

**Curriculum Vitae**  
**George Charles (Chad) Hughes, IV, M.D.**

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Date of Birth: November 29, 1967

**Education:** B.S., Wake Forest University, Winston-Salem, NC, Health and Sport  
Science, May, 1991

M.D., Duke University School of Medicine, Durham, NC, May, 1995

**Honors:** Varsity letterman, Wake Forest University, baseball  
Atlantic Coast Conference Academic Honor Roll 1986-7 & 1987-8  
Phi Beta Kappa  
Alpha Epsilon Delta (pre-medical honor society), Wake Forest University  
Magna cum laude, Wake Forest University  
Alpha Omega Alpha  
Senior Scholarship recipient, Duke University School of Medicine  
1998 Weck Closure Systems award for excellence in basic scientific research  
2009 Southern Thoracic Surgical Association President's Award  
2010 Society of Thoracic Surgeons 1<sup>st</sup> annual Richard E. Clark Award

**Organizations and participation:**

1991-2007 American Medical Association  
1995-Present North Carolina Medical Society  
2005-Present Heart Valve Society of America  
2005-Present International Society of Endovascular Specialists  
2005-Present Associate Fellow, American College of Surgeons  
2006-Present Southern Thoracic Surgical Association  
2006-Present The Society of Thoracic Surgeons  
2009-Present North Carolina Surgical Association  
2009-Present Committee on Post Graduate Education, Joint Council for Thoracic  
Surgical Education (JCTSE)  
2011-Present The Society of Thoracic Surgeons Task Force on Thoracic Endografting

2011-Present The Society of Thoracic Surgeons/FDA Center for Devices and Radiological Health (CDRH) Network of Experts Percutaneous Heart Valves bench

**Board Certification:**

American Board of Surgery (Certification #48670) 12/8/2003

American Board of Thoracic Surgery (Certification #7183) 6/2/2006

**Licensure:**

North Carolina permanent medical license #200201592

Virginia permanent medical license #0101239346

**Professional Training:** Intern in Surgery, Duke University Medical Center, 1995-1996  
Junior Assistant Resident in Surgery, Duke University Medical Center, 1996-1997  
Research Fellow in Surgery, Duke University Medical Center, 1997-1999  
Senior Assistant Resident in Surgery, Duke University Medical Center, 1999-2001  
Chief Resident in General Surgery, Duke University Medical Center, 2001-2002  
Resident in Cardiothoracic Surgery, Duke University Medical Center, 2002-2004  
Chief Resident in Cardiothoracic Surgery, Duke University Medical Center, 2004-2005  
Thoracic Aortic Surgery Fellowship, Hospital of the University of Pennsylvania, 2005

**Professional Employment:**

Assistant Professor, Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Duke University Medical Center, Durham, NC, 7/1/05-6/30/11.

Director, Aortic Surgery Program, Duke Heart Center, 7/1/05-present.

Associate Professor, Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Duke University Medical Center, Durham, NC, 7/1/11-present.

**Grants and Research Support:**

National Research Service Award, Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute; Grant Number: 1 F32 HL09969-01; Project title: TMR: Mechanisms of action & comparison of techniques. Dates of support: 5/1/98-5/1/00; Award: \$61,652.

**Editorial Experience:** Ad hoc reviewer for:

American Heart Journal

The American Journal of Physiology

Cardiovascular Research

Circulation

The Annals of Thoracic Surgery

Chest-rated among top 10% of Chest reviewers

Heart

Encyclopedia of Biomaterials and Biomedical Engineering

Microvascular Research

Journal of the American Medical Association

Journal of Thoracic and Cardiovascular Surgery

New England Journal of Medicine

Abstract reviewer American Heart Association annual meeting 2010

Editorial Board member, Journal of Surgical Radiology

**Peer-Reviewed Publications:**

1. Andersen ND, Williams JB, Fosbol EL, Shah AA, Bhattacharya SD, Mehta RH, Hughes GC. Cardiac catheterization within 1 to 3 days of proximal aortic surgery is not associated with increased postoperative acute kidney injury. *J Thorac Cardiovasc Surg* 2012; epub ahead of press.
2. Shah AA, Craig DM, Sebek JK, Haynes C, Stevens RC, Muehlbauer MJ, Granger CB, Hauser ER, Newby LK, Newgard CB, Kraus WE, Hughes GC, Shah SH. Metabolic profiles predict adverse events after coronary artery bypass grafting. *J Thorac Cardiovasc Surg* 2012; epub ahead of press.
3. Hughes GC, Barfield ME, Shah AA, Bhattacharya SD, Williams JB, Andersen ND, McCann RL. Staged total abdominal debranching and TEVAR for thoracoabdominal aneurysm. *J Vasc Surg* 2012; in press.

4. Williams JB, Andersen ND, Scheer E, Piccini JP, McCann RL, Hughes GC. Retrograde ascending aortic dissection as an early complication of thoracic endovascular aortic repair. *J Vasc Surg* 2012; epub ahead of press.
5. Hughes GC, Zhao Y, Rankin JS, Scarborough JE, O'Brien S, Bavaria JE, Wolfe WG, Gaca JG, Gammie JS, Shahian DM, Smith PK. Effects of institutional volumes on operative outcomes for aortic root replacement in North America. *J Thorac Cardiovasc Surg* 2012; epub ahead of press.
6. Hughes GC. Aggressive aortic replacement for Loeys-Dietz syndrome. *Tex Heart Inst J* 2011; 38:663-6.
7. Kiefer TL, Wang A, Hughes GC, Bashore TM. Management of patients with bicuspid aortic valve disease. *Curr Treat Options Cardiovasc Med* 2011; 13:489-505.
8. Mehta RH, Honeycutt E, Patel UD, Lopes RD, Williams JB, Shaw LK, O'Brien SM, Califf RM, Hughes GC, Sketch MH Jr. Relationship of the time interval between cardiac catheterization and elective coronary artery bypass surgery with postprocedural acute kidney injury. *Circulation* 2011; 124:S149-55.
9. Andersen ND, Williams JB, Harrison JK, Hughes GC. Ascending-descending aortic bypass with valve-sparing root replacement for coarctation with aortic root aneurysm. *J Thorac Cardiovasc Surg* 2011; epub ahead of press.
10. Andersen ND, Bhattacharya SD, Williams JB, McCann RL, Hughes GC. Mycotic aneurysm of the thoracoabdominal aorta in a child with end-stage renal disease. *J Vasc Surg* 2011; 54:1161-3.
11. Lima B, Williams JB, Bhattacharya SD, Shah AA, Andersen N, Gaca JG, Hughes GC. Results of proximal arch replacement using deep hypothermia for circulatory arrest: Is moderate hypothermia really justifiable? *Am Surg* 2011; 77:1438-44.
12. Lee TC, Andersen ND, Williams JB, Bhattacharya SD, McCann RL, Hughes GC. Results with a selective revascularization strategy for left subclavian artery coverage during thoracic endovascular aortic repair. *Ann Thorac Surg* 2011; 92:97-103.
13. Lima B, Williams JB, Bhattacharya SD, Shah AA, Andersen N, Wang A, Harrison JK, Hughes GC. Individualized thoracic aortic replacement for the aortopathy of bicuspid aortic valve disease. *J Heart Valve Dis* 2011; 20:387-95.
14. Williams JB, McCann RL, Hughes GC. Total aortic replacement in Loeys-Dietz syndrome. *J Cardiac Surg* 2011; 26:304-8.
15. Shah AA, Bhattacharya SD, McCann RL, Hughes GC. Pan-aortic hybrid treatment of mega-aorta syndrome. *J Vasc Surg* 2011; 53:1398-401.

