Curriculum Vitae

Vance Girard Nielsen, MD

Professor, Anesthesiology
Vice Chair, Research
The University of Arizona College of Medicine
Tucson, Arizona

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Education

5/83	Loyola Marymount University B.S./Biology Los Angeles, California
5/87	University of Southern California, School of Medicine M.D./Medicine Los Angeles, California
7/87-6/88	Transitional Internship Lloyd Noland Hospital Fairfield, Alabama
7/88-6/91	Anesthesiology Residency University of Alabama Hospitals Department of Anesthesiology Birmingham, Alabama
7/91-6/92	Fellowship Cardiothoracic Anesthesia Department of Anesthesiology University of Alabama Hospitals Birmingham, Alabama

Certification and Licensure

Certification

7/88	Diplomate of the National Board of Medical Examiners Certificate #345878
4/92	Diplomate of The American Board of Anesthesiology Certificate #20952

Licensure

6/88-1/10	Alabama State Medical Board License #14170
7/08-1/15	Pennsylvania State Medical Board License #MD435201
9/11-Present	Arizona State Medical Board License #45366

Employment

7/92-8/92	Instructor/Fellow University of Alabama at Birmingham Birmingham, Alabama
9/92-9/97	Assistant Professor Division of Cardiothoracic Anesthesia Department of Anesthesiology University of Alabama at Birmingham Birmingham, Alabama
10/97-9/04	Associate Professor Department of Anesthesiology University of Alabama at Birmingham Birmingham, Alabama
10/04-4/09	Professor (with Tenure) Department of Anesthesiology University of Alabama at Birmingham Birmingham, Alabama
9/07-4/09	Professor (Secondary Appointment) Department of Surgery University of Alabama at Birmingham Birmingham, Alabama
8/09-8/11	Professor Department of Anesthesiology Drexel University College of Medicine Philadelphia, Pennsylvania
1/12-Present	Professor (with Tenure) Department of Anesthesiology University of Arizona College of Medicine Tucson, Arizona

Clinical Activities

For over 17 years at the University of Alabama, I provided anesthetic care to cardiothoracic patients of all ages (birth-nonagenarian). The procedures include complex congenital cardiac repairs; high risk valve repair/replacement and coronary bypass grafting (mostly repeat operations); major vascular procedures (e.g., thoracic aneurysm repair), mediastinoscopy, thoracotomies, video assisted thoracostomy; ventricular assist device (VAD) placement; and both lung and heart transplantation in children and adults. At Hahnemann University Hospital I provided care to adult patients for general surgical, vascular, thoracic, cardiovascular and obstetrical procedures from August of 2009 until August 2011. At the University of Arizona, I attend complex cardiac and thoracic procedures that includes patients with congenital heart disease as well as mange general cases in the main operating room.

Honors and Awards

1983	Elected to *Alpha Sigma Nu*, National Jesuit Honor Society Loyola Marymount University Los Angeles, California
1985	First Place in the *Alpha Omega Alpha* Research Forum Saint Louis University St. Louis, Missouri
1999	University of Alabama at Birmingham Department of Anesthesiology, Tenure Birmingham, Alabama
2007-2010	Best Doctors in America
2012	University of Arizona College of Medicine Department of Anesthesiology, Tenure Tucson, Arizona
2013	Elected to Association of University Anesthesiologists

Service and Outreach

Memberships and Offices in Professional Societies

1987	American Medical Association
1988	American Society of Anesthesiologists
1988	International Anesthesia Research Society
1991	Society of Cardiovascular Anesthesiologists
2011	American Heart Association
2013	Association of University Anesthesiologists

Institutional

Committees

1993-2007	Anesthesiology Clinical Research Committee University of Alabama at Birmingham Birmingham, Alabama
1997-2004	Alternate member to institutional animal care and utilization committee (IACUC) University of Alabama at Birminham Birminham, Alabama
2001-2009	Anesthesiology Education Committee University of Alabama Birmingham Birmingham, Alabama
2007-2009	Anesthesiology Promotions and Tenure Committee University of Alabama Birmingham Birmingham, Alabama
2009-2011	Transfusion Committee Hahnemann University Hospital Philadelphia, Pennsylvania
2009-2001	Executive Research Committee Drexel University College of Medicine Philadelphia, Pennsylvania

Administrative Service

2010-2011	Vice-Chair of Anesthesiology Research Department of Anesthesiology Drexel University College of Medicine Philadelphia, Pennsylvania
2012-Present	Associate Head of Research Department of Anesthesiology University of Arizona College of Medicine Tucson, Arizona
2013-Present	Chairman of Department of Anesthesiology Promotions and Tenure Committee University of Arizona College of Medicine Tucson, Arizona

Extramural

Committees

1999-2002	American Society of Anesthesiologists Subcommittee on Experimental Circulation

Editorial Board Memberships

2000-2009	Guest Editor for Anesthesia & Analgesia
2009-Present	Associate Editor for Anesthesia & Analgesia

Reviewer of Manuscripts for Journal Publications

Ad hoc reviewer for:

1996	Chest
1998	Clinical Chemistry and Laboratory Medicine
2000	Drugs in R&D
2001	Blood Coagulation & Fibrinolysis
2006	Brittish Journal of Anaesthesia
2006	Pediatric Research
2006	Thrombosis Research

2007	Annals of Thoracic Surgery
2007	The Journal of Heart & Lung Transplantation
2008	The Journal of Thrombosis & Haemostasis
2009	Acta Pharmacologica Sinica
2009	Liver Transplantation
2010	American Journal of Cardiovascular Drugs
2010	Cellular and Molecular Life Sciences
2011	American Journal of Respiratory and Critical Care Medicine
2011	Toxicology Reports
2012	Acta Anaesthesiologica Scandinavica
2012	PLoS One
2012	Redox Report
2013	ASAIO J
2013	European Journal of Haematology
2013	Minerva Anesthesiologica
2014	Annals of Biomedical Engineering
2014	Artificial Organs
2014	Blood
2014	Life Sciences
2014	Microscopy Research and Techniques
2014	Neuroscience

Publications and Creatice Activity

Published Full-length, Peer-reviewed Manuscripts

1. **Nielsen VG**, Cheung ATW, Miller ME. Polarographic micromethod for the rapid and continuous assay of movement connected oxygen consumption of locomotory cells. Wasmann Journal of Biology 1983;41:108-112.

