

# TECHNION - RAPPAPORT FACULTY OF MEDICINE

## RESUME

1/8/2021

### 1. PERSONAL DETAILS

**Name:** Jonathan Lessick

**Identification number:** 01195568-9

**Date and place of birth:** 12/8/1960, Johannesburg, South Africa

**Address:** 9 Martin Buber Street, Haifa, Israel.

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### 2. ACADEMIC DEGREES

1986-1991 D.Sc. - Biomedical Engineering, Technion, Haifa.

- Doctoral thesis entitled "3D Characterization and Analysis of Regional Left Ventricular Geometry and Stresses in Various Disease States."

1978-1983 MB.BCh. (=MD) Witwatersrand University, Johannesburg, South Africa.

### 3. ACADEMIC APPOINTMENTS

- 1.4.2019 to present: Clinical Associate Professor, Dept. of Medicine, Technion IIT
- 10.2012-31.3.2019: Assistant Professor, Dept. of Medicine, Technion IIT
- 2005-10.2012: Adjunct Senior Lecturer, Dept. of Medicine, Technion IIT, Haifa.

### 4. PROFESSIONAL EXPERIENCE

- 6.2015 –present: Director of Cardiac Functional Imaging Service, Rambam Health Care Campus (Full-time)

- 9.2010 –6.2015: Director of Cardiac CT and MRI Service, Rambam Health Care Campus (Full-time)
- 1996 – 9/2010: Senior cardiologist in Cardiology Department, Rambam Health Care Campus (50% of time).
  - 2008 – 9/2010: Director of Cardiac CT Service.
  - 1996 - 2008: predominantly in Echocardiography Laboratory.
- 2002 – 8.2010: Philips Healthcare CT Division (50% of time).
  - 2006-2010: Research Scientist Cardiac CT project, Global Research & Development, Haifa, Israel.
  - 2001-2006: Applications Specialist, CT division, Cardiac CT project.
- 2008-2009: (part-time) Responsible for cardiac CT at MAR Institute, Bnei Zion Hospital, Haifa.
- 1996-2001: (part-time) Biosense Webster (Israel)
  - Advisor and R&D in the field of cardiac catheters, electromechanical ventricular mapping, ventricular mechanics and function and electrophysiology.
- 1993-1995: Cardiology Residency, Rambam Health Care Campus.
- 1985-1986, 1992-3: Medical Residency, Internal Medicine D, Rambam.
- 1990-1992: Medical Officer in Israeli Navy.
- 1984: Medical Internship, Baragwanath Hospital, Soweto, South Africa.

## **5. RESEARCH INTERESTS**

Cardiac imaging, geometry and mechanics. Diastolic function. Atrial function; Coronary plaque characterization. Myocardial perfusion.

## **6. TEACHING EXPERIENCE**

Courses:

- 2011-present: Senior Lecturer, Clinical-Engineering Project, Biomedical Engineering, Technion – 3 hours weekly [undergraduate].
- 2016-2018: Integrative course - Lecture on Acute rheumatic fever
- 5/2015: Post-graduate course in cardiology- myocardial perfusion.

- 5/2013: Post-graduate course in cardiology -MRI in non-coronary disease.
- 2008-2010: Technology Development & Enterprising, Technion [undergraduate] Non-Invasive Imaging of Coronary Arteries –The Problem, Solution and Unmet Needs.
- 2007-2010: American Students' Program – Cardiology [undergraduate] Cardiac CT & MRI.
- Early 2000's: American Students' Program – Cardiology [undergraduate] Valve disease.

#### Clerkships:

- Cardiology Department – teaching student groups echocardiography and heart failure

### **7. TECHNION ACTIVITIES**

- 2015-present: Appointed to the Committee for Initiatives, and Cooperation with Industry and Medicine on behalf of the Faculty of Biomedical Engineering .
- 2015-present: Appointed as a member of the committee for student research projects in the Faculty of Medicine.

### **8. PUBLIC PROFESSIONAL ACTIVITIES**

- Reviewer for International Journals:  
Circulation, JACC, American Journal of Physiology, Basic Research in Cardiology, American Journal of Cardiology, Cardiology, European Radiology, European Journal of Radiology, Journal of Cardiac Computed Tomography, European Heart Journal – Cardiovascular Imaging, Frontiers of Medicine, International Journal of Cardiovascular Imaging, PLOS ONE, Medical & Biological Engineering & Computing.
- Member of the Israeli Writing Group for Indications for Cardiac MRI published in Harefua in September 2016.

- Abstract Grader for Israel Heart Society Annual Congress 2016-2017.
- Abstract Grader for European Heart Society Annual Congress 2017.

## **9. MEMBERSHIP IN PROFESSIONAL SOCIETIES**

- NATIONAL
  1. 1996-present: Israel heart society
  2. 2005-present: The Israeli working group on echocardiography
  3. 2010-present: Israeli working group on nuclear cardiology & cardiac CT
  4. 2010-present: The working group on myocardial & pericardial diseases
- INTERNATIONAL
  5. 2012: International Society for Heart Research (ISHR) – European subsection
  6. 2012-present: ESC working group: Cardiovascular Magnetic Resonance.
  7. 2012-present: ESC working group: Nuclear Cardiology and Cardiac CT.
  8. 2016-present: Silver member EACVI

## **10. HONORS**

- Henry Neufeld Research Award Fund: Prize for Original Research, 1990 for the study titled "Left Ventricular Geometry and Stress Indices by Three Dimensional Reconstruction in Acute Experimental Ischemia."
- The Nathan Sachs Award for Medical Research in Cardiology, 1992.
- The IHA Prize for Outstanding Research in the Field of Non-invasive Cardiology in Memory of Prof. Richard, Hilda and Ezra Meltzer, 2013.