16. Parsa CJ, Williams JB, Bhattacharya SD, Wolfe WG, McCann RL, Hughes GC. Mid-term results with TEVAR for chronic type B aortic dissection with associated aneurysm. *J Thorac Cardiovasc Surg* 2011; 141:322-7.
17. Gaca JG, Sheng S, Rankin JS, O'Brien S, Daneshmand MA, Brennan JM, Hughes GC, Smith PK, Glower DD, Gammie JS. Outcomes for endocarditis surgery in North America: A simplified risk scoring system. *J Thorac Cardiovasc Surg* 2011; 141:98-106.
18. Williams JB, Bhattacharya SD, Phillips-Bute B, Lima B, Smith PK, Hughes GC, Welsby IJ. Predictors of massive transfusion with thoracic aortic procedures involving deep hypothermic circulatory arrest. *J Thorac Cardiovasc Surg* 2011; 141:1283-8.
19. Williams ML, Sheng S, Gammie JG, Rankin JS, Smith PK, Hughes GC. Aortic dissection as a complication of cardiac surgery: Report from the STS database. *Ann Thorac Surg* 2010; 90:1812-7.
20. Hughes GC, Lee SM, Daneshmand MA, Bhattacharya SD, Williams JB, Tucker SW Jr, McCann RL. Endovascular repair of descending thoracic aneurysms: results with "on-label" application in the post-FDA approval era. *Ann Thorac Surg* 2010; 90:83-9.
21. Hudson CCC, Welsby IJ, Phillips-Bute B, Mathew JP, Lutz A, Hughes GC, Stafford-Smith M and the Cardiothoracic Anesthesiology Research Endeavors (C.A.R.E.) Group. Glycosylated hemoglobin levels and outcome in non-diabetic cardiac surgery patients. *Can J Anesth* 2010; 57:565-72.
22. Parsa CJ, McCann RL, Hughes GC. A novel approach to the treatment of distal malperfusion secondary to ascending aortic dissection. *J Cardiac Surg* 2010; 25:220-2.
23. Andersen ND, Dubose J, Shah A, Lee T, Wechsler SB, Hughes GC. Thoracic endografting in a patient with hereditary hemorrhagic telangiectasia presenting with a descending thoracic aneurysm. *J Vasc Surg* 2010; 51:468-70.
24. Parsa CJ, Daneshmand MA, Lima B, Balsara KR, McCann RL, Hughes GC. Utility of Remote Wireless Pressure Sensing for Endoleak Detection Following Endovascular Thoracic Aneurysm Repair. *Ann Thorac Surg* 2010; 89:446-52.
25. Parsa CJ, Hughes GC. Rarity of aortic thrombus after aortic valve bypass (apicoaortic conduit) surgery reply. *Ann Thorac Surg* 2010; 89:342.
26. Parsa CJ, Schroder JN, Daneshmand MA, McCann RL, Hughes GC. Mid-term Results for Endovascular Repair of Complicated Acute and Chronic Type B Aortic Dissection. *Ann Thorac Surg* 2010; 89:97-104.

27. Williams ML, Wechsler SB, Hughes GC. Two-stage total aortic replacement for Loeys-Dietz syndrome. *J Cardiac Surg* 2010; 25:223-4.
28. Hughes GC, McCann RL. Hybrid thoracoabdominal aortic aneurysm repair: concomitant visceral revascularization and endovascular aneurysm exclusion. *Semin Thorac Cardiovasc Surg* 2009; 21:355-62.
29. Rajagopal K, Rogers JG, Lodge AJ, Gaca JG, McCann RL, Milano CA, Hughes GC. Two-stage total cardioaortic replacement for end-stage heart and aortic disease in Marfan syndrome: case report and review of the literature. *J Heart Lung Transplant* 2009; 28:958-63.
30. Hughes GC, Daneshmand MA, Balsara KR, Achneck HA, Sileshi B, Lee SM, McCann RL. "Hybrid" Repair of Aneurysms of the Transverse Aortic Arch: Mid-term Results. *Ann Thorac Surg* 2009; 88:1882-7.
31. Atkins BZ, Wooten MK, Kistler J, Hurley K, Hughes GC, Wolfe WG. Does negative pressure wound therapy have a role in preventing poststernotomy wound complications? *Surg Innov* 2009; 16:140-6.
32. Swaminathan M, Stuart M, Hughes GC, Hughes J, Jagers J, Hill SE, Milano CA, Bennett-Guerrero E, Stafford-Smith M. Institutional response to FDA warning on aprotinin and impact on outcomes. *hSR Proceedings in Intensive Care and Cardiovascular Anesthesia* 2009; 1:30-6.
33. Parsa CJ, Milano CA, Hughes GC. A previously unreported complication of apicoaortic conduit for severe aortic stenosis. *Ann Thorac Surg* 2009; 87:927-8.
34. Parsa CJ, Hughes GC. Surgical options to contend with thoracic aortic pathology. *Semin Roentgenol* 2009; 44:29-51.
35. Hughes GC, McCann RL, Sulzer CF, Swaminathan M. Endovascular Approaches to Complex Thoracic Aortic Disease. *Semin Cardiothorac Vasc Anesth* 2008; 12:298-319.
36. Mullenix PS, Parsa CJ, Mackensen GB, Jollis JG, Harrison JK, Hughes GC. Pannus-related prosthetic valve dysfunction and life-threatening aortic regurgitation. *J Heart Valve Dis* 2008; 17:666-9.
37. Hughes GC, Daneshmand MA, Swaminathan M, Nienaber JJ, Bush EL, Husain AH, Wolfe WG, McCann RL. "Real world" thoracic endografting: Results with the Gore TAG endoprosthesis 2 years following U.S. FDA approval. *Ann Thorac Surg* 2008; 86:1530-8.
38. Hughes GC, Nienaber JJ, Bush EL, Daneshmand MA, McCann RL. Use of custom dacron branch grafts for "hybrid" aortic debranching during endovascular repair of

