

CURRICULUM VITAE FOR ACADEMIC PROMOTION
The Johns Hopkins University School of Medicine

December, 2018

Steven M. Frank, MD

DEMOGRAPHIC AND PERSONAL INFORMATION:

Current Appointments

- 2016-present Professor, Johns Hopkins Hospital, Department of Anesthesiology and Critical Care Medicine, Division of Vascular, Thoracic, Transplant Anesthesia
 2012-present Medical Director, The Johns Hopkins Center for Bloodless Medicine and Surgery
 2014-present Medical Director, The Johns Hopkins Health System Blood Management Program

Personal Data

Department of Anesthesiology/Critical Care Medicine
 The Johns Hopkins Hospital
 1800 Orleans Street
 Zayed 6208L
 Baltimore, MD 21287-8711
 Tel: (410) 614-1518
 Fax: (410) 955-0994
 E-mail: sfrank3@jhmi.edu

Education and Training:

- 1979–1983 B.A., University of Missouri, Kansas City, Biology
 1979–1985 M.D., University of Missouri, Kansas City (6-year program, combined B.A., M.D.)
 1985–1986 Internship: Mount Zion Hospital, San Francisco, CA, Internal Medicine
 1986–1988 Residency: Johns Hopkins Hospital, Dept. of Anesthesiology and Critical Care Medicine
 1988–1989 Fellowship: Johns Hopkins Hospital, Dept. of Anesthesiology and Critical Care Medicine, Vascular/thoracic/cardiac anesthesia fellowship

Professional Experience

- 1989–1990 Assistant, Johns Hopkins Hospital Dept. of Anesthesiology and Critical Care Medicine, Division of Critical Care Anesthesia
 1990–1991 Instructor, Johns Hopkins Hospital Dept. of Anesthesiology and Critical Care Medicine, Division of Critical Care Anesthesia
 1991–1996 Assistant Professor, Johns Hopkins Hospital Dept. of Anesthesiology and Critical Care Medicine, Division of Critical Care Anesthesia
 1996–2001 Associate Professor, Johns Hopkins Hospital Dept. of Anesthesiology and Critical Care Medicine, Division of Critical Care Anesthesia
 1999–2000 Research Sabbatical, National Institutes of Health, Bethesda, Maryland Visiting Scientist, National Institute of Neurologic Disease and Stroke (NINDS)
 2001–2009 Staff Anesthesiologist, Greater Baltimore Medical Center
 2002–2009 Staff Anesthesiologist, Sheppard Pratt Health System
 2010–2012 Director, Interdisciplinary Blood Management Program, The Johns Hopkins Hospital
 2010–2016 Associate Professor, Johns Hopkins Hospital, Dept. of Anesthesiology and Critical Care Medicine, Division of Vascular, Thoracic, Transplant Anesthesia
 2012–present Medical Director, Center for Bloodless Medicine and Surgery, The Johns Hopkins Hospital
 2014–present Medical Director, The Johns Hopkins Health System Blood Management Program
 2016-present Professor and Division Chief, Vascular, Thoracic, Transplant Anesthesia
 Johns Hopkins Hospital, Department of Anesthesiology and Critical Care Medicine

RESEARCH ACTIVITIES

Publications

Peer Reviewed Manuscripts

1. **Frank SM**, Beattie C, Christopherson R, Rock P, Parker S, Gottlieb SO: Perioperative rate related silent myocardial ischemia and postoperative death. *J Clin Anesth* 1990;2:326-31.
2. **Frank SM**, Norris EJ, Christopherson R, Beattie C: Right and left arm blood pressure discrepancies in vascular surgery patients. *Anesthesiology* 1991;75:457-63.
3. **Frank SM**, Beattie C, Christopherson R, Norris EJ, Rock P, Parker S, Kimball AW: Epidural vs. general anesthesia, ambient temperature, and patient age as predictors of inadvertent hypothermia. *Anesthesiology* 1992;77:252-7.
4. **Frank SM**, Beattie C, Christopherson R, Norris EJ, Perler BA, Williams GM, Gottlieb SO: Unintentional hypothermia is associated with postoperative myocardial ischemia. *Anesthesiology* 1993;78:468-76.
5. Christopherson R, Beattie C, **Frank SM**, Norris EJ, Meinert CL, Gottlieb SO, Yates H, Rock P, Parker SD, Perler BA, Williams GM: Perioperative morbidity in patients randomized to epidural or general anesthesia for lower extremity vascular surgery. *Anesthesiology* 1993;79:422-34.
6. Rosenfeld BA, Beattie C, Christopherson R, Norris EJ, **Frank SM**, Breslow M, Rock P, Parker SD, Gottlieb SO, Perler BA, Williams GM, Bell W, and the PIRAT study group: The effects of different anesthetic regimens on fibrinolysis and the development of postoperative arterial thrombosis. *Anesthesiol.* 1993;79:435-43.
7. Breslow MJ, Parker SD, **Frank SM**, Norris EJ, Yates H, Raff H, Rock P, Christopherson R, Rosenfeld BA, Beattie C: Determinants of catecholamine and cortisol responses to lower extremity revascularization. *Anesthesiology* 1993;79:1202-9.
8. **Frank SM**, Shir Y, Raja S, Fleisher LA, Beattie C: Core hypothermia and skin-surface gradients: epidural versus general anesthesia and the effects of age. *Anesthesiology* 1994;80:502-8.
9. **Frank SM**, Parker SD, Rock P, Gorman R, Kelly S, Beattie C, Williams GM: Moderate hypothermia with partial bypass and segmental sequential repair for thoracoabdominal aneurysm. *J Vasc Surg* 1994;19:687-97.
10. Oken AC, **Frank SM**, Merritt WT, Fair J, Klein A, Burdick J, Thompson S, Beattie: A new percutaneous technique for establishing venous bypass access in orthotopic liver transplantation. *J Cardiovasc Thorac Anesth* 1994;8:59-60.
11. Stone CD, Greene, PS, Gott VL, **Frank S**, Williams GM: Single-stage repair of distal aortic arch and thoracoabdominal dissecting aneurysms using aortic tailoring and circulatory arrest. *Ann Thorac Surg* 1994;57:580-7.
12. Shir Y, Raja SN, **Frank SM**: The effect of epidural versus general anesthesia on postoperative pain and analgesic requirements in patients undergoing radical prostatectomy. *Anesthesiology* 1994;80:49-56.
13. Fleisher LA, **Frank SM**, Shir Y, Estafanous M, Kelly S, Raja SN: Cardiac sympathovagal balance and peripheral sympathetic vasoconstriction: Epidural versus general anesthesia. *Anesth Analg* 1994;79:165-71.
14. Shir Y, **Frank SM**, Brendler CB, Raja SN: Postoperative morbidity is similar in patients anesthetized with epidural and general anesthesia for radical prostatectomy. *Urology*.1994;44:232-6.
15. Clark AM, **Frank SM**, Williams GM, Kelly S, Rivard D: Descending aortic aneurysm repair utilizing moderate hypothermia (30 °C) in conjunction with left heart bypass. *J Extracorp Perf Tech.* 1994;26:172-7
16. **Frank SM**, Raja SN: Reflex cutaneous vasoconstriction during cold pressor test is mediated through alpha-adrenoceptors. *Clin Auton Res* 1994;4:257-62.
17. **Frank SM**, Higgins M, Breslow M, Fleisher LA, Gorman RB, Sitzman JV, Raff H, Beattie C: The catecholamine, cortisol, and hemodynamic responses to mild perioperative hypothermia: A randomized clinical trial. *Anesthesiology* 1995;82:83-93.
18. Krenzischek DA, **Frank SM**, Kelly S: Forced-air skin-surface warming vs. routine thermal care and core temperature measurement sites. *J Postanesth Nurs* 1995;10:69-78.
19. el-Gamal N, **Frank SM**: Perioperative thermoregulatory dysfunction in a patient with a previous traumatic hypothalamic injury. *Anesth Analg* 1995;80:1245-47.
20. Parker SD, Breslow MJ, **Frank SM**, Rosenfeld BA, Norris EJ, Christopherson R, Rock P, Gottlieb SO, Raff H, Perler BA, Williams GM, Beattie C: Catecholamine and cortisol responses to lower extremity revascularization: Correlation with outcome variables. *Crit Care Med* 1995;23:1954-61.

21. Shir Y, Raja SN, **Frank SM**, Brendler CB: Intraoperative blood loss during radical retropubic prostatectomy: Comparison of epidural vs. general anesthesia. *Urology* 1995;45:993-9.
22. Perler BA, Christopherson R, Rosenfeld BA, Norris, EJ, **Frank SM**, Beattie C, Williams GM: The influence of anesthetic method on infrainguinal bypass graft patency: A closer look. *Am Surg* 1995;61:784-9.
23. **Frank SM**, Fleisher LA, Olson KF, Gorman RB, Higgins MS, Breslow MJ, Sitzmann JV, Beattie C: Determinates of early postoperative oxygen consumption: The effects of body temperature, shivering, and gender. *Anesthesiology* 1995;83:241-9.
24. **Frank SM**, el-Gamal N, Raja SN, Wu PK, Afifi O: Role of alpha-adrenoceptors in the maintenance of core temperature in humans. *Clin Sci* 1995;89:219-25.
25. Fleisher LA, **Frank SM**, Sessler DI, Cheng C, Matsukawa T, Vannier CA: Thermoregulation and heart rate variability. *Clin Sci* 1996;90:97-103.
26. Nyhan DP, Shampaine EL, Hirshman CA, Hamilton RG, **Frank SM**, Baumgartner WA, Adkinson NF: Single doses of intravenous protamine result in the formation of protamine-specific IgE and IgG antibodies. *J Allergy Clin Immunol* 1996;97:991-7.
27. Fleckenstein JF, **Frank SM**, Thulavath PJ: Presence of autonomic neuropathy is a poor prognostic indicator in patients with advanced liver disease. *Hepatology* 1996;23:471-5.
28. **Frank SM**, Higgins MS, Fleisher LA, Sitzmann JV, Raff H, Breslow MJ: Adrenergic, respiratory, and cardiovascular effects of core cooling in humans. *Am J Physiol* 1997;272:R557-62.
29. **Frank SM**, El-Gamal N, Raja SN, Wu PK: Alpha -Adrenoceptor mechanisms of thermoregulation during cold challenge in humans. *Clinical Science* 91:627-631, 1996.
30. Christopherson R, Glavan NJ, Norris EJ, Beattie C, Rock P, **Frank SM**, Gottlieb SO: Control of blood pressure and heart rate in patients randomized to epidural or general anesthesia for lower extremity vascular surgery. Perioperative Ischemia Randomized Anesthesia Trial (PIRAT) Study Group. *J Clin Anesth* 1996;8: 578-84.
31. Drenger B, Parker SD, **Frank SM**, Beattie C: Changes in cerebrospinal fluid pressure and lactate concentrations during thoracoabdominal aortic aneurysm surgery. *Anesthesiol.* 1997; 86:41-7.
32. **Frank SM**, Fleisher LA, Breslow MJ, Higgins MS, Olson KF, Kelly S, Beattie C: Perioperative maintenance of normothermia reduces the incidence of morbid cardiac events: A randomized clinical trial. *JAMA* 1997;277:1127-34.
33. **Frank SM**, Raja SN, Wu PK, el-Gamal N: Alpha-adrenergic mechanisms of thermoregulation in humans. *Ann NY Acad Sci* 1997;813:101-10.
34. Haythornthwaite JA, Raja SN, Fisher B, **Frank SM**, Brendler CB, Shir Y: Pain and quality of life following radical retropubic prostatectomy. *J Urol* 1998;160:1761-4.
35. **Frank SM**, Nguyen JM, Garcia C, Barnes RA: Temperature monitoring practices during regional anesthesia. *Anesth Analg* 1999;88:373-7.
36. **Frank SM**, Raja SN, Bulcao C, Goldstein DS: Relative contribution of core and cutaneous temperatures to thermal comfort and autonomic responses in humans. *J Appl Physiol* 1999;86:1588-93.
37. Nelson JB, Opgenorth TJ, Fleisher LA, **Frank SM**: Perioperative plasma endothelin-1 and Big endothelin-1 concentrations in elderly patients undergoing major surgical procedures. *Anesth Analg* 1999;88:898-903.
38. **Frank SM**, Tran K, Fleisher LA: Clinical importance of body temperature in the surgical patient. *J Therm Biol* 2000;25:151-5.
39. **Frank SM**, Raja SN, Bulcao C, Goldstein D: Relative contribution of core and skin temperatures to thermal comfort in humans. *J Therm Biol* 2000;25:147-50.
40. Tran K, **Frank SM**, El-Rahmany H, Ghoneim N, Kim L: Thermal and hemodynamic responses to postoperative rewarming with a sub-atmospheric pressure device. *J Therm Biol* 2000;25:191-6.
41. Gupta N, **Frank SM**, Ghoneim N, El-Rahmany H, Talamini M, Zacur H: Thermoregulation and hormone replacement in postmenopausal women. *J Therm Biol* 2000;25:165-9.
42. El-Rahmany HK, **Frank SM**, Schneider GM, El-Gamal NA, Vannier CA, Ammar R, Okasha AS: Forced-air warming decreases vasodilator requirement following coronary artery bypass surgery. *Anesth Analg* 2000;90:286-91.
43. El-Gamal N, El-Kassabany N, **Frank SM**, Amar R, Khabar HA, ElRahmany HK, Okasha AS: Age-related thermoregulatory differences in a warm operating room environment ($\approx 26^{\circ}\text{C}$). *Anesth Analg* 2000;90:694-8.
44. **Frank SM**, El-Rahmany HK, Cattaneo CG, Barnes RA: Predictors of hypothermia during spinal anesthesia. *Anesthesiology* 2000;92:1330-34.

