CURRICULUM VITAE
Jonathan L. Elion M.D.

PUBLICATIONS

(1) Papers Published or in Press

1. Smith M, Dawson PL, Elion JL, Booth DC, Handshoe R, Kwan OL, Earle GF, and DeMaria AN. Correlation of continuous wave doppler velocities with cardiac catheterization gradients: An experimental model of aortic stenosis. J Am Coll Cardiol, 6(6):1306-1314, 1985.
2. Smith MD, Dawson PL, Elion JL, Wisenbaugh T, Kwan OL, Handshoe S, and DeMaria AN. Systematic correlation of continuous wave doppler and hemodynamic measurements in patients with aortic stenosis. Am Heart Journal, 111(2):345-353, 1986.
3. Nissen SE, Elion JL, Booth DC, Evans J, and DeMaria AN. Value and limitations of computer analysis of digital subtraction angiography in the assessment of coronary flow reserve. Circulation, 73:562, 1986.
4. Elion JL, Fischer PLC, and Nissen SE. Time stretching strategies for optimal temporal alignment of image sequences of unequal duration. IEEE Comput Cardiol, pages 619-22, October 1986.
5. Elion JL, Nissen SE, and DeMaria AN. Classification of cardiac structures in digital angiograms by the analysis of pixel variance. IEEE Comput Cardiol, pages 69-72, 1986.
6. Rovai D, Nissen SE, Elion JL, L'Abbate A, and DeMaria AN. Ejection fraction from the computerized analysis of contrast echo washout curves. IEEE Comput Cardiol, pages 405-408, October 1986.
7. Nissen SE, Elion JL, Waters JS, Booth DC, Baugh M, and DeMaria AN. Determination of left ventricular ejection fraction by computer densitometric analysis of digital subtraction angiography: Experimental validation and correlation with area-length methods. Am J Cardiol, 59:675-680, 1987.
8. Wisenbaugh T, Elion JL, and Nissen SE. Influence of aortic valve disease on systolic stiffness of the human left ventricular myocardium. Circulation, 75:964-972, 1987.
9. Rovai D, Nissen SE, Elion JL, Smith MD, L'Abbate A, Kwan OL, and DeMaria AN. Contrast echo washout curves from the left ventricle: Application of basic principles of indicator-dilution theory and calculation of ejection fraction. J Am Coll Cardiol, 10:125-134, 1987.
10. Elion JL and Nissen SE. A knowledge-based image processing system for the interpretation of coronary arteriograms. In Application of Optical Instrumentation in Medicine XV, pages 428-32. Soc Photo-Opt Instr Eng, 1987.
11. Rovai D, Nissen SE, Elion JL, Distante A, and DeMaria AN. Limitations of digital subtraction contrast-echocardiography in enhancing left ventricular endocardial definition. Am Heart J, 113:1437-1444, 1987.
12. Grayburn PA, Nissen SE, Elion JL, Evans J, and DeMaria AN. Quantitation of aortic regurgitation by computer analysis of digital subtraction angiography. J Am Coll Cardiol, 10:1122-7, 1987.
13. Booth DC, Cunningham BR, Roundtree RM, Elion JL, Nissen SE, and Gillespie MN. Coronary arteriography in the intact rabbit. demonstration of coronary vasomotor and electrocardiographic

effects of ergonovine and indomethacin in rabbits after abrupt cessation of prolonged nitroglycerin treatment. Am Heart Journal, 114:343-348, 1987.

14. Elion JL, Nissen SE, and DeMaria AN. Functional imaging of coronary artery flow reserve. Am J Cardiac Imaging, 1(2):103-110, 1987.

15. Elion JL. A knowledge-based expert system for the automated identification of structures in coronary angiograms. IEEE Comput Cardiol, pages 201-4, September 1987.

16. Elion JL. Digital cardiac imaging: Is it a replacement or an adjunct to cine angiography? (editorial). Am J Cardiac Imaging, 2(1):1-2, 1988.

17. Elion JL. Expert advisor system for the management of interventions in acute myocardial infarction. IEEE Comput Cardiol, 1988.

18. Gurley JC, Nissen SE, Booth DC, Harrison M, Grayburn P, Elion JL, and DeMaria AN. Comparison of simultaneously performed digital and film-based angiography in assessment of coronary artery disease. Circulation, 78:1411-20, 1988.

