# CURRICULUM VITAE FOR ACADEMIC PROMOTION

The Johns Hopkins University School of Medicine

Signature		<u>March 12, 2014</u>	
	Thomas Aversano, M.D.	Date of this Version	

#### DEMOGRAPHIC AND PERSONAL INFORMATION

# **Current Appointments**

Associate Professor of Medicine, Johns Hopkins University Associate Chief of Cardiology, Johns Hopkins Cardiology at GBMC Director, Atlantic Cardiovascular Patient Outcomes Research Team (C-PORT)

#### Personal Data

Thomas Aversano, M.D. Johns Hopkins Cardiology at GBMC Greater Baltimore Medical Center 6701 N. Charles Street, Suite 5104 Towson, Maryland 21204

Education and Training (in chronological order):

Dates	Institutions	Degree Program
1969-1973	University of Rochester	B.S./B.A. Biology/Philosophy
1974-1978	University of Oklahoma	M.D.
1978-1981	S.U.N.Y. at Buffalo	Residency Internal Medicine
1981-1982	S.U.N.Y. at Buffalo	Research Fellow in Cardiology
1982-1985	Johns Hopkins University	Cardiology Fellowship

Professional Experience (in chronological order, earliest first)

Dates	Positions	Institutions
1985-1993	Assistant Professor of Medicine	Johns Hopkins University
1993-present	Associate Professor of Medicine	Johns Hopkins University
1994-present	Director, Atlantic C-PORT Projects	Johns Hopkins University
2008-present	Associate Chief of Cardiology at GBMC	Johns Hopkins University

#### RESEARCH ACTIVITIES

**Publications: Peer-reviewed Original Science Research** 

- 1. <u>AVERSANO</u>, T. "Prolapsing Mitral Leaflet Syndrome", *Journal of the Oklahoma State Medical Association*, 1978, vol. 71, no. 11, pp. 418-424.
- 2. <u>AVERSANO</u>, T., KLOCKE, F., MATES, R. & CANTY, J. "Preload-Induced Alterations in Capacitance-Free Diastolic Pressure-Flow Relationships", *American Journal of Physiology*, 1984, vol. 246, no. 3, pp. H410-H417.
- 3. <u>AVERSANO</u>, T. & BECKER, L. "Persistence of Coronary Vasodilator Reserve Despite Functionally Significant Flow Reduction", *American Journal of Physiology*, 1985, vol. 248, no. 3, pp. H403-H411.
- 4. <u>AVERSANO</u>, T., MAUGHAN, W., HUNTER, W., KASS, D. & BECKER, L. "End-Systolic Measures of Regional Ventricular Performance", *Circulation*, 1986, vol. 73, no. 5, pp. 938-950.
- 5. BECKER, L., LEVINE, J., DIPAULA, A., GUARNIERI, T. & <u>AVERSANO</u>, T. "Reversal of Dysfunction in Postischemic Stunned Myocardium by Epinephrine and Postextrasystolic Potentiation", *Journal of the American College of Cardiology*, 1986, vol. 7, no. 3, pp. 580-589.
- STAHL, L., <u>AVERSANO</u>, T. & BECKER, L. "Selective Enhancement of Function of Stunned Myocardium by Increased Flow", *Circulation*, 1986, vol. 74, no. 4, pp. 843-851.
- 7. STAHL, L., <u>AVERSANO</u>, T., AMBROSIO, G. & BECKER, L. "Effect of Repeated Episodes of Drug-Induced Ventricular Dyskinesia on Subsequent Regional Function in the Dog - Comparison with