## **11. STUDENTS AND INSTRUCTION**

### **MD Thesis**

**Completed**

- 2000 Taufik Zidan Shwiri MD. "Failure of Regression of Left Ventricular Hypertrophy After Valve Replacement for Aortic Insufficiency: Predictors and Clinical Significance"
- 2006 Tsur Ben-Haim MD. "Quantitative Evaluation of the Regional Function of the Left Ventricle using Multidetector CT in Comparison to Trans Thoracic Echocardiography" 2005-2006.
- 2010 Itai Ghersin, MD. "Automatic Assessment of Cardiac Chamber Volumes from non-gated Chest CT"
- 2013 Ariel Schweitzer, MD. "A retrospective study comparing computed tomography of the heart with echocardiography, in the evaluation of left heart diastolic function"
- 2014 Karin Hershko, MD. "Evaluation of additive value of cardiac CT angiography in Patients admitted for acute coronary syndromes"
- 2016 Hayley-Ann van der Veen, MD. "Are physiological parameters of the left atria and ventricle evaluated by cardiac CT capable of evaluating diastolic function using echocardiography as a reference standard?"

### **Residency**

#### **Basic Science**

- 2015 Zvi Peled, MD. "Evaluation of the Clinical Utility of a Novel Automatic Myocardial Strain Analysis Tool for Cardiac CT Image Data"

### **MSc Thesis**

#### **Completed**

- 2005 Advisor for Michal Toledano, MSc. "Plaque Characterization using Multislice CT: Comparison with IVUS." (Primary supervisor – Prof. Rafael Beyar).
- 2014 Lior Gorodisky, MSc. "Quantification of Mitral Regurgitation using Magnetic Resonance Imaging." (Dr. Moshe Porat, Electrical engineering, co-supervisor)

### **PhD Thesis**

#### **Completed**

- 2008 Advisor for Guy Amit DSc. "Recording of Heart Signals from the Chest Wall." (Primary supervisors – Prof. Noam Gavrieli, Prof. Natan Intrator, Computer Science, University of Tel Aviv.)
- 2014 Yehiel Lamash, PhD. "Regional Mechanical Function of the Left Ventricle from Cardiac CT Image Data." (Dr. Anat Fischer, Mechanical Engineering, co-supervisor)

## **12. RESEARCH GRANTS**

2005, Philips Healthcare, \$10,000, Comparison between cardiac CT and IVUS. Principal Investigator – R. Beyar, Co-investigators – R. Dragu, J. Lessick.

2005, Philips Healthcare, \$10,000 Evaluation of myocardial perfusion defects by CT. Principal Investigator – J. Lessick, Co-investigator – E. Ghersin.

2009, Philips Healthcare, \$4,000 + Software for Philips Extended Brilliance Workstation, valued at \$50,000. Coronary plaque analysis by CT. Principal Investigator – J. Lessick, Co-investigator – D. Aronson.

2011, Atkins Medical Research Fund, Manlam Fund Grant, \$18,000. Principal investigators: J. Lessick, Y. Agmon, M. Porat.

## **13. SIGNIFICANT PROFESSIONAL PROJECTS**

- Clinical Advisor and Steering Committee Member for International Multicentre Trial of Coronary CT Angiography vs. Invasive Angiography for the Diagnosis of Coronary Artery Disease (CATSCAN trial) (2003-2006).
- Appointed to Philips Healthcare Medical Leadership Team (1.2009-2010).

## **14. PUBLICATIONS**

Doctoral thesis: "3D Characterization and Analysis of Regional Left Ventricular Geometry and Stresses in Various Disease States." 1991.

## **Refereed papers in professional journals:**

### **1 - Basic research (Hypothesis-driven)**

1. Lessick J, Sideman S, Azhari H, Marcus M, Grenadier E and Beyar R: Regional Three-Dimensional Geometry and Function of Left Ventricles with Fibrous Aneurysms, *Circulation*, 84:1072-1086, 1991.
2. Lessick J, Sideman S, Azhari H, Shapiro E, Weiss JL and Beyar R: Evaluation of Regional Load in Acute Ischemia by Three-Dimensional Curvatures Analysis of the Left Ventricle, *Annals of Biomedical Engineering*, 21:147-161,1993.
3. Halmann M; Sideman S; Lessick J; Beyar R: Relating Coronary Perfusion to Myocardial Function Using Three-dimensional Reconstruction of Heart and Coronary Arteries, *Medical and Biological Engineering and Computing*, 32(4 Suppl):S144-50,1994.
4. Lessick J, Fisher Y, Beyar R, Sideman S, Marcus M, Azhari H: Regional Three Dimensional Geometry of the Normal Human Left Ventricle Using Cine-CT, *Annals of Biomedical Engineering*, 24:583-594,1996.
5. Gepstein L, Goldin A, Lessick J, Hayam G, Shpun S, Schwartz Y, Hakim G, Shofty R, Turgeman A, Kirshenbaum D, Ben-Haim SA. Electromechanical characterisation of chronic myocardial infarction in the canine coronary occlusion model. *Circulation*; 98:2055-2064,1998.
6. Petrank YF, Azhari H, Lessick J, Sideman S, Beyar R. Effect of aneurysmectomy on left ventricular shape and function: case studies. *Med Eng Phys.*; 21(8):547-54,1999.
7. Lessick J., Smeets JLRM, Reisner SA, Ben-Haim SA. Electromechanical Mapping Of Regional Left Ventricular Function In Humans: Comparison With Echocardiography. *Catheter Cardiovasc Interv.*; 50(1):10-8, 2000.
8. The BIP Study Group. Secondary Prevention by Raising HDL cholesterol and reducing triglycerides in patients with coronary artery disease: The Bezafibrate Infarction Prevention (BIP) Study. *Circulation* 102: 21-27, 2000.
9. Lessick J, Mutlak D, Rinkevich D, Markiewicz W, Reisner SA. Prospective study of early atropine use in dobutamine stress echocardiography. *Eur J Echocardiography*; 1:257-262, 2000.