19. Smith MD, Elion JL, McClure RR, Kwan OL, and DeMaria AN. Left heart opacification with peripheral venous injection of a new saccharide echo contrast agent in dogs. J Am Coll Cardiol, 13(7), 1989.

20. Gurley JC, Nissen SE, Elion JL, Booth DC, and DeMaria AN. Determination of coronary flow reserve by digital angiography: Validation of a practical method not requiring power injection or electrocardiographic gating. J Am Coll Cardiol, 16(1):190-7, 1990.

21. Elion JL. Intermittent bundle branch block. Choices in Cardiology, 5(3):100-104, 1991.

22. Elion JL. Misplaced hearts and wires. Choices in Cardiology, 5(6):222-224, 1991.

23. Santos-Ocampo C and Elion JL. An irregular supraventricular tachycardia. Choices in Cardiology, 6(3):97-98, 1992.

24. Elion JL. ECG changes in right rundle branch block. Choices in Cardiology, 6(5):170-171, 1992.

25. Petrocelli RR and Elion JL. A new method for structure recognition in unsubtracted digital angiograms. IEEE Comput Cardiol, pages 207-10, 1992.

26. Petrocelli RR, Manbeck KM, and Elion JL. Three dimensional structure recognition in digital angiograms using Gauss-Markov methods. IEEE Comput Cardiol, pages 101-4, 1993.

27. Santos-Ocampo CD, Sadaniantz A, Elion JL, Garber CW, Malone LL, and Parisi AF. Echocardiographic assessment of the cardiac anatomy in patients with multifocal atrial tachycardia: A comparison with atrial fibrillation. Am J Med Sci, 307(4):264-8, 1994.

28. Elion JL and Petrocelli RR. A high-speed network for multi-modality cardiac image review. In Proceedings - The Annual Symposium on Computer Applications in Medical Care, pages 428-32, November 1994.

29. Nissen SE, Pepine CJ, Bashore TM, Block PC, Bonchek LI, Brinker JA, Carabello B, Douglas JS, Elion JL, Hirshfeld JW, Holmes DR, Johnson WL, Klinke WP, Levin DC, Mancini GBJ, Mullins CE, Thomas JD, Topol EJ, Vogel JHK, and Wondrow MA. Cardiac angiography without cine file: Erecting a "Tower of Babel" in the cardiac catheterization laboratory. J Am Coll Cardiol, pages 834-7, 1994.

30. ACC/ACR/Nema Ad Hoc Group. ACC. and Industry Develop Standard for Digital Transfer of Angiographic Images. J Am Coll Cardiol, 25(3) 800-802, 1995.

31. Elion JL. DICOM Media Interchange Standards for Cardiology: Initial Interoperability Demonstration. 19th Annual Symposium on Computer Applications in Medical Care. 591-5, 1995.

32. Elion JL, Whiting JS. Clinical Use of Lossy Image Compression in Digital Angiography. Am J Cardiol, 77(15), 1996.

33. Myhlonakis E, Kon D, Moulton A, Elion J, Ingeglia R, Koutkia P, and Katz A. Thrombosis of mitral valve prosthesis presenting as abdominal pain. Heart & Lung, 28(2):110-3, 1999.

34. Elion JL, Becker T, Keller A, Simon R, Sippel T, Solomon H, Weintraub W. IHE Interoperability for Cardiology: Year 1 Demonstration. IEEE Comput Cardiol, 32:691-4, 2005.

(2) Books and/or Chapters

1. Elion JL. Principles of digital imaging and processing. In Digital Cardiac Imaging, Wasserman A and Ross A, editors. Futura Publishing Company, 1989.

2. Nissen SE, Elion JL, and DeMaria AN. Value and limitations of densitometry in the calculation of right and left ventricular ejection fraction from digital angiography. In Clinical Applications of Cardiac Digital Angiography, Mancini G, editor. Raven Press, New York, 1988.

3. Elion JL and Nissen SE. Parametric encoding of coronary arteriograms for the evaluation of hyperemic reserve. In Progress in Digital Angiocardiography, Heintzen P and Bursch J, editors. Kluwer Academic Publishers, Dordrecht, Netherlands, 1988.