2. **Nielsen VG**, Webster RO. Inhibition of human polymorphonuclear leukocyte functions by ibuprofen. Immunopharmacology 1987;13:61-71.

3. **Nielsen VG**, Weinbroum A, Tan S, Samuelson PN, Gelman S, Parks DA. Xanthine oxidoreductase release after descending thoracic aorta occlusion and reperfusion in rabbits. J Thorac Cardiovasc Surg 1994;107:1222-1227.

4. Weinbroum A, **Nielsen VG**, Tan S, Gelman S, Matalon S, Skinner K, Bradley Jr. E, Parks DA. Liver ischemia-reperfusion increases pulmonary permeability in the rat: role of circulating xanthine oxidase. Am J Physiol 1995;268:G988-G996.

5. **Nielsen VG**, McCammon AT, Tan S, Samuelson PN, Parks DA. Xanthine oxidase inactivation attenuates post-occlusion shock after descending thoracic aorta occlusion and reperfusion in rabbits. J Thorac Cardiovasc Surg 1995;110:715-722.

6. Tan S, Liu Y-Y, **Nielsen VG**, Skinner K. Kirk KA, Baldwin ST, Parks DA. Maternal infusion of antioxidants (Trolox and ascorbic acid) protects the fetal heart in rabbit fetal hypoxia. Pediatr Res 1996;39:499-503.

7. **Nielsen VG**, Tan S, Baird MS, McCammon AT, Parks DA. Gastric intramucosal pH and multiple organ injury: impact of ischemia-reperfusion and xanthine oxidase. Crit Care Med 1996;24:1339-1344.

8. **Nielsen VG**, Tan S, Weinbroum A, McCammon AT, Samuelson PN, Gelman S, Parks DA. Lung injury after hepatoenteric ischemia-reperfusion: role of xanthine oxidase. Am J Respir Crit Care Med 1996;154:1364-1369.

9. **Nielsen VG**, Tan S, Baird MS, Samuelson PN, McCammon AT, Parks DA. Xanthine oxidase mediates myocardial injury after hepatoenteric ischemia-reperfusion. Crit Care Med 1997;25:1044-1050.

10. **Nielsen VG**, Tan S, Brix AE, Baird MS, Parks DA. Hextend® (hetastarch solution) decreases multiple organ injury and xanthine oxidase release after hepatoenteric ischemia-reperfusion in rabbits. Crit Care Med 1997;25:1565-1574.

11. **Nielsen VG,** Tan S, Baird MS, Kirk KA, McCammon AT, Samuelson PN, Parks DA. Halothane and xanthine oxidase increase hepatocellular enzyme release and

circulating lactate after ischemia-reperfusion in rabbits. Anesthesiology 1997;87:908-917.

12. Axon RN, Baird MS, Lang JD, Brix AE, **Nielsen VG**. PentaLyte® decreases lung injury after aortic occlusion-reperfusion in rabbits. Am J Respir Crit Care Med 1998;157:1982-1990.

13. **Nielsen VG**, Baird MS, McAdams ML, Freeman BA. Desflurane increases pulmonary alveolar-capillary membrane injury after aortic occlusion-reperfusion in rabbits: evidence of oxidant-mediated lung injury. Anesthesiology 1998;88:1524-1534.

14. Tan S, Yokoyama Y, Wang Z, Zhou F, **Nielsen VG**, Murdock AD, Adams C, Parks DA. Hypoxia-reoxygenation is as damaging as ischemia-reperfusion in the rat liver. Crit Care Med 1998;26:1089-1095.

15. Tan S, Zhou F, **Nielsen VG**, Wang Z, Gladson CL, Parks DA. Sustained hypoxia-ischemia results in reactive nitrogen and oxygen species production and injury in the premature fetal rabbit brain. J Neuropath Exp Neurol 1998;57:544-553.

16. **Nielsen VG**, DuVall MD, Baird MS, Matalon S. c-AMP activation of chloride and fluid secretion across the rabbit alveolar epithelium. Am J Physiol 1998;275 (Lung Cell Mol Physiol):L1127-L1133.

17. **Nielsen VG**, Baird MS, Brix AE, Matalon S. Extreme, progressive isovolemic hemodilution with 5% human albumin, PentaLyte® or Hextend® does not cause hepatic ischemia or histologic injury in rabbits. Anesthesiology 1999;90:1428-1435.

18. Tan S, Zhou F, **Nielsen VG**, Wang Z, Gladson CL, Parks DA. Increased injury following intermittent fetal hypoxia-reoxygenation is associated with increased free radical production in fetal rabbit brain. J Neuropath Exp Neurol 1999;58:972-981.

19. Lazrak A, **Nielsen VG,** Matalon S. Mechanisms of increased Na^+ transport in ATII cells by cAMP: we agree to disagree and do more experiments. Am J Physiol 2000;278 (Lung Cell Mol Physiol):L233-L238.

20. **Nielsen VG**, Baird MS. Extreme hemodilution in rabbits: an in vitro and in vivo thrombelastographic analysis. Anesth Analg 2000;90:541-545.

21. **Nielsen VG**, Geary BT, Baird MS. Effects of DETANONOate, a nitric oxide donor, on hemostasis in rabbits: an in vitro and in vivo thrombelastographic analysis. J Crit Care 2000;15:30-35.

22. **Nielsen VG**, Baird MS, Chen L, Matalon S. DETANONOate, a nitric oxide donor, decreases amiloride-sensitive alveolar fluid clearance in rabbits. Am J Respir Crit Care Med 2000;161:1154-1160.