10. Lessick J, Kornowski R, Fuchs S, Ben-Haim SA. Assessment of NOGA catheter stability during the entire cardiac cycle by means of a special needle-tipped catheter. *Catheter Cardiovasc Interv.*; 52(3):400-6, 2001.
11. Schwartzman A, Wolf T, Gepstein L, Hayam G, Lessick J, Reisfeld D, Schwartz Y, Uretzky G, Ben-Haim SA. Characterisation of acute myocardial ischaemia in a canine model based on principal component analysis of unipolar endocardial electrograms. *Med Biol Eng Comput.*; 39(5):571-8, 2001.
12. Lessick J, Mutlak D, Markiewicz W, Reisner SA. Failure of left ventricular hypertrophy to regress after surgery for aortic valve stenosis. *Echocardiography.* 19(5):359-66, 2002.
13. Lessick J, Hayam G, Zaretsky A, Reisner SA, Schwartz Y, Ben-Haim SA. Evaluation of inotropic changes in ventricular function by NOGA mapping: comparison with echocardiography. *J Appl Physiol.*; 93(2):418-26, 2002.
14. Lessick J, Wolf T, Gepstein L, Hayam G, Ben-Haim SA. Temporal changes in the endocardial ST segment during the evolution of myocardial infarction in dogs. *Pacing Clin Electrophysiol.*; 25(11):1616-23, 2002.
15. Reisner S, Lysyansky P, Agmon Y, Mutlak D, Lessick J, Friedman Z. "Global longitudinal strain" - a Novel Index of Left Ventricular Systolic Function. *J Am Soc Echocardiogr.*;17(6):630-3, 2004.
16. Aviram G, Finkelstein A, Herz I, Lessick J, Miller H, Graif M, Keren G. Clinical value of 16-slice multi-detector CT compared to invasive coronary angiography. *Int J Cardiovasc Intervent.*; 7(1):21-8, 2005.
17. Hoffmann MH, Lessick J, Manzke R, Schmid FT, Gershin E, Boll DT, Rispler S, Aschoff AJ, Grass M. Automatic determination of minimal cardiac motion phases for computed tomography imaging: initial experience. *Eur Radiol.*; 16(2):365-73, 2006.
18. Lessick J, Mutlak D, Rispler S, Gershin E, Dragu R, Litmanovich D, Engel A, Reisner SA, Agmon Y. Comparison of multidetector computed tomography versus echocardiography for assessing regional left ventricular function. *Am J Cardiol.*; 96(7):1011-5, 2005.
19. Gershin E, Litmanovich D, Ofer A, Lessick J, Dragu R, Rispler S, Brook OR, Gruberg L, Beyar R, Engel A. 16 Slice CT Coronary Angiography In Acute Chest Pain Syndrome Versus Invasive Coronary Angiography – a Blinded Prospective Study; *AJR*



- Am J Roentgenol.;186(1):177-84, 2006.
- 20.Garcia MJ, Lessick J, Hoffmann MH; CATSCAN Study Investigators. Accuracy of 16-row multidetector computed tomography for the assessment of coronary artery stenosis. JAMA.;296(4):403-11, 2006.
- 21.Dragu R, Rispler S, Ghersin E, Gruberg L, Lessick J, Litmanovich D, Aronson D, Hammerman H, Ofer A, Engel A, Beyar R. Contrast enhanced multi-detector computed tomography coronary angiography versus conventional invasive quantitative coronary angiography in acute coronary syndrome patients-correlation and bias. Acute Card Care.;8(2):99-104, 2006.
- 22.Aronson D, Goldsher N, Zukermann R, Kapeliovich M, Lessick J, Mutlak D, Dabbah S, Markiewicz W, Beyar R, Hammerman H, Reisner S, Agmon Y. Ischemic mitral regurgitation and risk of heart failure after myocardial infarction. Arch Intern Med.;166(21):2362-8, 2006.
- 23.Lessick J, Dragu R, Litmanovich D, Mutlak D, Rispler S, Agmon Y, Beyar R, Engel A, Kapeliovich M, Hammerman H, Ghersin E. Is Functional Improvement Post Myocardial Infarction is Predicted by Myocardial Enhancement Patterns on Multidetector Computed Tomography? *Radiology* 244 (3): 736-744; 2007.
- 24.Lessick J, Ghersin E, Dragu R, Litmanovich D, Mutlak D, Rispler S, Agmon Y, Engel A, Beyar R. Diagnostic Accuracy of Myocardial Hypoenhancement on Multidetector Computed Tomography in Identifying Myocardial Infarction in Patients Admitted with Acute Chest Pain Syndrome. *Journal of Computer Assisted Tomography* 31 (5):780-788; 2007.
- 25.Lessick J, Ghersin E, Abadi S, Yalonetsky S. Accuracy of Long-axis Area-Length Method for Measurement of Left Ventricular Volumes and Ejection Fraction using Multidetector Computed Tomography. *Can J Cardiol.*;24(9):685-9, 2008.
- 26.Dragu, R., Kerner, A., Gruberg, L., Rispler, S., Lessick, J., Ghersin, E., Litmanovich, D., Engel A, Beyar R, Roguin, A. Angiographically uncertain left main coronary artery narrowings: Correlation with multidetector computed tomography and intravascular ultrasound. *International Journal of Cardiovascular Imaging* 24 (5):557-563, 2008.
- 27.Mutlak D, Aronson D, Lessick J, Reisner SA, Dabbah S, Agmon Y. Functional Tricuspid Regurgitation in Patients with Pulmonary Hypertension: Is Pulmonary Artery Pressure the Only Determinant of Regurgitation Severity? *Chest*. 135(1):115-21, 2009.