- thoracic and thoracoabdominal aortic aneurysms. *J Thorac Cardiovasc Surg* 2008; 136:21-8.
39. Husain AM, Swaminathan M, McCann RL, Hughes GC. Neurophysiologic intraoperative monitoring during endovascular stent graft repair of the descending thoracic aorta. *J Clin Neurophysiol* 2007; 24:328-35.
  40. Rajagopal K, Lima B, Harrison JK, Swaminathan M, McCann RL, Hughes GC. Endovascular thoracic aortic aneurysm repair with concomitant myocardial and carotid revascularization. *Ann Thorac Surg* 2007; 84:e1-e3.
  41. Swaminathan M, Mackensen GB, Podgoreanu MV, McCann RL, Mathew JP, Hughes GC. Spontaneous echocardiographic contrast indicating successful endoleak management. *Anesth Analg* 2007; 104:1037-9.
  42. Hughes GC, Swaminathan M, Wolfe WG. Reimplantation technique (David operation) for multiple sinus of valsalva aneurysms. *Ann Thorac Surg* 2006; 82:e14-6.
  43. Lima B, Hughes GC, Lemaire A, Jagers J, Glower DD, Wolfe WG. Short and intermediate-term outcomes of aortic root replacement with St. Jude mechanical conduits and aortic allografts. *Ann Thorac Surg* 2006; 82:579-85.
  44. Hughes GC, Annex BH. Angiogenic therapy for coronary artery and peripheral arterial disease. *Expert Rev Cardiovasc Ther* 2005; 3:521-35.
  45. Hughes GC, Biswas SS, Yin B, Domkowski PW, Diodato LH, DeGrado TR, Coleman RE, Landolfo CK, Lowe JE, Annex BH, Landolfo KP. Therapeutic angiogenesis in chronically ischemic porcine myocardium: Comparative effects of bFGF and VEGF. *Ann Thorac Surg* 2004; 77:812-8.
  46. Biswas SS, Hughes GC, Scarborough JE, Domkowski PW, Diodato L, Smith ML, Landolfo C, Lowe JE, Annex BH, Landolfo KP. Intramyocardial and intracoronary basic fibroblast growth factor in porcine hibernating myocardium: A comparative study. *J Thorac Cardiovasc Surg* 2004; 127:34-43.
  47. Hughes GC, Baklanov DV, Biswas SS, Phippen AM, DeGrado TR, Coleman RE, Donovan CL, Lowe JE, Annex BH, Landolfo KP. Regional cardiac sympathetic innervation early and late after transmyocardial laser revascularization. *J Cardiac Surg* 2004; 19:21-7.
  48. Hughes GC, Post MJ, Simons M, Annex BH. Porcine models of human coronary artery disease: implications for pre-clinical trials of therapeutic angiogenesis. *J Appl Physiol* 2003; 94:1689-1701.
  49. Hughes GC, Biswas SS, Yin B, Baklanov DV, Annex BH, Coleman RE, DeGrado TR, Landolfo CK, Landolfo KP, Lowe JE. A comparison of mechanical and laser

transmyocardial revascularization for induction of angiogenesis and arteriogenesis in chronically ischemic myocardium. *J Am Coll Cardiol* 2002; 39:1220-8.

50. Biswas S, Clements F, Diodato L, Hughes GC, Landolfo K. Changes in systolic and diastolic function during multivessel off-pump coronary bypass grafting. *Eur J Cardiothorac Surg* 2001; 20:913-7.
51. Hughes GC. Cellular models of hibernating myocardium: implications for future research. *Cardiovasc Res* 2001; 51:191-3.
52. Domkowski PW, Hughes GC, Scarborough JE, Diodato LH, Smith ML, Landolfo KP, Lowe JE. Lasers in cardiothoracic surgery. *Optics & Photonics* 2001; 12:36-41.
53. Hughes GC, Donovan CL, Yin B, DeGrado TR, Coleman RE, Landolfo KP, Lowe JE. Is chronically dysfunctional yet viable myocardium distal to a severe coronary stenosis hypoperfused? *Ann Thorac Surg* 2001; 72:163-8.
54. Domkowski PW, Smith ML, Scarborough JE, Diodato LH, Hughes GC, Phippen AM, Annex BH, Lowe JE, Landolfo KP. Intramyocardial levels of vascular endothelial growth factor (VEGF) and basic fibroblast growth (bFGF) are significantly augmented 6-months following TMR in a porcine model of hibernating myocardium. *Surg Forum* 2001; 52:105-6.
55. Hughes GC, Kypson AP, Yin B, St. Louis JD, Biswas SS, Annex BH, Coleman RE, DeGrado TR, Donovan CL, Landolfo KP, Lowe JE. Induction of angiogenesis after TMR: A comparison of holmium:YAG, CO<sub>2</sub>, and excimer lasers. *Ann Thorac Surg* 2000; 70: 504-9.
56. Hughes GC, Shah AS, Yin B, Shu M, Donovan CL, Glower DD, Lowe JE, Landolfo KP. Early postoperative changes in regional systolic and diastolic left ventricular function after transmyocardial laser revascularization. A comparison of holmium:YAG and CO<sub>2</sub> lasers. *J Am Coll Cardiol* 2000; 35: 1022-30.
57. Domkowski PW, Hughes GC, Lowe JE. Ameroid constrictor versus hydraulic occluder: creation of hibernating myocardium. *Ann Thorac Surg* 2000; 69: 1984.
58. St. Louis JD, Hughes GC, Kypson AP, DeGrado TR, Donovan CL, Coleman RE, Yin B, Steenbergen C, Landolfo KP, Lowe JE. An experimental model of chronic myocardial hibernation. *Ann Thorac Surg* 2000; 69: 1351-7.
59. Hughes GC, Annex BH, Yin B, Phippen AM, Lin P, Kypson AP, Peters KG, Lowe JE, Landolfo KP. Transmyocardial laser revascularization limits in vivo adenoviral-mediated gene transfer in porcine myocardium. *Cardiovasc Res* 1999; 44: 81-90.
60. Hughes GC, Kypson AP, Yin B, St. Louis JD, Biswas SS, Coleman RE, DeGrado TR, Annex BH, Donovan CL, Landolfo KP, Lowe JE. Induction of angiogenesis following transmyocardial laser revascularization in a model of hibernating



myocardium: a comparison of holmium:YAG, carbon dioxide, and excimer lasers. *Surg Forum* 1999; 50: 115-7.