23. **Nielsen VG**, Baird MS, Geary BT, Matalon S. Halothane does not decrease amiloride-sensitive alveolar fluid clearance in rabbits. Anesth Analg 2000;90:1445-1449.

24. **Nielsen VG**, Geary BT, Baird MS. Evaluation of the contribution of platelets to clot strength by Thrombelastography® in rabbits: role of tissue factor and cytochalasin D. Anesth Analg 2000;91:35-39.

25. **Nielsen VG**, Geary BT. Thoracic aorta occlusion-reperfusion decreases hemostasis as assessed by Thrombelastography in rabbits. Anesth Analg 2000;91:517-521.

26. Holman WL, Li Q, Kiefe CI, McGiffin DC, Peterson ED, Allman RM, **Nielsen VG**, Pacifico AD. Prophylactic value of pre-incision intra-aortic balloon pump: analysis of a statewide experience. J Thorac Cardiovasc Surg 2000;120:1112-1119.

27. **Nielsen VG**, Geary BT. Hepatoenteric ischemia-reperfusion increases circulating heparinoid activity in rabbits. J Crit Care 2000;15:142-146.

28. **Nielsen VG**, Armstead VE, Geary BT, Opentanova IL. PentaLyte does not decrease heparinoid release but does decrease circulating thrombotic mediator activity associated with aortic occlusion-reperfusion in rabbits. Anesth Analg 2001;92:314-319.

29. **Nielsen VG**. Nitric oxide decreases coagulation protein function in rabbits as assessed by thrombelastography. Anesth Analg 2001;92:320-323.

30. Chaney JD, **Nielsen VG**. Considerations for the hemophiliac patient with inhibitors to factor VIII. Anesth Analg, 2001;92:785-786.

31. **Nielsen VG**. Endogenous heparin decreases the thrombotic response to hemorrhagic shock in rabbits. J Crit Care 2001;16:64-68.

32. **Nielsen VG**. Resuscitation with Hextend® decreases endogenous circulating heparin activity and accelerates clot initiation after hemorrhage in the rabbit. Anesth Analg 2001;93:1106-1110.

33. Chaney JD, Adair TM, Lell WA, McGiffin DC, **Nielsen VG**. Hemostatic analysis of a patient with hereditary angioedema undergoing coronary artery bypass grafting. Anesth Analg 2001;93:1480-1482.

34. Lell WA, **Nielsen VG**, McGiffin DC, Kirklin JK, Schmidt FE, Stanely AW. Glucose-insulin-potassium (GIK) infusion for myocardial protection during off-pump coronary artery surgery (OPCAB). Ann Thorac Surg 2002;73:1246-1251.

35. McCammon AT, Wright JP, Figueroa M, **Nielsen VG**. Hemodilution with albumin, but not Hextend®, results in hypercoagulability as assessed by thrombelastography® in rabbits: role of heparin-dependent serpins and factor VIII complex. Anesth Analg 2002;95:844-850.

36. **Nielsen VG**, Geary BT. Coagulopathy mediated by hepatoenteric ischemia-reperfusion in rabbits: role of xanthine oxidase. Transplantation 2002;74:1181-1183.

37. **Nielsen VG**. Detection of changes in heparin activity in the rabbit: a comparison of anti-Xa activity, thrombelastography, activated partial thromboplastin time and activated coagulation time. Anesth Analg 2002;95:1503-1506.

38. Kieta DR, McCammon AT, Holman WL, **Nielsen VG**. Hemostatic analysis of a patient undergoing off-pump coronary artery bypass surgery (OP-CAB) with argatroban anticoagulation. Anesth Analg 2003;96:956-958.

39. **Nielsen VG**. Hemodilution with lactated Ringer's solution causes hypocoagulability in rabbits. Blood Coagul Fibrinolysis 2004;15:55-59.

40. **Nielsen VG**, Crow JP. Peroxynitrite decreases rabbit tissue factor activity in vitro. Anesth Analg 2004;98:668-671.

41. **Nielsen VG**, Crow JP, Zhou F, Parks DA. Peroxynitrite decreases human tissue plasminogen activator activity in vitro. Anesth Analg 2004;98:1312-1317.

42. **Nielsen VG**, Crow JP, Mogal A, Zhou F, Parks DA. Peroxynitrite decreases hemostasis in human plasma. Anesth Analg 2004;99:21-26.

43. **Nielsen VG**, Gurley WQ, Burch TM. Impact of factor XIII on coagulation kinetics and clot strength determined by thrombelastography. Anesth Analg 2004;99:120-123.

44. **Nielsen VG**, Lyerly RT, Gurley WQ. The effect of dilution on plasma coagulation kinetics determined by thrombelastography is dependent on antithrombin activity and mode of activation. Anesth Analg 2004;99:1587-1592.

45. **Nielsen VG**, Cohen BM, Cohen E. Effects of coagulation factor deficiency on plasma coagulation kinetics determined via Thrombelastography®: critical roles of fibrinogen and Factors II, VII, X and XII. Acta Anaesthesiol Scand 2005;49:222-231.

46. **Nielsen VG.** Antithrombin efficiency is maintained in vitro in human plasma following dilution with hydroxyethyl starches. Blood Coagul Fibrinolysis 2005;16:319-322.

47. **Nielsen VG**. Colloids decrease clot propagation and strength: role of factor XIII-fibrin polymer and thrombin-fibrinogen interactions. Acta Anaesthesiol Scand 2005;49:1163-1171.

48. **Nielsen VG**. Effects of PentaLyte® and Voluven® hemodilution on plasma coagulation kinetics in the rabbit: role of thrombin-fibrinogen and factor XIII-fibrin interactions. Acta Anaesthesiol Scand 2005;49:1263-1271.

49. **Nielsen VG**, Cohen BM, Cohen E. Elastic modulus-based thrombelastographic quantification of plasma clot fibrinolysis with progressive plasminogen activation. Blood Coagul Fibrinolysis 2006;17:75-81.