- Myocardial Stunning Produced by Repeated Coronary Occlusions", *Journal of the American College of Cardiology*, 1987, vol. 9, no. 6, pp. 1339-1347.
- 8. MIDEI, M., <u>AVERSANO</u>, T., WALFORD, G., GOTTLIEB, S. & BRINKER, J. "Influence of Balloon Material Properties on the Performance of Coronary Angioplasty", *Catheterization and cardiovascular diagnosis*, 1987, vol. 13, no. 5, pp. 352-352.
- MIDEI, M., BRENNAN, M., WALFORD, G., <u>AVERSANO</u>, T., GOTTLIEB, S. & BRINKER, J. "Double Vs Single Balloon Technique for Aortic Balloon Valvuloplasty", *Chest*, 1988, vol. 94, no. 2, pp. 245-250.
- 10. <u>AVERSANO</u>, T., MAUGHAN, W., SUNAGAWA, K. & BECKER, L. "Effect of Afterload Resistance on End-Systolic Pressure-Thickness Relationship", *American Journal of Physiology*, 1988, vol. 254, no. 4, pp. H658-H663.
- 11. JEREMY, R., STAHL, L., GILLINOV, M., LITT, M., <u>AVERSANO</u>, T. & BECKER, L. "Preservation of Coronary Flow Reserve in Stunned Myocardium", *American Journal of Physiology*, 1989, vol. 256, no. 5, pp. H1303-H1310.
- 12. WALFORD, G., MIDEI, M., <u>AVERSANO</u>, T., GOTTLIEB, S., CHEW, P. & BRINKER, J. "Coronary-Artery Aneurysm Formation Following Percutaneous Transluminal Coronary Angioplasty Treatment of Associated Restenosis with Repeat Percutaneous Transluminal Coronary Angioplasty", *Catheterization and cardiovascular diagnosis*, 1990, vol. 20, no. 2, pp. 77-83.
- 13. <u>AVERSANO</u>, T. & MARINO, P. "Effect of Ischemic Zone Size on Nonischemic Zone Function", *American Journal of Physiology*, 1990, vol. 258, no. 6, pp. H1786-H1795.
- 14. DROSSNER, M. & <u>AVERSANO</u>, T. "Effect of Perfusate Rheology on the Diastolic Coronary Pressure-Flow Relationship", *American Journal of Physiology*, 1990, vol. 259, no. 2, pp. H603-H609.
- 15. <u>AVERSANO</u>, T. & MARINO, P. "End-Systolic Pressure-Thickness Relationship in the Ischemic Canine Ventricle", *Coronary artery disease*, 1990, vol. 1, no. 3, pp. 355-362.
- 16. <u>AVERSANO</u>, T., OUYANG, P. & SILVERMAN, H. "Blockade of the ATP-Sensitive Potassium Channel Modulates Reactive Hyperemia in the Canine Coronary Circulation", *Circulation research*, 1991, vol. 69, no. 3, pp. 618-622.
- 17. RESAR, J., TREROTOLA, S., OSTERMAN, F., <u>AVERSANO</u>, T. & BRINKER, J. "Ultrasound Guided Ablation of Pseudoaneurysm Following Coronary-Artery Stent Placement a Preliminary-Report", *Catheterization and cardiovascular diagnosis*, 1992, vol. 26, no. 3, pp. 215-218.
- 18. Raul R, Geckle WJ, <u>AVERSANO T</u>, Walford GD. "Visualization and numerical modeling of disturbed flows observed in cineangiogrphy. *Computes in Cardiology 1992*. Proceedings, 323-326
- 19. <u>AVERSANO</u>, T., OUYANG, P., SILVERMAN, H., ZIEGELSTEIN, R. & GIPS, S. "Effect of Blockade of the Atp-Sensitive Potassium Channel on Metabolic Coronary Vasodilation in the Dog", *Pharmacology*, 1993, vol. 47, no. 6, pp. 360-368.
- 20. GECKLE, W., RAUL, R. & <u>AVERSANO</u>, T. "Effects of Simulated Pulsatile Background Flow on Parametric Visualization in Cineangiography", *Computers in Cardiology 1993, Proceedings*, 1993, pp. 369-372.
- AVERSANO, T., WALFORD, G., MIDEI, M., CHEW, P., GOTTLIEB, S., DROSSNER, M., WEISMAN, H., WEISS, J. & BRINKER, J. "Regional Intracoronary Analgesia during Percutaneous Transluminal Coronary Angioplasty", *Pain*, 1993, vol. 52, no. 1, pp. 93-99.
- 22. FITZGERALD, S., MERRILL, A., <u>AVERSANO</u>, T. & SORKIN, A. "Direct and Indirect Cost of Percutaneous Transluminal Coronary Angioplasty", *Cardiology*, 1994, vol. 85, no. 5, pp. 298-302.
- AVERSANO, T., RUDIKOFF, B., WASHINGTON, A., TRAILL, S., COOMBS, V. & RAQUENO, J. "High-Frequency Qrs Electrocardiography in the Detection of Reperfusion Following Thrombolytic Therapy", Clinical cardiology, 1994, vol. 17, no. 4, pp. 175-182.
- 24. ZIEGELSTEIN, R., CHENG, L., <u>AVERSANO</u>, T., OUYANG, P., LAKATTA, E. & SILVERMAN, H. "Increase in Rat Aortic Endothelial Free Calcium-Mediated by Metabolically Sensitive Calcium-Release from Endoplasmic-Reticulum", *Cardiovascular research*, 1994, vol. 28, no. 9, pp. 1433-1439.
- 25. CALIFF, R., SHADOFF, N., VALETT, N., BATES, E., GALEANA, A., KNOPF, W., SHAFTEL, J., BENDER, M., <u>AVERSANO</u>, T., RAQUENO, J., GURBEL, P., COWFER, J., COHEN, M., CROSS, P., BITTL, J., EDDINGS, K., TAYLOR, M., DEROSA, K., HATTEL, L., COOPER, L., ESHELMAN, B., FINTEL, D., NIEMYSKI, P., KLEIN, L., KENNEDY, H., THORNTON, T., KEREIAKES, D., MARTIN, L., ANDERSON, L., HIGBY, N., ELLIS, S., BREZINA, K., GEORGE, B., CHAPEKIS, A., SMITH, D., ANWAR, A., GERBER, T., PRITCHARD, G., MYLER, R., SHAW, R., MURPHY, M., WARD, K., MADIGAN, N., BLANKENSHIP, J., HALBERT, M., FLANAGAN, C., TANNENBAUM, M., POLICH, M., STEVENSON, C., TCHENG, J., HOFFMAN, S., MOORE, R., SMITH, J., HENRY, P., MCDONOUGH, T., WESZT, S., BRODIE, B., MUNCY, D., KLEIMAN, N., TRAINOR, K., ROSE, D., JOHNSON, S., WILLERSON, J., FERGUSON, J., HARLAN, M., BASS, T., ROHMAN, G., BROWNE, K., CIESLA, C., WORLEY, S., TUZI, J., HETTLEMAN, B., BURKE, W., OLSEN, G., KENNEDY, S., TALLEY, J., YUSSMAN, Z., RAWERT, M., GRASSMAN, E., WRONA, L., SAMAHA, J., EHEMANN, B., BLEICH, S., LEONHARD, R., CUMMINS, F., NONNWEILER, J., SANZ, M., MAYER, D., CLEMAN, M., PASCALE, V., MCCONNELL, S., DELCORE, M., STENGEL, L., IVANHOE, R., GRANGER, N., ROSENBERG, M., SCHAECHTER, A., AYCOCK, G., WILCOX, T., GOTTLIEB, R., HUNTER, H., UNTERECKER, W.,

HART, B., HEUSER, R., HOOPMANN, S., HANOVICH, G., ANTOLICK, A., GACIOCH, G., CHIODO, V., KARSKI, K., TIMMIS, G., SAFIAN, M., AGUIRRE, F., STONNER, T., TAYLOR, G., WOMACK, K., RUYLE, B., KRAUTHAMER, D., WELCOM, G., WESTON, M., DILLON, K., FRENCH, W., REYNOLDS, G., NAVETTA, F., MURPHY, G., LEBOEUF, R., SPENCER, S., POPMA, J., SWEET, L., TOPOL, E., SMITH, C., WEISMAN, H., LEE, K., MILLER, J., SIGMON, K., TCHENG, J., LEE, K., LUI, M., KOSLOFF, A., DIFULVIO, J., WANG, A., ANDERSON, K., WEISMAN, H., DANN, R., KINGMA, W., NORTON, D., MYER, B., MASEK, R., LEWANDOWSKI, M., BRODERICK, S., MUSCO, M., SCHORR, M., HARTMAN, P., MCCARDLE, L., FAXON, D., ARMSTRONG, P., GORE, J., LOSCALZO, J., MCCULLOUGH, L., VERTER, J., MARK, D., DAVIDSONRAY, L., CLAPPCHANNING, N., LAM, L., WAUGH, R., MCCANTS, C., HINDMAN, M., DEHMER, G., HILLEGASS, W., FRID, D., FORTIN, D., BROTT, B., FOREST, T., UNKS, D., HAMER, M., WAGNER, G., GATES, K. & SANE, D. "Use of a Monoclonal-Antibody Directed Against the Platelet Glycoprotein lib/iiia Receptor in High-Risk Coronary Angioplasty", New England Journal of Medicine, 1994, vol. 330, no. 14, pp. 956-961.

