

BIOGRAPHICAL SKETCH

NAME Victor F. Froelicher, MD	POSITION TITLE Professor of Medicine, Emeritus		
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
St. Vincent's College, Latrobe, PA	BA	1963	Pre-Medical
University of Pittsburgh, Pittsburg, PA	M.D.	1967	Medicine

A. Personal Statement

I am a Professor of Medicine in the Cardiology Division at Stanford University and Director of the Sportsmedicine Clinic at Stanford Health Care Organization. I have been performing research and writing in the areas of exercise testing and training for more than 40 years. My research has also focused on the epidemiology of cardiovascular disease, particularly exercise test factors related to outcomes. The PI, Dr. Jonathan Myers, and I have collaborated for more than 30 years on funded research studies in the areas of clinical applications of exercise testing and training in cardiovascular disease. We have written several books together in addition to numerous peer-reviewed articles. I have been a co-author of guidelines and scientific statements on exercise testing and rehabilitation by the American Heart association, American College of Cardiology, and American College of Sports Medicine, and I am a founding member of the American Association of Cardiovascular and Pulmonary Rehabilitation. I was PI on an NIH-funded Specialized Center of Research project entitled "Perfusion, Performance and Exercise Trial" (PERFEXT), a randomized trial which addressed the effects of one-year training on myocardial perfusion and function in patients with coronary artery disease. This was the first randomized study to employ nuclear techniques to study the effects of rehabilitation on myocardial perfusion. This project produced a number of landmark studies, including the effects of training on computerized ischemic changes, predictors of the training response, optimization of measures of perfusion, and training adaptations of ventricular size and function. I was also PI of an VA Cooperative study employing computerized methods to assess the diagnostic accuracy of the computerized exercise test (QUEXTA). The latter project was the first to evaluate the diagnostic characteristics of the computerized exercise test in the absence of work-up bias. In the current proposal, I will assist Dr. Myers in overseeing study issues related to exercise testing and training, and assist Dr Ashley in the design and assessment of the effects of exercise training on molecular and genetic adaptations. In addition, I will assist both PIs in the overall supervision and scientific conduct of the study. Having joint clinical appointments at both the VA and Stanford will facilitate my involvement.

B. Positions and Honors

Positions and Employment

1967-1971	Internal Medicine Residency, Wilford Hall USAFMC, San Antonio, Tx
1970-1971	Cardiology Fellowship, University of Alabama, Birmingham
1972-1976	Director, Exercise Laboratory, USAFSAM, Brooks Air Force Base, San Antonio, TX
1972-1974	Director, Cardiac Catheterization Laboratory, USAFSAM, Brooks Air Force Base, San Antonio, TX
1972-1974	Chief, Cardiovascular Division, USAFSAM, Brooks Air Force Base, San Antonio, TX
1976-1977	Assistant Chief, Cardiology Service, Wilford Hall, US Air Force Medical Center, Lackland AFB, TX
1977-1980	Assistant Professor of Medicine, University of California School Medicine, San Diego, CA
1977-1983	Director, Cardiac Rehabilitation and Exercise Testing, Attending Physician, University of CA Medical Center, University Hospital and VA Hospital, San Diego, CA
1980-1983	Associate Professor of Medicine, University of California School of Medicine, San Diego, CA
1983-1991	Chief, Cardiology Section, VA Medical Center, Long Beach, CA
1984-1991	Professor of Medicine, University of California School of Medicine, Irvine, CA

- 1984-1991 Assistant Chief, Cardiology Division, University of California, Irvine, CA
1992- Professor of Medicine, Stanford University School of Medicine, Stanford, CA
1992-2015 Director, ECG and Exercise Testing Laboratory, VA Palo Alto Health Care System, Palo Alto, CA
2015- Director Sports Cardiology, Stanford Health Care Organization, Stanford, California and Staff Cardiologist at the Palo Alto VA (fee-basis)

Other Experience and Professional Memberships

Fellow, American College of Cardiology,
Fellow, American College of Sports Medicine
Fellow, American College of Physicians
Fellow, American Heart Association