45. **Frank SM**, Raja SN, Bulcao C, Goldstein DS: Age-related thermoregulatory differences during core cooling in humans. *Am J Physiol Regul Integr Comp Physiol* 2000;279:R349-54.
46. Cattaneo CM, **Frank SM**, Hesel TW, ElRahmany HK, Kim LJ, Tran KM: Accuracy and precision of temperature monitoring methods during regional and general anesthesia. *Anesth Analg* 2000;90:938-45.
47. **Frank SM**, El-Rahmany HK, Tran KM, Vu B, Raja SN: Comparison of lower extremity cutaneous temperature changes in patients receiving lumbar sympathetic ganglion blocks versus epidural anesthesia. *J Clin Anesth* 2000;12(7):525-30.
48. Tran KM, **Frank SM**, Raja SN, El-Rahmany HK, Kim LJ, Vu B: Lumbar sympathetic block for sympathetically maintained pain: Changes in cutaneous temperatures and pain perception. *Anesth Analg* 2000;90:1396-1401.
49. Fleisher LA, Fleckenstein JF, **Frank SM**, Thulavath PJ: Heart rate variability as a predictor of autonomic dysfunction in patients awaiting liver transplantation. *Dig Dis Sci* 2000;45:340-44.
50. **Frank SM**, Hesel T, El-Rahmany HK, Tran KM, Bamford OS: Warmed humidified inspired oxygen accelerates postoperative rewarming. *J Clin Anesth* 2000;12:283-287.
51. ElRahmany HK, **Frank SM**, Vannier CA, Schneider G, Okasha AS, Bulcao CF: Determinants of core temperature at the time of admission to intensive care following cardiac surgery. *J Clin Anesth* 2000;12:177-83.
52. **Frank SM**, Kluger MJ, Kunkel SL: Elevated thermostatic setpoint in postoperative patients. *Anesthesiology* 2000;93:1426-31.
53. Goldstein DS, **Frank SM**: The wisdom of the body revisited: The adrenomedullary response to mild core hypothermia in humans, *Endocr Regul* 2001;35:3-7.
54. Goldstein DS, Holmes C, **Frank SM**, Dendi R, Cannon RO 3rd, Sharabi Y, Esler MD, Eisenhofer G: Cardiac sympathetic dysautonomia in chronic orthostatic intolerance syndromes. *Circulation* 2002;106(18):2358-65.
55. Goldstein DS, Holmes C, **Frank SM**, Naqibuddin M, Dendi R, Snader S, Calkins H: Sympathoadrenal imbalance before neurocardiogenic syncope. *Am J Cardiol* 2003;91:53-8.
56. **Frank SM**, Cattaneo CG, Wieneke-Brady MB, El-Rahmany HK, Gupta N, Lima JA, Goldstein DS: Threshold for adrenomedullary activation and increased cardiac work during mild core hypothermia in awake humans. *Clin Sci (Lond)* 2002;102:119-125.
57. **Frank SM**, Satitpunwaycha P, Bruce SR, Herscovitch P, Goldstein DS: Increased myocardial perfusion and sympathoadrenal activation during mild core hypothermia in awake humans. *Clin Sci (Lond)* 2003;104(5):503-8.
58. Agrawal N, Sewell DA, Griswold ME, **Frank SM**, Hessel TW, Eisele DW: Hypothermia during head and neck surgery. *Laryngoscope* 2003;113(8):1278-82.
59. Gottschalk A, **Frank SM**: Prolonged differential wound hyperalgesia after an interval of unilateral epidural blockade during lower abdominal surgery. *Anesth Analg* 2005;100(5):1411-3.
60. **Frank SM**: Who benefits from red cell salvage? – Utility and value of intraoperative autologous transfusion. *Transfusion* 2011;51:2058-60.
61. **Frank SM**, Savage WJ, Rothschild JA, Rivers RJ, Ness PM, Paul SL, Ulatowski JA: Variability in blood and blood component utilization as assessed by an anesthesia information management system. *Anesthesiology* 2012;117:99-106.
62. George TJ, Beaty CA, Kilic A, Haggerty KA, **Frank SM**, Savage WJ, Whitman GJ: Hemoglobin drift after cardiac surgery. *Ann Thorac Surg* 2012;94:703-9.
63. Zheng Y, Villamayor AJ, Merritt W, Pustavoitau A, Latif A, Bhambhani R, **Frank SM**, Gurakar A, Singer A, Cameron A, Stevens RD, Hogue CW: Continuous cerebral blood flow autoregulation monitoring in patients undergoing liver transplantation. *Neurocrit Care* 2012;17:77-84.
64. **Frank SM**, Rothschild JA, Masear CG, MD, Rivers RJ, Merritt WT, Savage WJ, Ness PM: Optimizing preoperative blood ordering with data acquired from an anesthesia information management system. *Anesthesiology* 2013;118:1286-97.
65. **Frank SM**, Abazyan B, Ono M, Hogue CW, Cohen DB, Berkowitz DE, Ness PM, Barodka VM: Decreased erythrocyte deformability after transfusion and the effects of erythrocyte storage duration. *Anesth Analg* 2013; 116:975-81.
66. **Frank SM**, Smith-Resar L, Rothschild JA, Dackiw EA, Savage WJ, Ness PM: A novel method of data analysis for utilization of red cell transfusion. *Transfusion* 2013;53:3052-9.
67. Brown CH, Savage WJ, Masear CG, Walston JD, Tian J, Hogue CW, **Frank SM**: Odds of transfusion for older adults compared with younger adults undergoing surgery. *Anesth Analg* 2014;118(6):1168-78.

68. Grant MC, Whitman GJ, Savage WJ, Ness PM, **Frank SM**: Clinical predictors of postoperative hemoglobin drift. *Transfusion* 2014;54(6):1460-8, doi: 10.1111/trf.12491.
69. Stonemetz JL, Allen PX, Wasey J, Rivers RJ, Ness PM, **Frank SM**: Development of a risk-adjusted blood utilization metric. *Transfusion*. 2014 Oct;54(10 Pt 2):2716-23. doi: 10.1111/trf.12548.
70. **Frank SM**, Masear CG. Optimizing preoperative blood product orders at the Johns Hopkins Hospital. *MLO Med Lab Obs* 2013; 45:13-4.
71. Lucas DJ, Schexneider KI, Weiss M, Wolfgang CL, **Frank SM**, Hirose K, Ahuja N, Makary M, Cameron JL, Pawlik TM: Trends and risk factors for transfusion in hepatopancreatobiliary surgery. *J Gastrointest Surg* 2014;18(4):719-28.
72. Salaria ON, Barodka VM, Hogue CW, Berkowitz DE, Ness PM, Wasey JO, **Frank SM**: Impaired red blood cell deformability after transfusion of stored allogeneic blood but not autologous salvaged blood in cardiac surgery patients. *Anesth Analg* 2014;118(6):1179-87.
73. Chalfin HJ, **Frank SM**, Feng Z, Trock BJ, Drake CG, Partin AW, Humphreys E, Ness PM, Jeong BC, Lee SB, Han M: Allogeneic vs. autologous blood transfusion and survival after radical prostatectomy, *Transfusion* 2014 Sep;54(9):2168-74. doi: 10.1111/trf.1261.
74. **Frank SM**: The effects of storage duration on erythrocytes. *Clin Adv Hematol Oncol* 2013; 11(6):358-9.
75. Hicks CW, **Frank SM**, Wasey JO, Efron J, Gearhart, S, Fang, S, Safar B, Makary MA, Wick EC: A novel means of assessing institutional adherence to blood transfusion guidelines, *Am J Med Quality*, 2015 Nov-Dec;30(6):584-90. doi: 10.1177/1062860614542972.
76. **Frank SM**, Wick EC, Dezern AE, Ness PM, Wasey JO, Pippa AC, Dackiw E, Resar LM: Risk-adjusted clinical outcomes for patients enrolled in a bloodless program. *Transfusion*. 2014 Oct;54(10 Pt 2):2668-77. doi: 10.1111/trf.12752.
77. **Frank SM**, Oleyar MJ, Ness PM, Tobian AA: Reducing unnecessary preoperative blood orders and costs by implementing an updated institution-specific maximum surgical blood order schedule and remote electronic blood issue. *Anesthesiology*, 2014 Sep;121(3):501-9. doi: 10.1097/ALN.0000000000000338.
78. **Frank SM**, Wasey JO, Dwyer IM, Gokaslan ZL, Ness PM, Kebaish KM: Radiofrequency bipolar hemostatic sealer reduces blood loss, transfusion requirements and cost for patients undergoing multilevel spinal fusion surgery. *J Orthopaed Surg Res*, 2014 Jul 5;9:50. doi: 10.1186/s13018-014-0050-2.
79. Brown C, Grega M, Selnes O, McKhann G, Shah A, LaFlam A, Savage W, **Frank SM**, Hogue C, Gottesman R: Length of red cell-unit storage and risk for delirium after cardiac surgery. *Anesth Analg* 2014; Aug;119(2):242-50. doi: 10.1213/ANE.0000000000000134.
80. Ejaz A, Spolverato G, Kim Y, **Frank SM**, Pawlik TM: Identifying variations in blood use based hemoglobin transfusion trigger and target among hepatopancreaticobiliary surgeons. *J Am Coll Surg*. 2014 Aug;219(2):217-28. doi: 10.1016/j.jamcollsurg.2014.02.033.
81. Ejaz A, Spolverato G, Kim Y, **Frank SM**, Pawlik TM. Variation in triggers and use of perioperative blood transfusion in major gastrointestinal surgery. *Br J Surg* 2014, 101(11):1424-33.
82. Ness PM, **Frank SM**. Enhancing patient blood management: A long term focus. *Lancet*. 2014 Dec 9. pii: S0140-6736(14)62344-8. doi: 10.1016/S0140-6736(14)62344-8
83. Resar LS, **Frank SM**. Bloodless Medicine: What to do when you can't transfuse. *Am Soc Hematol Educ Program*. 2014 Dec 5;2014(1):553-558
84. Zuckerberg GS, Scott AV, Wasey JO, Wick EC, Pawlik TM, Ness PM, Patel ND, Resar LM, **Frank SM**: Efficacy of education followed by computerized provider order entry with clinician decision support to reduce red blood cell utilization. *Transfusion*. 2015 Jul;55(7): 1628-36 3. doi: 10.1111/trf.13003
85. Ejaz A, Spolverato G, Kim Y, Gupta R, Amini N, **Frank SM**, Pawlik TM. Impact of blood transfusions and transfusion practice on long term outcomes following hepatopancreatobiliary surgery. *J Gastrointest Surg*. 2015 May;19(5):887-96
86. Ejaz A, **Frank SM**, Spolverato G, Kim Y, Pawlik TM. Defining Transfusion Triggers and Utilization of Fresh Frozen Plasma and Platelets: Among Patients Undergoing Hepatopancreaticobiliary and Colorectal Surgery. *Ann Surg*. 2015 Dec;262(6):1079-85
87. Mirski MA, **Frank SM**, Kor DJ, Vincent JL, Holmes DR Jr. Restrictive and liberal red cell transfusion strategies in adult patients: reconciling clinical data with best practice. *Crit Care*. 2015 May 5;19(1):202. doi: 10.1186/s13054-015-0912-y.
88. Ejaz A, **Frank SM**, Spolverato G, Kim Y, Pawlik TM. Potential Economic Impact of Using a Restrictive Transfusion Trigger Among Patients Undergoing Major Abdominal Surgery. *JAMA Surg*. 2015 May 6. doi: 10.1001/jamasurg. 2015 Jul;150(7):625-30