- XUE, Q., REDDY, B. & <u>AVERSANO</u>, T. "Analysis of high-frequency signal-averaged ECG measurements", *Journal of electrocardiology*, 1995, vol. 28, pp. 239-245.
- AVERSANO, T., ZHOU, W., NEDELMAN, M., NAKADA, M. & WEISMAN, H. "A Chimeric Igg4 Monoclonal-Antibody Directed Against Cd18 Reduces Infarct Size in a Primate Model of Myocardial-Ischemia and Reperfusion", *Journal of the American College of Cardiology*, 1995, vol. 25, no. 3, pp. 781-788.
- 28. HALLE, A., DISCIASCIO, G., MASSIN, E., WILSON, R., JOHNSON, M., SULLIVAN, H., BOURGE, R., KLEIMAN, N., MILLER, L., <u>AVERSANO</u>, T., WRAY, R., HUNT, S., WESTON, M., DAVIES, R., RINCON, G., CRANDALL, C., COWLEY, M., KUBO, S., FISHER, S. & VETROVEC, G. "Coronary Angioplasty, Atherectomy and Bypass-Surgery in Cardiac Transplant Recipients", *Journal of the American College of Cardiology*, 1995, vol. 26, no. 1, pp. 120-128.
- 29. ARAI, M., LEFER, D., SO, T., DIPAULA, A., <u>AVERSANO</u>, T. & BECKER, L. "An anti-CD18 antibody limits infarct size and preserves left ventricular function in dogs with ischemia and 48-hour reperfusion", *Journal of the American College of Cardiology*, 1996, vol. 27, no. 5, pp. 1278-1285.
- 30. MARK, D., TALLEY, J., TOPOL, E., BOWMAN, L., LAM, L., ANDERSON, K., JOLLIS, J., CLEMAN, M., LEE, K., <u>AVERSANO</u>, T., UNTEREKER, W., DAVIDSONRAY, L. & CALIFF, R. "Economic assessment of platelet glycoprotein IIb/IIIa inhibition for prevention of ischemic complications of high-risk coronary angioplasty", *Circulation*, 1996, vol. 94, no. 4, pp. 629-635.
- 31. KRAL, B., BECKER, L., BLUMENTHAL, R., <u>AVERSANO</u>, T., FLEISHER, L., YOOK, R. & BECKER, D. "Exaggerated reactivity to mental stress is associated with exercise-induced myocardial ischemia in an asymptomatic high-risk population", *Circulation*, 1997, vol. 96, no. 12, pp. 4246-4253.
- 32. TOPOL, E., CALIFF, R., LINCOFF, A., TCHENG, J., CABOT, C., WEISMAN, H., KEREIAKES, D., LAUSTEN, D., RUNYON, J., HOWARD, W., KELLY, T., MUNCY, D., TIMMIS, G., SAFIAN, M., DAVEY, D., KLEIMAN, N., ROSE, D., BASINGER, L., ROUSE, C., KRAMER, J., WILSON, R., TALLEY, J., BOYLES, M., NAVETTA, F., LEBUEUF, R., KRAFT, P., DVORAK, L., SMIGLA, R., FERGUSON, J. HARLAN, M., BROWNE, K., TELATNIK, M., BLANKENSHIP, J., DEMKO, L., IVANHOE, R., JACKSON, C., SHADOFF, N., GOEBEL, S., TAYLOR, M., CLEARY, E., GACIOCH, G., CHIODO, V., BATES, E., QUAIN, L., SNYDER, H., BASS, T., ROHMAN, C., GRADMAN, A., BOLTEY, L., TANNENBAUM, M., STENGL, D., GORDON, P., WRIGHT, N., CUMMINS, F., NONNWEILER, J., AVERSANO, T., PELTZER, L., BEAR, P., CRAIG, M., HATTEL, L., TOOKE, G., ANDERSON, H., WEIGELT, L., HETTLEMAN, B., KENNEDY, S., TEIRSTEIN, P., CLAIRE, D., SAREMBOCK, I., SAYRE, S., DAVIDSON, C., SCHAECHTER, A., AGUIRRE, F., STONNER, T., AZRIN, M., BODETT, J., BARRY, M., WORLEY, S., FREY, L., SPRIGGS, D., WAHL, S., WESTON, M., YEDINAK, K., GEORGE, B., SMITH, D., GILLILAND, C., SMITH, D., RICCI, D., FOX, R., HARTMAN, C., LUNOW, S., FARAH, T., PETRUOLO, S., SANDER, G., STEVENS, A., DELISE, K., REEN, B., WHISNANT, D., HENDERSON, L., HEUSER, R., SWIDERSKI, K., KALUZNIAK, M., LARKIN, T., JACKSON, B., POPMA, J., PRUNKA, N., SANZ, M., MAYER, D., MACKEY, K., BURTON, J., HOGG, N., BROWN, R., STEVENS, K., FRENCH, W., WANG, S., ADELMAN, A., FOULGER, V., WEBER, S., GOTTLIEB, R., LAVOIE, J., KING, S., FRERICHS, F., HOLLYWOOD, L., DUCAS, J., SCHICK, U., HOCHMAN, J., SLATER, J., TORMEY, D., ONEILL, B., FOSHAY, K., FITZGERALD, N., CHEUNG, P., BEDARD, D., KNUDTSON, M., GALBRAITH, D., WATT, H., SAMAHA, J., HAMILTON, B., KLEIN, L., HEBSON, L., ALMOND, D., WHITE, J., ROSENBERG, M., TEULLY, S., UNKS, M., RODGERS, K., FAXON, D., GORE, J., KELSEY, S., LEE, K., SANE, D., WALTERS, L., BOOTH, J., CANNATA, R., CASTLE, V., COHEN, H., DELUCA, S., KUTNER, M., KNUTH, T., MCCOLLOUGH, T., MCPHERSON, J., MELTON, J., MILLER, D., PULLIAM, M., SAPP, S., SIGMON, K., MONTAGUE, E., ALEXANDER, K., AUGOSTINI, R., BAJZER, C., BART, B., BELLI, G., CARLSON, J., CHALLAPALLI, R., CRENSHAW, B., DAWSON, I., DICKEY, A., ECHOLS, A., ERICKSON, B., FONTANA, M., GHAFFARI, S., GORDON, C., GRANGER, C., GRANO, G., GRIMM, R., JOHNSON, T., JURAN, N., KINGSLEY, A., KRUSE, K., LAUER, M., MAHAFFEY, K., MALONE, K., MARK, D., MARWICK, T., MIGRINO, R., MILLER, J., NEWBY, K., PACE, C., PETERSON, E., RABBANI, R., RAGAN, J., RIMMERMAN, C., RODKEY, S., SAVOR, V., SHAW, W., SILA, C., SILVER, M., TAN, W., TOBIASZ, D., VANDERVOORT, P., WANG, C., WARD, C., WATERS, J., WIEHLE, D., WINCHELL, M., UNDERWOOD, D., CLEMONS, P., HEUPLER, S., POWERS, J., RUBIN, D., SGARBOSSA, E., STEINHUBL, S., MOLITERNO, D., DEBOWEY, D.,

