpation.

Conclusions: NIR fluorescence guided surgery with ICG in MPM is safe and feasible. NIR imaging provides excellent sensitivity and can reliably identify occult macroscopic disease that persists following cytoreductive surgery. This technology may provide an approach to improve surgery and possibly long-term outcomes for patients with resectable MPM.



ICG accumulates in MPM and identifies occult macroscopic residual disease following resection. Specimens resected by standard-of-care approaches underwent macroscopic fluorescent profiling using a combination of standard white-light, NIR monochromatic, and NIR merged views (top row). Following standard-of-care pleurectomy and decortication, the ipsilateral hemithorax was evaluated with NIR imaging to determine if residual disease was present (middle row). All resected specimens then underwent a series of fluorescent and histopathologic correlative analyses to determine accuracy and patterns of dye accumulation (bottom row). White gate—macroscopic tumor foci; yellow gate—benign tissue by histopathologic analysis; red gate—MPM by histopathologic analysis.

5:03 PM

Should Saphenous Vein Grafts Be Totally Abandoned in Favor of Total Arterial Revascularization? Insights From the Arterial Revascularization Trial

U. Benedetto¹, D. Altman², M. Flather³, S. Gerry², A. M. Gray², G. Angelini¹, D. P. Taggart⁴

¹University of Bristol, United Kingdom, ²University of Oxford, United Kingdom, ³Norwich Medical School, United Kingdom, ⁴John Radcliffe Hospital, Oxford, United Kingdom

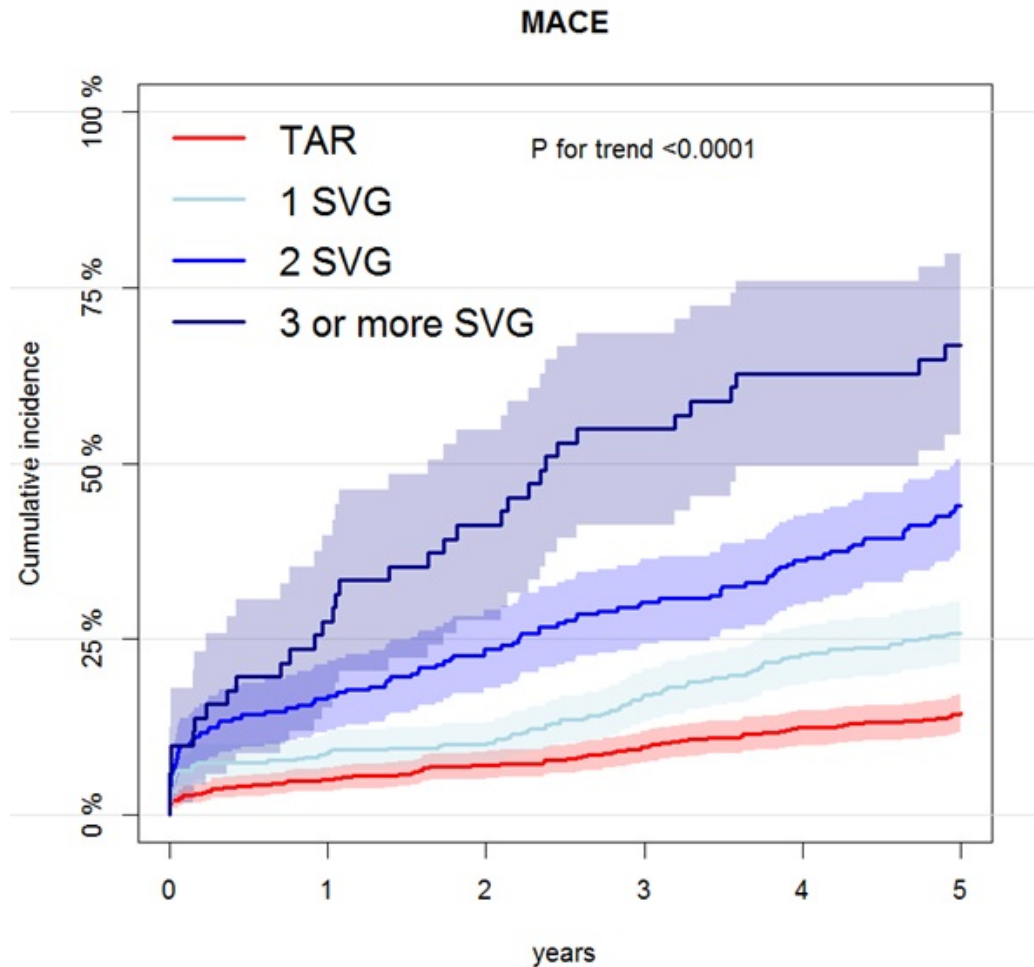
COMMERCIAL RELATIONSHIPS D. P. Taggart: Ownership Interest, VGS; Research Grant, Medistim, VGS; Consultant/Advisory Board, Stryker; Speakers Bureau/Honoraria, Medistim, Medtronic, Stryker, VGS; Other Research Support, VGS