89. **Frank SM**, Ejaz A, Pawlik TM: Blood transfusion strategy and clinical outcomes. *Ann Surg*. 2015 2015 Jul;262(1):7-8
90. White MJ, Hazard SW 3rd, **Frank SM**, Boyd JS, Wick EC, Ness PM, Tobian AA. The evolution of perioperative transfusion testing and blood ordering. *Anesth Analg*. 2015 Jun;120(6):1196-203. doi: 10.1213/ANE.0000000000000619.
91. Scott AV, Stonemetz JL, Wasey JO, Johnson DJ, Rivers RJ, Koch CG, **Frank SM**. Compliance with Surgical Care Improvement Project for Body Temperature Management (SCIP Inf-10) Is Associated with Improved Clinical Outcomes. *Anesthesiology* 2015 2015 Jul;123(1):116-25
92. Valero-Elizondo J, Spolverato G, Kim Y, Wagner D, Ejaz A, **Frank SM**, Pawlik TM. Sex- and age-based variation in transfusion practices among patients undergoing major surgery. *Surgery*. 2015 Nov;158(5):1372-81 pii: S0039-6060(15)00359-1. doi: 10.1016/j.surg.2015.04.030
93. Klaus SA, **Frank SM**, Salazar JH, Cooper S, Beard L, Abdullah F, Fackler JC, Heitmiller ES, Ness PM, Resar LM. Hemoglobin thresholds for transfusion in pediatric patients at a large academic health center. *Transfusion*. 2015 2015 Dec;55(12):2890-7. doi: 10.1111/trf.13296.
94. Ejaz A, **Frank SM**, Spolverato G, Mavros M, Kim Y, Pawlik TM. Variation in the use of type and crossmatch blood ordering among patients undergoing hepatic and pancreatic resections. *Surgery*. 2016 Mar;159(3):908-18. pii: S0039-6060(15)00620-0. doi: 10.1016/j.surg.2015.07.029.
95. Gani F, Kim Y, Weiss MJ, Makary MA, Wolfgang CL, Hirose K, Cameron JL, Wasey JO, **Frank SM**, Pawlik TM. Effect of surgeon and anesthesiologist volume on surgical outcomes. *J Surg Res*. 2016 Feb;200(2):427-34. pii: S0022-4804(15)00823-9. doi: 10.1016/j.jss.2015.08.010.
96. Kim Y1, Spolverato G, Lucas DJ, Ejaz A, Xu L, Wagner D, **Frank SM**, Pawlik TM. Red Cell Transfusion Triggers and Postoperative Outcomes After Major Surgery. *J Gastrointest Surg*. 2015 Nov;19(11):2062-73.
97. Mavros MN1, Xu L, Maqsood H, Gani F, Ejaz A, Spolverato G, Al-Refaie WB, **Frank SM**, Pawlik TM. Perioperative Blood Transfusion and the Prognosis of Pancreatic Cancer Surgery: Systematic Review and Meta-analysis. *Ann Surg Oncol*. 2015 Dec;22(13):4382-91.;22:4382-91
98. Kim Y, Ejaz A, Gani F, Wasey JO, Xu L, **Frank SM**, Pawlik TM. Crystalloid administration among patients undergoing liver surgery: Defining patient- and provider-level variation. *Surgery*. 2016 Feb;159(2):389-98. pii: S0039-6060(15)00536-X. doi: 10.1016/j.surg.2015.06.037.
99. Spolverato G, Kim Y, Ejaz A, **Frank SM**, Pawlik TM. Effect of Relative Decrease in Blood Hemoglobin Concentrations on Postoperative Morbidity in Patients Who Undergo Major Gastrointestinal Surgery. *JAMA Surg*. 2015 Jul 29. doi: 10.1001/jamasurg. 2015 Oct;150(10):949-56. 1704.
100. Klaus SA, **Frank SM**, Salazar JH, Cooper S, Beard L, Abdullah F, Fackler JC, Heitmiller ES, Ness PM, Resar LM. Hemoglobin thresholds for transfusion in pediatric patients at a large academic health center. *Transfusion*. 2015 Dec;55(12):2890-7. Doi: 10.1111/trf.13296.
101. **Frank SM**, Ejaz A, Pawlik TM. Optimal transfusion trigger is surgical patients with coronary artery disease. *JAMA Surg*. 2016 Feb 1;151(2):146.. Doi:10.1001/jamasurg.
102. Johnson DJ, Scott AV, Barodka VM, Park S, Wasey JO, Ness PM, Gniadek T, **Frank SM**. Morbidity and Mortality after high-dose transfusion. *Anesthesiology* 2016 Feb;124(2):387-95.
103. DeZern AE, Williams K, Zahurak M, Hand W, Stephens RS, King KE, **Frank SM**, Ness PM. Red blood cell transfusion triggers in acute leukemia: a randomized pilot study. *Transfusion*. 2016 Dec;56(12):3150.
104. Grant MC, Resar LM, **Frank SM**. The efficacy and utility of acute normovolemic hemodilution. *Anesth Analg* 2015 Dec;121(6):1412-4.
105. Nagababu E, Scott AV, Johnson DJ, Dwyer IM, Lipsitz JA, Barodka VM, Berkowitz DE, **Frank SM**. Oxidative stress and rheologic properties of stored red blood cells before and after transfusion to surgical patients. *Transfusion*. 2016 May;56(5):1101-11. doi: 10.1111/trf.13458.
106. Scott AV, Nagababu E, Johnson DJ, Kebaish KM, Lipsitz J, Dwyer IM Zuckerberg GS, Barodka VM, Berkowitz DE, **Frank SM**. 2,3-Diphosphoglycerate concentrations in autologous salvaged versus stored red blood cells and in surgical patients after transfusion. *Anesth Analg* 2016 Mar;122(3):616-23.
107. Chalfin HJ, Liu JJ, Gandhi N, Feng Z, Johnson D, Netto GJ, Drake CG, Hahn NM, Schoenberg MP, Trock BJ, Scott AV, **Frank SM**, Bivalacqua TJ. Blood transfusion is associated with increased perioperative morbidity and adverse oncologic outcomes in bladder cancer patients receiving neoadjuvant chemotherapy and radical cystectomy. *Ann Surg Oncol*. 2016 Aug;23(8):2715-22. doi: 10.1245/s10434-016-5193-4
108. **Frank SM**, Johnson DJ, Resar LS. Ultra-massive transfusion: Give blood save a life. *Transfusion*, 2016 Mar;56(3):546-8. doi: 10.1111/trf.13403.

109. Lucas DJ, Ejaz A, Spolverato G, Kim Y, Gani F, **Frank SM**, Pawlik TM. Packed red blood cell transfusion after surgery: Are we “overtransfusing” our patients? *Am J Surg* 2016 Jul;212(1):1-9. doi: 10.1016/j.amjsurg.2015.12.020.
110. Nagababu E, Scott AV, Johnson DJ, Goyal A, Lipsitz JA, Barodka VM, Berkowitz DE, **Frank SM**. Impact of surgery and stored red blood cell transfusions on nitric oxide homeostasis, *Anesth Analg*, 2016 Aug;123(2):274-82. doi: 10.1213/ANE.0000000000001392.
111. Kim, Y, Amini, N, Gani F, Wagner D, Johnson DJ, Scott A, Ejaz A, Margonis A, Xu L, Buettner S, Wasey J, Goel R, **Frank SM**. Age of transfused blood impacts perioperative outcomes among patients who undergo major gastrointestinal surgery. *Ann Surg*. 2017 Jan;265(1):103-110. doi: 10.1097/SLA.0000000000001647.
112. Wintermeyer TL, Liu J, Lee KH, Ness PM, Johnson DJ, Hoffman NA, Wachter PA, Cemski R, **Frank SM**. Interactive dashboards to support a patient blood management program across a multi-institutional healthcare system. *Transfusion*, 2016 Jun;56(6):1480-1. doi: 10.1111/trf.13621.
113. Podlasek SJ, Thakkar RN, Rotello LC, Fleury TA, Demski R, Ness PM, **Frank SM**. Implementing a “Why give 2 when 1 will do?” choosing wisely campaign. *Transfusion* 2016 Sep;56(9):2164. doi: 10.1111/trf.13664
114. Goel R, Johnson DJ, Scott AV, Tobian AR, Ness PM, Nagababu E, **Frank SM**. Red blood cells stored for 35 days or longer are associated with adverse outcomes in high-risk patients. *Transfusion* 2016 Jul;56(7):1690-8. doi: 10.1111/trf.13559.
115. Dezern AE, Williams K, Zahurak M, Hand W, Stephens RS, King KE, **Frank SM**, Ness PM. Red Cell Transfusion Triggers in Acute Leukemia: A randomized pilot study. *Transfusion* 2016 Jul;56(7):1750-7. doi: 10.1111/trf.13658.f
116. Nagababu E, Scott AV, Johnson DJ, Goyal A, Lipsitz JA, Barodka VM, Berkowitz DE, **Frank SM**. The Impact of Surgery and Stored Red Blood Cell Transfusions on Nitric Oxide Homeostasis. *Anesth Analg*. 2016 Aug;123(2):274-82. doi: 10.1213/ANE.0000000000001392.
117. Spolverato G, Bagante F, Weiss M, He J, Wolfgang CL, Johnston F, Makary MA, Yang W, **Frank SM**, Pawlik TM. Impact of Delta Hemoglobin on Provider Transfusion Practices and Post-operative Morbidity Among Patients Undergoing Liver and Pancreatic Surgery. *J Gastrointest Surg*. 2016 Dec;20(12):2010-2020
118. Ejaz A, Gani F, **Frank SM**, Pawlik TM. Improvement of the Surgical Apgar Score by Addition of Intraoperative Blood Transfusion Among Patients Undergoing Major Gastrointestinal Surgery. *J Gastrointest Surg*. 2016 Oct;20(10):1752-9. doi: 10.1007/s11605-016-3234-8.
119. Kim Y, Bagante F, Gani F, Ejaz A, Xu L, Wasey JO, Johnson DJ, **Frank SM**, Pawlik TM. Nomogram to predict perioperative blood transfusion for hepatopancreaticobiliary and colorectal surgery. *Br J Surg*. 2016 Aug;103(9):1173-83. doi: 10.1002/bjs.10164.
120. Chappidi MR, Chalfin HJ, Johnson DJ, Kates M, Sopko NA, Johnson MH, Liu JJ, **Frank SM**, Bivalacqua TJ. Longer average blood storage duration is associated with increased risk of infection and overall morbidity following radical cystectomy. *Urol Oncol*. 2016 Oct 19. pii: S1078-1439(16)30273-3. doi: 10.1016/j.urolonc.2016.09.005.
121. Kim Y, Gani F, Spolverato G, Ejaz A, Xu L, Buettner S, Wagner D, Wasey JO, **Frank SM**, Pawlik TM. Variation in crystalloid administration: an analysis of 6248 patients undergoing major elective surgery. *J Surg Res*. 2016 Jun 15;203(2):368-77. doi: 10.1016/j.jss.2016.02.045.
122. **Frank SM**, Shander A, Shore-Lesserson L. Update from ASA committee on patient blood management. *ASA Monitor*. 2016; 80(8):52-53.
123. Yang WW, Thakkar RN, Gehrie EA, Chen W, **Frank SM**. Single unit transfusions and hemoglobin trigger: Relative impact on red cell utilization. *Transfusion*. 2017;57(5):1163-1170.
124. Chen W, **Frank SM**. Patient blood management. *Anesth Analg*. 2017. Mar 22. doi: 10.1213/ANE.0000000000001969. [Epub ahead of print].
125. Pustavoitau A, Lesley M, Ariyo P, Latif A, Villamayor AJ, **Frank SM**, Rizkalla N, Merritt W, Cameron A, Dagher N, Philosophe B, Gurakar A, Gottshalk A. Predictive modeling of massive transfusion requirements during liver transplantation and its potential to reduce utilization of blood bank resources. *Anesth Analg*. 2017; 124(5):1644-1652.
126. Purvis TE, Goodwin CR, De la Garza-Ramos R, Ahmed AK, Lafage V, Neuman BJ, Passias PG, Kebaish KM, **Frank SM**, Sciubba DM. Effect of liberal blood transfusion on clinical outcomes and cost in spine surgery patients. *Spine J*. Sep; 17(9):1255-1263. doi: 10.1016/j.spinee.2017.04.028.

127. Cerullo M, Gani F, Chen SY, Canner JK, Tang WW, **Frank SM**, Pawlik TM. Physiologic correlates of intraoperative blood transfusion among patients undergoing major gastrointestinal operations. *Surgery*. 2017 Aug; 162(2): 211-222. doi: 10.1016/j.surg.2017.03.026
128. Sikorski RA, Rizkalla NA, Yang WW, **Frank SM**. Autologous blood salvage in the era of patient blood management. *Vox Sang* 2017 Aug;112(6):499-510. doi: 10.1111/vox.12527
129. Ejaz A, Schmidt C, Johnston FM, **Frank SM**, Pawlik TM. Risk factors and prediction model for inpatient surgical site infection after major abdominal surgery. *J Surg Res*. 2017 Sep; 217:153-159. doi: 10.1016/j.jss.2017.05.018.
130. Hicks CW, Liu J, Yang WW, DiBrito SR, Johnson DJ, Brito A, Higgins RSD, **Frank SM**, Wick EC. A comprehensive Choosing Wisely quality improvement initiative reduces unnecessary transfusions in an academic department of surgery. *Am J Surg*. 2017 Oct;214(4):571-576. doi: 10.1016/j.amjsurg.2017.06.020.
131. Johnson DJ, Johnson CC, Cohen DB, Wetzler JA, Kebaish KM, **Frank SM**. Thrombotic and infectious morbidity are associated with transfusion in posterior spine fusion. *HSS J*. 2017 Jul;13(2):152-158. doi: 10.1007/s11420-017-9545-9.
132. Goobie SM, **Frank SM**. Tranexamic acid: What is known and unknown, and where do we go from here? *Anesthesiology*. 2017 Sep;127(3):405-407. doi: 10.1097/ALN.0000000000001788.
133. Resar LM, Wick EC, Almasri TN, Dackiw EA, Ness PM, **Frank SM**. Bloodless medicine: Current strategies and emerging treatment paradigms. *Transfusion*. 2016; 56(10):2637-2647.
134. Thakkar RN, Lee KH, Ness PM, Wintermeyer TL, Johnson DJ, Liu E, Rajprasad A, Knight AM, Wachter PA, Demski R, **Frank SM**. Relative impact of a patient blood management program on utilization of all three major blood components. *Transfusion*. 2016;56(10):2212-2220.
135. Gani F, Cerullo M, Ejaz A, Gupta PB, Demario VM, Johnston FM, **Frank SM**, Pawlik TM. Implementation of a blood management program at a tertiary care hospital: Effect on transfusion practices and clinical outcomes among patients undergoing surgery. *Ann Surg*. 2017 Nov 2. doi: 10.1097/SLA.0000000000002585. [Epub ahead of print]
136. **Frank SM**, Thakkar RN, Podlasek SJ, Ken Lee KH, Wintermeyer TL, Yang WW, Liu J, Rotello LC, Fleury TA, Wachter PA, Ishii LE, Demski R, Pronovost PJ, Ness PM. Implementing a Health System-wide Patient Blood Management Program with a Clinical Community Approach. *Anesthesiology*. 2017 Nov;127(5):754-764. doi: 10.1097/ALN.0000000000001851.
137. Sadana D, Pratzler A, Scher LJ, Saag HS, Adler N, Volpicelli FM, Auron M, **Frank SM**. *JAMA Int Med* 2018;178:116-22.
138. Amin RM, Raad M, Jain A, Sandhu KP, **Frank SM**, Kebaish KM. Increasing body mass index is associated with worse perioperative outcomes and higher costs in adult spinal deformity surgery. *Spine* 2018 43;693-8.
139. Johnson DJ, Johnson CC, Goobie SM, Nami N, Wetzler JA, Sponseller PD, **Frank SM**. High-dose versus low-dose tranexamic acid to reduce transfusion requirements in pediatric scoliosis surgery. *J Pediatr Orthop* 2017;37:e552-e557.
140. Yang WW, Thakkar RN, Gehrie EA, Chen W, **Frank SM**. Single-unit transfusions and hemoglobin trigger: relative impact on red cell utilization. *Transfusion*. 2017 May;57(5):1163-1170. doi: 10.1111/trf.14000.
141. Thakkar RN, Podlasek SJ, Rotello LC, Ness PM, **Frank SM**. Two-Unit Red Cell Transfusions in Stable Anemic Patients. *J Hosp Med* 2017 12;747-49.
142. Purvis TE, Goodwin CR, Molina CA, **Frank SM**, Sciubba DM. Percentage change in hemoglobin level and morbidity in spine surgery patients. *J Neurosurg Spine* 2018;28:345-51.
143. Purvis TE, Goodwin CR, Molina CA, **Frank SM**, Sciubba DM. Transfusion of red blood cells stored more than 28 days is associated with increased morbidity following spine surgery. *Spine* 2017 2018 Jul 1;43(13):947-953
144. Goeddel LA, **Frank SM**, Steppan J. Blood Transfusions in Cardiac Surgery: Balancing Science and Art. *J Cardiothorac Vasc Anesth*. 2018 Jan 31 2018 Jun;32(3):1233-1235. doi: 10.1053/j.jvca.2018.01.019.
145. Semerjian A, Milbar N, Kates M, Gorin MA, Patel HD, Chalfin HJ, **Frank SM**, Wu CL, Yang WW, Hobson D, Robertson L, Wick E, Schoenberg MP, Pierorazio PM, Johnson MH, Stimson CJ, Bivalacqua TJ. Hospital charges and length of stay following radical cystectomy in the enhanced recovery after surgery era. *Urology* 2018;111:86-91.
146. Hensley NB, Kostibas MP, Yang WW, Crawford TC, Mandal K, Gupta PB, **Frank SM**, Brown CH 4th. Blood utilization in revision versus first-time cardiac surgery: an update in the era of patient blood management. *Transfusion* 2018;58:168-75.