4. Nissen SE, Elion JL, and DeMaria AN. Methods for calculating coronary flow reserve by computer processing of digital angiograms. In Progress in Digital Angiocardiography, Heintzen P and Bursch J, editors. Kluwer Academic Publishers, Dordrecht, Netherlands, 1988.

5. Elion JL: Digital Image Formats and Archiving Practices. In The Interventional Cardiologist, King S and Yeung A, editors. McGraw Hill, New York, 2006 (*in press*).

(3) Abstracts

1. Elion JL, Rembert JC, and Greenfield JC. Fiber orientation in canine hypertrophy. Circulation, 66(Suppl II):II-254, 1982.

2. Elion JL, Nissen SE, and DeMaria AN. A new approach for visualizing echocardiographic tissue characteristics: Graphic representation of regional grey level statistics. Circulation, 70(Suppl II):II-405, 1984.

3. Elion JL, Nissen SE, Booth DC, and DeMaria AN. Videodensitometric assessment of coronary stenosis: Validation of the technique and comparison with visual methods. Circulation, 70(Suppl II):II-30, 1984.

4. Smith MD, Dawson P, Elion JL, Wisenbaugh T, Handshoe S, Kwan OL, and DeMaria AN. Comparative correlation of continuous wave doppler spectral measurements with hemodynamic parameters in patients with aortic stenosis. Circulation, 70(Suppl II):II-116, 1984.

5. Nissen SE, Elion JL, Booth DC, Evans J, Wisenbaugh T, and DeMaria AN. Quantitative assessment of coronary blood flow by measurement of myocardial perfusion from digital subtraction angiograms. Circulation, 70(Suppl II):II-324, 1984.

6. Nissen SE, Elion JL, Booth DC, Evans J, Roundtree R, and DeMaria AN. Quantitation of coronary flow reserve by computer analysis of digitally subtracted and processed coronary angiograms. Circulation, 70(Suppl II):II-324, 1984.

7. Elion JL, Nissen SE, and DeMaria AN. Restoration and enhancement of technically sub-optimal cineangiograms by digital image processing. Interamerican Society of Cardiology, June 1985.

8. Nissen SE, Elion JL, and DeMaria AN. Value and limitations of digital fluoroscopic imaging in cardiac diagnosis. Annual Congress on Engineering in Medicine and Biology, September 1985.

9. Elion JL, Nissen SE, and DeMaria AN. Visual representation of coronary hyperemic reserve: Methodology and evaluation. Circulation, 72(Suppl III):III-263, 1985.

10. Nissen SE, Elion JL, Smith M, and DeMaria AN. Predictive value of angiography in assessment of coronary flow reserve. Circulation, 72(Suppl II):III-262, 1985.

11. Waters JS, Elion JL, Smith M, and DeMaria AN. Analysis of magnetic resonance imaging (MRI) of hypertrophic cardiomyopathy. Circulation, 72(Suppl II):III-122, 1985.

12. Morris KG, Hettleman BD, Elion JL, and Phillips HR. Comparative hemodynamic effects of constant intravenous infusions of Pirmenol and Lidocaine. Circulation, 72(Suppl III):III-165, 1985.

13. Rovai D, Nissen SE, Robinson W, and Elion JL. Application of basic principles of indicator-dilution theory to quantitative contrast echocardiography. Circulation, 72(Suppl III):III-427, 1985.

14. Smith M, Kwan OL, Nissen S, Elion JL, Rovai D, and DeMaria AN. Left heart opacification after peripheral venous injection: Pulmonary transmission of ZK44012, a new echo contrast agent. Circulation, 72(Suppl III):III-57, 1985.

15. Nissen SE, Elion JL, Smith M, Wisenbaugh T, and DeMaria A. Unsharp masking: A new technique for digital coronary angiography unaffected by motion artifact. Circulation, 72(Suppl III):III-454, 1985.

16. Grayburn PA, Nissen SE, Elion JL, Evans J, and DeMaria AN. Quantitation of aortic regurgitation by computer analysis of digital subtraction angiography. J Am Coll Cardiol, 7(2):154A, 1986.