61. Biswas SS, Hughes GC, Yin B, Baklanov DV, Donovan CL, DeGrado TR, Coleman RE, Lowe JE, Annex BH, Landolfo KP. Effects of low-dose intramyocardial basic fibroblast growth factor on regional blood flow and function in a porcine model of hibernating myocardium. *Surg Forum* 1999; 50:122-4.
62. Hughes GC, Abdel-aleem S, Biswas SS, Landolfo KP, Lowe JE. Transmyocardial laser revascularization: current status. *Egypt Heart J* 1999; 51: 294-300.
63. Hughes GC, Annex BH, Peters KG, Paavonen KJA, Lowe JE, Landolfo KP. Lymphatic angiogenesis induced by transmyocardial laser revascularization. *Ann Thorac Surg* 1999; 68: 295-6.
64. Abdel-aleem S, St. Louis JD, Hughes GC, Lowe JE. Metabolic changes in the normal and hypoxic neonatal myocardium. *Ann NY Acad Sci* 1999; 874: 254-61.
65. Lowe JE, Hughes GC, Biswas SS. Non-blood-contacting biventricular support: direct mechanical ventricular actuation. *Operative Techniques Thorac Cardiovasc Surg* 1999; 4: 345-51.
66. Hughes GC, Abdel-aleem S, Biswas SS, Landolfo KP, Lowe JE. Transmyocardial laser revascularization: experimental and clinical results. *Can J Cardiol* 1999; 15: 797-806.
67. Landolfo CK, Landolfo KP, Hughes GC, Coleman RE, Coleman RB, Lowe JE. Intermediate-term clinical outcome following transmyocardial laser revascularization in patients with refractory angina pectoris. *Circulation* 1999; II-128-33.
68. Hughes GC, Ketchersid TL, Lenzen JM, Lowe JE. Thoracic complications of peritoneal dialysis. *Ann Thorac Surg* 1999; 67: 1518-22.
69. Hughes GC, Smith TP, Eachempati SR, Vaslef SN, Reed RL. The use of a temporary vena caval interruption device in high-risk trauma patients unable to receive standard venous thromboembolism prophylaxis. *J Trauma* 1999; 46: 246-9.
70. Hughes GC, Landolfo KP, Lowe JE, Coleman RB, Donovan CL. Perioperative morbidity and mortality after transmyocardial laser revascularization: Incidence and risk factors for adverse events. *J Am Coll Cardiol* 1999; 33: 1021-6.
71. Hughes GC, Landolfo KP, Lowe JE, Coleman RB, Donovan CL. Diagnosis, incidence, and clinical significance of early postoperative ischemia after transmyocardial laser revascularization. *Am Heart J* 1999; 137: 1163-8.
72. Hughes GC, Kypson AP, St.Louis JD, Annex BH, Coleman RE, DeGrado TR, Donovan CL, Lowe JE, Landolfo KP. Improved perfusion and contractile reserve

after transmyocardial laser revascularization in a model of hibernating myocardium. *Ann Thorac Surg* 1999; 67: 1714-20.

73. Abdel-aleem S, El-Guindy N, Sallam T, Hughes GC, Lowe JE. Stimulation of long-chain fatty acid uptake by dipyridamole in isolated myocytes. *J Cardiovasc Pharm* 1999; 1: 43-8.
74. Hughes GC, Lowe JE, Kypson AP, St.Louis JD, Phippen AM, Peters KG, Coleman RE, DeGrado TR, Donovan CL, Annex BH, Landolfo KP. Neovascularization after transmyocardial laser revascularization in a model of chronic ischemia. *Ann Thorac Surg* 1998; 66: 2029-36.
75. Hughes GC, Donovan CL, Lowe JE, Landolfo KP. Combined TMR and mitral valve replacement via left thoracotomy. *Ann Thorac Surg* 1998; 65: 1141-3.
76. Hughes GC, Hasselman CT, Best TM, Martinez S, Garrett WE Jr. Incomplete, intrasubstance strain injuries of the rectus femoris. *Am J Sports Med* 1995; 23: 500-506.
77. Hasselman CT, Best TM, Hughes GC, Martinez S, Garrett WE Jr. An explanation for various rectus femoris strain injuries using previously undescribed muscle architecture. *Am J Sports Med* 1995; 23: 493-499.
78. Erens GA, Hughes GC, Seaber AV, Garrett WE Jr. Evaluation of an acute active muscle strain injury using a physiologic injury model. *Surg Forum* 1995; XLVI: 609-611.

### **Book Chapters:**

1. Lee TC, Hughes GC. Complications of thoracic endovascular stent grafts. In: Franco KL, Thourani VH, eds: Cardiothoracic surgery review. Philadelphia: Lippincott, Williams & Wilkins; 2012: 581-8.
2. Stafford-Smith M, Hughes GC, Shaw AD, Swaminathan M. Renal protection strategies. In: Subramaniam K, Park KY, Subramaniam B, eds: Anesthesia and perioperative care for aortic surgery. Springer Science+Business Media, LLC 2011: 329-47.
3. Lee TC, Swaminathan M, Hughes GC. Surgical considerations and assessment of endovascular management of thoracic vascular disease. In: Savage RM, Aronson S, Thomas JD, Shanewise JS, Shernan SK, eds: Comprehensive textbook of perioperative transesophageal echocardiography, 2<sup>nd</sup> edition. Philadelphia: Lippincott, Williams & Wilkins; 2011: 599-610.
4. Hughes GC, McCann RL. Visceral debranching techniques for hybrid thoracoabdominal aortic aneurysm repair. In: Davies AH ed: Vascular and

endovascular surgery highlights 2009-10. Health Press Limited, Oxford, UK; 2010: 84-93.

5. Atkins BZ, Kon ND, Hughes GC. Contemporary considerations in aortic valve surgery. In: Bashore TM, Wang A, eds: Contemporary Cardiology: Valvular heart disease. Humana Press, Inc.; 2009: 281-310.
6. Husain AM, Ashton KH, Hughes GC. Thoracic Aortic Surgery. In: Husain AM, ed: A practical approach to neurophysiologic intraoperative monitoring. New York: Demos Medical Publishing, LLC; 2008: 227-259.
7. Hughes GC, Lowe JE. Animal models of acute and chronic coronary ischemia I: effects of TMR on perfusion and left ventricular function. In: Bridges CR, Chiu RCJ eds: Myocardial laser revascularization. Blackwell/Futura Publishing; 2006: 65-78.
8. Hughes GC, Annex BH. Therapeutic Angiogenesis for Ischemic Heart and Peripheral Vascular Disease. In Topol EJ ed: Textbook of cardiovascular medicine, 3<sup>rd</sup> edition. Philadelphia: Lippincott, Williams & Wilkins; 2007: 1462-72.
9. Swaminathan M, Hughes GC. Endograft repair of the thoracic aorta. In: Cook DJ, ed. Innovations in cardiovascular care. SCA Monograph on DVD. Richmond, VA: Lippincott, Williams & Wilkins, 2006: Chapter 11.
10. Hughes GC, Annex BH. Therapeutic Angiogenesis and Myocardial regeneration. In: Herrmann HC ed. Interventional cardiology: percutaneous non-coronary intervention. Totowa, NJ: Humana Press; 2005: 271-92.
11. Hughes GC, Newman MF, Landolfo KP. Is OPCAB Superior to CABG? In: Fleisher LA ed. Evidence-Based Practice of Anesthesia. W.B. Saunders Company; 2004: 353-8.
12. Hughes GC, Gray JL. Aortoiliac Disease. In: Pappas TN, Purcell GP, eds. Unbound Surgery. Charlottesville, VA: Unbound Medicine, Inc.; 2004, available at [www.unboundsurgery.com](http://www.unboundsurgery.com).
13. Hughes GC, Ludwig KA. Acute Diverticulitis. In: Pappas TN, Purcell GP, eds. Unbound Surgery. Charlottesville, VA: Unbound Medicine, Inc.; 2004, available at [www.unboundsurgery.com](http://www.unboundsurgery.com).
14. Hughes GC, Lowe JE. Revascularization versus denervation: what are the mechanisms of symptom relief? In: Abela GS ed. Myocardial revascularization: novel percutaneous approaches. New York: Wiley-Liss, Inc; 2002: 63-79.
15. Hughes GC. The Renal System. In: Clary BM, Milano CA, eds. The Handbook of Surgical Intensive Care, 5<sup>th</sup> edition. St. Louis: Mosby, Inc.; 2000: 115-45.