- BALAZS, E., CROWE, T., IVANC, T., OLS, L., POLISZCZUK, R., VILSACK, H., WITHERSPOON, B., DAVIDSONRAY, L., ANDERSON, K., GIEL, K., MUSCO, M. & STONER, G. "Platelet glycoprotein IIb/IIIa receptor blockade and low-dose heparin during percutaneous coronary revascularization", *New England Journal of Medicine*, 1997, vol. 336, no. 24, pp. 1689-1696.
- 33. LANDESBURG, G., ZHOU, W. & <u>AVERSANO</u>, T. "Tachycardia-induced subendocardial necrosis in acutely instrumented dogs with fixed coronary stenosis", *Anesthesia and Analgesia*, 1999, vol. 88, no. 5, pp. 973-979.
- 34. <u>AVERSANO</u>, T., AVERSANO, L., PASSAMANI, E., KNATTERUD, G., TERRIN, M., WILLIAMS, D., FORMAN, S. & Atlant Cardiovascular Patient Outcomes "Thrombolytic therapy vs primary percutaneous coronary intervention for myocardial infarction in patients presenting to hospitals without on-site cardiac surgery A randomized controlled trial", *Jama-Journal of the American Medical Association*, 2002, vol. 287, no. 15, pp. 1943-1951.
- 35. BLUMENTHAL, R., BECKER, D., YANEK, L., <u>AVERSANO, T.</u>, MOY, T., KRAL, B. & BECKER, L. "Detecting occult coronary disease in a high-risk asymptomatic population", *Circulation*, 2003, vol. 107, no. 5, pp. 702-707.
- 36. KENT, D., RUTHAZER, R., BESHANSKY, J., GRIFFITH, J., GRINES, C., <u>AVERSANO, T.</u>, ZALENSKI, R. & SELKER, H. "A predictive instrument for reperfusion therapy for acute myocardial infarction.", *Journal of General Internal Medicine*, 2003, vol. 18, pp. 225-225.
- 37. WATKINS, S., TIRABASSI, L. & <u>AVERSANO, T</u>. "Improving systems of care in primary angioplasty", *Cardiology clinics*, 2006, vol. 24, no. 1, pp. 79-+.
- 38. KING, SPENCER B.,, III, <u>AVERSANO, T.</u>, BALLARD, W.L., BEEKMAN, ROBERT H.,, III, COWLEY, M.J., ELLIS, S.G., FAXON, D.P., HANNAN, E.L., HIRSHFELD, J.W., JR., JACOBS, A.K., KELLETT, M.A., JR., KIMMEL, S.E., LANDZBERG, J.S., MCKEEVER, L.S., MOSCUCCI, M., POMERANTZ, R.M., SMITH, K.M. & VETROVEC, G.W. "ACCF/AHA/SCAI 2007 update of the clinical competence statement on cardiac interventional procedures", *Journal of the American College of Cardiology*, 2007, vol. 50, no. 1, pp. 82-108.
- 39. KING, SPENCER B.,, II, <u>AVERSANO</u>, T., BALLARD, W.L., BEEKMAN, ROBERT H.,, II, COWLEY, M.J., ELLIS, S.G., FAXON, D.P., HANNAN, E.L., HIRSHFELD, J.W., JR., JACOBS, A.K., KELLETT, M.A., JR., KIMMEL, S.E., LANDZBERG, J.S., MCKEEVER, L.S., MOSCUCCI, M., POMERANTZ, R.M., SMITH, K.M. & VETROVEC, G.W. "ACCF/AHA/SCAI 2007 update of the clinical competence statement on cardiac interventional procedures A report of the American College of Cardiology Foundation/American Heart Association/American College of Physicians Task Force on Clinical Competence and Training (Writing Committee to Update the 1998 Clinical Competence Statement on Recommendations for the Assessment and Maintenance of Proficiency in Coronary Interventional Procedures)", *Circulation*, 2007, vol. 116, no. 1, pp. 98-124.
- KENT, D.M., RUTHAZER, R., GRIFFITH, J.L., BESHANSKY, J.R., GRINES, C.L., <u>AVERSANO</u>, T., CONCANNON, T.W., ZALENSKI, R.J. & SELKER, H.P. "Comparison of mortality benefit of immediate thrombolytic therapy versus delayed primary angioplasty for acute myocardial infarction", *American Journal of Cardiology*, 2007, vol. 99, no. 10, pp. 1384-1388.
- 41. ELLRODT, G., SADWIN, L.B., <u>AVERSANO</u>, T., BRODIE, B., O'BRIEN, P.K., GRAY, R., HIRATZKA, L.F. & LARSON, D. "Development of systems of care for ST-elevation myocardial infarction patients The non-percutaneous coronary intervention-capable (ST-elevation myocardial infarction referral) hospital perspective", *Circulation*, 2007, vol. 116, no. 2, pp. E49-E54.
- 42. CONCANNON, T.W., KENT, D.M., NORMAND, S., NEWHOUSE, J.P., GRIFFITH, J.L., RUTHAZER, R., BESHANSKY, J.R., WONG, J.B., <u>AVERSANO</u>, T. & SELKER, H.P. "A geospatial analysis of emergency transport and inter-hospital transfer in ST-segment elevation myocardial infarction", *American Journal of Cardiology*, 2008, vol. 101, no. 1, pp. 69-74.
- 43. KENT, D.A., RUTHAZER, R., GRIFFITH, J.L., BESHANSKY, J.R., CONCANNON, T.W., <u>AVERSANO</u>, T., GRINES, C.L., ZALENSKI, R.J. & SELKER, H.P. "A percutaneous coronary intervention-thrombolytic predictive instrument to assist choosing between immediate thrombolytic therapy versus delayed primary percutaneous coronary intervention for acute myocardial infarction", *American Journal of Cardiology*, 2008, vol. 101, no. 6, pp. 790-795.
- 44. CONCANNON, T.W., KENT, D.M., NORMAND, S., NEWHOUSE, J.P., GRIFFITH, J.L., COHEN, J., BESHANSKY, J.R., WONG, J.B., <u>AVERSANO</u>, T. & SELKER, H.P. "Comparative Effectiveness of ST-Segment-Elevation Myocardial Infarction Regionalization Strategies", *Circulation-Cardiovascular Quality and Outcomes*, 2010, vol. 3, no. 5, pp. 506-513.
- 45. SINGH, M., HOLMES, D.R., JR., DEHMER, G.J., LENNON, R.J., WHARTON, T.P., KUTCHER, M.A., <u>AVERSANO</u>, T. & RIHAL, C.S. "Percutaneous Coronary Intervention at Centers With and Without On-site Surgery A Meta-analysis", *Jama-Journal of the American Medical Association*, 2011, vol. 306, no. 22, pp. 2487-2494.
- 46. SILBER, H.A., TROST, J.C., JOHNSTON, P.V., MAUGHAN, W.L., WANG, N., KASPER, E.K., <u>AVERSANO</u>, T.R. & BUSH, D.E. "Finger photoplethysmography during the Valsalva maneuver reflects left ventricular filling pressure", *American Journal of Physiology-Heart and Circulatory Physiology*, 2012, vol. 302, no. 10, pp. H2043-H2047.