Honors

Chosen for "Best Doctors" in the US and the Pacific Region
Writing group for the AHA Exercise Standards
Writing group for ACC Exercise Testing Guidelines
Writing Group for the Seattle ECG Criteria for screening Athletes for sudden cardiac death.
Editorial Board Member for Circulation, Journal of the American College of Cardiology, CHEST, American Journal of Cardiology, American Heart Journal, Journal of Clinical Cardiology, Founding Editor, Journal of Cardiopulmonary Rehabilitation, Annals of Non-Invasive Cardiology

C. Contribution to Science

1. **Screening of Asymptomatic USAF Aircrewmembers** – While Director of CV research at the USAF School of Medicine (1972-1977), I presented seminal data on the angiographic findings and follow up of aircrewmembers with abnormal ECGs and abnormal exercise tests. These studies were critical to the understanding of Bayesian statistics and screening. I was also responsible for seminal studies regarding the physiological responses to exercise testing.
 - a. Froelicher VF, Thomas M, Pillow C, and Lancaster MC. An epidemiological study of asymptomatic men screened by maximal treadmill testing for latent CAD. *Am J Cardiol* 1974;34:770-776.
 - b. Froelicher VF, Thompson AJ, Wolthius R, Fuchs R, Balusek R, Longo MR, Triebwasser JH, and Lancaster MC. Angiographic findings in asymptomatic aircrewmembers with electrocardiographic abnormalities. *Am J of Cardiol*, 1977;39:32-38.
 - c. Froelicher VF, Thompson AJ, Noquero I, Davis G, Stewart A, and Triebwasser J. Prediction of maximal oxygen consumption. Comparison of the Bruce and Balke treadmill protocols. *Chest* 1975;68:331-336.
 - d. Froelicher VF, Brammell H, Davis G, Noguera I, Stewart A, and Lancaster MC. A comparison of three maximal treadmill exercise protocols. *J Appl Physiol* 1974;36:720-725.
2. **The Cardiovascular Effects of Cardiac Rehabilitation (PERFEXT)** – While Director of Cardiac Rehabilitation at University Hospital and The San Diego VA (1977-1983), I was PI of an NHLBI funded randomized trial of Cardiac Rehabilitation. We demonstrated physiological adaptations but minimal changes in nuclear perfusion.
 - a. Froelicher VF, Jensen D, Genter F, Sullivan M, McKirnan MD, Witztum K, Scharf J, Strong ML and Ashburn W. A randomized trial of exercise training in patients with coronary heart disease. *JAMA* 1984;252:1291-1297.
 - b. Froelicher VF, Sullivan M, Myers J, Jensen D. Can patients with coronary artery disease receiving beta blockers obtain a training effect? *Am J Cardiol* 1985;55:155D-161D.
 - c. Myers J, Ahnve S, Froelicher VF, Sullivan M, Friis R. Influence of exercise training on spatial R-wave amplitude in patients with coronary artery disease. *J Appl Physiol* 1987;62:1231-1235.
3. **Prognostic Studies in Veterans** – While Chief of Cardiology at the LBVAMC, I developed the cardiology data bases for follow up studies of Veterans who had ECGs and exercise tests. The techniques we perfected were the basis for the **VETs** treadmill studies and the ECG studies that are still on-going. These studies have led to over 100 peer review publications in major journals and have led to clinical risk factors and scores widely applied internationally. They have demonstrated the prognostic value of both

the ECG and the exercise test and dealt with issues including the health benefits of exercise, the obesity paradox, the inverse relationship of exercise capacity and health care costs, heart failure and early repolarization.