16. Hughes GC, Laws HL, Landolfo KP. Thoracoscopic Splanchnicectomy. In: Pappas TN, Chekan EG, Eubanks WS, eds. Atlas of Laparoscopic Surgery, 2<sup>nd</sup> edition. Philadelphia, PA: Current Medicine, Inc; 1999: 20.1-20.10.
17. Hughes GC, Harpole DH, Jr. Thoracoscopic Pulmonary Resection. In: Pappas TN, Chekan EG, Eubanks WS, eds. Atlas of Laparoscopic Surgery, 2<sup>nd</sup> edition. Philadelphia, PA: Current Medicine, Inc; 1999: 22.1-22.8.

### **Abstracts and Presentations:**

1. Hughes GC. TEVAR: Indications and contraindications. STS University: TAVR/TEVAR. Society of Thoracic Surgeons 48<sup>th</sup> Annual Meeting, February 1, 2012, Fort Lauderdale, FL.
2. Hughes GC. TAVR table instructor: CoreValve. STS University: TAVR/TEVAR. Society of Thoracic Surgeons 48<sup>th</sup> Annual Meeting, February 1, 2012, Fort Lauderdale, FL.
3. Shah AA, Barfield ME, Andersen ND, Bhattacharya SD, Williams JB, McCann RL, Hughes GC. Results of thoracic endovascular aortic repair six years after FDA approval: Excellent aorta-specific but low overall survival. Society of Thoracic Surgeons 48<sup>th</sup> Annual Meeting, January 31, 2012, Fort Lauderdale, FL.
4. Bavaria JE, White R, Brinkman WT, Szeto WY, Hughes GC, Beavers FP, Lee WA. Mid-term analysis of TEVAR in acute complicated Type B aortic dissection from the FDA IDE Valiant dissection trial. Late breaking clinical trial abstract presentation. Society of Thoracic Surgeons 48<sup>th</sup> Annual Meeting, January 30, 2012, Fort Lauderdale, FL.
5. Hughes GC. Transcatheter aortic therapeutics at Duke: An update. Department of Anesthesiology Grand Rounds, Duke University Medical Center, November 30, 2011, Durham, NC.
6. Hughes GC. Starting a thoracic aortic surgery program. Cardiovascular early career symposium. American Heart Association Scientific Sessions, November 12, 2011, Orlando, FL.
7. Shah AA, Craig DM, Haynes C, Bain J, Stevens R, Hughes GC, Newby KL, Hauser ER, Kraus WE, Newgard CB, Gregory SG, Shah SH. Integration of genetics with metabolomics identifies a novel gene associated with risk of incident cardiovascular events: TRAF3IP2. *Circulation* 2011; 124:A9989.
8. Andersen ND, Bhattacharya SD, Williams JB, Fosbol EL, Lockhart E, Patel MB, Gaca JG, Welsby IJ, Hughes GC. Intraoperative low-dose recombinant activated factor VII for the treatment of severe post-cardiopulmonary bypass coagulopathy

following thoracic aortic surgery. 58th Annual Meeting, Southern Thoracic Surgical Association, November 9-12, 2011, San Antonio, TX.

9. Harrison JK, Hughes GC. Transcatheter aortic valve implantation. Cardiovascular Medicine Grand Rounds, Duke University Medical Center, October 25, 2011, Durham, NC.
10. Hughes GC. Transcatheter aortic therapeutics at Duke: An update. Department of Surgery Grand Rounds, Duke University Medical Center, October 12, 2011, Durham, NC.
11. Hughes GC. Hybrid thoracoabdominal aortic aneurysm repair: Concomitant visceral revascularization and endovascular aneurysm exclusion. Vascutek Symposium: Innovative product designs and emerging implantation techniques. 25<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, October 3, 2011, Lisbon, Portugal.
12. Hughes GC. Valve-sparing aortic root replacement. St. Jude Clinical Applications and Beyond Physician Training Seminar, September 16, 2011, New York, NY.
13. Hughes GC. Five cases: Aortic dissection-stent versus open treatment. 38<sup>th</sup> South Atlantic Cardiovascular Society Annual Meeting, August 4-7, 2011, Kiawah Island, SC.
14. Williams JB, Peterson ED, Zhao Y, O'Brien SM, Gammie JS, Chen EP, Hughes GC. Contemporary results for replacement of the ascending aorta and arch in North America. 37<sup>th</sup> Annual Meeting of the Western Thoracic Surgical Association, June 22-25, 2011, Colorado Springs, CO.
15. Shah AA, Craig DM, Sebek JK, Kraus WE, Hughes GC, Shah SH. Baseline metabolomics profiles predict adverse events following coronary artery bypass grafting. 37<sup>th</sup> Annual Meeting of the Western Thoracic Surgical Association, June 22-25, 2011, Colorado Springs, CO.
16. Hughes GC, Williams JB. Modern techniques and results in surgery for disease of the thoracic aorta. Cardiovascular Medicine Grand Rounds, Duke University Medical Center, June 21, 2011, Durham, NC.
17. Shah AA, Craig DM, Williams JB, Bhattacharya SD, Andersen ND, Shah SH, McCann RL, Hughes GC. Risk factors for non-procedure related mortality one year after thoracic endovascular aortic repair. Society for Vascular Surgery 2011 Vascular Annual Meeting, June 16-18, 2011, Chicago, IL.
18. Williams JB, Piccini JP, Bhattacharya SD, Andersen ND, McCann RL, Hughes GC. Retrograde ascending aortic dissection as an early complication of thoracic endovascular aortic repair. Society for Vascular Surgery 2011 Vascular Annual Meeting, June 16-18, 2011, Chicago, IL.