47. <u>AVERSANO</u>, T., LEMMON, C.C., LIU, L. & ATLANTIC CPORT INVESTIGATORS "Outcomes of PCI at Hospitals with or without On-Site Cardiac Surgery", *New England Journal of Medicine*, 2012, vol. 366, no. 19, pp. 1792-1802.

# NOTE: REFERENCES 38 AND 39 ARE THE SAME GUIDELINE STATEMENT PUBLISHED IN TWO DIFFERENT JOURNALS

# **Inventions, Patents, Copyrights**

1999 Sextant: A Multicenter Clinical Trials Data Management System.

#### **Extramural Funding**

#### **Current**

2002--present Title: Atlantic Cardiovascular Patient Outcomes Research Team

Identification Number: 217-2857 Sponsor: Participating Sites Total direct cost: \$ 11,282,425

Principal Investigator: Thomas Aversano

Role: Principal Investigator

Effort: 50 %

#### Previous

1987-1990 Title: Load-independent measures of regional ventricular function.

Identification Number: R23 HL-36741-01/HL Sponsor: National Heart Lung and Blood Institute

Total Direct Cost: \$107,000

Principal Investigator: Thomas Aversano Role: Principal Investigator, 50% effort

1987-1990 Title: Load-independent measures of regional ventricular function.

Identification Number: R23 HL-36741-01/HL Sponsor: National Heart Lung and Blood Institute

Total Direct Cost:

Principal Investigator: Thomas Aversano Role: Principal Investigator, 50% effort

1990-91 Title: Flusolol Trial

Identification Number: Sponsor: Alpha-Therapeutics

**Total Direct Cost:** 

Principal Investigator: Thomas Aversano Role: Principal Investigator, 10% effort

1991-1993 Title: EPIC Trial

Identification Number: Sponsor: Centocor Total Direct Cost:

Principal Investigator: Thomas Aversano Role: Principal Investigator, 5% effort

1993-1994 Title: MARCATOR Trial

Identification Number: Sponsor: Hoffman-Laroche

Total Direct Cost:

Principal Investigator: Thomas Aversano

Role: Principal Investigator, 10% effort

1993-1994 Title: RD-Heparin Trial

Identification Number:

Sponsor:

**Total Direct Cost:** 

Principal Investigator: Thomas Aversano Role: Principal Investigator, 5% effort

1996-2000 Title: SCOR in Ischemic Heart Disease

Identification Number: P50HL52315

Sponsor: National Heart Lung and Blood Institute

Total direct cost: \$ 3,288,901 Principal Investigator: Lewis Becker

Role: Co-Investigator

Effort: 5 %

1997-2003 Title: Post Menopausal Hormone Replacement Therapy

Identification Number: U01HL50840

Sponsor: National Heart Lung and Blood Institute

Total direct cost: \$ 550,000

Principal Investigator: Pamela Ouyang

Role: Co-Investigator

Effort: 5 %

1998-2002 Title: Angiographic Trial in Women

Identification Number: N01HV68170

Sponsor: National Heart Lung and Blood Institute

Total direct cost: \$ 59,492

Principal Investigator: Pamela Ouyang

Role: Co-investigator

Effort: 3%

2002-2005 Title: Informatics & Other Technology – Patient Initiated Emergency Response System

Identification Number: N01LM13542 Sponsor: National Library of Medicine

Total direct cost: \$ 1,032,248

Principal Investigator: Thomas Aversano

Role: Principal Investigator

Effort: 24 %

2004-2005 Title: Sudden Cardiac Death

Identification Number: 217-2870 Sponsor: Reynolds Foundation Total direct cost: \$ 20,906,607

Principal Investigator: Edwardo Marban

Role: Co-Investigator

Effort: 22 %

2006-2012 Title: Maryland Health Care Commission STEMI Registry

**Identification Number:** 

Sponsor: Maryland Health Care Commission

Total direct cost: \$

Principal Investigator: Thomas Aversano

Role: Principal Investigator

Effort: 5%

#### Research Program Building / Leadership

1994- present

Created and leads the Atlantic Cardiovascular Patient Outcomes Research Team (C-PORT) whose projects have involved 87 hospitals in 11 States and recruited more than 30,000 patients in randomized trials and registries. C-PORT worked with Departments of Health in 13 States to perform these studies. These projects were instrumental in changing both national heart association guidelines and State health care policy regarding performance of percutaneous coronary intervention (PCI).

2006-2010

Maryland Health Care Commission STEMI Registry – Medical Director of the State of Maryland registry for acute myocardial infarction. Developed, managed, analyzed and reported results of the registry to the Maryland Health Care Commission.