50. **Nielsen VG**. Effects of aprotinin on plasma coagulation kinetics determined by thrombelastography: role of factor XI. Acta Anaesthesiol Scand 2006;50:168-172.

51. **Nielsen VG**. Effects of Hextend® hemodilution on plasma coagulation kinetics in the rabbit: role of Factor XIII-mediated fibrin polymer crosslinking. J Surg Res 2006;132:17-22.

52. **Nielsen VG**. Protamine enhances fibrinolysis by decreasing clot strength: role of tissue factor-initiated thrombin generation. Ann Thorac Surg 2006;81:1720-1727.

53. **Nielsen VG**, Steenwyk BL, Gurley WQ, Pereira SJ, Lell WA, Kirklin JK. Argatroban, bivalirudin and lepirudin do not decrease clot propagation and strength as effectively as heparin activated antithrombin in vitro. J Heart Lung Transplant 2006;25:653-663.

54. Audu P, **Nielsen VG**, Armstead VE, Powell G, Kim J, Kim L, Mehta M. Impact of tissue factor pathway inhibitor on coagulation kinetics determined by thrombelastography. Anesth Analg 2006;103:841-845.

55. **Nielsen VG**, Steenwyk BL, Gurley WQ. Contact activation prolongs clot lysis time in human plasma: role of thrombin activatable fibrinolysis inhibitor and factor XIII. J Heart Lung Transplant 2006;25:1247-1252.

56. **Nielsen VG**. Hemodilution modulates the time of onset and rate of fibrinolysis in human and rabbit plasma. J Heart Lung Transplant 2006;25:1344-1352.

57. **Nielsen VG**, Audu P, Cankovic L, Lyerly III RT, Steenwyk BL, Armstead VE, Powell G. Qualitative thrombelastographic method of detection of tissue factor in human plasma. Anesth Analg 2007;104:59-64.

58. **Nielsen VG**, Ellis TC. Thrombelastographic quantification of the contributions of thrombin activatable fibrinolysis inhibitor and alpha$_2$-antiplasmin to antifibrinolytic activity in human plasma. Blood Coagul Fibrinolysis 2007;18:29-33.

59. **Nielsen VG**, Cankovic L, Steenwyk BL. Epsilon aminocaproic acid inhibition of fibrinolysis in vitro: should the “therapeutic” concentration be reconsidered? Blood Coagul Fibrinolysis 2007;18:35-39.

60. Ellis TC, **Nielsen VG,** Marques MB, Kirklin JK. Thrombelastographic measures of clot propagation: a comparison of alpha to maximum rate of thrombus generation. Blood Coagul Fibrinolysis 2007;18:45-48.

61. **Nielsen VG**, Kirklin JK. Hydroxyethyl starch enhances argatroban-mediated decreases in clot propagation and strength by diminishing thrombin-factor XIII-fibrin interactions. Blood Coagul Fibrinolysis 2007;18:49-54.

62. **Nielsen VG**, Hoogendoorn H, Kirklin JK, Ellis TC, Holman WL. Thrombelastographic method to quantify the contribution of Factor XIII to coagulation kinetics. Blood Coagul Fibrinolysis 2007;18:145-150.

63. Steenwyk BL, Kirklin JK, Gurley WQ, **Nielsen VG**. Hemostatic history of a 15 month old child implanted with a Berlin left ventricular assist device prior to transplantation. Anesth Analg 2007;104:538-540.

64. **Nielsen VG**. A comparison of the Thrombelastograph and ROTEM. Blood Coagul Fibrinolysis 2007;18:247-252.

65. **Nielsen VG**. High molecular weight hydroxyethyl starch accelerates kallikrein-dependent clot initiation. J Trauma 2007;62:1491-1494.

66. **Nielsen VG**. Hydroxyethyl starch enhances fibrinolysis in human plasma by diminishing α_2-antiplasmin-plasmin interactions. Blood Coagul Fibrinolysis 2007;18:647-656.

67. **Nielsen VG**, Steenwyk BL, Burch TM, King CK, McGiffin DC. Hemostatic analysis of a 13 year old with antiphospholipid syndrome and restrictive pericarditis. Blood Coagul Fibrinolysis 2007;18:695-697.

68. **Nielsen VG**. Beyond cell based models of coagulation: analyses of coagulation with clot "lifespan" resistance-time relationships. Thromb Res 2008;122:145-152.

69. **Nielsen VG**. Clot lifespan model analysis of clot growth and fibrinolysis in normal subjects: role of thrombin activatable fibrinolysis inhibitor. Blood Coagul Fibrinolysis 2008;19:283-287.

70. **Nielsen VG**, Steenwyk BL, Holman WL, Kirklin JK, Parks DA, Zhou F, George JF, Ellis TC. Mechanical circulatory device thrombosis: a new paradigm linking hypercoagulation and hypofibrinolysis. ASAIO J 2008;54:351-358.

71. **Nielsen VG**, Kirklin JK, Holman WL, Ellis TC, Steenwyk BL. Case report of a patient with hypofibrinolysis-mediated thromboembolism converted to a hypercoagulable/hyper-fibrinolytic state via ventricular assist device placement. J Heart Lung Transplant 2008; 27:1169-1171.

72. Cankovic L, Steenwyk BL, McGiffin DC, **Nielsen VG**. Practical approach to anticoagulation for cardiopulmonary bypass in the patient with congenital prolonged activated partial thromboplastin time. Blood Coagul Fibrinolysis 2008;19:725-726.

73. **Nielsen VG**, Kirklin JK. Argatroban enhances fibrinolysis by differential inhibition of thrombin-mediated activation of thrombin activatable fibrinolysis inhibitor and Factor XIII. Blood Coagul Fibrinolysis 2008;19:793-800.

74. **Nielsen VG**, Kirklin JK, Holman WL, Steenwyk BL. Clot lifespan model analysis of the effects of warfarin on thrombus growth and fibrinolysis: role of contact protein and tissue factor initiation. ASAIO J 2009;55:33-40.