17. Drinkovic N, Wisenbaugh T, Kwan OL, Elion JL, Smith MD, and DeMaria AN. Assessment of diastolic left ventricular function by doppler: Comparisons with catheterization measurements. J Am Coll Cardiol, 7(2):227A, 1986.

18. Wisenbaugh T, Elion JL, and Nissen SE. Effect of aortic valve disease on dynamic myocardial elastance. Circulation, 74(Suppl II):II-398, 1986.

19. Nissen SE, Grayburn PA, Evans J, Elion JL, Gurley JC, and DeMaria AN. Calculation of absolute coronary blood flow from digital angiography: Correlation with electromagnetic flow. Circulation, 74(Suppl II):II-485, 1986.

20. Mahony C, Elion JL, and Fischer PLC. Computerized analysis of platelet aggregates detected by ultrasound. Circulation, 74(Suppl II):II-144, 1986.

21. Drinkovic N, Wisenbaugh T, Nissen SE, Elion JL, Smith MD, Kwan OL, and DeMaria AN. Sensitivity and specificity of transmitral flow velocity measurements in detecting impaired left ventricular compliance. Circulation, 74(Suppl II):II-46, 1986.

22. Elion JL, Nissen SE, Fischer PLC, and Booth DC. Gated digital roadmapping: A new computer-based imaging support system for angioplasty. J Am Coll Cardiol, 9(1):70A, 1987.

23. Nissen SE, Gurley JC, Elion JL, Grayburn PA, Booth DC, Fischer PLC, Berk M, Gash D, and DeMaria AN. Coronary flow reserve by digital angiography: Correlation with quantitative angiography and clinical status. Circulation, 76(Suppl II):II-392, 1987.

24. Gurley JC, Nissen SE, Elion JL, Evans J, McMinn M, and DeMaria AN. Determination of coronary flow reserve by digital angiography: Validation of a practical method not requiring power injection or ECG gating. J Am Coll Cardiol, 11(2):62A, 1988.

25. Gurley JC, Nissen SE, Elion JL, Grayburn P, Fischer C, Booth DC, and DeMaria AN. Comparison of vessel appearance following PTCA and coronary flow reserve by digital angiography. J Am Coll Cardiol, 11(2):130A, 1988.

26. Gurley JC, Nissen SE, Haynie D, Elion JL, Booth D, and DeMaria A. A new method for measurement of absolute arterial blood flow by digital angiography. Circulation, 80(Suppl II):II-413, 1989.

27. Gurley JC, Elion JL, Nissen SE, Haynie D, and Booth D. Effect of edge enhancement image processing on the interpretation of digital coronary arteriograms. (presented at the Annual Scientific Sessions, American College of Cardiology), 1990.

28. Chandrase Karan K, Sehgal CM, Hus TL, Katz S, Weintraub A, Mintz G, Elion JL, Parisi A, Salem D, and Pandian N. Three-dimensional intravascular ultrasound imaging of arterial atherosclerosis and its complications: Improved recognition of the atheroma bulk, the span of dissection and intimal flaps, and the thrombus extent. (submitted for presentation at the ACC Scientific Sessions), March 1991.

29. Elion JL, Geman SA, and Manbeck K. Computer recognition of coronary arteries. (Presented at the ACC Scientific Sessions), March 1991.

30. Albrecht FJ and Elion JL. A computer-based expert system for consultation on the use and interpretation of high-resolution electrocardiography. (presented at the ACC Scientific Sessions), March 1991.

31. Elion JL. Automated arterial recognition using deformable templates. In 4th International Symposium on Coronary Arteriography, Rotterdam, Netherlands, June 23-25 1991.

32. Elion JL. A personal digital cine review station. In 5th International Symposium on Coronary Arteriography, Rotterdam, Netherlands, June 1993.

33. Katz A, Nelson BS, Elion JL, Petrocelli R, Hadi MS, St.Laurent L, Parisi A. Clinical information is preserved when complete doppler echocardiograms are digitally stored and review. JASE 8:35F, 412, 1995

(4) Non-Print Material

1. DISC'95 (Digital Interchange Standards for Cardiology) Wrote the computer software to store and review angiographic and echocardiographic images on CD-ROM; a multi-vendor demonstration in collaboration with the American College of Cardiology, March, 1995.