19. McCann RL, Hughes GC. Staged total abdominal debranching and TEVAR for thoracoabdominal aneurysm (video presentation). Society for Vascular Surgery 2011 Vascular Annual Meeting, June 16-18, 2011, Chicago, IL. Society for Vascular Surgery 2011 Vascular Annual Meeting, June 16-18, 2011, Chicago, IL.
20. Hughes GC. Extensive mid and distal arch aneurysms: best therapy. Classic zone 0 hybrid debranching procedure “off pump.” Great Debates: 5 Controversies in Thoracic Aortic Surgery Satellite Symposium, American Association for Thoracic Surgery 91st Annual Meeting, May 8, 2011, Philadelphia, PA.
21. Hughes GC. Aggressive aortic replacement in patients with Loeys-Dietz syndrome. 8<sup>th</sup> Current Trends in Aortic and Cardiothoracic Surgery, April 29, 2011, Houston, TX.
22. Shah AA, Williams JB, Phillips-Bute B, Bartz RR, Hughes GC, Welsby JJ. Pulmonary Dysfunction after Thoracic Aortic Surgery Utilizing Deep Hypothermic Circulatory Arrest. *Am J Respir Crit Care Med* 2011; 183:A4642.
23. Hughes GC. Duke center for aortic disease: clinical and translational research program. 2011 Duke Cardiovascular Research Symposium, Duke University Medical Center, April 27, 2011, Durham, NC.
24. Hughes GC, Kappel D. Vintage hydroplanes and vintage drivers – Aortic endovascular stents may be problematic. 41<sup>st</sup> annual meeting Western Trauma Association, February 27-March 4, 2011, Big Sky, MT.
25. Lima B, Williams JB, Bhattacharya SD, Hughes GC. Results of proximal arch replacement using deep hypothermia for circulatory arrest: Is moderate hypothermia really justifiable? Southeastern Surgical Congress 2011 Annual Scientific Meeting, February 12-15, 2011, Chattanooga, TN.
26. Hughes GC. Stent grafts for aortic dissection: Acute uncomplicated but high-risk Type B. STS/AATS Tech-Con 2011, January 30, 2011, San Diego, CA.
27. Hughes GC, Zhao Y, Rankin JS, O’Brien S, Bavaria JE, Wolfe WG, Gaca JG, Gammie JS, Shahian DM, Smith PK. Effects of institutional volumes on operative outcomes for combined aortic valve and ascending aortic surgery. *Circulation* 2010; 122:A11225.
28. Mehta RH, Honeycutt E, Hughes GC, Sketch MH Jr. Relationship of time interval between elective coronary artery bypass surgery and cardiac catheterization with the risk of post-surgical acute kidney injury. *Circulation* 2010; 122:A14402.
29. Patel MB, Bhattacharya SB, Williams JB, Sweeney TE, Vaslef SN, Hughes GC, Kuo PC, Lawson JL. Six Year Single Institution Off Label Use of Recombinant Factor

VIIa. Blood. Supplement: Proceedings of the 52<sup>nd</sup> American Society of Hematology. s1402, 2010.

30. Lee, T, Williams JB, Bhattacharya D, McCann RL, Hughes GC. Results with a selective revascularization strategy for left subclavian artery coverage during thoracic endovascular aortic repair. 57th Annual Meeting, Southern Thoracic Surgical Association, November 3-6, 2010, Orlando, FL.
31. Hughes GC. “Hybrid” repair of thoracoabdominal aortic aneurysm: Visceral debranching with endovascular exclusion. Techno-College, Japanese Association for Thoracic Surgery, October 23, 2010, Osaka, Japan.
32. Hughes GC. “Hybrid” Repair of Aneurysms of the Transverse Aortic Arch. Japanese Association for Thoracic Surgery, October 25, 2010, Osaka, Japan.
33. Hughes GC. Cardiac surgery in the next decade. 13<sup>th</sup> Annual Duke Cardiothoracic Update and TEE Review Course. August 5, 2010, Hilton Head, SC.
34. Hughes GC. Aortic valve surgery: Indications and options. 13<sup>th</sup> Annual Duke Cardiothoracic Update and TEE Review Course. August 5, 2010, Hilton Head, SC.
35. Gaca JG, Sheng S, Rankin JS, O’Brien S, Daneshmand MA, Brennan JM, Hughes GC, Smith PK, Glower DD, Gammie JS. Outcomes for endocarditis surgery in North America: A simplified risk scoring system and need for clinical innovation. 36<sup>th</sup> Annual Meeting of the Western Thoracic Surgical Association, June 23-26, 2010, Ojai, CA.
36. Parsa CJ, Williams JB, Bhattacharya SD, Wolfe WG, McCann RL, Hughes GC. Mid-term results with TEVAR for chronic type B aortic dissection with associated aneurysm. 36<sup>th</sup> Annual Meeting of the Western Thoracic Surgical Association, June 23-26, 2010, Ojai, CA.
37. Hughes GC. Surgical Options: What is the right surgical approach for this patient? Society of Cardiovascular Anesthesiologists 32nd Annual Meeting & Workshops. April 24-28, 2010, New Orleans, LA.
38. Hughes GC. Surgical Perspective: What do I do during a hybrid repair? Society of Cardiovascular Anesthesiologists 32nd Annual Meeting & Workshops. April 24-28, 2010, New Orleans, LA.
39. Hughes GC. “Hybrid” Repair of Aneurysms of the Transverse Aortic Arch. Cardiology Grand Rounds, Johns Hopkins University School of Medicine, April 14, 2010.
40. Hughes GC. Debate: Pro-Open Repair of Chronic Dissection/Aneurysm. STS/AATS Tech-Con 2010, January 24, 2010, Fort Lauderdale, FL.

41. Williams ML, Sheng S, Haan CK, Smith PK, Hughes GC. Richard E. Clark Presentation: Aortic Dissection as a Complication of Cardiac Surgery: A Report From the STS National Database. Society of Thoracic Surgeons 46<sup>th</sup> Annual Meeting, January 25-27, 2010, Fort Lauderdale, FL.
42. Hughes GC. Endovascular Therapy for Traumatic Aortic Disruption. Update on Endovascular Stent Grafting. American Heart Association Scientific Sessions, November 16, 2009, Orlando, FL.
43. Hughes GC, Lee SM, Daneshmand MA, Tucker SW Jr, McCann RL. Endovascular repair of descending thoracic aneurysms: results with “on-label” application in the post-FDA approval era. 56th Annual Meeting, Southern Thoracic Surgical Association, November 4-7, 2009, Marco Island, FL.
44. Hughes GC. Current management of thoracic aortic dissection. Department of Radiology Grand Rounds, Duke University Medical Center, October 29, 2009, Durham, NC.
45. Hughes GC. Paving the thoracic aorta. North Carolina Surgical Association Fall Meeting. September 25, 2009, The Greenbrier, White Sulphur Springs, WV.
46. Hughes GC. Current management of thoracic aortic dissection. 12<sup>th</sup> Annual Duke Cardiothoracic Update and TEE Board Review Course. June 18th, 2009, Hilton Head, SC.
47. Hughes GC. Thoracic aortic aneurysms-surgical treatment. 12<sup>th</sup> Annual Duke Cardiothoracic Update and TEE Board Review Course. June 18th, 2009, Hilton Head, SC.
48. Hughes GC. Endovascular repair of the thoracic aorta. 3<sup>rd</sup> Annual Duke/IRMC Cardiovascular Symposium for Physicians, May 16, 2009, Vero Beach, FL.
49. Hughes GC. TEVAR: Indications, Current Trends, and Results. AATS/STS Adult Cardiac Surgery Symposium, American Association for Thoracic Surgery 89<sup>th</sup> Annual Meeting, May 10, 2009, Boston, MA.
50. Hughes GC. “Hybrid” Procedures for Thoracoabdominal Aortic Aneurysms. 7<sup>th</sup> Annual Current Trends in Aortic and Cardiothoracic Surgery, May 1, 2009, Houston, TX.
51. Hughes GC, Szeto W, Roselli E. Hybrid repair of thoracoabdominal aortic aneurysms. Society of Thoracic Surgeons Breakfast Session, San Francisco, CA, January 27, 2009.
52. Parsa CJ, Daneshmand MA, Lima B, Balsara KR, McCann RL, Hughes GC. Utility of Remote Wireless Pressure Sensing for Endoleak Detection Following