147. Suffredini G, Diaz-Rodriguez N, Chakravarthy K, Mathur A, Hayanga HK, **Frank SM**, Ringel RE, Freiberg S, Barodka VM, Steppan J. Anesthetic management of pheochromocytoma resection in adults with single ventricle physiology. *Cureus*. 2017 Dec 8;9(12):e1928. doi: 10.7759/cureus.1928.
148. Goel R, Chappidi MR, Patel EU, Ness PM, Cushing MM, **Frank SM**, Tobian AAR. Trends in red blood cell, plasma, and platelet transfusions in the United States, 1993-2014. *JAMA* 2018;319:825-7.
149. Sikorski RA, Hensley NB, **Frank SM**. Auditing intraoperative transfusions to promote high-value perioperative care. *Anesth Analg* 2018;126:1433-4.
150. Sharma K, Johnson DJ, Johnson B, **Frank SM**, Stevens RD. Hemoglobin concentration does not impact 3-month outcome following acute ischemic stroke. *BMC Neurol*. 2018; Jun 2;18(1):78. doi: 10.1186/s12883-018-1082-8.
151. Goel R, Patel EU, Cushing MM, Frank SM, Ness PM, Takemoto CM, Vasovic LV, Sheth S, Nellis ME, Shaz B, Tobian AAR. Association of Perioperative Red Blood Cell Transfusions With Venous Thromboembolism in a North American Registry. *JAMA Surg*. 2018 ; 153(9) 826-833: doi 10.1001/jamasurg.2018.1565.
152. Tan GM, Guinn NR, **Frank SM**, Shander A. Proceedings from the Society for Advancement of Blood Management annual meeting 2017: Management dilemmas of the surgical patient-when blood is not an option. *Anesth Analg*. 2018 Jun 28. doi: 10.1213/ANE.0000000000003478. [Epub ahead of print]
153. Koch CG, Duncan AI, Figueroa P, Dai L, Sessler DI, **Frank SM**, Ness PM, Mihaljevic T, Blackstone EH. Real Age: Red Blood Cell Aging During Storage. *Ann Thorac Surg*. 2018 Oct 17. pii: S0003-4975(18)31495-4. doi: 10.1016/j.athoracsur.2018.08.073
154. Sadana D, Pratzler A, Scher LJ, Saag HS, Adler N, Volpicelli FM, Auron M, **Frank SM**. Promoting High-Value Practice by Reducing Unnecessary Transfusions With a Patient Blood Management Program. *JAMA Intern Med*. 2018 Jan 1;178(1):116-122. doi: 10.1001/jamainternmed.2017.6369.
155. DeMario VM, Sikorski RA, Efron DT, Serbanescu MA, Buchanan RM, Wang EJ, Visagie M, Gehrie EA, Manukyan MC, Noll K, Ken Lee KH, Ness PM, **Frank SM**. Blood utilization and mortality in victims of gun violence. *Transfusion*. 2018 Oct;58(10):2326-2334. doi: 10.1111/trf.14925
156. Gupta PB, DeMario VM, Amin RM, Gehrie EA, Goel R, Lee KHK, Yang WW, Khanuja HS, Sterling RS, Ness PM, **Frank SM**. Patient Blood Management Program Improves Blood Use and Clinical Outcomes in Orthopedic Surgery. *Anesthesiology*. 2018 Dec;129(6):1082-1091. doi: 10.1097/ALN.0000000000002397
157. Cho BC, DeMario VM, Grant MC, Hensley NB, Brown CH 4th, Hebbar S, Mandal K, Whitman GJ, **Frank SM**. Discharge Hemoglobin Level and 30-Day Readmission Rates After Coronary Artery Bypass Surgery. *Anesth Analg*. 2018 Jul 27. doi: 10.1213/ANE.0000000000003671. [Epub ahead of print]
158. Goel R, Patel EU, Cushing MM, **Frank SM**, Ness PM, Takemoto CM, Vasovic LV, Sheth S, Nellis ME, Shaz B, Tobian AAR. Association of Perioperative Red Blood Cell Transfusions With Venous Thromboembolism in a North American Registry. *JAMA Surg*. 2018 Sep 1;153(9):826-833. doi: 10.1001/jamasurg.2018.1565.
159. Suffredini G, Diaz-Rodriguez N, Chakravarthy K, Mathur A, Hayanga HK, **Frank SM**, Ringel RE, Freiberg S, Barodka VM, Steppan J. Anesthetic Management of Pheochromocytoma Resection in Adults with Single Ventricle Physiology. *Cureus*. 2017 Dec 8;9(12):e1928. doi: 10.7759/cureus.1928.
160. Chaturvedi S, Koo M, Dackiw L, Koo G, **Frank SM**, Resar LMS. Preoperative Treatment of Anemia and Outcomes in Surgical Jehovah's Witness Patients. *Am J Hematol*. 2018 Nov 25. doi: 10.1002/ajh.25359. [Epub ahead of print]
161. Resar LMS, Chaturvedi S, **Frank SM**. Keeping the blood in “bloodless” medicine: Therapeutic strategies, outcomes & future directions. Submitted.

Inventions, Patents, Copyrights none

Extramural Funding

Current

2012-2017 Center for Bloodless Medicine and Surgery
 Johns Hopkins Hospital
 New York Community Trust
 \$2,100,000
 Role: PI, 30% of effort, Medical Director

2013-2014	Comparison of Efficacy between Salvaged Autologous and Stored Allogeneic Blood Haemonetics Corp. \$160,000 Role: PI, 100% salary support for Enika Nagababu
<i>Previous</i>	
1992-1995	Perioperative Body Temperature Myocardial Ischemia Trial Mallinckrodt Medical Inc \$331,284 Role: PI, % effort: 20%
1993-1994	Core Cooling in Humans (pilot study) Aquarius Medical \$3,100 Role: PI, % effort: 5%
1994-1995	Adrenergic and Cardiovascular Effects of Core Hypothermia Aquarius Medical Corporation \$6,125 Role: PI, % effort: 5%
1994-1995	Effects of Age on the Response to Core Cooling Aquarius Medical Corporation \$11,655 Role: PI, % effort: 5%
1995-1996	Cardiac Surgery Thermoregulation Study Mallinckrodt Medical Inc \$140,000 Role: PI, % effort: 20%
1996-1997	Core and Skin Temperature Contribution to Thermoregulation Aquarius Medical Corporation \$20,000 Role: PI, % effort: 5%
1996-1997	Determinates of the Adrenergic and Metabolic Responses to Core Hypothermia International Anesthesia Research Society, (Clinical Scholar Research Award) \$75,000 Role: PI, % effort: 20%
1997-1998	Perioperative Blood Loss and Body Temperature Trial Mallinckrodt Medical Inc \$126,000 Role: PI, % effort: 20%
1998-1999	Comparison of Conventional to Sub-atmospheric Pressure Rewarming in Postoperative Patients, Aquarius Medical Corporation \$60,000 Role: PI, % effort: 20%
1998-1999	Hemodynamic, Adrenergic, and Metabolic Responses to Postoperative Rewarming with a Negative Pressure Device Aquarius Medical Corporation \$90,393 Role: PI, % effort: 20%

- 1998-2000 Hypothermia During Regional Anesthesia and the Effects of Body Temperature on Surgical Bleeding, Anesthesia Patient Safety Foundation
\$50,000
Role: PI, % effort: 20%
- 1999-2000 Effects of Sub-atmospheric Pressure and Skin-Surface Warming on Cutaneous Blood Flow
Baxter Healthcare
\$63,899
Role: PI, % effort: 10%
- 1999-2000 Neurocirculatory Effects of Decreased Core Temperature
NIH/ National Institute of Neurologic Disorders and Stroke/Clinical Neurocardiology Section
\$101,500 to support sabbatical at NIH
Role: PI, % effort: 50%
- 1999-2000 Warmed Humidified Oxygen Therapy in Postoperative Surgical Patients
National Sleep Technologies
\$26,830
Role: PI, % effort: 5%
- 2000-2001 Clinical Neurocardiology Service at Johns Hopkins
NIH/National Institute of Neurologic Disorders and Stroke/ Clinical Neurocardiology Section
\$98,950
Role: PI, % effort: 50%

Research Program Building / Leadership none

EDUCATIONAL ACTIVITIES

Educational Publications

Peer Reviewed Publications (i.e., consensus statements, expert opinions) none

Invited Review Articles

1. **Frank SM:** Book review, "Clinical Procedures in Anesthesia and Intensive Care," Benumof JL, *Anesthesiology* 1992;77: 408-409.
2. **Frank SM, Myers TP, Olson KF:** Hemostatic, metabolic, and cardiovascular implications of perioperative hypothermia. In: Smith CE (ed). Etiology, Prevention, and Treatment of Hypothermia in the Trauma Patient. 8th Annual Trauma Anesthesia and Critical Care Symposium, Baltimore, MD, 1995.
3. **Frank SM:** Does outcome differ with regional versus general anesthesia? ASA Regional Refresher Course. September, 1996.
4. **Frank SM:** Importance of body temperature in the perioperative period. ASA Regional Refresher Course. September, 1996.
5. **Frank SM, Bulcao CF:** Pathophysiology and consequences of hypothermia. In: Smith CE, ed. Hypothermia in the Trauma Patient. 10th Annual Trauma Anesthesia and Critical Care Symposium, Baltimore, MD, 1997.
6. **Frank SM:** Postoperative outcome and anesthetic technique: regional vs. general anesthesia. In: Proceedings of 3rd Annual Conference of Alexandria Society of Anesthesia and Intensive Care, Alexandria, Egypt, 1997.
7. **Frank SM:** Body temperature and postoperative outcomes. In: Proceedings of 3rd Annual Conference of Alexandria Society of Anesthesia and Intensive Care, Alexandria, Egypt, 1997.
8. **Frank SM:** Clinical Importance of Body Temperature in the Perioperative Period. Monograph for Meeting of Society of Cardiovascular Anesthesiologists, Seattle, WA, May, 1998
9. **Frank SM:** Regional vs. general anesthesia for vascular surgery: Results of audience polling at the SCA meeting. August, 1999, *Society of Cardiovascular Anesthesiologists Newsletter*.
10. **Frank SM, Fleisher LA:** Temperature's importance in patient safety reviewed. *Anesthesia Patient Safety Foundation Newsletter* 1999;14(2).
11. **Frank SM:** Hypothermia for neurosurgery: CON. Proceedings of the 27th Annual Meeting of the Society of Neuroanesthesia and Critical Care, October, 1999.

12. **Frank SM**, Bulcao CF: Consequences physiopathologiques de l'hypothermie. *Ungence Pratique*, No 44, January, 2001.
13. **Frank SM**: Consequences of hypothermia. *Curr Anesth Crit Care* 2001;12:79-86.
14. Resar LS, **Frank SM**. Bloodless Medicine: What to do when you can't transfuse. *Hematology Am Soc Hematol Educ Program*. 2014 Dec 5;2014(1):553-558. Epub 2014 Nov 18.
15. Resar LM, Wick EC, Almasri TN, Dackiw EA, Ness PM, Frank SM. Bloodless medicine: Current strategies and emerging treatment paradigms. *Transfusion*. 2016; 56(10):2637-2647.

Editorials

1. **Frank SM**: Who benefits from red cell salvage? – Utility and value of intraoperative autologous transfusion. *Transfusion* 2011;51:2058-60.
2. Ness PM, **Frank SM**. Enhancing patient blood management: A long term focus. *Lancet*. 2014 Dec 9. pii: S0140-6736(14)62344-8. doi: 10.1016/S0140-6736(14)62344-8. [Epub ahead of print]
3. **Frank SM**, Ejaz A, Pawlik TM: Blood transfusion strategy and clinical outcomes. *Ann Surg*. 2015 May 27. [Epub ahead of print]
4. **Frank SM**, Johnson DJ, Resar LS. Ultra-massive transfusion: Give blood save a life. *Transfusion*, 2016 Mar;56(3):546-8. doi: 10.1111/trf.13403.
6. **Frank SM**, Ejaz A, Pawlik TM. Optimal transfusion trigger is surgical patients with coronary artery disease. *JAMA Surg*. 2015 Oct 7;1. Doi:10.1001/jamasurg.2015.3399/ [Epub ahead of print]
7. Grant MC, Resar LM, **Frank SM**. The efficacy and utility of acute normovolemic hemodilution. *Anesth Analg* 2015; 121:1412-4.

Case Reports

1. El-Gamal N, **Frank SM**: Perioperative thermoregulatory dysfunction in a patient with a previous traumatic hypothalamic injury. *Anesth Analg* 1995;80:1245-47.