Purpose: The ART showed comparable 5-year results with single vs. bilateral internal thoracic artery (BITA v sSITA) grafts. However, 65% of BITA grafts were supplemented with additional saphenous vein grafts (SVG) which might have neutralised a BITA effect. We aimed to investigate the effect of Total Arterial Revascularization (TAR, without SVG) by post-hoc analysis of ART.

Methods: Patients from ART (n=3102) were classified as TAR or non-TAR according to surgery actually received depending on the use of SVG. Only those receiving at least 2 grafts were included. Patients with no information on conduits used (n=25) and those who received 1 graft only (n=20) were excluded. Finally we compared 683 patients receiving TAR (TAR group) vs 2374 patients receiving at least 1 SVG (no-TAR group). The primary outcome was the composite of major adverse cardiac events (MACE) including death, myocardial infarction (MI) and repeat revascularization. Propensity matching and Cox regression were used to estimate TAR effect on outcomes.

Results: Propensity matching created 683 comparable matched pairs (Table 1). Hospital mortality occurred in 10(1.5%) and 20 (2.9%) patients in TAR vs no-TAR group respectively ($P=0.13$). At 5 years, MACE occurred in 97 (14.5%) and 235 (35.0%) patients in the TAR and no-TAR group respectively. After full adjustment, TAR was associated with a significantly lower risk of MACE (adjusted HR 0.34; 95%CI 0.30-0.44; $P<0.0001$). TAR was associated with a significantly lower risk of all-cause mortality (adjusted HR 0.39, 95%CI 0.28-0.54; $P<0.0001$), MI (0.35; 95%CI 0.21-0.60: $P=0.0001$) and repeat revascularization (HR 0.35; 95%CI 0.24-0.51; $P<0.0001$). We found an increasing risk of MACE with increasing number of SVG performed (P for trend <0.0001 ; Figure 1). In those receiving at least 1 SVG, the total number of arterial grafts used did not significantly reduce the risk of MACE (P for trend $=0.1$).

Conclusions: The present post-hoc ART analysis showed that the exclusive use of arterial grafts during CABG was associated with a significantly lower rate of MACE and the higher the number of SVG the higher the risk of MACE. TAR should be the focus of future research in coronary bypass surgery.



	TAR	No-TAR (original)	SMD	No-TAR (matched)	SMD
n	683	2374		683	
Age (mean (sd))	63 (9)	64 (9)	0.14	63 (9)	0.038
female n(%)	114 (16.7)	318 (13.4)	0.09	115 (16.8)	0.004
ethnicity n(%)			0.13		0.034
Caucasian	635 (93.0)	2171 (91.4)		639 (93.6)	
East Asian	2 (0.3)	4 (0.2)		0 (0.0)	
South Asian	22 (3.2)	127 (5.3)		26 (3.8)	
Afro-Caribbean	1 (0.1)	1 (0.0)		1 (0.1)	
African	3 (0.4)	2 (0.1)		0 (0.0)	
Other	20 (2.9)	69 (2.9)		17 (2.5)	
BMI (mean (sd))	28 (4)	28(4)	0.05	28 (4)	0.006
Creatinine (mean (sd))	95 (22)	97 (22)	0.08	96 (22)	0.001
NYHA34 n(%)	120 (17)	532 (22.4)	0.12	128 (18.7)	0.03
Unstable Angina n(%)	45 (6.6)	192 (8.1)	0.06	45 (6.6)	<0.001
treated Hypertension n(%)	536 (78.5)	1844 (77.7)	0.02	557 (81.6)	0.077
treated Hyperlipaemia n(%)	636 (93.1)	2232 (94.0)	0.04	636 (93.1)	<0.001
Diabetes (%)			0.06		0.057
No diabetes	515 (75.4)	1818 (76.6)		506 (74.1)	
DM on Insulin	45 (6.6)	125 (5.3)		40 (5.9)	
DM orally treated	123 (18.0)	431 (18.2)		137 (20.1)	
PVD n(%)	48 (7.0)	168 (7.1)	0	53 (7.8)	0.028
CVA n(%)	15 (2.2)	75 (3.2)	0.06	18 (2.6)	0.029
Smoking n(%)			0.09		0.074
Current smoker	107 (15.7)	334 (14.1)		115 (16.8)	
Ex-smoker	359 (52.6)	1353 (57.0)		374 (54.8)	
Never	217 (31.8)	687 (28.9)		194 (28.4)	
COPD n(%)	13 (1.9)	63 (2.7)	0.05	16 (2.3)	0.03
Asthma n(%)	31 (4.5)	102 (4.3)	0.01	40 (5.9)	0.059
MI n(%)	277 (40.6)	1004 (42.3)	0.04	285 (41.7)	0.024
PCI n(%)	117 (17.1)	362 (15.2)	0.05	110 (16.1)	0.028
AF n(%)	8 (1.2)	36 (1.5)	0.03	12 (1.8)	0.049
LVEF n(%)			0.06		0.055
≥50%(good)	513 (75.1)	1815 (76.5)		514 (75.3)	
31-49% (moderate)	159 (23.3)	508 (21.4)		153 (22.4)	
≤30% (poor)	11 (1.6)	51 (2.1)		16 (2.3)	
OFF-PUMP n(%)	313 (45.8)	933 (39.3)	0.13	323 (47.3)	0.029
N grafts (mean (sd))	2.73 (0.75)	3.33 (0.75)	0.8	2.81 (0.69)	0.1
LAD n(%)	674 (98.7)	2339 (98.5)	0.01	673 (98.5)	0.013
CX n(%)	615 (90.0)	2212 (93.2)	0.11	607 (88.9)	0.038
RCA n(%)	287 (42.0)	1831 (77.1)	0.77	298 (43.6)	0.033