Endovascular Thoracic Aneurysm Repair. Society of Thoracic Surgeons Poster Session, San Francisco, CA, January 26-27, 2009.

53. Hughes GC. Endovascular repair of the thoracic aorta. Cardiology Grand Rounds, Cedars-Sinai Medical Center, Los Angeles, CA, January 20, 2009.
54. Hughes GC. Hybrid repair of thoracoabdominal aortic aneurysms. STS Thoracic Endografting Symposium, November 21-22, 2008, Chicago, IL.
55. Hughes GC, Daneshmand MA, Balsara KR, Achneck HA, Sileshi B, Lee SM, McCann RL. "Hybrid" Repair of Aneurysms of the Transverse Aortic Arch: Mid-term Results. 55th Annual Meeting, Southern Thoracic Surgical Association, November 5-8, 2008, Austin, TX.
56. Parsa CJ, Schroder JN, McCann RL, Hughes GC. Mid-term Results for Endovascular Repair of Complicated Acute and Chronic Type B Aortic Dissection. 55th Annual Meeting, Southern Thoracic Surgical Association, November 5-8, 2008, Austin, TX.
57. Hughes GC. Current management of thoracic aortic dissection. Department of Surgery Grand Rounds, Duke University Medical Center, September 10, 2008, Durham, NC.
58. Hughes GC. Thoracic aortic aneurysms-surgical treatment. 11<sup>th</sup> Annual Duke Cardiothoracic and Regional Update Meeting. July 6th, 2008, Hilton Head, SC.
59. Hughes GC. Hybrid TEVAR of thoracoabdominal aneurysms with concomitant debranching of visceral vessels. Thoracic Aortic Hybrid Procedures with Arch and Visceral Vessel Debranching: Techniques and Concepts Satellite Symposium, American Association for Thoracic Surgery 88th Annual Meeting, San Diego, CA, May 12, 2008.
60. Hughes GC, McCann RL. Hybrid repair of thoracoabdominal aortic aneurysms. Aortic Surgery Symposium 2008, May 8-9, 2008, New York, NY.
61. Gaca JG, Lima B, Smigla GR, Hughes GC. Utility of surface warming with direct conduction thermal pads to shorten rewarming times following deep hypothermic circulatory arrest. Aortic Surgery Symposium 2008, May 8-9, 2008, New York, NY.
62. Hughes GC. "Hybrid" approaches to the treatment of complex thoracic & thoracoabdominal aortic disease. Society of Cardiovascular Anesthesiologists 13<sup>th</sup> Annual Update on Cardiopulmonary Bypass, March 9-14, 2008, Whistler, BC, Canada.
63. Hughes GC, Swaminathan M, Nienaber JJ, Bush EL, Daneshmand MA, Wolfe WG, McCann RL. "Real world" thoracic endografting: Results with the Gore TAG endoprosthesis 2 years following Food and Drug Administration approval. 54th

Annual Meeting, Southern Thoracic Surgical Association, November 7-10, 2007, Bonita Springs, FL.

64. James ML, Husain A, Swaminathan M, Hughes GC. EEG monitoring maximizes cerebral protection for intraoperative hypothermic circulatory arrest. *Anesthesiology* 2007; 107:A819.
65. Swaminathan M, Hughes GC, Jagers JJ, Hollowell L, Bennett-Guerrero E. Institutional response to FDA warnings on aprotinin. *Anesthesiology* 2007; 107:A1601.
66. Hughes GC, Nienaber JJ, Bush EL, Daneshmand MA, McCann RL. Use of custom Dacron branch grafts for “hybrid” aortic debranching during endovascular repair of thoracic and thoracoabdominal aortic aneurysms. 33<sup>rd</sup> Annual Meeting, Western Thoracic Surgical Association, June 27-30, 2007, Santa Ana Pueblo, NM.
67. Hughes GC. Thoracic aortic aneurysms-surgical issues. 10<sup>th</sup> Annual Duke Cardiothoracic, Regional, and Critical Care Update Meeting. June 16<sup>th</sup>, 2007, Hilton Head, SC.
68. Hughes GC. “Hybrid” approaches to expand the applicability of endovascular repair for thoracic & thoracoabdominal aortic disease. 5<sup>th</sup> Annual Current Trends in Cardiovascular Surgery, June 1-2, 2007, Houston, TX.
69. Hughes GC. Thoracic Aortic Surgery. Decision making in cardiothoracic surgery. 3<sup>rd</sup> Annual Cardiothoracic Surgery Fellows Program, Chest 2006, October 22, 2006, Salt Lake City, Utah.
70. Hughes GC. Endovascular Repair of the Thoracic Aorta. 3<sup>rd</sup> Annual Cardiothoracic Surgery Fellows Program, Chest 2006, October 22, 2006, Salt Lake City, Utah.
71. Hughes GC, Hill S. Thoracic aortic surgery. 9<sup>th</sup> Annual Duke Cardiothoracic and Regional Update Meeting. June 19<sup>th</sup>, 2006, Hilton Head, SC.
72. Hughes GC, Glower DD, Smith PK, Grocott H. Disasters in Cardiac and Vascular Surgery. 9<sup>th</sup> Annual Duke Cardiothoracic and Regional Update Meeting. June 19<sup>th</sup>, 2006, Hilton Head, SC.
73. Husain A, Ashton K, Mohrhaus C, Rendahl R, Elliott S, Smigla G, Swaminathan M, Hughes GC. Effects of Cooling on Brainstem Auditory Evoked Potentials. 28th International Congress of Clinical Neurophysiology, September, 2006, Edinburgh, Scotland.
74. Swaminathan M, Lima B, Rajagopal K, McCann R, Hughes GC. Utility of intraoperative transesophageal echocardiography for endoleak detection during thoracic endografting. Aortic Surgery Symposium X, April 27-28, 2006, New York, New York.