#### **EDUCATIONAL ACTIVITIES**

#### **Educational Publications**

Consensus Statements

1. KING,SPENCER B.,,II, <u>AVERSANO</u>, T., BALLARD, W.L., BEEKMAN,ROBERT H.,,II, COWLEY, M.J., ELLIS, S.G., FAXON, D.P., HANNAN, E.L., HIRSHFELD, J.W., JR., JACOBS, A.K., KELLETT, M.A., JR., KIMMEL, S.E., LANDZBERG, J.S., MCKEEVER, L.S., MOSCUCCI, M., POMERANTZ, R.M., SMITH, K.M. & VETROVEC, G.W. "ACCF/AHA/SCAI 2007 update of the clinical competence statement on cardiac interventional procedures - A report of the American College of Cardiology Foundation/American Heart Association/American College of Physicians Task Force on Clinical Competence and Training (Writing Committee to Update the 1998 Clinical Competence Statement on Recommendations for the Assessment and Maintenance of Proficiency in Coronary Interventional Procedures)", *Circulation*, 2007, vol. 116, no. 1, pp. 98-124.

#### **Invited Review Articles**

1. WATKINS, S., TIRABASSI, L. & <u>AVERSANO</u>, T. "Improving systems of care in primary angioplasty", *Cardiology Clinics*, 2006, vol. 24, no. 1, pp. 79-+.

# **Book Chapters**

- 1. <u>Aversano</u> T: Coronary blood flow in reperfused myocardium. In <u>Regulation of Coronary Blood Flow</u>, Inoue M, Hori M, Imai S, Berne RM (eds.), Springer-Verlag, Tokyo, Japan, Auguest, 1991.
- 2. <u>Aversano</u> T: Reperfusion injury in cardiac arrest and cardiopulmonary resuscitation. Paradis MA, Halperin HR and Nowak RM eds. <u>Cardiac Arrest</u>: The Science and Practice of Resuscitation Medicine. Baltimore. Williams and Wilkins Inc.: 146-159, 1996 (revised in 2006)
- 3. <u>Aversano</u> T: Management of Pericardial Metastases in Breast Cancer. Bland KL and Copeland EM. eds. <u>The Breast</u> St. Louis. Elsevier. 2004 (revised in 2008)

#### **Teaching**

Classroom instruction

1985-1988 Course Title: Pathophysiology

Role: Instructor (small group) Location: School of Medicine

Clinical instruction

1985-1992 Course Title: Clinical Skills

Role: Instructor (small group) Location: Johns Hopkins Hospital

1985-present Course Title: Cardiology Fellowship

Role: Interventional cardiologist – supervision and training of invasive and interventional

cardiology fellows

Location: Johns Hopkins Hospital and Bayview Medical Center

# Mentoring

1985-88 Lloyd Stahl, M.D. Currently interventional cardiologist. My role was research mentor in coronary

flow physiology and regional myocardial function. Resulted in publications in Am J Physiol,

Circulation and J Am Coll Cardiol.

1988-90 Michael Drossner, M.D., interventional cardiologist. My role was research mentor in

coronary blood flow physiology. Resulted in publication in Am J Physiol.

#### **CLINICAL ACTIVITIES**

#### Certification

1982 Internal Medicine (ABIM 083204)

1985 Cardiovascular Disease (ABIM ID 83204)

#### Clinical (Service) Responsibilities

1985-2008 Interventional Cardiologist, Johns Hopkins Hospital and Bayview Medical Center.

Responsibilities including diagnostic and therapeutic cardiac catheterization. Outpatient clinic

assignments at Johns Hopkins Outpatient Center and Greenspring Station. 60% time

commitment.

2008-present Associate Chief of Cardiology for Administration, Johns Hopkins Cardiology at GBMC.

Responsibilities include administrative oversight of the Johns Hopkins Cardiology at GBMC

hospital and outpatient operations. 45 % time commitment

2013-present Initiation of a cardiology program in Westminster, Maryland in support of the Johns Hopkins

Community Physicians (5 %)

# Clinical Program Building / Leadership

2008-present Associate Chief of Cardiology for Administration, Johns Hopkins Cardiology at GBMC. Directing

program development in this new location for Johns Hopkins Cardiology.

2013-present Initiation of the Johns Hopkins cardiology program in Westminster, Maryland in support of the

Johns Hopkins Community Physicians

#### SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES

### **System Innovation and Quality Improvement Publications**

Ellrodt G, Sadwin LB, <u>Aversano</u> T, Brodie B, O'Brien PK, Gray R, Hiratzka LF, Larson D. Development of systems of care for ST-elevation myocardial infarction patients: the non-percutaneous coronary intervention-capable (ST-elevation myocardial infarction referral) hospital perspective. Circulation. 2007 Jul 10;116(2):e49-54. Epub 2007 May 30.

#### System Innovation and Quality Improvement efforts within JHM:

1994-present **Site of Intervention:** Bayview Medical Center

**Role:** Project Director

**Percent Effort:** 50% (part of a larger program outside of JHM)

**Results:** Development of primary angioplasty system of care, and subsequently elective angioplasty. This program improved outcomes of acute myocardial infarction patient compared with previous available therapy (see reference X above).

## System Innovation and Quality Improvement efforts outside of JHM:

1994-present **Sites of Intervention:** 87 hospitals in 11 States – see Appendix

**Role:** Project Director **Percent Effort:** 50%

**Results**: Development of primary angioplasty system of care, and subsequently elective

angioplasty. These programs improved outcomes of acute myocardial infarction patient compared with previous available therapy (see reference 34). For elective PCI, outcomes were similar to PCI performed at hospitals with surgery on-site, while access improved, particularly in more rural locations (see reference 47 above).

2005-2009 Maryland Health Care Commission STEMI Registry, Medical Director, 10% effort. The STEMI

registry reported quality outcomes measures including mortality, bleeding, stroke, renal failure, recurrent myocardial infarction and process measures of quality such as door-to-balloon time and institutional volume. Process and outcomes measures of quality improved significantly over time.

March 2007 American Heart Association Conference: Development of Systems of Care for STEMI Patients

**Role:** Program participant

**Percent Effort:** N/A (3 day conference, then writing group)

Results: Consensus statement regarding development of systems of care for STEMI patients.