75. **Nielsen VG**. Corn trypsin inhibitor decreases tissue-type plasminogen activator-mediated fibrinolysis of human plasma. Blood Coagul Fibrinolysis 2009;20:191-196.

76. **Nielsen VG**, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 increases the velocity of thrombus growth and strength in human plasma. Blood Coagul Fibrinolysis 2009;20:377-380.

77. **Nielsen VG**, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 (CORM-2) decreases fibrinolysis in human plasma. Blood Coagul Fibrinolysis 2009;20:448-455.

78. **Nielsen VG**, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 (CORM-2) increases the velocity of thrombus growth and strength in hemophilia A, hemophilia B and Factor VII deficient plasmas. Blood Coagul Fibrinolysis 2010;21:41-45.

79. **Nielsen VG**, Kirklin JK, George JF, Messinger JD. Carbon monoxide releasing molecule-2 decreases thick diameter fibrin fibre formation in normal and factor XIII deficient plasma. Blood Coagul Fibrinolysis 2010;21:101-105.

80. **Nielsen VG**, Asmis LM. Hypercoagulability in the perioperative period. Best Practice & Research Clinical Anaesthesiology 2010;24:133-144.

81. **Nielsen VG**, Malayaman SN, Khan ES, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 increases fibrinogen-dependent coagulation kinetics but does not enhance prothrombin activity. Blood Coagul Fibrinolysis 2010;21:349-353.

82. **Nielsen VG**, Khan ES, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 enhances coagulation and diminishes fibrinolytic vulnerability in subjects exposed to warfarin. Thromb Res 2010;126:68-73.

83. **Nielsen VG**. The antifibrinolytic effects of carbon monoxide releasing molecule-2 are fibrin and α_2-antiplasmin dependent. Blood Coagul Fibrinolysis 2010;21:584-587.

84. **Nielsen VG**, Khan ES, Kirklin JK, George JF. Carbon monoxide releasing molecule enhances coagulation and diminishes fibrinolytic vulnerability in plasma exposed to heparin or argatroban. Anesth Analg 2010;111:1347-1352.

85. Cohen JB, Persaud JM, Malayaman SN, **Nielsen VG**. Carbon monoxide releasing molecule-2 enhances coagulation and attenuates fibrinolysis by two mechanisms: insights gained with colloid dilution. Blood Coagul Fibrinolysis 2011;22:60-66.

86. **Nielsen VG**, George SJ. Carbon monoxide releasing molecule-2 attenuates the anticoagulant and amplifies the hypofibrinolytic effects of hypothermia in plasma. Blood Coagul Fibrinolysis 2011;22:67-72.

87. **Nielsen VG**, Green P, Green M, Martin-Ross A, Khan ES, Kirklin JK, George JF. Carbon monoxide releasing molecule-2 enhances coagulation and diminishes fibrinolytic vulnerability in diluted plasma. J Trauma 2011;70:939-947.

88. Malayaman SN, **Nielsen VG**, Cohen JB, Machovec KA, Bernhardt BE, Arkebauer MR. Carbon monoxide releasing molecule-2 enhances alpha-2-antiplasmin activity. Blood Coagul Fibrinolysis 2011;22:345-348.

89. Malayaman SN, Entwistle III JWC, Boateng P, Wechsler AS, Persaud JM, Cohen JB, Kirklin JK, **Nielsen VG**. Carbon monoxide releasing molecule-2 improves coagulation in patient plasma in vitro following cardiopulmonary bypass. Blood Coagul Fibrinolysis 2011;22:362-368.

90. **Nielsen VG**, Cohen JB, Malayaman SN, Nowak M, Vosseller K. Fibrinogen is a heme-associated, carbon monoxide sensing molecule: a preliminary report. Blood Coagul Fibrinolysis 2011;22:443-447.

91. Brodsky MA, Machovec KA, Chambers BP, **Nielsen VG**. Platelet-mediated thrombolysis in patients with delta-storage pool deficiency: a thrombelastographic analysis. Blood Coagul Fibrinolysis 2011;22:610-612.

92. **Nielsen VG**, Arkebauer MR, Vosseller K. Redox-based thrombelastographic method to detect carboxyhemefibrinogen mediated hypercoagulability. Blood Coagul Fibrinolysis 2011;22:657–661.

93. Arkebauer MR, Kanaparthy SS, Malayaman SN, Vosseller K, **Nielsen VG**. Carbon monoxide and nitric oxide modulate alpha-2-antiplasmin and plasmin activity: role of heme. Blood Coagul Fibrinolysis 2011;22:712–719.

94. Green MS, Heyer A, Green P, **Nielsen VG**, Parekh J. Endotracheal cardiac output monitor in a patient with severe tricuspid regurgitation. J Cardiothorac Vasc Anesth 2011;25:830-832.

95. **Nielsen VG**, Chawla N, Mangla D, Gomes SB, Arkebauer MR, Wasko KA, Sadacharam K, Vosseller K. Carbon monoxide releasing molecule-2 enhances coagulation in rabbit plasma and decreases bleeding time in clopidogrel/aspirin treated rabbits. Blood Coagul Fibrinolysis 2011;22:756–759.

96. **Nielsen VG**, Arkebauer MR, Wasko KA, Malayaman SN, Vosseller K. Carbon monoxide releasing molecule-2 decreases fibrinolysis in vitro and in vivo in the rabbit. Blood Coagul Fibrinolysis 2012;23:104–107.

97. **Nielsen VG**, Malayaman SN, Cohen JB, Persaud JM. Carbon monoxide releasing molecule-2 improves protamine-mediated hypocoagulation/hyperfibrinolysis in human plasma in vitro. J Surg Res 2012;173:232-239.

98. Machovec KA, Ushakumari DS, Welsby IJ, **Nielsen VG**. The procoagulant properties of purified fibrinogen concentrate are enhanced by carbon monoxide releasing molecule-2. Thromb Res 2012;129:793-796.