28. Aronson D, Mutlak D, Lessick J, Kapeliovich M, Dabbah S, Markiewicz W, Beyar R, Hammerman H, Reisner S, Agmon Y. Relation of statin therapy to risk of heart failure after acute myocardial infarction. *Am J Cardiol.*; 102(12):1706-10, 2008.
29. Lessick J, Ben-Haim T, Mutlak, D, Abadi S, Agmon Y, and Ghersin E. Quantitative Evaluation of Regional Left Ventricular Function by Multidetector Computed Tomography; *J Comput Assist Tomogr.*;33(2):204-10, 2009.
30. Ghersin E, Abadi S, Lessick J. Clinical Evaluation of a Fully Automated Model-based Algorithm to Calculate Left Ventricular Volumes and Ejection Fraction using Multidetector Computed Tomography; *Acute Card Care.*; 11(1):43-51, 2009.
31. Carasso S, Cohen O, Mutlak D, Adler Z, Lessick J, Reisner SA, Rakowski H, Bolotin G, Agmon Y. Differential effects of afterload on left ventricular long-and short-axis function: insights from a clinical model of patients with aortic valve stenosis undergoing aortic valve replacement. *Am Heart J.*;158(4):540-5, 2009.
32. Abadi S, Roguin A, Engel A, Lessick J. Feasibility of automatic assessment of four-chamber cardiac function with MDCT: Initial clinical application and validation. *Eur J Radiol.*;74(1):175-81, 2010.
33. Aronson D, Musallam A, Lessick J, Dabbah S, Carasso S, Hammerman H, Reisner S, Agmon Y, Mutlak D. Impact of diastolic dysfunction on the development of heart failure in diabetic patients after acute myocardial infarction. *Circ Heart Fail.*; 3(1):125-31, 2010.
34. Bahouth F, Mutlak D, Furman M, Musallam A, Hammerman H, Lessick J, Dabbah S, Reisner S, Agmon Y, Aronson D. Relationship of functional mitral regurgitation to new-onset atrial fibrillation in acute myocardial infarction. *Heart.*;96(9):683-8, 2010.
35. Mutlak D, Aronson D, Lessick J, Reisner SA, Dabbah S, Agmon Y. Frequency, characteristics, and outcome of patients with aortic stenosis, left ventricular dysfunction, and high (versus low) trans-aortic pressure gradient. *Isr Med Assoc J.*; 12(9):563-7, 2010.
36. Peters J, Lessick J, Kneser R, Wächter I, Vembar M, Ecabert O, Weese J. Accurate segmentation of the left ventricle in computed tomography images for local wall thickness assessment. *Med Image Comput Comput Assist Interv.*;13(Pt 1):400-8, 2010.
37. Carasso S, Cohen O, Mutlak D, Adler Z, Lessick J, Aronson D, Reisner SA, Rakowski H, Bolotin G, Agmon Y. Relation of Myocardial Mechanics in Severe Aortic Stenosis

- to Left Ventricular Ejection Fraction and Response to Aortic Valve Replacement. *Am J Cardiol.*;107(7):1052-7,2011.
- 38.Feuchtner GM, Spoeck A, Lessick J, Dichtl W, Plass A, Leschka S, Mueller S, Klauser A, Scheffel H, Wolf F, Jaschke W, Alkadhi H. Quantification of aortic regurgitant fraction and volume with multi-detector computed tomography comparison with echocardiography. *Acad Radiol.*; 18(3):334-42, 2011.
- 39.Aronson D, Mutlak D, Bahouth F, Bishara R, Hammerman H, Lessick J, Carasso S, Dabbah S, Reisner S, Agmon Y. Restrictive Left Ventricular Filling Pattern and Risk of New-Onset Atrial Fibrillation After Acute Myocardial Infarction. *Am J Cardiol.*;107(12):1738-43, 2011.
- 40.Ecabert O, Peters J, Walker MJ, Ivanc T, Lorenz C, von Berg J, Lessick J, Vembar M, Weese J. Segmentation of the heart and great vessels in CT images using a model-based adaptation framework. *Med Image Anal.*;15(6):863-76, 2011.
- 41.Bishara R, Telman G, Bahouth F, Lessick J, Aronson D. Transient atrial fibrillation and risk of stroke after acute myocardial infarction. *Thromb Haemost.*;106(5):877-84, 2011.
- 42.Mutlak D, Aronson D, Carasso S, Lessick J, Reisner SA, Agmon Y. Frequency, Determinants and Outcome of Pulmonary Hypertension in Patients With Aortic Valve Stenosis. *Am J Med Sci.*;343(5):397-401, 2012.
- 43.Lessick J, Abadi S, Agmon Y, Keidar Z, Carasso S, Aronson D, Ghersin E, Rispler S, Sebbag A, Israel O, Hammerman H, Roguin A. Multidetector computed tomography predictors of late ventricular remodeling and function after acute myocardial infarction. *Eur J Radiol.*;81(10):2648-57, 2012.
- 44.Mutlak D, Lessick J, Carasso S, Kapeliovich M, Dragu R, Hammerman H, Agmon Y, Aronson D. Utility of Pulmonary Hypertension for the Prediction of Heart Failure Following Acute Myocardial Infarction. *Am J Cardiol.*; 109(9):1254-9, 2012.
- 45.Carasso S, Biaggi P, Rakowski H, Mutlak D, Lessick J, Aronson D, Woo A, Agmon Y. Velocity Vector Imaging: Standard Tissue-Tracking Results Acquired in Normals-The VVI-STRAIN Study. *J Am Soc Echocardiogr.*; 25(5):543-52, 2012.
- 46.Mutlak D, Carasso S, Lessick J, Aronson D, Reisner SA, Agmon Y. Excessive respiratory variation in tricuspid regurgitation systolic velocities in patients with severe tricuspid regurgitation. *Eur Heart J Cardiovasc Imaging.*; 14(10):957-62, 2013.