75. Hughes GC. Endovascular repair of the thoracic aorta. Department of Anesthesiology Grand Rounds, Duke University Medical Center, January 25, 2006, Durham, NC.
76. Lima B, Hughes GC, Lemaire A, Jagers J, Glower DD, Wolfe WG. Short and intermediate-term outcomes of aortic root replacement with St. Jude mechanical conduits and aortic allografts. Southern Thoracic Surgical Association, November 11, 2005, Orlando, FL.
77. Hughes GC. Tough choices in great vessels. Decision making in cardiothoracic surgery. 2<sup>nd</sup> Annual Cardiothoracic Surgery Fellows Program, Chest 2005, October 30, 2005, Montreal, Canada.
78. Biswas SS, Domkowski PW, Diodato LH, Scarborough JE, Hughes GC, Landolfo C, Lowe JE, Landolfo KP. Intramyocardial delivery of bFGF (fibroblast growth factor) improves blood flow in a porcine model of hibernating myocardium. 81<sup>st</sup> Annual Meeting of The American Association for Thoracic Surgery, May 6-9, 2001, San Diego, CA.
79. Biswas SS, Hughes GC, Clements F, Landolfo KP. Changes in systolic and diastolic function during multivessel off-pump coronary artery bypass grafting (OPCAB). 2<sup>nd</sup> Annual International Society of Minimally Invasive Cardiac Surgery, June 10, 2000, Atlanta GA.
80. Hughes GC, Donovan CL, Biswas SS, Yin B, DeGrado TR, Coleman RE, Landolfo KP, Lowe JE. Is hibernating myocardium hypoperfused? Insights from quantitative positron emission tomography and dobutamine echocardiography in 52 swine with single-vessel coronary stenosis. *Circulation* 1999; I-377.
81. Hughes GC, Biswas SS, Yin B, Baklanov DV, DeGrado TR, Coleman RE, Donovan CL, Lowe JE, Landolfo KP, Annex BH. Intramyocardial but not intravenous vascular endothelial growth factor improves regional perfusion in hibernating myocardium. *Circulation* 1999; I-476.
82. Hughes GC, Baklanov DV, Annex BH, Biswas SS, Kypson AP, Phippen AM, Yin B, Donovan CL, Lowe JE, Landolfo KP. Denervation is not the long-term mechanism of action of transmyocardial laser revascularization. *Circulation* 1999; I-249.
83. Baklanov DV, Zalam S, Biswas SS, Hughes GC, Thompson MA, Annex BH, Lowe JE. Low atrial levels of the glucose transporter GLUT-4 are associated with the development of atrial fibrillation after coronary artery bypass graft surgery. *Circulation* 1999; I-665.
84. Ibrahim IA, Hassan A, Abdel-Wahab Z, El-ghanam A, Hughes GC, Thomas R, Taylor D, Lowe JE, Abel-aleem S. Depression of cytosolic heart fatty acid binding

protein (H-FABP) expression in adriamycin-induced cardiomyopathy and its reversal by L-carnitine. *FASEB J* 1999; 13: A907.

85. Hughes GC, Annex BH, Yin B, Phippen AM, Lin P, Kypson AP, Peters KG, Lowe JE, Landolfo KP. Transmyocardial laser revascularization (TMR) limits in vivo adenoviral-mediated gene transfer in porcine myocardium. *J Am Coll Cardiol* 1999; 33: 355A.
86. Hughes GC, Shah AS, Yin B, Shu M, Donovan CL, Glower DD, Lowe JE, Landolfo KP. Early postoperative changes in regional systolic and diastolic left ventricular function following transmyocardial laser revascularization (TMR) with holmium:YAG and CO<sub>2</sub> lasers. *J Am Coll Cardiol* 1999; 33: 342A.
87. dos Santos FC, Landolfo KP, Hughes GC, Coleman RB, Ryan T, Lowe JE, Donovan CL. Results of dobutamine stress echocardiography at one year following transmyocardial laser revascularization. *J Am Coll Cardiol* 1999; 33: 567A.
88. Hughes GC. Early postoperative changes in regional systolic and diastolic left ventricular function following transmyocardial laser revascularization (TMR) with holmium:YAG and CO<sub>2</sub> lasers. *American College of Cardiology Extended Learning (ACCEL)* 1999; Vol 31, No 3.
89. St. Louis JD, Hendrickson SC, Kypson AP, Hughes GC, Coleman RE, Donovan CL, DeGrado TR, Seabage L, Abdel-aleem S, Landolfo KP, Lowe JE. An experimental model of myocardial hibernation. *J Am Coll Cardiol* 1998; 31: 409A.
90. Hughes GC, Landolfo KP, Lowe JE, Coleman RB, Donovan CL. Perioperative morbidity and mortality following transmyocardial laser revascularization. *J Am Coll Cardiol* 1998; 31: 285-6A.
91. Hughes GC, Landolfo KP, Lowe JE, Coleman RB, Donovan CL. Detection of perioperative ischemia following transmyocardial laser revascularization. *J Am Coll Cardiol* 1998; 31: 285A.
92. Abdel-aleem S, El-Guindy N, Hughes GC, Sallam T, Lowe JE. Stimulation of fatty acid oxidation by dipyridamole in isolated myocytes. ISHR World Congress, 1998.
93. Abdel-aleem S, Kishk AM, Hassan AG, Hughes GC, Ibrahim IA, Taylor DA, Lowe JE. The enhancement of insulin-sensitive glucose transporter expression by chronic inhibition of fatty acid oxidation in the diabetic rat heart. *Circulation* 1998; 98: I-213.
94. Donovan CL, Landolfo KP, Hughes GC, Coleman RB, Lowe JE. Intermediate clinical outcome following transmyocardial laser revascularization for end-stage coronary artery disease. *Circulation* 1998; 98: I-542.

95. Hughes GC, Kypson AP, St.Louis JD, Annex BH, DeGrado TR, Coleman RE, Lowe JE, Landolfo KP. Angiogenesis accompanies improved perfusion in regions of hibernating myocardium following transmyocardial laser revascularization. 78<sup>th</sup> Annual Meeting of The American Association for Thoracic Surgery, May 3-6, 1998, Boston, MA.
96. Hughes GC, Smith TP, Eachempati SR, Vaslef SN, Reed RL. The use of a temporary vena caval interruption device in high-risk trauma patients unable to receive standard venous thromboembolism prophylaxis. Western Trauma Association, February 22-28, 1998, Lake Louise, Alberta.
97. Hughes GC, Best TM, Glisson RR, Seaber AV, Garrett WE Jr. Recurrent muscle strain injury: A minor experimental strain injury predisposes to subsequent major injury. American Orthopaedic Society for Sports Medicine Specialty Day Meeting, February 19, 1995, Orlando, FL.