99. **Nielsen VG**, Hafner DT. Freezing does not decrease carbon monoxide mediated hypercoagulation and hypofibrinolysis in human plasma. Blood Coagul Fibrinolysis 2012;23:784-786.

100. Smith MC, **Nielsen VG**. Detection of carboxyhemefibrinogen and methemefibrinogen in a patient with thrombosis of a Heartmate II ventricular assist device. ASAIO J 2013;59:93-95.

101. Olver CS, **Nielsen VG**. Thrombelastographic characterization of coagulation/fibrinolysis in horses: role of carboxyheme and metheme states. Blood Coagul Fibrinolysis 2013;24:273-278.

102. **Nielsen VG**, Hafner DT, Steinbrenner EB. Can divergent plasmin-antiplasmin-carbon monoxide interactions in young, healthy tobacco smokers explain the “smoker’s paradox”? Blood Coagul Fibrinolysis 2013;24:381-385.

103. **Nielsen VG**, Hafner DT, Steinbrenner EB. Tobacco smoke induced hypercoagulation in human plasma: role of carbon monoxide. Blood Coagul Fibrinolysis 2013;24:405-410.

104. **Nielsen VG**, Garol BD, Zelman EA, Guerrero MA. Hemeoxygenase-1 mediated hypercoagulability in a patient with thyroid cancer. Blood Coagul Fibrinolysis 2013;24:663-665.

105. **Nielsen VG**, Ley MLB, Waer AL, Alger PW, Matika RW, Steinbrenner EB. Plasmatic hypercoagulation in patients with breast cancer: role of hemeoxygenase-1. Blood Coagul Fibrinolysis 2013;24:809-813.

106. **Nielsen VG**, Pearson T, Smith MC. Increased carbon monoxide production by hemeoxygenase-1 caused by device-mediated hemolysis: thrombotic phantom menace? Artif Organs 2013;37:1008-1014.

107. **Nielsen VG**, Gharagozloo F, Matika RW, Kim S, Zelman EA, Steinbrenner EB. Thoracic tumor effects on plasmatic coagulation: role of hemeoxygenase-1. Lung Cancer 2014 Feb;83(2):288-291. Doi: 10.1016/j.luncan.2013.11.012. PMID: 24355260.

108. **Nielsen VG,** Pretorius E. Carbon monoxide: Anticoagulant or procoagulant? Thromb Res 2014 Mar;133(3):315-321. Doi: 10.106/j.thromres.2013.12.004. PMID: 24360115.

109. **Nielsen VG**, Matika RW, Ley MLB, Waer AL, Gharagozloo F, Kim S, Nfonsam VN, Ong ES, Jie T, Warneke JA. Tissue type plasminogen activator induced fibrinolysis is enhanced in patients with breast, lung, pancreas and colon cancer. Blood Coagul Fibrinolysis 2014 Apr;25(3):248-253. Doi: 10.1097/MBC.000000000000040. PMID: 24674880.

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Book Reviews

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Letters to the Editor

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2. **Nielsen VG**. In response: hemodilution induced hypercoagulability. Anesth Analg 2003;96:1539-40.

3. **Nielsen VG**. In response: argatroban for off-pump coronary artery bypass surgery. Anesth Analg 2003;97:1201-2.

4. **Nielsen VG**. Effects of hydroxyethyl starch and calcium on platelet activation. Anesth Analg 2005;100:1538.

5. **Nielsen VG**. A ROTEM®-based method of drug assessment developed with human experimentation without consent. Acta Anaesthesiol Scand 2007;51:1403.

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3. **Nielsen VG**, Malayaman SN. Protamine sulfate: crouching clot or hidden hemorrhage? Anesth Analg, 2010;111:593-594.

4. **Nielsen VG**. Coagulation crystal ball: why can't we predict bleeding after cardiac surgery? Anesth Analg, 2012;115:490-492.

5. **Nielsen VG**. Old mineshaft, new canary: can circulating osteopontin concentrations predict septic shock? Minerva Anestesiol 2014, in press.

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Inventions and Patents

1. “Enhancing Coagulation or Reducing Fibrinolysis” – USPTO application No. 13/254,287, generated by the University of Alabama at Birmingham Research Foundation. This patent concerns the use of site-directed carbon monoxide for enhancement of coagulation and attenuation of fibrinolysis. Coinventors: James F. George, Ph.D. & James K. Kirklin, M.D.

2. “Compositions and Methods for Diagnosing Hypercoagulability” – USPTO application No. PCT/US12/47407, generated by by Drexel University Department of Entrepreneurship and Technoloby Commercialization. This patent concerns the viscoelastic detection of carbon monoxide-mediated hypercoagulability. Coinventor: Keith Voseller, Ph.D.

3. “Methods for Diagnosing Iron-Related Pathologies” – USPTO application No. submitted, generated by th University of Arizona, Tucson, AZ. Inventor: Vance G. Nielsen, M.D.

Conferences and Scholarly Presentations

Educational Activities

I have provided educational experiences to medical students, residents and cardiothoracic fellows in the operating room and lecture in either Grand Rounds or Cardiothoracic Anesthesia Lecture format for more than 20 years. In addition to instructing trainees on the safe conduct of anesthesiology, I have focused on perioperative coagulation issues (e.g., anticoagulation during cardiopulmonary bypass, effects of colloids on coagulation, and blood-biomaterial interface biochemistry).