47. Hamoud S, Mahamid R, Halabi M, Lessick J, Abbadi S, Shreter R, Keidar Z, Aronson D, Hammerman H, Hayek T. Chest pain unit in an internal medicine department: comparison of a year with the facility to a year without. *Isr Med Assoc J.*;15(2):79-84, 2013.
48. Ghersin N, Abadi S, Sabbag A, Lamash Y, Anderson RH, Wolfson H, Lessick J. The three-dimensional geometric relationship between the mitral valvar annulus and the coronary arteries as seen from the perspective of the cardiac surgeon using cardiac computed tomography. *Eur J Cardiothorac Surg.*; 44(6):1123-30, 2013.
49. Kerner A, Abadi S, Abergel E, Solomonica A, Aronson D, Roguin A, Lessick J. Direct comparison between coronary computed tomography and invasive angiography for calculation of SYNTAX score. *Eurointervention*; 22;8(12):1428-34; 2013.
50. Ghersin E, Castellon I, Runco Therrien JE, Tanawuttiwat T, Lessick J, Checkver A, Soto V. ECG-gated cardiac MDCT for detection of systolic anterior motion of mitral valve. *Acute Card Care.*;15(3):69-75; 2013.
51. Aronson D, Darawsha W, Atamna A, Kaplan M, Makhoul BF, Mutlak D, Lessick J, Carasso S, Reisner S, Agmon Y, Dragu R, Azzam ZS. Pulmonary hypertension, right ventricular function, and clinical outcome in acute decompensated heart failure. *J Card Fail.*;19(10):665-71; 2013.
52. Carasso S, Agmon Y, Roguin A, Keidar Z, Israel O, Hammerman H, Lessick J. Left ventricular function and functional recovery early and late after myocardial infarction: a prospective pilot study comparing two-dimensional strain, conventional echocardiography, and radionuclide myocardial perfusion imaging. *J Am Soc Echocardiogr.*;26(11):1235-44; 2013.
53. Yalonetsky S, Eden H, Lessick J, Kapeliovich M, Dragu R, Mutlak D, Carasso S, Reisner S, Agmon Y, Hammerman H, Aronson D. Impact of functional mitral regurgitation on right ventricular function and outcome in patients with right ventricular infarction. *Am J Cardiol.*;114(1):36-41; 2014.
54. Lamash Y, Fischer A, Carasso S, Lessick J. Strain analysis from 4-D cardiac CT image data. *IEEE Trans Biomed Eng.*;62(2):511-21; 2015.
55. Carasso S, Mutlak D, Lessick J, Reisner SA, Rakowski H, Agmon Y. Symptoms in severe aortic stenosis are associated with decreased compensatory circumferential myocardial mechanics. *J Am Soc Echocardiogr.*; 28(2):218-25, 2015.

56. Lessick J, Klass O, Wuchenauer S, Walker MJ, Schmitt H, Peters J, Weese J, Brunner H, Vembar M, Grass M, Aronson D, Hoffmann MH. Automatic Determination of Differential Coronary Artery Motion Minima for Cardiac Computed Tomography Optimal Phase Selection. *Acad Radiol.*; 22(6):697-703; 2015.
57. Schweitzer A, Agmon Y, Aronson D, Abadi S, Mutlak D, Carasso S, Walker JR, Lessick J. Assessment of left sided filling dynamics in diastolic dysfunction using cardiac computed tomography. *Eur J Radiol.*;84(10):1930-7; 2015.
58. Marai I, Boulos M, Lessick J, Abadi S, Blich M, Suleiman M. Outflow tract ventricular arrhythmia originating from the aortic cusps: our approach for challenging ablation. *J Interv Card Electrophysiol.* 45(1):57-62; 2016.
59. Walker JR, Abadi S, Solomonica A, Mutlak D, Aronson D, Agmon Y, Lessick J. Left-sided Cardiac Chamber Evaluation using Single-phase Mid-diastolic Coronary Computed Tomography Angiography: Derivation of Normal Values and Comparison with Conventional End-diastolic and End-systolic Phases. *Eur Radiol.* 26(10):3626-34; 2016.
60. Ghersin I, Ghersin E, Abadi S, Runco Therrien JE, Tanawuttiwat T, Aronson D, Lessick J. Assessment of Diastolic Function in Hypertrophic Cardiomyopathy by Computed Tomography-Derived Analysis of Left Ventricular Filling. *J Comput Assist Tomogr.* 41(3):339-343; 2017.
61. Shahar K, Darawsha W, Yalonetsky S, Lessick J, Kapeliovich M, Dragu R, Mutlak D, Reisner S, Agmon Y, Aronson D. Time Dependence of the Effect of Right Ventricular Dysfunction on Clinical Outcomes After Myocardial Infarction: Role of Pulmonary Hypertension. *J Am Heart Assoc.* 11;5(7); 2016.
62. Marai I, Suleiman M, Blich M, Lessick J, Abadi S, Boulos M. Impact of computed tomography image and contact force technology on catheter ablation for atrial fibrillation. *World J Cardiol.* 26;8(4):317-22; 2016.
63. Kerner A, Abadi S, Dotan R, Javitt M, Aronson D, Lessick J. Automatic Estimation of Optimal Deployment of Transcatheter Aortic Valve Implantation by Computed Tomography. *J Heart Valve Dis.* 26(2):130-138; 2017.
64. Mutlak D, Lessick J, Khalil S, Yalonetsky S, Agmon Y, Aronson D. Tricuspid regurgitation in acute heart failure: is there any incremental risk? *Eur Heart J Cardiovasc Imaging.* 19(9):993-1001; 2018.