Letters, Correspondence

1. **Frank SM**: Perioperative maintenance of normal temperature: In reply: *JAMA* 1997;278:545-546
2. **Frank SM**, Barodka VM: In Response, *Anesth Analg* 2013;117:1260-1.
3. **Frank SM**: In Response: *Anesthesiology* 2014;120:241-2.
4. **Frank SM**, In Response: Barodka VM, Harness HL. *Anesth Analg* 2015 120(4):955-6.
5. Goel R, **Frank SM**. Response to assuring hospital supply of fresh red blood cells for critically ill patients. *Transfusion*. 2017;57(5):1321-1322.

Book chapters, Monographs

1. Wilson RS, **Frank SM**: Tracheal reconstruction. In: Rogers MC (ed). *Current Practice in Anesthesiology*. Toronto, Philadelphia: BC Decker; 1991.
2. Beattie C, **Frank SM**: Anesthesia for major vascular Surgery. In: Rogers MC, Tinker JH, Longnecker DE, Covino BG (eds). *Principles and Practice of Anesthesia*. St. Louis: CV Mosby Yearbook, Inc; 1992.
3. **Frank SM**. Body temperature monitoring. In: Levitt R (ed). *Anesthesiology Clinics of North America*. Philadelphia: WB Saunders Company; 1993.
4. **Frank SM**, Raja SN, Fleisher LA, Beattie C, Higgins MS, Breslow MJ: Adrenergic and cardiovascular manifestations of cold stress. In: Zeisberger E, Schonbaum E, Lomax PL (eds). *Thermal Balance in Health and Disease: Recent Basic Research and Clinical Progress*. Basel: Birkhauser Verlag; 1994.
5. **Frank SM**, Rosenberg H, Horrow J: Causes and consequences of hyperthermia and hypothermia. In: Saidman LJ, Benumof JL (eds). *Anesthesia and Perioperative Complications*, 2nd ed. Philadelphia: Mosby Yearbook Inc.; 1999.
6. **Frank SM**: Thermoregulation. In: Hemmings HC, Hopkins PM (eds). *Basic and Applied Science for Anesthesia*. London: Mosby International; 1999.
7. Norris EJ, **Frank SM**.; Anesthesia for vascular surgery. In: Miller ED, Miller RD (eds). *Anesthesia*, 5th ed. New York: Churchill Livingstone; 1999.
8. **Frank SM**: Hypothermia following vascular surgery: complications, prevention, and treatment. In: Roizen M, Ellis J (eds). *Seminars in Cardiothoracic and Vascular Anesthesia*. Philadelphia: WB Saunders Company; 2000.

9. **Frank SM**, Wasey JO: Using data to support patient blood management. In: Murphy M, Roberts D, Yazer M (eds). *Practical Transfusion Medicine*, 5th ed. Oxford, United Kingdom: John Wiley and Sons, Inc.; 2015
10. **Frank SM**, Johnson, DJ, Resar LS: Development of a Blood Management Program. In: **Frank SM**, Waters JH (editors), *Blood Management*, 2nd ed., Bethesda, Maryland, AABB Press, 2016
11. **Frank SM**: Polycythemia Vera. In: Fleisher LA, Roizen MF (eds). *Essence of Anesthesia Practice*, 4th Ed., Philadelphia, Pennsylvania, Saunders, Elsevier, 2016
12. Norgaard, KL, **Frank SM**: Megaloblastic Anemia. In: Fleisher LA, Roizen MF (eds). *Essence of Anesthesia Practice*, 4th Ed., Philadelphia, Pennsylvania, Saunders, Elsevier, 2016
13. **Frank SM**, Masear CG: Optimizing Preoperative Blood Orders with a Surgical Blood Order Schedule. In: Sweitzer BJ (ed). *Preoperative Assessment of Management*. 3rd Ed., Philadelphia, PA, Wolters Kluwer, 2018.
14. Hensley NB, Kostibas MP, **Frank SM**, Koch CG: Blood Management. In: Gravlee GP, Shaw AD, Bartels K (eds) *Hensley's Practical Approach to Cardiothoracic Anesthesia*. 6th Edition, Netherlands, Wolters Kluwer, 2018.
15. Hensley NB, Kostibas MP, Koch CG, **Frank SM**. Perioperative Blood Management in Cardiac Surgery. In: Cheng DCH, Martin J, David TE (eds). *Evidence-based Practice in Perioperative Cardiac Anesthesia and Surgery*. Switzerland, Springer International Publishing, 2019.
16. Cho BC, **Frank SM**. Surgery and Anesthesia. In: Yazer MH (ed). *The Clinical Use of Blood: In Medicine, Obstetrics, Paediatrics, Surgery & Anesthesia, Trauma & Burns* World Health Organization. Geneva, Switzerland. Publisher: The World Health Organization, 2019.

Books, Textbooks

1. **Frank SM**, Waters JH (editors), *Blood Management*, 2nd ed., Bethesda, Maryland, AABB Press, 2016

Other media (Media coverage)

- | | |
|---------|---|
| 4/97 | New York Times Health Section – Surgery’s Chill Can Be Risky
http://www.nytimes.com/1997/04/16/us/surgery-s-chill-can-be-risky.html |
| 4/97 | Baltimore Sun – Warm Patients, Fewer Problems: Temperature: Doctors Find that Patients Kept Warm with Heated Blankets During Surgery Have Fewer Heart Attacks, Chest Pain and Abnormal Heart Rhythms as a Consequence of Surgery
http://articles.baltimoresun.com/1997-04-09/news/1997099063_1_heated-blankets-heart-unstable-angina |
| 4/12 | International Business Times – Wide Variation in Transfusion
http://www.ibtimes.com/blood-transfusions-overused-study-693062 |
| 4/24/12 | Science Daily – Blood Transfusions Still Overused and May Do More Harm than Good in Some Patients; http://www.sciencedaily.com/releases/2012/04/120424142111.htm |
| 4/25/12 | Baltimore Sun – Doctors May Be Transfusing Blood Too Often
http://articles.baltimoresun.com/keyword/blood-transfusion/featured/2 |
| 7/12 | Transfusion News Video: Transfusion of Red Blood Cells: New Guidelines from AABB
http://transfusionnews.com/2012/07/20/transfusion-of-red-blood-cells-new-guidelines-from-aabb/ |
| 3/13 | New York Times Health Section – The Shelf Life of Donor Blood
http://well.blogs.nytimes.com/2013/03/11/the-shelf-life-of-donor-blood/?_r=0 |
| 3/13 | The Telegraph (UK) – Blood Should Be Stored for Three Weeks Maximum Study Shows
http://www.telegraph.co.uk/health/9908613/Blood-should-be-stored-for-three-weeks-maximum-study-finds.html |
| 4/13 | CBS News – Stored Blood Transfusion May Have Shorter Shelf Life Than Once Thought
http://www.cbsnews.com/news/stored-blood-for-transfusions-may-have-shorter-shelf-life-than-once-thought/ |
| 5/28/13 | The Fiscal Times – The Novel Way Hospitals Can Save Millions
http://www.thefiscaltimes.com/Articles/2013/05/28/The-Novel-Way-Hospitals-Can-Save-Millions |
| 6/13 | ASA News Release – Data from Anesthesia Information Management Systems Help Reduce Costs and Improve Patient Safety |

- <https://www.asahq.org/For-the-Public-and-Media/Press-Room/Anesthesiology-and-Other-Scientific-Press-Releases/Data-from-anesthesia-information-management-systems-help-reduce-costs-and-improve-patient-safety.aspx>
- 8/13 Physician's Weekly – Wide Variation in Blood Transfusion Use
<http://www.physiciansweekly.com/blood-transfusion/>
- 10/13 AABB News – An Electronic Maximum Surgical Blood Order Schedule
<http://www.aabbnews-digital.org/aabbnews/201310/?pg=16#pg16>
- 5/14 New York Times Health Section – Using a Patient's Own Blood in Heart Surgery
<http://well.blogs.nytimes.com/2014/05/19/using-a-patients-own-blood-in-heart-surgery/>
- 5/14 Washington Post – Recycled blood is better than donated blood for transfusions, Hopkins study finds
<http://www.washingtonpost.com/news/to-your-health/wp/2014/05/09/recycled-blood-is-better-than-donated-blood-for-transfusions-hopkins-study-finds/>
- 3/16 Bloodless Medicine and Surgery: What You Need to Know. Steven M. Frank, Johns Hopkins.
<https://www.youtube.com/watch?v=uDmVS8PVvA>
- 5/16 Getting Ready for Joint Commission Patient Blood Management Certification.
https://www.jointcommission.org/assets/1/18/Patient_Blood_Management_Certification_May-12_2016.pdf
- 9/17 Johns Hopkins Health System Reduces Unnecessary Transfusions with New Blood Management Program. https://www.eurekalert.org/pub_releases/2017-09/jhm-jhh090617.php
- 11/17 Blueprint for Saving Blood Units: A Patient Blood Management Program – How Hospitals can reduce the draining of the blood supply.
<https://www.medpagetoday.com/surgery/generalsurgery/69433>
- 1/18 Multifacility Blood Transfusion Management Program Led to \$2 Million in Annual Savings.
<https://www.healio.com/hematology-oncology/hematology/news/online/%7B458c7c71-2fd2-4427-80d3-5400492894c2%7D/multifacility-blood-transfusion-management-program-led-to-2-million-in-annual-savings>
- 3/18 Bloodless Medicine with Steve Frank, Podcast by The Blood Bank Guy. (Joe Chaffin)
<https://www.bbgy.org/2018/03/26/048/>
- 9/18 Gunshot Victims Require Much More Blood And Are More Likely To Die Than Other Trauma Patients. <https://www.sciencedaily.com/releases/2018/09/180917082446.htm>

Teaching

Classroom Instruction: (several resident and fellow lectures and conferences per year); Too many to list here

Clinical Instruction: (ongoing daily instruction to residents and fellows (2-3 days/week))

CME Instruction: (please see the list of invited lectures below under “Invited Talks and Panels”)

Workshops/seminars: (please see the list of invited lectures below under “Invited Talks and Panels”)

Mentoring (pre- and postdoctoral)

Advisees: Full Time

- | | |
|-------------|--|
| 9/92–9/97 | Susan Kelly, Research Nurse, RN, Lewes, Delaware |
| 9/94–9/95 | Krista Olson, Medical Student, ER Physician, Columbus OH |
| 8/95–10/95 | Maki Hsieh, Undergraduate, unknown |
| 8/95–12/95 | Daniel Ho Jay, Undergraduate, unknown |
| 9/96–9/97 | Christian Bulcao, Graduate Student, Cardiac Surgery, Univ. of Cincinnati |
| 7/97–7/98 | Nak Soon Lee, Research Fellow, Anesthesiologist, Seoul, Korea |
| 8/97–8/98 | Rachel Barnes, Graduate Student, unknown |
| 12/97–12/99 | Hossam el-Rahmany, Research Fellow, Anesthesiologist, Alexandria, Egypt |
| 1/98–1/99 | Neveen Ghoneim, Research Fellow, OB-GYN, Alexandria, Egypt |
| 6/98–8/99 | Kha Tran, Medical Student, Assistant Professor Anesthesiology, Children's Hospital of Philadelphia |
| 10/98–10/99 | Christine Cattaneo, Anesthesiology Fellow, Anesthesiologist, Ann Arundel Medical Center |
| 10/99–10/01 | Mohamed Naqibuddin, Postdoctoral Fellow, Senior Research Program Coordinator, Armstrong Institute |
| 7/11–7/13 | Jim Rothschild, Anesthesiology Fellow, Anesthesiologist, First Colony Group |

6/12–present	Courtney Masear, Postdoctoral Fellow, Anesthesiology Resident, JHMI
7/12–present	Michael Grant, Anesthesiology Research Elective, Cardiac Anesthesiology Fellow, Johns Hopkins
7/12–present	Jack Wasey, Anesthesiology Research Elective,
10/12–present	Osman Salaria, Postdoctoral Research Fellow, Resident, Anesthesiology, Mt. Sinai, NY
5/13–8/13	Andrew Scott, Summer Research Associate, Medical Student, JHU
5/13–present	Gabe Zuckerberg, Undergraduate Summer Research Associate, Univ. of MD student
7/14–7/15	Andrew Scott, Research Associate, Currently a JHU Medical Student taking off for research Received the Doris Parrish Scholarship Research Award – Johns Hopkins Medical School
7/13–2/14	Jessica Morgan, Anesthesiology Research Fellow, Anesthesiology Resident
1/14–present	Nagababu Enika, Postdoctoral Research Associate, Assistant Professor, ACCM, JHMI
2/15–5/16	Daniel Johnson, Research Associate, Medical Student (Vanderbilt), research rotation
5/16–6/17	Will W. Yang, Research Associate, current Medical Student (Hofstra)
5/17–5/18	Vince DeMario, Postgraduate Research Associate
5/18–present	Mereze Visagie, Postgraduate Research Associate

Advisees: Part Time

7/93–10/93	Armando Soto, Medical Student Research Elective, Surgeon, Orlando, FL
3/94–5/94	Bernard Jiang, Medical Student Research Elective, Anesthesiology, LA, CA
6/94–8/94	Peter Wu, Medical Student Research Elective, Anesthesiology, Fairfax, VA
6/94–8/94	Trevor Myers, Medical Student Research Elective, Anesthesiology, Arlington, VA
9/93–10/94	Osamo Afifi, Postdoctoral Research Fellow, Anesthesiologist, Children’s Cancer Hospital, Cairo
9/93–3/95	Nadir El Gamal, Postdoctoral Research Fellow, Anesthesiologist, Univ. Alexandria, Egypt
6/95–8/95	Jay Weller, Medical Student Research Elective, Anesthesiologist, Univ. of Cincinnati, OH
5/95–8/95	Rico Tagliaferri, Undergraduate Research Assistant, Lawyer, Public Defender, Colorado
8/95–5/97	Meng Wu, Undergraduate, unknown
8/95–8/97	Giselle Schneider, Graduate Student Research, Pediatrician, Cincinnati Children’s Hospital
4/97–4/98	Lauren Kim, Undergraduate, unknown
9/97–9/98	Neeraj Gupta, Undergraduate, unknown