Visiting Professorships

9/98	Ischemia-Reperfusion Injury Department of Anesthesiology The Health Services Division of Saint Louis Univerisity St. Louis, Missouri
6/04	Thrombelastography: Clinical & Experimental Insights Department of Anesthesiology Thomas Jefferson University Philadelphia, Pennsylvania
2/08	Mechanical Circulatory Device Thrombosis: A New Paradigm Linking Hypercoagulation and Hypofibrinolysis Department of Anesthesiology The University of Pennsylvania Philadelphia, Pennsylvania
5/08	Mechanical Circulatory Device Thrombosis: A New Paradigm Linking Hypercoagulation and Hypofibrinolysis Department of Anesthesiology Pennsylvania State University University Park, Pennsylvania
1/11	Carbon Monoxide and Hemostasis: Therapeutic Potential, Pathological Implications Department of Anesthesiology The University of Maryland School of Medicine Baltimore, Maryland
6/11	Hemes, Hares and Hemostasis: Carbon Monoxide-Mediated Effects on Blood Coagulation and Fibrinolysis Department of Anestheisology University of Arizona College of Medicine Tucson, Arizona

Conferences and Seminars

3/96 Cardiovascular Anesthesia
Anesthesiology Journal Club
University of Alabama at Birminghmam
Birmingham, Alabama

2/97 Gastric Tonometry: Theory and Application
Anesthesiology Journal Club
University of Alabama at Birmingham
Birmingham, Alabama

5/82 **Nielsen VG**, Cheung ATW, Miller ME
Polarographic micromethod for the rapid and continuous assay of movement connected oxygen consumption of locomotory cells
University of Santa Clara Undergraduate Research Conference
Santa Clara, California

4/85 **Nielsen VG**, Webster RO
Inhibition of human polymorphonuclear leukocyte functions by ibuprofen
University of Texas Medical Branch at Galveston National Student Research Forum
Galveston, Texas

10/93 **Nielsen VG**, Weinbroum A, Samuelson PN, Gelman S, Tan S, Baldwin S, Matalon S, Parks DA
Hetastarch decreases lung injury after descending thoracic aorta occlusion and reperfusion in rabbits
American Society of Anesthesiologists Annual Meeting
Washington, D.C.

4/94 **Nielsen VG**, McCammon AT, Kuhn LH, Tan S, Samuelson PN, Baldwin S, Parks DA
Xanthine oxidase contributes to pulmonary and hepatic injury following thoracic aorta occlusion and reperfusion in rabbits
Society of Cardiovascular Anesthesiologists
Montreal, Canada

10/98 Kreul JF, **Nielsen VG**
Moderators for “Equipment, Monitoring and Engineering Technology: Cardiac Output”
American Society of Anesthesiologists Annual Meeting
Orlando, Florida

10/99 Kreul JF, **Nielsen VG**
Moderators for “Equipment, Monitoring and Engineering Technology”
American Society of Anesthesiologists Annual Meeting

Dallas, Texas

10/14 **Nielsen VG**
Hemolysis-Mediated Hypercoagulability in Hemodialysis Patients: Role of Hemeoxygenase-1
American Society of Anesthesiologists Annual Meeting
New Orleans, LA

5/15 DaDeppo AJ, Hadley HA, Chen A, Matika RW, **Nielsen VG**
Poster Presentation: Chronic Migraineurs Form Carboxyhemeifbrinogen and Iron-Bound Fibrinogen
Western Anesthesia Residents Conference
Seattle, WA

Lectures

8/91 Cardiopulmonary Resuscitation Review
Introductory Tutorial Course
University of Alabama at Birmingham
Birmingham, Alabama

8/92 Cardiopulmonary Resuscitation Review
Introductory Tutorial Course
University of Alabama at Birmingham
Birmingham, Alabama

1/93 Cardiovascular Physiology and Monitoring
Anesthesiology Grand Rounds
University of Alabama at Birmingham
Birmingham, Alabama

2/93 Biochemical Consequences of Aortic Cross-Clamping
Department of Surgery, Division of Cardiothoracic Surgery
Cardiovasular Surgical Seminar
University of Alabama at Birmingham
Birmingham, Alabama

4/93 Adult Cardiac Surgery
Anesthesiology Grand Rounds
University of Alabama at Birmingham
Birmingham, Alabama

8/93 Cardiopulmonary Resuscitation Review
Introductory Tutorial Course
University of Alabama at Birmingham
Birmingham, Alabama

9/93 Cardiovascular Physiology

Anesthesiology Grand Rounds
University of Alabama at Birmingham
Birmingham, Alabama

1/95 **Nielsen VG** and McGiffin D
Surgery of the Descending Thoracic Aorta
Anesthesiology Grand Rounds
University of Alabama at Birmingham
Birmingham, Alabama

6/95 Anesthetic-Oxidant Interactions
Department of Surgery, Divistion of Cardiothoracic Surgery
Cardiovascular Research Seminar
University of Alabama at Birmingham
Birmingham, Alabama

10/95 Free Radical Biology
Department of Cardiology
Basic Cardiovascular Sciences Lecture
University of Alabama at Birmingham
Birmingham, Alabama

12/95 Circulating Oxidants and Their Implications on Cardiac Functions
Department of Cardiology
Basic Cardiovascular Sciences Lecture
University of Alabama at Birmingham
Birmingham, Alabama

2/96 IIC11-16. Physics: Ventilators; alarms; defibrillators; pacemakers; electrical; fire and explosion hazards; and basic electronics
Department of Anesthesiology
ABA-ASA Content Outline Review
University of Alabama at Birmingham
Birmingham, Alabama

4/96 IIIB3a-e. Cardiovascular: Ischemic & valvular heart disease; rhythm disorders and conduction defects; heart failure and cardiomyopathy (ischemic, viral, hypertrophic); cardiac tamponade and constrictive pericarditis
Department of Anesthesiology
ABA-ASA Content Outline Review
University of Alabama at Birmingham
Birmingham, Alabama

1/97 Anesthesia for Thoracic Surgery
Anesthesiology Grand Rounds
University of Alabama at Birmingham
Birmingham, Alabama