65. Gorodisky L, Agmon Y, Porat M, Abadi S, Lessick J. Assessment of mitral regurgitation by 3-dimensional proximal flow convergence using magnetic resonance imaging: comparison with echo-Doppler. *Int J Cardiovasc Imaging*. 34(5):793-802; 2018.
66. Peled Z, Lamash Y, Carasso S, Fischer A, Agmon Y, Mutlak D, Aronson D, Bolotin G, Lessick J. Automated 4-dimensional regional myocardial strain evaluation using cardiac computed tomography. *Int J Cardiovasc Imaging*. 36(1):149-159; 2020.
67. Mutlak D, Khoury E, Lessick J, Kehat I, Agmon Y, Aronson D. Lack of Increased Cardiovascular Risk due to Functional Tricuspid Regurgitation in Patients with Left-Sided Heart Disease. *J Am Soc Echocardiogr*. 32(12):1538-1546; 2019.
68. Mutlak D, Khalil J, Lessick J, Kehat I, Agmon Y, Aronson D. Risk Factors for the Development of Functional Tricuspid Regurgitation and Their Population-Attributable Fractions. *JACC Cardiovasc Imaging*. 13(8):1643-1651; 2020.
69. van der Veen HA, Lessick J, Abadi S, Mutlak D. Accuracy of Diastolic Function by Cardiac Computed Tomography Relative to Echo-Doppler: Additive Clinical and Prognostic Value. *J Comput Assist Tomogr*. 45(2):242-247; 2021.
70. Hamdan A, Nassar M, Schwammenthal E, Perlman G, Arow Z, Lessick J, Kerner A, Barsheshet A, Assa HV, Assali A, Aviv Y, Goitein O, Brodov Y, Codner P, Orvin K, Biton D, Klein E, Danenberg H, Finkelstein A, Kornowski R. Short membranous septum length in bicuspid aortic valve stenosis increases the risk of conduction disturbances. *J Cardiovasc Comput Tomogr*. 15(4):339-347; 2021.
71. Lessick J, Mutlak D, Mutlak M, Sheik-Muhamad R, Naami R, Efraim R, Abadi S, Aronson D. Left atrial function by cardiac computed tomography is a predictor of heart failure and cardiovascular death. *Eur Radiol*. 2021. doi: 10.1007/s00330-021-08093-4. Epub ahead of print. PMID: 34136947.
72. Shiyovich A, Kornowski R, Plakht Y, Aviv Y, Assa HV, Assali A, Bental T, Lessick J, Kerner A, Segev A, Barabash IM, Goitein O, Brodov Y, Massalha E, Finkelstein A, Perlman GY, Hamdan A. Increased Rate of New-onset Left Bundle Branch Block in Patients With Bicuspid Aortic Stenosis Undergoing Transcatheter Aortic Valve Implantation (From a National Registry). *Am J Cardiol*. 2021:S0002-9149(21)00630-5. doi: 10.1016/j.amjcard.2021.06.046. Epub ahead of print. PMID: 34344509.

## 2 - Clinical Descriptive Research

- 1 Rinkevich D, Lessick J, Mutlak D, Markiewicz W, Reisner SA. Natural history of moderate mitral valve stenosis. *Isr Med Assoc J*.;5(1):15-8, 2003.
- 2 Yalonetsky S, Agmon Y, Lessick J. Contrast Echocardiographic Imaging of Left Ventricular Diverticulum in Adult Patients. *J Am Soc Echocardiogr*.; 20(2):198.e1-3, 2007.
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## 3 - Case Reports

- 1 Lessick J, Schwartz Y, Lorber A: Neonatal Advanced Heart Block due to Cardiac Tumour. *Pediatric Cardiology*; 19:263-265, 1998.
- 2 Ghersin E, Litmanovich D, Ofer A, Lessick J, Dragu R, Rispler S, Beyar R, Engel A. Anomalous origin of right coronary artery: diagnosis and dynamic evaluation with multidetector computed tomography. *J Comput Assist Tomogr*.; 28(2):293-4, 2004.
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#### **4 - Review papers**



1. Hoffmann MH, Lessick J. Multidetector-row computed tomography for noninvasive coronary imaging. (Review). *Expert Rev Cardiovasc Ther.* 4(4):583-94, 2006.