Thesis committee

10/12–12/13	Jose Salazar, Postdoctoral, PhD, Clinical Research, PhD. Peds Surgery Role: Advisor, mentor, thesis evaluator
-------------	--

Training grant participation

10/14–present	Co-Investigator and Mentor - NIH T32 training grant Department of Anesthesiology/Critical Care Medicine Principal Investigator – Alan Gottschalk MD, PhD
---------------	--

Educational Program Building/Leadership

7/15–present	Faculty liaison – Johns Hopkins Medical Student Anesthesiology Interest Group
--------------	---

Educational Extramural Funding None

CLINICAL ACTIVITIES

Certification

1986	National Medical Board Examiners diplomat
1988	Maryland medical license
1991	American Board of Anesthesiology

Clinical (service) Responsibilities

1989–2001	Faculty member at Johns Hopkins Hospital, Department of Anesthesiology and Critical Care Medicine, staffing surgical cases in major vascular, thoracic, transplant (average commitment – 3 days per week)
1990–2001	Member of emergency vascular anesthesia team
1990–2001	Member of liver transplant team (8 days/nights per month)

- 1991–2001 General Operating Room Coordinator at Johns Hopkins Hospital one to two days per week with responsibility for scheduling cases and arranging operating room schedule to optimize efficiency of the 23 general operating rooms.
- 2001–2010 Private practice Anesthesiologist at Greater Baltimore Medical Center; 100% clinical anesthesia services at GBMC in Towson MD
- 2010–present Faculty member at Johns Hopkins Hospital, Department of Anesthesiology and Critical Care Medicine staffing surgical cases in major vascular, thoracic, transplant (2010: 4 days/wk, 2011: 3 days/week, 2012–2013: 2 days/week, 2014: 1 day/week)
- 2010–present Member of liver transplant team (6 days/nights per month)

Clinical Program Building / Leadership

*See below under “System Innovation and Quality Improvement Efforts within JHM”

Clinical Extramural Funding

- 2012–2016 “Center for Bloodless Medicine and Surgery”
New York Community Trust
\$2,100,000
Role: PI, 35% effort; Notes: see details below under: “System Innovation and Quality Improvement efforts within JHM”

SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES

System Innovation and Quality Improvement Publications

1. “Standards for a Patient Blood Management Program,” 1st Ed. 2014, American Association of Blood Banks (AABB), Bethesda, Maryland

System Innovation and Quality Improvement efforts within JHM

- 4/11–present **Johns Hopkins Hospital Interdisciplinary Blood Management Program**
In April, 2011, the Department of Pathology began funding a Patient Blood Management Program with the primary goal of conserving blood and reducing unnecessary transfusions. I was the Co-Director then, and I am now the Medical Director of the Program. After multiple interventions, we achieved a 9.8% reduction in red cell utilization, a 7% reduction in plasma utilization, and a 2% reduction in platelet utilization. This translates into \$1,500,000/year in cost avoidance for JHH. Our annual blood expenditure is \$22,000,000.
- 5/12–present **Center for Bloodless Medicine and Surgery Program**
In May, 2012, after procuring funding from the New York Community Trust, I was responsible for starting a program to care for patients who decline blood transfusions. This program was endorsed by Ron Peterson and Ron Werthman after reviewing the business plan. In the first year we brought in 342 inpatients and a total of 1,549 outpatient encounters. Our first year financial analysis revealed \$3.6 million in variable net margin revenue, which was three-fold ahead of projections. In our second year, and our patient volumes were up more than 50% over the first year we brought in \$6.3 million, and now in our third year we are on pace to bring in \$6.9 million. We have created a self-sustaining program to provide medical care to patients who are often turned down by other hospitals since these patients will not accept transfusions.
- A recent financial report up to January, 2016 shows that we are on pace to attract 516 inpatients this year and 2,500 outpatient encounters. Our adjusted actual variable net margin is \$6.7 million for FY16.
- 7/14–present **Johns Hopkins Health System Blood Management Clinical Community**
In July, 2014, the Armstrong Institute began supporting the Blood Management Program to expand the above-described program to the entire Johns Hopkins Health System (all five hospitals). Armstrong sees Blood Management as a safety/quality measure. Its goal is to reduce unnecessary

transfusions in order to reduce risk, improve outcomes, and save costs. The business plan was approved by Ron Werthman and Ron Peterson, and the current level of funding is \$3,500,000 over 6 years, including 50% salary support for me to be the Medical Director. The projected return on investment for reducing the \$30,000,000 annual health system blood expenditure is between 50% and 300%.

In FY16 our efforts are on pace to achieve \$1.25 million/year in cost avoidance for the Health System. This includes a 20% decrease in blood use at Bayview Medical Center, a 21.5% decrease at Howard County Hospital, a 24.5% decrease at Suburban Hospital, and an 18.5% decrease at Sibley Hospital.

System Innovation and Quality Improvement efforts outside of JHM

2013-2014 American Association of Blood Banks (AABB)
Standards Program Unit
Site of intervention – Hospitals nationwide
Role – Member of panel that developed Patient Blood Management Standards released in 2014;
Impact: Reduce risks, improve outcomes, reduce cost by achieving blood conservation and reducing unnecessary transfusions

Production of Guidelines and/or Protocols

Lead advisor for periodic revision of The Johns Hopkins Hospital Clinical Practice Manual PAT029 “Blood and Blood Component Transfusion” in 2013 and 2015.
Co-advisor for creation and revision of The Johns Hopkins Hospital Clinical Practice Manual PAT064 “Massive Transfusion for Adult Patients” in 2012 and 2015.
(see above for blood management guideline development for Am. Assn. of Blood Banks - AABB)

System Innovation and Quality Improvement Program Building/Leadership

(see above – “Center for Bloodless Medicine and Surgery Program” role – Medical Director)
(see above – “Johns Hopkins Health System Blood Management Program” role – Medical Director)
(see above – “Johns Hopkins Hospital Interdisciplinary Blood Management Program” role – Medical Director)

System Innovation and Quality Improvement Extramural Funding

(see above – “Center for Bloodless Medicine and Surgery Program”)

ORGANIZATIONAL ACTIVITIES

Institutional Administrative Appointments

1989–1991 Member of the Anesthesiology Clinical Pharmacy Committee, Johns Hopkins Hospital.
1988–1992 Member of the clinical monitoring committee for the PIRAT study; an NIH funded randomized clinical trial on cardiac outcomes and anesthetic techniques.
1990–1996 Scheduling coordinator for the daily and night call schedules for the Division of Critical Care Anesthesia, Johns Hopkins Hospital.
1991–1996 Coordinator for resident evaluations, Division of Critical Care Anesthesia, Johns Hopkins Hospital.
1994–1996 Clinical Standards Committee, Department of Anesthesiology/Critical Care Medicine, Johns Hopkins Hospital.
1997–2001 Manpower and Program Planning Committee, Department of Anesthesiology/Critical Care Medicine, Johns Hopkins Hospital.
2001–2009 Director of Continuing Medical Education Department of Anesthesiology, The Greater Baltimore Medical Center.
6/10–present Director, Interdisciplinary Blood Management Program, Johns Hopkins Hospital.
6/10–present Director, Perioperative Blood Management Services, The Johns Hopkins Hospital.
6/10–present Member, Transfusion Practice Committee, The Johns Hopkins Hospital.
6/12–present Vice-Chair, Transfusion Practice Committee, The Johns Hopkins Hospital.
6/12–present Medical Director, Bloodless Medical and Surgery Program, The Johns Hopkins Hospital.
6/14–present Medical Director, Johns Hopkins Health System Blood Management Program

6/15-present Faculty Senate representative, Department of Anesthesiology/Critical Care Medicine, Johns Hopkins
 8/14-present EPIC EMR Orderset Build Team – Lead for Blood Transfusion Ordersets
 1/15-present Search Committee member for the Dept. of Pathology faculty member in Transfusion Medicine
 12/15-present Research Committee member – Dept. of Anesthesiology Critical Care Medicine
 10/15-present Committee member – Dept. of Anesthesiology Critical Care Medicine
 Anesthesiology Quality Institute EPIC EMR Advisory Group

Editorial Activities

Editorial board appointments

1999–2001 Associate Editor, *Anesthesiology*
 1997-2001 *Cardiovascular and Thoracic Anesthesia Journal Club Journal*
 2013–present *International Journal of Clinical Transfusion Medicine*
 2014–present Member, Editorial Board, *Transfusion*

Journal peer reviewer activities

Anesthesiology
Blood
Transfusion
Anesthesia and Analgesia
Lancet
Critical Care Medicine
International Journal of Clinical Transfusion Medicine
Cardiovascular and Thoracic Anesthesia Journal Club Journal
Obstetrics and Gynecology
PLOS One
Journal of Clinical Anesthesiology
Journal of the American Medical Association
Urology
Journal of Refractive Surgery
Journal of Hospital Medicine
Seminars in Cardiothoracic and Vascular Anesthesia
Health Care: The Journal of Delivery Science and Innovation
Analytical Chemistry
Transfusion Medicine
Pediatrics
Annals of Surgery
JAMA Surgery
BMC Health Services Research
Transfusion Medicine Reviews
Transfusion Medicine
Journal of Surgical Oncology
Journal of Clinical Investigation
Journal of Infection and Public Health
Vox Sanguis
Transfusion and Apheresis Science
BMJ Open
BMC Health Services Research

Advisory Committees, Review Groups/Study Sections

1996–1998 Appointed to the Scientific Program Committee for the Society of Cardiovascular Anesthesiologists
 2012–present North American Blood Management Advisory Group yearly meeting for strategic planning in Oct.
 2012–present Co-Chair, Research Committee, Society for Advancement of Blood Management.
 2013–present Director at Large, Board of Directors, Society for Advancement of Blood Management.

- 2013–present Data monitoring and safety board: Noninvasive and Continuous Hemoglobin Monitoring for Surgical Blood Management (NACHO) SABM-sponsored study.
- 2013–present Patient Blood Management National Standards Committee of the American Association of Blood Banks (creation of standards for blood management programs).
- 2013–present Chair, Research Committee, Society for Advancement of Blood Management.
- 2014–present Elected to Board of Directors, American Association of Blood Banks.
- 2014–present American Society of Anesthesiologists (ASA) Committee of Blood Management
- 2016–present Liaison from American Society of Anesthesiologists (ASA) to American Association of Blood Banks (AABB)
- 2016–present Blood Management Technical Advisory Panel (Joint Commission Committee)
- 2016–present American Society of Anesthesiologists Liaison to the AABB Perioperative Standards Committee
- 2016–present American Association of Blood Banks, Perioperative Standards Committee
- 2016–2017 American Association of Blood Banks, Governance Committee
- 2017 – 2018 American Association of Blood Banks, Human Resources Committee

Professional Societies

- 1989–present American Society of Anesthesiologists
- 1990–present American Medical Association
- 1990–2000 Society of Cardiovascular Anesthesiologists
- 1994–2000 International Trauma Anesthesia and Critical Care Society
- 1995–1997 American Physiological Society
- 1998–1999 American Society of Testing and Materials
- 1998–1999 American Society of Echocardiography
- 1999–present International Anesthesia Research Society (IARS)
- 2011–present American Association of Blood Banks (AABB)
- 2011–present Society for Advancement of Blood Management (SABM)
- 2013–present Association of University Anesthesiologists (AUA)

Conference Organizer, Session Chair

- 2013 Society for Advancement of Blood Management (SABM) Annual Meeting, Los Angeles, CA
- 2014 Society for Advancement of Blood Management (SABM) Annual Meeting, Houston, TX
- 2014 Society for Advancement of Blood Management (SABM) Annual Meeting: Panel – President’s Award to honor speaker Denton Cooley
- 2015 Society for Advancement of Blood Management (SABM) Annual Meeting: Planning Committee
- 2016 Society for Advancement of Blood Management (SABM) Annual Meeting: Planning Committee

Consultantships

- 2012–present CSL Behring Inc. – Blood Management Advisory Board; Massive Transfusion Protocols and Coagulopathies
- 2012–present Haemonetics Corp. Key Opinion Leaders Conference; Blood Management Advisory Board; North American Blood Management Advisory Board
- 2013–present Medtronic Faculty – Blood Management Academy: Lectures on Blood conservation and patient blood management
- 2014 Biomet Inc. – Key Opinion Leaders Meeting, Blood Storage Solutions
- 2014 Mediware Inc. – “Evidence-based Transfusion Practice” – lecture and education
- 2015–2016 Zimmer-Biomet – Red blood cell storage lesion and clinical impact
- 2016–current Baxter Health Care – Topical Hemostatics
- 2018–current Biom’Up – Topical Hemostatics

RECOGNITION

Teaching Awards

- 1999 Received the *Robert T. Donham Teacher of the Year Award* for teaching clinical anesthesiology to residents and medical students at the Johns Hopkins Hospital (Chosen from ≈ 100 faculty members)

- 2012 Received the *Robert T. Donham Teacher of the Year Award*, Department of Anesthesiology/Critical Care Medicine, Johns Hopkins Medical Institutions (Chosen from over 100 faculty members)
- 2015 Received the Resident Research Mentorship Award, Department of Anesthesiology/Critical Care Medicine, Johns Hopkins Medical Institutions (Chosen from over 100 faculty members)

Clinical Awards

- 2016- present Elected to the Miller-Coulson Academy of Clinical Excellence
One of 10 physicians inducted into the Academy on April 18, 2016

Articles Accompanied by Editorials (numbers refer to list above)

- 32 *JAMA* 1997;277:1127-34
- 64 *Anesthesiology* 2013;118:1286-97
- 66 *Transfusion* 2013;53:3052-9
- 67 *Anesth Analg* 2014;118(6):1168-78
- 68 *Transfusion* 2014;54(6):1460-8

Articles Featured on Journal Cover (numbers refer to list above)

- 60 *Transfusion* 2011;51:2058-60
- 66 *Transfusion* 2013;53:3052-9
- 67 *Anesth Analg* 2014;118(6):1168-78