Please note: This abstract will be presented at 2:45 PM in Room 315 during Adult Cardiac: General, which will be held from 1:00 PM to 3:00 PM on Tuesday, January 30.

The DRAMA Trial: Deep Hypothermia and Retrograde Cerebral Perfusion Against Moderate Hypothermia and Antegrade Cerebral Perfusion for Aortic Arch Replacement—Results of a Pilot Study

B. G. Leshnower¹, S. Rangaraju¹, J. W. Allen¹, A. Y. Stringer¹, T. G. Gleason², E. P. Chen¹

¹Emory University School of Medicine, Atlanta, GA, ²University of Pittsburgh, PA

COMMERCIAL RELATIONSHIPS T. G. Gleason: Research Grant, Medtronic; Nonremunerative Position of Influence, Medtronic; B. G. Leshnower: Speakers Bureau/Honoraria, Medtronic

Purpose: Patients undergoing aortic arch replacement are at high risk for neurologic injury, but the optimal method of cerebral protection has yet to be defined. The purpose of this study was to compare two different neuroprotective strategies in patients undergoing elective transverse hemiarch replacement.

Methods: Twenty patients undergoing hemiarch replacement and concomitant cardiac surgery were prospectively randomized to receive either: Deep hypothermic circulatory arrest + retrograde cerebral perfusion (DHCA+RCP) or Moderate hypothermic circulatory arrest + antegrade cerebral perfusion (MHCA+ACP). NIH stroke scale and neurocognitive tests were administered preoperatively, and on postoperative days 7 and 180. All patients received Neurologist-adjudicated exams on postoperative days 1 and 7, and MRI's prior to discharge. Serum S-100 was measured

on postoperative days 1, 3 and 7. The primary endpoint was a composite of stroke, transient ischemic attack and MRI-adjudicated injury. Secondary endpoints were transient neurologic dysfunction (TND), and the NIH stroke

Results: Randomization resulted in 11 DHCA+RCP patients, and 9 MHCA+ACP patients. Preoperative demographics were equivalent between groups. There was no difference in cardiopulmonary bypass, cross-clamp or circulatory arrest times. MHCA+ACP patients underwent circulatory arrest at a significantly warmer nasopharyngeal temperature than DHCA+RCP patients (MHCA+ACP $26.3 \pm 1.8^\circ\text{C}$ vs DHCA+RCP $19.9 \pm 0.1^\circ\text{C}$, $p < 0.0001$). There were no deaths or renal failure in either group. There was 1 stroke in each group, and the incidence of TND was 22% (2/9) in the MHCA+ACP group and zero in the DHCA+RCP group. There was no difference in the results of S-100 levels, NIH stroke scales or neurocognitive testing between groups. Diffusion weighted imaging MRI demonstrated lesions in 100% (9/9) of MHCA+ACP patients compared to 45% (5/11) of DHCA+RCP patients ($p < 0.01$). MHCA+ACP patients had a significantly higher number of lesions compared to DHCA+RCP (MHCA+ACP 4.1 ± 3.5 vs DHCA+RCP 1.2 ± 2.1 , $p < 0.01$) (Table). The primary endpoint was achieved in 100% of MHCA+ACP patients compared to 45% of DHCA+RCP patients, $p < 0.01$.