2. ESC'95 European Society of Cardiology Wrote the computer software to store and review angiographic and echocardiographic images on CD-ROM; a multi-vendor demonstration in collaboration with the Europen Society of Cardiology DICOM Demonstration, August, 1995.

3. SR2001 (Structured Reporting 2001). Wrote the computer software to create and display DICOM Structured Reporting files, and produced reference data sets distributed on CD-ROM; a multi-vendor demonstration in collaboration with the American College of Cardiology, March 2001.

(5) Patents

1. Elion JL. Dynamic Coronary Roadmapping, U.S. Patent Number 4,878,115, October 31, 1989
2. Elion JL. Complexity Scores for Electrocardiography Reading Sessions, 60/644,876, January, 2005
3. Elion JL. Similarity Scores for Electrocardiography, 60/644,875, January, 2005
4. Elion JL. Feature-Based Editing for Electrocardiography, 60/644,888, January, 2005

INVITED PRESENTATIONS

1. American Heart Association, Kentucky Affiliate, Advances in Cardiovascular Medicine, Lexington, Kentucky, October 13-15, 1983: "*Selection of the Patient with Acute Myocardial Infarction for Streptokinase - Recanalization Effects on LV Function*".
2. Personal Computers in Medicine Conference, Des Moines, Iowa, March 1984: "*Database Management Systems, Information Networks, and Remote Linkups", and "Personalized Computers and Medical Education*".
3. Core Curriculum on Cardiac Ultrasound, July 16-20, 1984, Lexington, Kentucky: "*Cardiac Image Processing*".
4. Digital Imaging in Cardiology, Garmisch, West Germany, December 1984: "*Digital Image Restoration Techniques", and "Coronary Artery Stenosis Quantification*".
5. American Heart Association, Kentucky Affiliate, Advances in Cardiovascular Medicine, October 5, 1984: "*New Antiarrhythmic Drugs*".
6. Digital Cardiac Imaging, Washington, D.C., November 1985: "*Parametric Imaging: Visual Representation of Coronary Hyperemic Reserve*".
7. Core Curriculum on Cardiac Ultrasound, January 28-February 1 1985, Lexington, Kentucky: "*Cardiac Image Processing*".
8. University of Virginia, November 26, 1985, Cardiology Grand Rounds: "*Principles of Cardiac Image Processing*".
9. Optical Disk Storage and Retrieval Conference, Hyannis, Massachusetts, September 1986: "*Digital Archival Storage Requirements for Medical Imaging Systems*".
10. Progress in Digital Angiography, Kiel, West Germany, October 1986: "*Graphic Representation of Coronary Flow Reserve*".
11. American College of Cardiology, Fireside Panel, March 1987: "*Role of Computers in Cardiology*".
12. Conference on Fiber Optics and Optical Disk Storage and Retrieval, Centerville, Massachusetts, May 1987: "*Medical Diagnostic Archival Storage and Retrieval*".

13. Digital Cardiac Imaging, Anaheim California, November, 1987: *"Application of Computer Processing Methods for Cardiac Imaging*", and "*Dynamic Roadmapping: A New Method for the Representation of Coronary Anatomy During Angioplasty*".

14. The Human Dimension in Artificial Intelligence, Lexington, Kentucky, April 6-9, 1988. "*Artificial Intelligence and the Brain: The Biological Dimension" (featured panelist).*

15. General Electric CGR, Digital Angiography Department, Paris, France, June, 1988. "*Dynamic Coronary Roadmapping*"

16. Global Leadership Task Force, General Electric Medical Systems Group, Tokyo, Japan, October 20-21, 1988. "*A Clinical Approach to Cardiology and Cardiac Imaging*".

17. American College of Cardiology, Meet the Experts Session, March 1989: "*Image Acquisition, Processing, and 3-D Reconstruction*".

18. Digital Angiography Engineering Task Force, General Electric Medical Systems Group, Milwaukee, April, 1989. "*Digital Angiography in the 1990's*".

19. Tufts University Medical Center, February 1990, Cardiology Grand Rounds: "*Cardiac Image Processing*".

20. American College of Cardiovascular Administrators, Hartford, Connecticut, November 2, 1990: "*Imaging Equipment for th Cath Lab: Present and Future. Is a Cineless Cath Lab on the Horizon?*".