Implemented as American Heart Association's Mission Lifeline

# Production of guidelines and/or protocols:

Guideline: ACC/AHA Guidelines for Percutaneous Coronary Intervention (Revision of the

1993 PTCA Guidelines): American College of Cardiology/American Heart Association Task

Force on Practice Guidelines

Role: Study Chair of the C-PORT Primary PCI randomized trial – the only randomized trial that was key in creating these new guidelines which changed performance of primary PCI at hospitals without on-site cardiac surgery from class III to class IIb recommendation. Current status: primary PCI at hospitals without surgery on-site has now moved to category IIa

recommendation (see guideline below) Location: *Circulation* 2001, 103:3019-3041

Adopted: in 2001 to present

2012 Guideline: 2011 ACCF/AHA/SCAI Guideline for Percutaneous Coronary Intervention

Role: Study Chair of the C-PORT Elective PCI randomized trial – the only U.S. randomized trial whose results were key in creating these new guideline which changed performance of elective PCI at hospitals without on-site cardiac surgery from class III to class IIb recommendation.

Location: Circulation. 2011 Dec 6;124(23):e574-651.

Adopted: in 2012 to present

Health Care Policy: State of Maryland health care regulations allow performance of primary PCI

at hospitals without on-site cardiac surgery as a clinical (not research) procedure.

Role: Advisor to the State of Maryland Health Care Commission. The C-PORT criteria and methodology for performance of primary PCI at hospitals without surgery on-site is adopted by

and written into the Maryland regulation.

Location: Maryland

Adopted: in 2005 and continuing to present

Health Care Policy: State of Maryland is developing health care regulations to allow performance

of elective PCI at hospitals without on-site cardiac surgery as a clinical procedure.

Role: Advisor to the State of Maryland Health Care Commission. The C-PORT criteria and

methodology for performance of elective PCI at hospitals without surgery on-site is being adopted

by and written into Maryland regulation that will be in force in the near future.

Location: Maryland

Adopted: current in process of adoption

2000-present The states of Georgia and Massachusetts have written C-PORT criteria and methodology into

State policy for performance of PCI at hospitals without surgery on-site. Dr Aversano is actively working with Departments of Health in Pennsylvania, New Jersey and Ohio to develop their health care policy and regulations in this area, as well, based on the methods and outcomes of the

C-PORT projects.

System Innovation and Quality Improvement Extramural Funding (current, pending, previous)

Grants or contracts obtained to support a system innovation or quality improvement initiative

2002--present Title: Atlantic Cardiovascular Patient Outcomes Research Team

Identification Number: 217-2857 Sponsor: Participating Sites Total direct cost: \$ 11,282,425

Principal Investigator: Thomas Aversano

Role: Principal Investigator

Effort: 50 %

2006-2009 Title: Maryland Health Care Commission STEMI Registry

Identification Number:

Sponsor: Maryland Health Care Commission

Total direct cost: \$

Principal Investigator: Thomas Aversano

Role: Principal Investigator

Effort: 5%

## ORGANIZATIONAL ACTIVITIES

#### **Editorial Activities**

Current Reviewer for:

Circulation

New England Journal of Medicine American Journal of Cardiology American Journal Physiology

Journal American College of Cardiology

J. Pharmacology and Experimental Therapeutics

J.Electrocardiography

# **Advisory Committees, Review Groups/Study Sections**

1990-1993 Chairman, Peer Review Subcommittee American Heart Association MD Affiliate

2001-present National Institute of Health Data and Safety Monitoring Board Intramural

CardiovascularResearch – Board Member

#### **Professional Societies**

1992- 1997	Board of Directors American Heart Association MD Affiliate
1993- 1997	Major Gifts Management Committee American Heart Association MD Affiliate
1993-1994	Vice President for Research American Heart Association MD Affiliate
1994-1996	First Vice President American Heart Association MD Affiliate
1996-1997	President-Elect American Heart Association MD Affiliate (AHA Affiliates restructured in 1997 with absorption of MD into a Mid-Atlantic Affiliate)

# **Conference Organizer, Session Chair**

February 24, 1996 Baltimore Cardiovascular Patient Outcomes Research Team

Location: Towson Sheraton Hotel Sponsor: Baltimore C-PORT Role: Organizer, Presenter

#### **Consultantships**

June 2003 Fairbanks Memorial Hospital, Fairbanks, AK. Visited Fairbanks and worked with

hospital administration and physician to assess need for a formal cardiology program which at the time did not exist in Fairbanks (closest cardiologists were in Anchorage). Successfully supported hospital at the State level in getting permission to move forward with both cardiology program and with catheterization laboratory

and interventional services development.

July 2010 Beverly Hospital, Beverly MA. Development of primary PCI program (not part of

research project).

2012 Science First (for Takeda Pharmaceuticals). Consulted to help develop and then

recruit centers for a multicenter research project examining the use of a new

xanthine oxidase inhibitor (febuxistat) in refractory angina.

# RECOGNITION

#### **Awards and Honors**

1990 Michel Mirowski, M.D. Fellow (American Heart Association)

1993 Presidential Recognition Award (American Heart Association-Maryland Affiliate)

# **Invited Talks, Panels**

Date: 9/11/2009 and 9/12/2009

Title: Acute Myocardial Infarction 2009: Raising the Bar on Therapies and Outcomes

**Venue:** Ohio State University School of Medicine **Sponsor:** Ohio State University School of Medicine

**Date:** October 30, 2012

Title: PCI in Facilities Without Cardiac Surgery On-site: An Expert Panel Review

**Venue:** Forsgate Country Club, Monroe Township, New Jersey **Sponsor:** American College of Cardiology, New Jersey Affiliate

Date: November 6, 2012

Title: Walking a Tightrope Without a Net: Percutaneous Coronary Intervention Without Surgical Backup

Venue: American Heart Association Scientific Sessions, Los Angeles, CA

**Sponsor:** American Heart Association

Date:

Title: Balfour Lecture

Venue: Archbold Memorial Hospital, Thomasville, Georgia

**Sponsor:** Archbold Memorial Hospital

**Date:** May 19,2005

**Title:** David M. Flowers Memorial Lecture **Venue:** Grand View Hospital, Sellersville, PA

**Sponsor:** Grand View Hospital

Date: December 13, 2002

Title: STEMI - Outcomes with Lysis vs PCI in Hospitals with and without PCI or Surgical Facilities

**Venue:** 35<sup>th</sup> Annual New York Cardiovascular Symposium, New York, NY

Sponsor: American College of Cardiology Foundation and New York Cardiological Society Chapter of the