9/97	Management of Thoracic Aortic Aneurysms: Experimental Approach to Therapeutic Intervention Anesthesiology Grand Rounds University of Alabama at Birmingham Birmingham, Alabama
10/00	Thrombelastography: Clinical Utility and Experimental Insights Anesthesiology Grand Rounds University of Alabama at Birmingham Birmingham, Alabama
4/03	Perioperative Hypercoagulability Anesthesiology Grand Rounds University of Alabama at Birmingham Birmingham, Alabama
5/04	Thrombelastography: Clinical and Experimental Insights Anesthesiology Grand Rounds University of Alabama at Birmingham Birmingham, Alabama
2/10	TEG 101 Department of Anesthesiology Grand Rounds Drexel University College of Medicine Philadelphia, Pennsylvania
8/12	Carbon Monoxide and Cardiovascular Disease Department of Surgery, Division of Cardiothoracic Surgery Uninversity of Arizona College of Medicine Tucson, Arizona
9/12	TEG 101 Department of Anesthesiology Grand Rounds University of Arizona College of Medicine Tucson, Arizona
9/12	**Nielsen VG**, Schoenhage K, Hameroff S Current Research Directions Department of Anesthesiology Grand Rounds University of Arizona College of Medicine Tucson, Arizona
11/12	Carbon Monoxide Hypercoagulability Department of Surgery, Division of Neurosurgery University of Arizona College of Medicine Tucson, Arizona

8/15 Anesthetic Management of Mitral Stenosis and Regurg
Department of Anesthesiology
University of Arizona College of Medicine
Tucson, Arizona

2/16 "Stealth" Fibrinogen vs Snake Venom: A New Therapeutic Paradigm
Department of Anesthesiology Grand Rounds
University of Arizona College of Medicine
Tucson, Arizona

4/16 Laboratory Analyses of Coagulation
Department of Anesthesiology
University of Arizona College of Medicine
Tucson, Arizona

Awarded Grants and Contracts

1. Ischemia-Reperfusion Injury and Circulating Oxidants. NIH HL 48676, 9/30/92- 8/30/97, $983,329. Dale A. Parks, Primary Investigator; Vance G. Nielsen, Co-Investigator.

2. Impact of Halogenated Anesthetics on Oxidant-Mediated Multiple Organ Injury After Thoracic Aorta Occlusion and Reperfusion. Society of Cardiovascular Anesthesiologists, Research Starter Grant, 12/1/93-11/30/94, $10,000. Vance G. Nielsen, Primary Investigator; Paul N. Samuelson and Dale A. Parks, Co-Investigators.

3. Impact of Resuscitation on Oxidant-mediated Multiple Organ Injury: A Double-blind Comparison of Hextend®, Albumin and Ringer's Solution. BioTime, Inc., 1/1/95-12/31/95, $30,000. Vance G. Nielsen and Dale A. Parks, Co-Primary Investigators.

4. Comparison of Ultiva vs Fentanyl in Subjects Undergoing Coronary Bypass Graft Surgery. GlaxoWelcome, 7/16/96 - 3/31/97, $90,888. Vance G. Nielsen, Primary Investigator.

5. Amelioration of Multiple Organ Injury: An Evaluation of Hextend® and Pentalyte® Administration During Shock. BioTime, Inc., 1/1/97-12/31/97, 61,282. Vance G. Nielsen, Primary Investigator.

6. Lung Free Radical Metabolism and Injury. RO1 HL51245, 12/01/93-11/30/98, $167,862/yr average. Bruce A. Freeman, Primary Investigator, Vance G. Nielsen Co-Investigator.

7. Evaluation of Hextend® and PentaLyte® as Anti-inflammatory and Plasma Expanding Solutions. BioTime, Inc., 4/1/98-3/31/00, $150,000. Vance G. Nielsen, Primary Investigator.

8. Effects of Aortic Occlusion-Reperfusion and Circulating Xanthine Oxidase on Alveolar Fluid Clearance in Rabbits. American Heart Association (Southeast Affiliate) Grant-In-Aid, 7/1/98-6/30/00, $70,000. Vance G. Nielsen, Primary Investigator.

9. Evaluation of Hextend® and PentaLyte® Administration on Ischemia-Reperfusion and Hemorrhagic Shock Induced Coagulopathy. BioTime, Inc., 4/1/00-3/31/02, $53,840. Vance G. Nielsen, Primary Investigator.

10. Evaluation of Hextend® and PentaLyte® Versus Generic 6% Hetastarch in 0.9% NaCl on Hemostasis In Vivo Following Isovolemic Hemodilution. BioTime, Inc., 3/1/04-2/28/05, $20,000. Vance G. Nielsen, Primary Investigator.

11. DX-88 (Ecallantinde) for the Reduction of Blood Loss Associated with Cardiopulmonary Bypass: A Phase 2 Randomized, Double-Blind, Placebod-Controlled, Multicenter Study in Patients Undergoing Primary Coronary Artery Bypass Grafting, Single Valve Repair or Single Valve Replacement. Dyax Corporation, August 2007-July 2008; $383,700. Vance G. Nielsen, Primary Investigator. Closed December 2007 by sponsor.

12. Effect of Carbon Monoxide Releasing Molecule-2 on Coagulation and Fibrinolysis Following Cardiopulmonary Bypass. Professional Enrichment Grant, Drexel University College of Medicine, 4/2010-3/2011, $6,550. S. Nini Malayaman, Primary Investigator, Vance G. Nielsen, Mentor.

13. Mechanisms of Carbon Monoxide Mediated Hypercoagulability. Drexel University College of Medicine Commonwealth Universal Research Enhancement Program (CURE) grant, 1/1/2011-12/31/2011, $100,000. Vance G. Nielsen, Primary Investigator; Keith Vosseller, coinvestigator.

14. Hemolysis-Mediated Hypercoagulability in Hemodialysis Patients: Role of Hemeoxygenase-1. Dialysis Clinics, Inc. extramural grant, 10/22/2013-8/14/2014, $9,762.53. Ryan W. Matika, Primary Investigator; Vance G. Nielsen, mentor & coinvestigator.

Graduate Students, Postdoctoral Fellows and Postgraduate Medical Trainees

1. Matt R. Arkebauer, D.O. October 2010 to May 2011 for M.S. from the Philadelphia College of Osteopathic Medicine.