## **5 - Editorials**

- 1 Lessick J, Aronson D. Automatic annular sizing - What's in a millimeter? *Int J Cardiol.* 272:279-280; 2018.
2. Lessick J. Is CMR the gold standard for evaluating transvalvular flow? *Int J Cardiol.* 2020 Oct 15;317:221-222.
3. Lessick J, Gepstein L. Is image integration with preprocedural CT a necessity? *Int J Cardiovasc Imaging.* 2021 doi: 10.1007/s10554-021-02360-7. Epub ahead of print. PMID: 34363122.

## **6 - Books and book chapters**

1. Azhari H, Beyar R, Lessick J, Marcus ML, and Sideman S: Global and Regional Shape-Function Relationship in Left Ventricular Aneurysm., In *Imaging, Measurements and Analysis of the Heart*, Editors S. Sideman, R. Beyar, Hemisphere Publishing Corporation, New York, Chapter 3, pp33-46,1991.
2. Beyar R, Manor D, Hallman M, Azhari H, Dinnar U, Lessick J, and Sideman S: A Coronary Circulatory Model Linked to Three-Dimensional Cardiac Mechanics., In *Imaging, Measurements and Analysis of the Heart*, Editors S. Sideman and R. Beyar, Hemisphere Publishing Corporation, New York, Chapter 10, pp127-138,1991.
3. Lessick J, Aviram G. Myocardial Perfusion and Delayed Enhancement. In *The Complete Guide to Cardiac CT*. Editor S. Abramson. McGraw-Hill Companies, New York. Chapter 22, pp571-601, 2011.
4. Agmon Y, Lessick J, Reisner S: Left atrial thrombus. In *ASE's Comprehensive Echocardiography*, 2nd Edition, Editors RM Lang, SA Goldstein, I Kronzon, BK Khanderia, V Mor-Avi, Publishers Elsevier Saunders, PA, pp627-633, 2015.

## **Patents**

1. US Pat. 20040039293A1 - Filed Aug 20, 2003. Joshua Porath, Jonathan Lessick. Transient event mapping in the heart. (Also EP20040254991, JP2004239824, CA 2477986).
2. US Pat. 20050288598A1 - Filed Jun 2, 2004. Guy Lavi, Jonathan Lessick. Automatic determination of the long axis of the left ventricle in 3D cardiac imaging.
3. US Pat. 20080219527A1 – Filed July 17, 2006. Guy Lavi, Jonathan Lessick .Cardiac Region Detection From Motion Analysis of Small Scale Reconstruction. (Also EP1913553A2).
4. US Pat. 20100040193A1 - Filed Nov 13, 2007. Jonathan Lessick. Gated computed tomography.
5. EP2088918A2 – Filed Nov 13, 2007. Jonathan Lessick. Reconstruction window adaption in ecg-gated computed tomography.
6. US Pat. 20100104160A1 - Filed Feb 13, 2008. Guy Lavi, Jonathan Lessick. Image Viewing Window.
7. US Pat. 20130077838A1 – Filed April 27, 2011. Yechiel Lamash, Jonathan Lessick, Asher Gringauz. Tissue classification. (Also EP20110722170).

**Other publications** (letters, editorials, commentaries, etc.)

1. Agmon Y, Lessick J, Reisner SA. Heart failure with a normal ejection fraction. (Letter). *Circulation*;105(6):e48; 2002.
2. M Garcia, M Hoffmann, J Lessick - CATSCAN (coronary assessment by CT scanning and catheter angiography): Protocol of a multi-center trial. *MEDICAMUNDI*, 48(3):30-35, 2004.
3. Lessick J, Aronson D. Noninvasive approach to assess coronary artery stenoses and ischemia. (Letter). *JAMA.*;309(3):234; 2013.

**15. CONFERENCES**

**Plenary or invited talks to international conferences**

- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2003  
*CT of the coronary arteries (plenary)*
- Cardiac CT Workshop, Paris 6/2007  
*Scanning the Myocardium (plenary)*
- IX Congres Francophone de Cardiologie Interventionnelle, Paris 10/2007  
*Use of Perfusion Defects in Predicting Myocardial Recovery (plenary)*
- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2007  
*Use of CT to Assess Myocardial Perfusion and Viability (parallel sessions)*
- South African Heart Congress, Wild Coast, South Africa, 10/2008  
*The Role of CT/MRI in Diagnosing Coronary Artery Disease (parallel sessions)*
- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2008  
*Panel discussion: Will CT become the ultimate imaging modality? (parallel sessions)*
- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2012  
*The Role of CT & MRI for Cardiac Interventions (parallel sessions)*
- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2013  
*Can Cardiac CT Assess the Functional Significance of a Coronary Stenosis? (parallel sessions)*
- Innovations in Cardiovascular Interventions, Tel Aviv, 12/2014  
*Assessment of LV Systolic Function from Cardiac CT by Automatic 3D Myocardial Strain Analysis. (parallel sessions)*

### **Plenary or invited talks to national conferences**

- Echocardiography Working Group Annual Meeting, Tel Aviv 2007  
Non-coronary cardiac applications of multi-detector computerized tomography (plenary)
- Invasive Cardiology Working Group Annual Meeting, Tel Aviv 2009  
CT of the coronary arteries from a cardiologists perspective (plenary)
- Nuclear Cardiology Working Group Annual Meeting, Tel Aviv 2010  
CT vs. MPI: Direct Comparison in Assessing CAD (plenary)
- Congestive Heart Failure Working Group annual meeting Tel Aviv 6.2019  
Imaging of the right ventricle

- Cardio Femme 2019, Kefar Bloom, 12-14.9.2019  
MRI in Takotsubo cardiomyopathy
- Decision-making in Primary Medicine, Dan Carmel, Haifa, 11/12/2019  
Use of imaging in cardiac risk stratification