Article Chosen as *Anesthesia and Analgesia* Editor's Choice Article of the Month

- 67 *Anesth Analg* 2014;118(6):1168-78

Invited Talks and Panels

- 7/92 Grand Rounds, Department of Anesthesiology, University of Minnesota, Minneapolis, "Inadvertent Hypothermia"
- 7/92 Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, "The PIRAT Study Results"
- 8/92 Grand Rounds, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, "Inadvertent Hypothermia"
- 1/93 St. Agnes Hospital, Baltimore, MD, "Anesthesia for Hepatic Surgery"
- 3/93 Franklin Square Hospital, Baltimore, MD, "Inadvertent Hypothermia"
- 4/93 Osler Institute Lecture (Board Review Course), Annapolis, Maryland, "Anesthesia for Hepatic Surgery"
- 11/93 Department of Anesthesia Research Conference, University of California, San Francisco, "Adrenergic, Metabolic and Cardiovascular Manifestations of Inadvertent Hypothermia"
- 11/93 Grand Rounds, Department of Anesthesiology, University of Oregon, Portland, "Adrenergic, Metabolic and Cardiovascular Manifestations of Inadvertent Hypothermia"
- 5/94 Annual Meeting of the Society of Cardiovascular Anesthesiologists, Discussant, Scientific Poster Session, Montreal, Canada
- 10/94 Annual Meeting of the American Society of Anesthesiologists, San Francisco, CA, "Consequences of Inadvertent Hypothermia"
- 11/94 Grand Rounds, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University, "Adrenergic, Metabolic and Cardiovascular Effects of Cold Stress"
- 4/95 Grand Rounds, Department of Anesthesiology, Washington University, St Louis, "Adrenergic, Metabolic and Cardiovascular Effects of Cold Stress"
- 5/95 17th Annual Meeting of the Society of Cardiovascular Anesthesiologists, Philadelphia, PA, "Metabolic Management of the Vascular Surgery Patient: Glucose, Hematocrit and Temperature, Does it Matter?"
- 12/95 Autonomic Research Seminar, Johns Hopkins University, Baltimore, MD, "Cold Stress: Adrenergic and Cardiovascular Implications"
- 12/95 Cardiac Surgery Grand Rounds, Johns Hopkins University, Baltimore, MD, "Cardiac Surgery Temperature Study"
- 2/96 Baltimore Society of Operating Room Nurses, Union Memorial Hospital, Baltimore, Maryland, "Perioperative Hypothermia: Consequences, Prevention, and Treatment"

- 2/96 Grand Rounds, Department of Anesthesiology, Vanderbilt University, Nashville, TN, "Cardiovascular Manifestations of Perioperative Hypothermia"
- 4/96 Grand Rounds, Department of Anesthesiology, Boston University Medical Center, Boston, MA, "Perioperative Hypothermia: Consequences, Prevention, and Treatment"
- 6/96 17th International Congress of the Israeli Society of Anesthesiologists, Tel Aviv, Israel, "Risks and Benefits of Hypothermia in Noncardiac Surgery"
- 9/96 ASA Regional Refresher Course Lecture, Chicago, IL, "Does Outcome Differ with Regional versus General Anesthesia?"
- 9/96 ASA Regional Refresher Course Lecture, Chicago, IL, "Clinical Importance of Body Temperature in the Perioperative Period"
- 11/96 Grand Rounds, Department of Anesthesiology/Critical Care Medicine, University of Chicago, Chicago, IL, "Body Temperature and Perioperative Outcomes"
- 11/96 Department of Anesthesiology/Critical Care Medicine Research Conference, University of Chicago, Chicago, IL, "Does Outcome Differ with Regional versus General Anesthesia?"
- 11/96 Third Annual Conference of the Alexandria Society of Anesthesia and Intensive Care, Alexandria, Egypt, "Body Temperature and Postoperative Outcomes"
- 12/96 Redding Hospital, Redding, PA, "Body Temperature and Perioperative Outcomes"
- 5/97 Panel Moderator, Society of Cardiovascular Anesthesiologists Annual Meeting, Baltimore, MD, "Postoperative Management"
- 9/97 Third Annual Conference of Alexandria Society of Anesthesia and Intensive Care, Alexandria, Egypt, "Postoperative Outcome and Anesthetic Technique: Regional vs. General"
- 11/97 Grand Rounds, Franklin Square Hospital, Baltimore, MD, "Body Temperature and Perioperative Outcome"
- 12/97 Grand Rounds, Johns Hopkins Department of Anesthesiology/Critical Care Medicine, Baltimore, MD, "Regional vs. General Anesthesia: Does Outcome Differ?"
- 4/98 Food and Drug Administration, American Society of Testing and Materials, Rockville, MD, "The Clinical Importance of Body Temperature During Surgery"
- 5/98 Society of Cardiovascular Anesthesiologists Annual Meeting, Seattle, WA, "Clinical Importance of Body Temperature in the Perioperative Period"
- 5/98 Montgomery General Hospital, Olney, MD, "Body Temperature and Perioperative Outcome"
- 6/98 Grand Rounds, Department of Anesthesiology, Jefferson University Hospital, Philadelphia, PA, "Body Temperature and Perioperative Outcome"
- 10/98 Grand Rounds, Department of Anesthesiology, Union Memorial Hospital, Baltimore, MD, "Body Temperature and Perioperative Outcome"
- 12/98 Postgraduate Assembly in Anesthesiology, New York State Society of Anesthesiologists, New York, "Perioperative Normothermia Improves Surgical Outcome"
- 12/98 National Institutes of Health, Neurocardiology Branch, Bethesda, MD, "Adrenergic, Metabolic, and Cardiovascular Effects of Cold Stress"
- 5/99 Japanese Society of Anesthesiologists, Sapporo, Japan, "Body Temperature and Perioperative Outcome"
- 10/99 Society of Neuroanesthesia and Critical Care (SNACC), Dallas, TX, "Hypothermia for Neurosurgery"
- 6/00 World Congress of Anesthesiology, Montreal, Canada, "Practice Parameters and Clinical Guidelines"
- 7/00 Grand Rounds, Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, "Body Temperature: The Forgotten Vital Sign"
- 9/00 National Institutes of Health, Institute of Childhood Health and Development Research Conference, "Adrenergic and Cardiovascular Effects of Cold Stress"
- 5/01 Society of Cardiovascular Anesthesiologists, Vancouver, British Columbia, "Regional vs. General Anesthesia for Vascular Surgery"
- 5/01 Grand Rounds, Department of Anesthesiology, Mount Sinai Hospital, NY, NY, "Regional vs. General Anesthesia: Does Outcome Differ?"
- 9/11 Grand Rounds, Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, "Blood Transfusion: Guidelines, Controversies, and Clinical Outcomes"
- 9/11 Department of Surgery, Johns Hopkins Medical Institutions, Baltimore, MD, "Blood Transfusion and Clinical Outcomes"

- 11/11 Division of Cardiac Anesthesiology, Johns Hopkins Medical Institutions, Baltimore, MD, “Cardiac Surgery and Intraoperative Blood Utilization”
- 3/12 Grand Rounds, Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, “The Hemosafe Automated Blood Dispenser and Other Blood Related Topics”
- 4/12 Haemonetics Impact Online Blood Management Users Conference, Atlanta, GA, “Variability in Blood and Blood Product Utilization as Assessed by an Anesthesia Information Management System”
- 9/12 National Red Cross Meeting for Medical Directors, Rockville, MD, “Assessment of Blood Utilization Using Data Acquired from Electronic Medical Records”
- 10/12 American Association of Blood Banks Annual Meeting, Boston, MA, “Collection and Analysis of Blood Utilization Data”
- 10/12 American Society of Anesthesiologists Annual Meeting, Washington, DC, “Neuromonitoring for Thoracoabdominal Aortic Aneurysm Surgery”
- 10/12 Speaker, Panel on thoracoabdominal aortic aneurysms, American Society of Anesthesiologists Annual Meeting, Washington, DC, “Update of Methods for Spinal Cord Protection during TAA Repair”
- 12/12 Beijing Society of Anesthesiologists, Peking Union Memorial Hospital, Beijing, China, “Blood Transfusion: Guidelines, Controversies and Clinical Outcomes”
- 12/12 Beijing Society of Anesthesiologists, Invited lecture, Beijing, China, “Blood Transfusion: Guidelines, Controversies, and Clinical Outcome Studies”
- 12/12 Grand Rounds, Johns Hopkins Hematology, Baltimore, MD, “Blood Transfusion: Guidelines, Controversies, and Clinical Outcome Studies”
- 1/13 Grand Rounds, Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, “What’s New in Patient Blood Management?”
- 1/13 Johns Hopkins Hospital Management Committee, Baltimore, MD, Invitation from Ron Peterson, “Blood Utilization Quality Improvement”
- 1/13 Johns Hopkins Quality Assurance Quality Improvement Committee, Baltimore, MD, Invitation from Judy Reitz, “Blood Utilization Quality Improvement”
- 1/13 Patient-based Learning Discussion, Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, “Perioperative Death: TRALI vs. TACO,” complications from transfusion
- 4/13 Health Care Insights Meeting, Phoenix Arizona, “Blood Management Opportunities to Reduce Risk, Improve Outcomes, and Save Cost”
- 7/13 Grand Rounds, Georgetown University Hospital, Department of Anesthesiology, Washington, DC, “Blood Transfusion: Guidelines, Controversies, and Clinical Outcome Studies”
- 9/13 Grand Rounds, Department of Pathology, Johns Hopkins University, Baltimore, MD, “Blood Transfusion: Guidelines, Controversies, and Clinical Outcome Studies”
- 9/13 Society for the Advancement of Blood Management, Los Angeles, CA, “Implementing Change in Transfusion Practice: Conquering Habit with Evidence”
- 10/13 American Association of Blood Banks Annual Meeting, Denver, CO, “The Maximum Surgical Blood Order Schedule – MSBOS”
- 10/13 Johns Hopkins Surgical Intensive Care Units Research Conference, Baltimore, MD, “Update on Patient Blood Management at Johns Hopkins”
- 1/14 Grand Rounds, Johns Hopkins Hematology, Baltimore, MD, “Patient Blood Management: Opportunities to Reduce Risk, Improve Outcomes and Save Costs”
- 1/14 American Association of Blood Banks Webinar, “Can CPOE Reduce Blood Usage/Increase Compliance”
- 1/14 Blood Management Academy, Atlanta, GA, “Patient Blood Management Programs: Opportunities to Reduce Risk, Improve Outcomes, and Reduce Costs”
- 3/14 CUSP Series Webinar, Funded by AHRQ, “Patient Blood Management: Opportunities to Reduce Risk, Improve Outcomes, and Reduce Costs”
- 3/14 TransFuse Meeting, Mayo Clinic Symposium on Blood Management, Phoenix, AZ, “Hemoglobin Transfusion Triggers, Targets, and Patient Blood Management”
- 4/14 Blood Management Academy, Portsmouth, NH, “Patient Blood Management: Opportunities to Reduce Risk, Improve Outcomes and Save Costs”

- 4/14 Haemonetics Software Users Group Annual Meeting, Las Vegas, NV “PBM: Using Evidence to Improve Practice”
- 4/14 Audio-conference Webinar, American Association of Blood Banks (AABB), “The Maximum Surgical Blood Order Schedule” and “Hemoglobin Transfusion Triggers and Targets”
- 5/14 Patient Blood Management Seminar, University of Maryland, Baltimore, “Patient Blood Management: Using Evidence to Improve Practice”
- 5/14 Blood Management Clinical Community Lecture, Johns Hopkins Health System (Howard County General Hospital), Columbia, MD, “Evidence Based Transfusion Practice and Patient Blood Management Programs”
- 6/14 Greater New York Hospital Association, New York, “Using data for evidence-based practice improvement in patient blood management”
- 9/14 Visiting Professor, University of Miami, Miami, FL, “Evidence Based Transfusion Practice and Patient Blood Management Programs”
- 9/14 European Association of Cardiothoracic Anaesthesiologists (EACTA) and 14th International Congress on Cardiovascular Anesthesia (ICCVA), Florence, Italy, “Blood Transfusion and Clinical Outcomes”
- 10/14 American Society of Extracorporeal Perfusion (AMSECT) Meeting
Baltimore, Maryland, “Evidence-based Transfusion Practice and Patient Blood Management Programs”, and “Collection, Analysis, and Presentation of Blood Utilization Data to Improve Practice and Reduce Costs”
- 10/14 Visiting Professor, Tokyo, Japan, “Evidence Based Transfusion Practice and Patient Blood Management Programs”
- 10/14 American Society of Anesthesiologists, Nominated as speaker, 90-minute panel, New Orleans, LA, “How to Build a Patient Blood Management Program”
- 10/14 American Association of Blood Banks Annual Meeting, Philadelphia, PA, “Triggers and Targets: Evidence-based Assessment of Transfusion Practice”
- 10/14 American Association of Blood Banks Annual Meeting, Philadelphia, PA, “Cost Repositioning for Transfusion Services in the Era of On-Going Reimbursement Changes”
- 10/14 Johns Hopkins Supply Chain Retreat, “Enhancing Value through Evidence-based Transfusion Practice – The JHHS Blood Management Clinical Community”
- 11/14 Visiting Professor, Cleveland Clinic Department of Anesthesiology, Cleveland, OH, “Evidence Based Transfusion Practice and Patient Blood Management Programs”
- 11/14 American Society of Anesthesiologists Surgical Home Webinar, “Evidence-based Transfusion Practice and the Perioperative Surgical Home”
- 11/14 Johns Hopkins Hospital Quality Improvement Council,
“Enhancing Value through Evidence-based Transfusion Practice”
- 11/14 Johns Hopkins Hospital Committee on Quality Improvement, Nov 26th, 2014
“Promoting Evidence-based Transfusion Practice”
- 12/14 Johns Hopkins Orthopaedic Total Joint Clinical Community
“The Johns Hopkins Health System Blood Management Clinical Community”
- 1/15 Comprehensive Unit-based Safety Program (CUSP) Webinar
“Evidence-based transfusion practice and patient blood management programs”
- 1/15 Pediatric ICU (PICU) Noon Conference Lecture
“Using Data in a Patient Blood Management Program”
- 1/15 The Johns Hopkins Hospital Clinical Directors Meeting
“Evidence-based Transfusion Practice and Data Reporting”
- 2/15 “Assessing Clinical Outcomes in a Patient Blood Management Program”
AABB/Mayo Clinic Transfuse Annual Meeting, Phoenix, Arizona
- 2/15 Grand Rounds – Dept. of Internal Medicine, Suburban Hospital, Bethesda, Maryland
“Evidence-based Transfusion Practice and Patient Blood Management”
- 2/15 Problem-based Learning Discussion, Anesthesiology/Critical Care Medicine – Johns Hopkins
“Urgent/Emergent Crico-thyroidotomy to Secure the Airway”
- 3/15 Strategic Healthcare Webinar
“Promoting Evidence-based Transfusion Practice”
- 3/15 The Armstrong Patient Safety and Quality Institute Board of Directors Meeting