21. New Frontiers in Cardiac Imaging, Dallas Texas, November 11, 1990: "*Principles of Digital Cardiac Imaging: Acquisition, Processing, and Storage*".

22. Cardiology in the 1990's: New Developments in Image Techniques for the Practitioner, Providence, Rhode Island, November 28, 1990: "*Recent Advances in Digital Cardiac Imaging*".

23. Second Conference on Applications of Computer Visualization and Imaging in Research, University of Iowa, March 28, 1990: "*Computer Vision Methods for the Automated Recognition of Coronary Arteries*".

24. Massachusetts Medical Society Publishing Division (New England Journal of Medicine), April 7, 1992: "*New Technologies for Medical Journal Publication*".

25. "*A Personal Digital Cine Review Station*", demonstrated as a Works in Progress, American Heart Association meetings (November 1992 and November 1993), and American College of Cardiology Meetings (March 1993 and March 1994).

26. Third Live Demonstration Course in Interventional Cardiology, Singapore, July 26-28, 1993: "*Digital Image Archiving and Review*".

27. Luminary Speaking Tour (Beijing China, July 30-31 1993; Taipeh Taiwan, August 3, 1993; and Seoul Korea August 6-7, 1993): "*Digital Image Archiving and Review*", and "*Current Issues in Digital Coronary Angiography*".

28. Workshop on Medical Visualization, Milwaukee, June, 1994: "*High-Performance Graphics Requirements for Multi-Modality Cardiac Image Review*".

29. Workshop on Cardiac Information Systems, Seattle, June, 1994: "*Cardiac Image Networking*".

30. Computational Sciences Center, University of Kentucky, October, 1994: "*Cardiac Image Storage and Review Over High-Speed Networks*".

31. Fifth Annual Southern New England Symposium on Peripheral Vascular Diseases , Newport, August 1995: "*Assessment of Coronary Risk Factors in Patients with Peripheral Vascular Diseases*"

32. Public Safety Diver Training, East Greenwich RI, March-April, 1995: "*Management of Near-Drowning*" (and assisted with diver training).

33. American College of Cardiology, Meet the Experts Session, March 1997: "*Configuring the All-Digital Cath Lab*".

34. American College of Cardiology, "Info at ACC" presentations (three), March 2001: "*DICOM Structured Reporting*"

35. DICOM Structed Reporting Implementor's Workshop, June 2001, Arlington VA: "*DICOM Structured Reporting Demonstration of the American College of Cardiology*".

36. Japanese Society of Interventional Cardiology, Tokyo, July 2001: "*Integrating Data in the Cardiac Catheterization Laboratory: DICOM Structured Reporting*"

37. Texas Heart Institute, Cardiology Grand Rounds, August 2001: "*Digital Coronary Angiography: State if the Art*"

38. European Society of Cardiology, September 2001: "*DICOM Structured Reporting*"

39. Society for Cardiovascular Angiography and Interventions (SCAI), Boston, May 2003: "*Electronic Patient Records and Interventional Cardiology*"

40. Japanese Circulation Society, Tokyo, March 2004: "*Information Systems for Cardiac Catheterization*"

41. PACS School 2004, Perugia, Italy: "*RIS/PACS and Cardiology*"

42. American College of Cardiology, March, 2005: "*Integrating the Healthcare Environment*"

43. American College of Cardiology, March, 2005: "*Integrating Cardiology Systems, The Tower of Babel: 10 Years of Progress*"

44. Integrating the Healthcare Enterprise (IHE) Workshop, June 2005, Oakbrook, IL. "*Cross-Enterprise Document Sharing" and "Cardiology Roadmap*"

45. Healthcare Information and Management Systems Society Public Policy Forum, Washington DC, October 2005. "*Overcoming Barriers to Interoperability Using IHE*"

46. American College of Cardiology Administrators, March 2006: "*Integrating the Healthcare Enterprise: The IHE Initiative for Cardiology*"

47. American College of Cardiology, March 2006: "*IHE Cardiology Integration Profiles: What Clinical Problems Does IHE Solve for Me?*"

48. American College of Cardiology, March 2006: "*IHE: Path to the Future*"