Conclusions: Although there was no significant difference in clinically evident neurologic injury between the cerebral protection strategies, this pilot study suggests that MHCA+ACP may be associated with a higher incidence of neurologic injury than DHCA+RCP in patients undergoing elective hemiarch replacement. Larger-scale studies are planned to determine the optimal cerebral protection

Table 1. Neurologic injury in patients undergoing Hemiarch Replacement

	DHCA+RCP (n=11)	MHCA+ACP (n=9)	p
Stroke (n)	1 (9%)	1 (11%)	0.28
Transient Ischemic Attack (n)	0	0	1
Temporary Neurologic Dysfunction (n)	0	2 (22%)	0.19
MRI DWI lesions (n)	5 (45%)	9 (100%)	0.01*
Number of MRI lesions (n/patient)	1.2 ± 2.1	4 ± 3.5	0.01*

Please note: This abstract will be presented at 5:18 PM in Room 304 during Quality Improvement, which will be held from 4:30 PM to 5:30 PM on Tuesday, January 30.

Collaborative Quality Improvement Reduces Postoperative Pneumonia Following Isolated Coronary Artery Bypass Grafting Surgery

D. S. Likosky¹, S. D. Harrington², L. M. Cabrera¹, A. Delucia³, C. E. Chenoweth¹, S. L. Krein¹, D. P. Thibault⁴, M. Zhang⁵, R. A. Matsouaka⁶, R. J. Strobel⁷, R. L. Prager⁵

¹University of Michigan, Ann Arbor, ²Henry Ford Macomb Hospital, Clinton Township, MI, ³Bronson Methodist Hospital, Kalamazoo, MI, ⁴Duke Clinical Research Institute, Durham, NC, ⁵University of Michigan Health System, Ann Arbor, ⁶Duke University, Durham, NC, ⁷University of Michigan Medical School, Ann Arbor

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Purpose: Post-operative pneumonia is the predominant healthcare-associated infection following coronary artery bypass (CABG). Rates vary considerably across centers, and its occurrence is associated with increased risk of adverse sequelae. We examined the impact of a statewide quality improvement project aimed at reducing the overall rate of post-operative pneumonia.

Methods: Among 33 centers participating in a statewide quality improvement collaborative, 18 (MI-18) agreed to receive center-specific, monthly data feedback detailing pneumonia-prevention practices for CABG; team members attended quarterly face-to-face meetings. We assessed the intervention's (Q4/2012 – Q4/2016) impact using two controls: (1) 15 centers (MI-15), which did not receive monthly data feedback although participated in quarterly meetings, and (2) 1164 non-Michigan centers (STS). We accounted for center-level variation using random effects for each center in a multivariable logistic regression model, and used two slopes to assess the odds of pneumonia in the pre-intervention and intervention time periods for each group.

Results: Baseline characteristics were qualitatively similar across groups and time (pre-intervention: n=196,954; intervention: n=714,800). Bypass times were higher for the MI-18 than the STS and MI-15 ($p<0.001$), which was consistent across time. During pre-intervention period, for every calendar quarter there was a 2.53% reduction in adjusted pneumonia odds for STS centers ($p<0.001$), which was similar in Michigan ($p>0.05$). During the intervention period, there was a 1% reduction in adjusted odds for STS centers ($p<0.0001$) -- the reduction rate was faster in Michigan. For MI-15, there was a 4.23% reduction ($p<0.0001$) relative to the STS ($p=0.001$), and a 2.54% reduction ($p<0.0001$) for MI-18 – this latter result was equivalent to the STS ($p=0.12$). Major morbidity/mortality rates were equivalent across groups before the intervention (13.7% overall) and were reduced to 12.2% during the intervention. Prolonged intubation rates were lowered (10.1% to 8.6%), although length of stay was qualitatively similar by group and time period.

Conclusions: Our quality collaborative project was associated with a significant reduction in post-operative pneumonia relative to national norms, although the reduction among the subset of hospitals (MI-18) participating in the enhanced intervention was not significantly different. Future work should evaluate broader dissemination of these pneumonia prevention practices.