- “Promoting Evidence-based transfusion Practice: The Johns Hopkins Health System Blood Management Clinical Community”
- 3/15 The Johns Hopkins Hospital Patient Safety Quality Improvement Committee Board Meeting
“Promoting Evidence-based transfusion Practice: The Johns Hopkins Health System Blood Management Clinical Community”
- 3/15 Strategic Healthcare Group – educational webinar
“Evidence-based Transfusion Practice and Patient Blood Management”
- 3/31/15 Nesbitt OB/GYN Society - State University of New York (SUNY) Health System
“Patient Blood Management and Postpartum Hemorrhage”
- 4/1/15 State University of New York (SUNY) Health System (Crouse Medical Center), Syracuse, NY
“Evidence-based Transfusion Practice and Patient Blood Management”
- 4/7/15 Suburban Hospital, Washington, D.C. – Johns Hopkins Health System
The Cost per Case (CPC) Committee Meeting
“Enhancing Value Through Evidence-based Transfusion Practice”
- 4/7/15 Quality Improvement Committee – All Staff – Johns Hopkins Hospital
“Promoting Evidence-based Transfusion Practice: The Johns Hopkins Health System Blood Management Clinical Community”
- 4/20/15 Johns Hopkins Health System Hospitalists Clinical Community
“The Johns Hopkins Health System Clinical Community”
- 4/22/15 Blood Management Symposium – Renown Medical Center, Reno, Nevada
“Evidence-based Transfusion Practice and Blood Management Programs”
- 4/23/15 Blood Management Seminar – University of Maryland, Shock Trauma Inst.
“Promoting Evidence-based Transfusion Practice”
- 9/10/15 “Patient Blood Management: An Overview”
Chinese Society of Anesthesiologists, X’ian, China
- 9/15/15 “Evidence-based Transfusion Practice and Patient Blood Management”
New York University (NYU) Medical Center, NY, NY
- 9/30/15 “Evidence-based Transfusion Practice and Patient Blood Management”
Allegheny General Hospital, Pittsburgh, PA
- 10/02/15 “Implementing a Johns Hopkins Health System Blood Management Program to Promote Evidence-based Transfusion Practice and Reduce Unnecessary Transfusions”
Armstrong Institute Patient Safety Summit, Johns Hopkins Medical Institutions
- 10/15/15 “Morbidity and Mortality after Massive Transfusion”
Johns Hopkins Transfusion Medicine Conference
- 10/22/15 “Evidence-based Transfusion Practice and Patient Blood Management”
Orientation lecture for Johns Hopkins Physicians’ Assistants residents
- 10/24/15 “Meaningful Outcome Measures in PBM”
American Assn. of Blood Banks Annual Meeting, Anaheim, CA
- 10/26/15 “Patient Blood Management and the Transfusion Service”
American Assn. of Blood Banks Annual Meeting, Anaheim, CA
- 10/26/15 “Promoting Evidence-based Transfusion Practice: PBM and the Transfusion Committee”
American Assn. of Blood Banks Annual Meeting, Anaheim, CA
- 10/25/15 “The Maximum Surgical Blood Order Schedule: How to Curtail Behavior”
American Society of Anesthesiologists Annual Meeting, San Diego, CA
- 11/3/15 “Evidence-based Transfusion Practice and Patient Blood Management”
Case Western Reserve University Hospital, Cleveland, OH
- 11/4/15 “Evidence-based Transfusion Practice”
Noon conference – Johns Hopkins Hospitalists
- 11/6/15 “Evidence-based Transfusion Practice and Patient Blood Management Programs”
Englewood Hospital and Medical Center Blood Management Symposium
- 12/10/15 “Data Collection, Dashboards, and Reports to Support PBM”
Howard County General Hospital – Blood Management Committee
- 3/9/16 “Blood Management Clinical Community: Progress Report and Update”
The Johns Hopkins Quarterly Quality Improvement Results Meeting
- 3/7/16 “The Johns Hopkins Health System Clinical Community”

- 3/16/16 Mid-Atlantic Hub Group Purchasing Organization
 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Department of Anesthesiology
 Boston Children’s Hospital, Harvard Medical School
- 3/16/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Department of Pathology (Transfusion Medicine)
 Brigham and Women’s Hospital, Harvard Medical School
- 3/17/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Department of Anesthesiology
 Massachusetts General Hospital, Harvard Medical School
- 3/31/16 “Evidence-based Transfusion Practice and Blood Utilization Initiatives”
 Combined Multidisciplinary Grand Rounds
 Johns Hopkins Depts. of Surgery/Anesthesiology/Critical Care Medicine/Nursing
- 5/3/16 Webinar – Broadcast worldwide
 “Bloodless Medicine and Surgery – Top 10 Things to Consider”
- 5/4/16 “Evidence-based Transfusion Practice and Blood Utilization Initiatives”
 Combined Multidisciplinary Grand Rounds
 Fairfax INOVA, Virginia, Depts. of Surgery/Anesthesiology/Nursing
- 5/24/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Department of Anesthesiology
 University of Texas, Southwestern, Dallas, Texas
- 5/12/16 “Evidence-based Transfusion Practice and Blood Utilization Initiatives”
 Suburban Hospital, Bethesda, Maryland
- 5/17/16 “Transfusion-related Topics”
 Neuroanesthesia Conference – Johns Hopkins Hospital
- 8/8/16 “Transfusion-related Topics”
 Critical Care Conference – Johns Hopkins Hospital
- 9/2016 “Interactive Dashboards to Asses Transfusion Guideline Compliance Across a Multi-institutional
 Healthcare System” Epic Usergroup Conference, Verona, WI
- 8/24/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Jefferson Medical College, Philadelphia, PA
- 9/2016 “Evidence-based Transfusion Practice and Patient Blood Management”
 National Institutes of Health, Symposium on Transfusion Practices, Bethesda, MD
- 9/27/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Advanced Practice Providers Conference, Johns Hopkins Health System
- 9/28/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Delegation from China at Johns Hopkins Hospital
- 9/28/16 “Evidence-based Perioperative Blood Management”
 Society for Advancement of Blood Management, Grand Rapids, MI
- 10/5/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Prince George’s Hospital, Washington DC
- 10/6/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Council of Teaching Hospitals and Health Systems, Baltimore, MD
- 10/18/16 “Blood Management Update”
 Quality Improvement Council, Johns Hopkins Hospital
- 10/16 “Patient Blood Management and Clinically Relevant Outcomes”
 AABB Webinar
- 11/10/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Northwestern University, Chicago, IL
- 11/16/16 “Perioperative Blood Wastage”
 AABB Webinar
- 11/27/16 “Evidence-based Transfusion Practice and Patient Blood Management”
 Visiting Professor, Northwestern University, Chicago, IL
- 11/29/16 “Update of Blood Management at Johns Hopkins”
 Medical ICU Staff, Johns Hopkins Hospital

- 12/2/16 “Update of Blood Management at Johns Hopkins”
Surgery Quality Forum, Johns Hopkins Hospital
- 12/12/16 “Evidence-based Transfusion Practice and Patient Blood Management”
Visiting Professor, Quality Improvement Meeting, Hangzhou, China
- 12/13/16 “Evidence-based Transfusion Practice and Patient Blood Management”
Visiting Professor, Peking Union Medical College, Beijing, China
- 12/21/16 “Evidence-based Transfusion Practice and Patient Blood Management”
Plastic Surgery Grand Rounds, Johns Hopkins Hospital
- 2/8/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Dept. Surgery grand Rounds, Massachusetts General Hospital, Boston, MA
- 4/7/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Dept. of Internal Medicine, Johns Hopkins Hospital
- 4/27/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Kansas University Medical Center Symposium, Kansas City, Missouri
- 4/27/17 “Perioperative Thermoregulation”
Kansas University Medical Center Symposium, Kansas City, Missouri
- 4/27/17 “Bloodless Medicine and Surgery”
Kansas University Medical Center Symposium, Kansas City, Missouri
- 5/2/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Mercy Medical Center Internal Medicine Grand Rounds, Baltimore, MD
- 5/11/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Tumulty Lecture Series, Johns Hopkins Hospital
- 5/13/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Roanoke Medical Center, Roanoke, VA
- 5/25/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Cookville Medical Center, Cookville, TN
- 6/17 “Perioperative Blood Transfusions: Is Bloodless Surgery an Oxymoron?”
Biennial Conference, Johns Hopkins Hospital
- 5/29/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Haemonetics Advisory Board, Braintree, MA
- 6/5/17 “Data Collection and Analysis for Patient Blood Management”
AABB – Joint Commission Webinar of PBM certification
- 7/20/17 “Transfusion Practices”
CA! Anesthesia resident lecture, Johns Hopkins Hospital
- 8/7/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Surgical ICU Conference, Johns Hopkins Hospital
- 8/17/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Martin Health System, Stuart, Florida
- 9/17 “Ethical and Legal Issues with Bloodless Medicine”
Society for Advancement of Blood Management Annual Meeting (Portland, OR)
- 9/17 “Top Articles of the Year in Patient Blood Management”
Society for Advancement of Blood Management Annual Meeting (Portland, OR)
- 9/18/17 “Update of Blood Management and Evidence-based Transfusion Practice”
Pathology Grand Rounds, Johns Hopkins Hospital
- 9/23/17 “Overview of Bloodless Medicine and Surgery at Johns Hopkins Hospital”
Seminar, Sibley Memorial Hospital, Washington, DC
- 10/8/17 “Decision Support of Annoying Popup Alerts?”
AABB Annual Meeting, San Diego, CA
- 10/26/17 “Evidence-based Transfusion Practice and Patient Blood Management”
Mayo Clinic Transplant Surgery Grand Rounds, Scottsdale, AZ
- 10/14/17 “Implementing a Health-system Wide, Evidence-based, Data driven Patient Blood Management
Program”, American Society of Anesthesiology Annual Meeting, Boston, MA
- 10/16/17 “Evidence-based Perioperative Blood Management”
American Society of Anesthesiology Annual Meeting, Boston, MA

- 10/16/17 “Patient Blood Management and Evidence-based Transfusion Practice”
Keynote Speaker, American Society of Anesthesiology Annual Meeting, Boston, MA
Outcomes Research Symposium
- 10/30/17 Case Conference: “Liver Transplant”, Johns Hopkins Anesthesiology
- 11/6/17 “Patient Blood Management and Evidence-based Transfusion Practice”
Anesthesia Grand Rounds, Georgia Medical College, Augusta, GA
- 12/4/17 “Patient Blood Management and Evidence-based Transfusion Practice”
Vizient Webinar
- 1/25/18 “Optimizing Outcomes in Patients Requiring Massive Transfusion”
AABB Exhibition in the Middle East, Abu Dhabi, UAE
- 1/25/18 “Evidence-based Transfusion Practice and Patient Blood Management Programs”
AABB Exhibition in the Middle East, Abu Dhabi, UAE
- 2/5/18 “Implementing Patient Blood Management at Johns Hopkins: Budget and Resources”
Rutgers University Hospital (Robert Wood Johnson), New Brunswick, NJ
- 3/1/18 “Enhancing Quality and safety with a Blood Management Program”
Discovery Grand Rounds, Dept, Anesthesiology, Johns Hopkins Hospital
- 3/21/18 “Evidence-based Transfusion Practice and Patient Blood Management Programs”
University of Toronto Transfusion Medicine Grand Rounds, Toronto, CA
- 3/29/18 “Choosing Wisely and Patient Blood Management”
Multidisciplinary Grand Rounds, Johns Hopkins Hospital, Surgery, Anesthesiology, Nursing
- 4/28/18 “Bloodless Medicine and Surgery: Top 10 Things to Consider”
Missouri State Society of Anesthesiologists, St Louis, MO
- 5/17/18 “Patient Blood Management and Evidence-based Transfusion Practice”
Blood Management Seminar, El Camino Hospital, Redwood City, CA
- 6/11/18 “Anemia and Transfusion in Cardiac Patients” 11th International Conference of Cardiac Care.
Tel Aviv, Israel,
- 8/3/18 “Enhancing Value with Patient Blood Management” High Value Practice Academic Alliance.
National Webinar
- 9/14/18 “Keeping the Blood in the Patient and other Proven PBM Methods”,
Society for Advancement of Blood Management. Brooklyn, New York
- 9/14/18 “Moving on Up: Converting Data Metrics into Achievable Action”
Society for Advancement of Blood Management. Brooklyn, New York
- 9/14/18 “Top 10 PBM Papers of the Year”
Society for Advancement of Blood Management. Brooklyn, New York
- 9/21/18 “Ordering Wisely: Transfusions and Patient Blood Management”
High Value Practice Academic Alliance., Baltimore, Maryland
- 9/22/18 “Enhancing Value with Patient Blood Management” High Value Practice Academic Alliance.
Baltimore, Maryland
- 10/22/18 “Blood Sparing Methods in Cardiac Surgery” American Society of Anesthesiologists Refresher
Course Lecture. San Francisco, California.

OTHER PROFESSIONAL ACCOMPLISHMENTS

None which are not included above