### Refereed papers in conference proceedings

- 1 Hallman M, Sideman S, Lessick J and Beyar R: Three Dimensional Display of the Heart and Coronaries Relating Stenosis Shape and Severity to Regional Function, *Computers in Cardiology*, pp. 325-327, 1991.
- 2 Lessick J, Sideman S, Azhari H, Hallman M and Beyar R: Automatic Characterisation of Geometric Remodeling in Aneurysmal Left Ventricles, *Computers in Cardiology* pp. 505-507, 1992.
- 3 Schwartzman A, Wolf T, Gepstein L, Hayam G, Lessick J, Reisfeld D, Schwartz Y, Uretzky G, Ben-Haim SA. Principal component analysis as a method of investigation of endocardial signals in acute myocardial ischemia *Computers in Cardiology*, pp. 837-840, 2000.
- 4 Schwartzman A, Wolf T, Gepstein L, Hayam G, Lessick J, Reisfeld D, Schwartz Y, Uretzky G, Ben-Haim SA. Characterisation of acute myocardial ischaemia in a canine model based on principal component analysis of unipolar endocardial electrograms. *Medical and Biological Engineering and Computing* 39 (5), pp. 571-578, 2001.
- 5 Lorenz C, Lessick J, Lavi G, Bülow T, Renisch S: Fast Automatic Delineation of Cardiac Volume of Interest in MSCT images. *Proceedings of SPIE - The International Society for Optical Engineering* 5370 I, pp. 456-466, 2004.
- 6 Lavi G, Lessick J, Johnson PC, Khullar D - Single-seeded coronary artery tracking in CT angiography. *IEEE Nuclear Science Symposium Conference*, Record 5, pp. 3308-3311, 2004.
- 7 Shechter G, Naveh G, Lessick J, Altman A: Streak artifact reduction in cardiac cone beam CT. *Progress in Biomedical Optics and Imaging - Proceedings of SPIE* 5747 (III), pp. 2148-2157, 2005.

- 8 Amit G, Gavriely N, Lessick J, Intrator N - Automatic Extraction of Physiological Features from Vibro-Acoustic Heart Signals: Correlation with Echo-Doppler. *Computers in Cardiology* 32: pp. 299-302, 2005.
- 9 Amit G, Gavriely N, Lessick J, Intrator N. Acoustic Indices of Cardiac Functionality. *International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS)*, Vol 2, pp 77-83, 2008.
- 10 Schmitt H, Peters J, Lessick J, Weese J and Grass M. Spatially Resolved Automatic Cardiac Rest Phase Determination in Coronary Computed Tomography Angiography. *IFMBE Proceedings. World Congress on Medical Physics and Biomedical Engineering*, Volume 25/2: 162-165; 2009.
- 11 Peters J; Lessick J; Kneser R; Wächter I; Vembar M; Ecabert O; Weese, J. Accurate segmentation of the left ventricle in computed tomography images for local wall thickness assessment. In Medical image computing and computer-assisted intervention : MICCAI . International Conference on Medical Image Computing and Computer-Assisted Intervention , vol. 13; pp 400-408, 2010.
- 12 Peters J; Lessick J; Kneser R; Wächter I; Vembar M; Ecabert O; Weese J. Accurate segmentation of the left ventricle in computed tomography images for local wall thickness assessment. In Lecture Notes in Computer Science, vol. 6361, LNCS, 2010.
- 13 Lamash Y, Lessick J, Gringauz A; An automatic method for the identification and quantification of myocardial perfusion defects or infarction from cardiac CT images *Biomedical Imaging: From Nano to Macro, Proceedings IEEE International Symposium on Biomedical Engineering*, pp 1314 – 1317; 2011.
- 14 Gorodisky L, Lessick J, Porat M. Use of magnetic resonance imaging (MRI) vs. acoustic imaging to assess the severity of Mitral Regurgitation. *Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED)*, XVIIth International Seminar/Workshop on. pp 136 – 140, 2012.
- 15 Lamash Y, Fischer A, and Lessick J. Texture mapping by isometric spherical embedding for the visualization and assessment of regional myocardial function. In *Functional Imaging and Modeling of the Heart*. Springer Berlin Heidelberg. Vol 7945;383-390, 2013.

- 16 Lamash Y, Fischer A, and Lessick J. Elastic Image Registration using Linear Basis Functions for Non-Continuously Deforming Objects Biomedical Imaging: From Nano to Macro, 2014 IEEE 11<sup>th</sup> International Symposium on. ISBI, pp 572 – 575, 2014.
- 17 Lamash Y, Fischer A, Carasso S and Lessick J. Fast Method for Estimating the Regional Mechanical Function of the Left Ventricle from 4D Cardiac CT DataBiomedical Imaging: From Nano to Macro, 2014 IEEE 11<sup>th</sup> International Symposium on Biomedical Engineering. ISBI, pp 441 – 444, 2014.
- 18 Raviv D, Lessick J, Raskar R. Evaluating Local Contractions from Large Deformations Using Affine Invariant Spectral Geometry. In Statistical Atlases and Computational Models of the Heart - Imaging and Modelling Challenges, Lecture Notes in Computer Science Volume 8896, pp 147-157, 2015.

## **16. SPECIAL PROFESSIONAL ACTIVITIES**

### ***Visiting Physician:***

- New York University Hospital Echocardiography Laboratory (August-September 2000)
- New York Presbyterian Hospital (Cornell) MRI program (September-November 2010)