American College of Cardiology

**Date:** March 8, 2005

**Title:** Stay Local: The Case for Primary Percutaneous Coronary Intervention Without Surgical Backup **Venue:** American College of Cardiology Scientific Sessions 2005. Symposium: Optimizing the Treatment of ST-Elevation Myocardial Infarction in a Nonpercutaneous Coronary Intervention Center,

Orlando, FL

Sponsor: American College of Cardiology

Date: March 8, 2005

Title: Community Percutaneous Coronary Intervention

Venue: American College of Cardiology Scientific Sessions 2005. Symposium: STEMI – Outcomes with

Lysis vs PCI in Hospitals with and without PCI or Surgical Facilities, Orlando, FL

**Sponsor:** American College of Cardiology Foundation and New York Cardiological Society Chapter of the

American College of Cardiology

**Date**: July 7, 2012

Title: New Therapies for Coronary Artery Disease

Venue: Hyatt Hotel, Baltimore, MD

**Sponsor:** 32<sup>nd</sup> Annual Convention of the Bangladesh Medical Association of North America

# **Appendix A**: Institutions in which PCI programs were developed

Facility Name	City	State
Crestwood Medical Center	Huntsville	AL
Stamford Hospital	Stamford	CT
Archbold Memorial Hospital	Thomasville	GA
Fairview Park Hospital	Dublin	GA
Hamilton Medical Center	Dalton	GA
Southeast Georgia Health System	Brunswick	GA
Southern Regional Medical Center	Riverdale	GA
Spalding Regional Medical Center	Griffin	GA
Tanner Health System	Carrollton	GA
Tift Regional Medical Center	Tifton	GA
Wellstar Cobb Hospital	Austell	GA
West Georgia Health System	LaGrange	GA
Advocate South Suburban Hospital	Hazel Crest	IL
Little Company of Mary Hospital	Evergreen Park	IL
Faxton-St. Lukes	Lexington	MA
Lowell General Hospital	Lowell	MA
Melrose-Wakefield Hospital	Melrose	MA
Metrowest Medical Center	Framingham	MA
Saints Memorial Hospital	Lowell	MA
Anne Arundel Medical Center	Annapolis	MD
Baltimore Washington Medical Center	Baltimore	MD
Bayview Medical Center	Baltimore	MD
Doctors Community Hospital	Lanham	MD
Franklin Square Hospital Center	Baltimore	MD
Frederick Memorial Hospital	Takoma Park	MD
Holy Cross	Silver Spring	MD
Howard County General Hospital	Columbia	MD
Memorial Hospital at Easton	Easton	MD
Mercy Medical Center	Baltimore	MD
Shady Grove	Rockville	MD
Southern Maryland Hospital Center	Clinton	MD
St. Agnes Hospital	Baltimore	MD
Suburban Hospital	Bethesda	MD
Washington County Hospital	Chevy Chase	MD
Duke Health Raleigh Hospital	Raleigh	NC
Rowan Regional Medical Center	Salisbury	NC
Bayonne Medical Center	Bayonne	NJ
Clara Maass Medical Center	West Orange	NJ
Community Medical Center	Toms River	NJ
Holy Name Hospital	Teaneck	NJ
JFK Medical Center	South Plainfield	NJ
Monmouth Medical Center	Long Branch	NJ
Muhlenberg Regional Medical Center	South Plainfield	NJ

Facility Name	City	State
Overlook Hospital	Summit	NJ
Riverview Medical Center	Tinton Falls	NJ
Robert Wood Johnson Medical Center	Hamilton	NJ
Somerset Medical Center	Somerville	NJ
Trinitas Hospital	Newark	NJ
Virtua-West Jersey Hospital	Voorhees	NJ
Elmhurst Hospital Center	Elmhurst	NY
Glenns Falls Hospital	Glenns Falls	NY
Good Samaritan Islip	West Islip	NY
Good Samaritan Suffern	Suffern	NY
Huntington Hospital	Huntington	NY
Jamaica Hospital	Jamaica	NY
Long Island College Hospital	Brooklyn	NY
Parkridge Hospital	Rochester	NY
Raritan Bay Medical Center	Perth Amboy	NY
Saint Catherine of Siena	Smithtown	NY
South Nassau Communities Hospital	Oceanside	NY
Southside Hospital	Bay Shore	NY
Adena Medical Center	Chillicothe	ОН
Community Health and Wellness Center	Bryan	ОН
Fort Hamilton Hospital	Hamilton	ОН
Knox Community Hospital	Mount Vernon	ОН
Licking Memorial Hospital	Newark	ОН
Marietta Memorial Hospital	Marietta	ОН
Mercy Franciscan Mount Airy	Cincinnati	ОН
Mt. Carmel St. Ann	Westerville	ОН
Ohio State University Hospital East	Columbus	ОН
Southern Ohio Medical Center	Portsmouth	ОН
Southview Medical Center	Dayton	ОН
University Hospital, Geauga Medical Center	Cleveland	ОН
West Chester Hospital	Cincinnati	ОН
Legacy Meridian Park	Portland	OR
Armstrong County Memorial Hospital	Kittanning	PA
Chambersburg Hospital	Chambersburg	PA
Evangelical Community Hospital	Danville	PA
Meadville Medical Center	Meadville	PA
Memorial Hospital	York	PA
Monongahela Valley Hospital	Monongahela	PA
Nazareth Hospital	Philadelphia	PA
Sacred Heart Hospital	Allentown	PA
UPMC McKeesport	McKeesport	PA
Kingwood Medical Center	Kingwood	TX
Mainland Medical Center	Texas City	TX

# Appendix B

Meetings with State Departments of Health outside of Maryland

#### Georgia

#### HEALTH STRATEGIES COUNCIL

Department of Community Health, Division of Health Planning Bainbridge College, 2500 E. Shotwell Street (Hwy.84), Continuing Education Building / Room 416, Bainbridge, GA 31717-3249 Friday, May 21, 2004

# SPECIAL CALLED MEETING of HEALTH STRATEGIES COUNCIL

Department of Community Health/Division of Health Planning 2 Peachtree Street, Atlanta, GA 30303 Friday, February 4, 2005

#### **New Jersey**

State Health Planning Board (SHPB) Marriott @ Lafayette in Trenton. October 6, 2005

Health Care Administration Board (HCAB) July 19,2007

State Health Planning Board (SHPB) June 23, 2008

Health Care Administration Board (HCAB) August 2011

# Pennsylvania

Pennsylvania Department of Health 2007

# Ohio

Ohio Department of Health Division of Quality Assurance Interventional Cardiology Advisory Group December 12, 2012