- a. McAuley P, Myers J, Abella J, Froelicher V. Body mass, fitness and survival in veteran patients: another obesity paradox? *Am J Med.* 2007 Jun;120(6):518-24.
 - b. Froelicher VF, Morrow K, Brown M, Atwood E, Morris C. Prediction of atherosclerotic coronary death in men using a prognostic score. *Am J Cardiol* 1994;73:133-138.
 - c. Myers J, Prakash M, Froelicher V, Do D, Partington S, Atwood JE. Exercise capacity and mortality among men referred for exercise testing. *N Engl J Med.* 2002; 346: 793-801.
 - d. Pargaonkar VS, Perez MV, Jindal A, Mathur MB, Myers J, Froelicher VF. Long-Term Prognosis of Early Repolarization with J-Wave and QRS Slur Patterns on the Resting Electrocardiogram: A Cohort Study. *Annals of Internal Medicine.* 2015 Nov 17;163(10):747-55.
 - e. Weiss JP, Froelicher VF, Myers JN, Heidenreich PA. Health-care costs and exercise capacity. *Chest.* 2004 Aug;126(2):608-13.
4. **VA Co-operative Study of Quantitative Exercise Testing and Angiography (QUEXTA)** – I was the originator and Co PI for this study which applied computer techniques to both exercise testing and coronary angiography. It is seminal in that it also removed work up bias by only including patients with chest pain who agreed to both exercise testing and coronary angiography prior to any testing. This essential element of assessing diagnostic tests has never been applied in evaluating patients with possible CAD and dramatically demonstrated that testing has a lower sensitivity and higher specificity when applied in clinical practice.
- a. Froelicher VF; Lehmann KG; Thomas R; Goldman S; Morrison D; Edson R; Lavori P; Myers J; Dennis C; Shabetai R; Do D; Froning J. Quantitative Exercise Testing and Angiography. *Ann Intern Med* 1998; 128:965-74
5. **Sports Cardiology** – For the past 22 years I have been the Cardiology Consultant for the Stanford Medicine program and since 2015, the Director of the Stanford Sports Cardiology Clinic. During that time, our group has contributed to the recent advancements in sports cardiology. We have presented data regarding the application of ECG screening and of the cause of sudden cardiac death in athletes. A recent meta-analysis demonstrates that inherited arrhythmic diseases are the most common cause of sudden cardiac death in young athletes.
- a. Uberoi A, Stein R, Perez MV, Freeman J, Wheeler M, Dewey F, Peidro R, Hadley D, Drezner J, Sharma S, Pelliccia A, Corrado D, Niebauer J, Estes NA, Ashley E, Froelicher V. Interpretation of the electrocardiogram of young athletes. *Circulation.* 2011 Aug 9;124(6):746-57.
 - b. Ullal AJ, Abdelfattah RS, Ashley EA, Froelicher VF. Hypertrophic Cardiomyopathy as a Cause of Sudden Cardiac Death in the Young: A Meta-Analysis. *The American Journal of Medicine.* 2016 Jan 20.(Epub online first)
 - c. Asif IM, Roberts WO, Fredericson M, Froelicher VF. The Cardiovascular Preparticipation Evaluation (PPE) for the Primary Care and Sports Medicine Physician, Part I. *Current Sports Medicine Reports.* 2015 Jul 1;14(4):246-346.
 - d. Froelicher V, Wagner G. The ECG and the pre-participation examination of young athletes. *J Electrocardiol.* 2015 May-Jun;48(3):281-2.

D. Research Support

Ongoing Research Support

B0344-1 (Myers, Froelicher, Co-PIs)

4/1/12 – 3/30/15

Department of Veterans Affairs / Rehabilitation Research & Development Merit Review

PCI Alternative using Sustained Exercise (PAUSE)

The purpose of this study is determine the cost-effectiveness and utility of a non-invasive technology to document the efficacy of exercise training as an alternative treatment strategy to PCI for coronary lesions.

Role: Co-PI

P50 HL083800 Dalman (PI)

5/1/06 - 4/30/12

NIH/NHLBI

Evaluation of Exercise Therapy for Small Abdominal Aortic Aneurism Disease

The purpose of this study is to test the effectiveness of exercise training to reduce abdominal aortic aneurysm risk, limit small aneurysm progression, and modify biologic markers of disease.

Role: Co-Investigator

Completed Research Support

B3122R Myers (PI)

10/1/03 - 9/30/06

Department of Veterans Affairs / Rehabilitation Research & Development Merit Review

A Multidisciplinary Risk Management Program to Reduce Cardiac Risk

The objectives of this study are to implement a comprehensive risk reduction program (CHARM), determine its durability, and evaluate its cost-effectiveness

Role: Co-Investigator