

CURRICULUM VITAE

Elizabeth S. Kaufman, M.D.

PERSONAL INFORMATION

Professional address and telephone: Heart and Vascular Center, Hamann 3rd Floor
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PRESENT ACADEMIC RANK AND POSITION

Assistant Professor of Medicine, Case Western Reserve University (9/17/98-present)
Attending Cardiac Electrophysiologist, MetroHealth Medical Center (7/1/91-present)
Courtesy Staff, Fairview General Hospital (12/3/93-present)
Active Staff, Parma Community General Hospital (2/24/95-present)
Active Staff, Saint Vincent Charity Hospital 3/2/95-present)
Courtesy Staff, Saint John West Shore Hospital 7/13/95-present)
Consulting Staff, Medina General Hospital (10/22/96-present)
Provisional Staff, Deaconess Hospital (10/26/2001-present)

EDUCATION

College: Yale University, 1977-1981, B.A.
Medical School: Harvard Medical School, 1981-1985, M.D.
Residency: Columbia-Presbyterian Medical Center, New York, New York, Internal
Medicine Internship and Residency, 1985-1988
Fellowship: Columbia-Presbyterian Medical Center, New York, New York,
Fellowship in Cardiovascular Medicine and Clinical Cardiac
Electrophysiology, 1988-1991

BOARD CERTIFICATION

9/1986 National Board of Medical Examiners
9/1988 Diplomate of the American Board of Internal Medicine
11/1991 Diplomate in the Subspecialty of Cardiovascular Disease
11/1992 Diplomate in Clinical Cardiac Electrophysiology
11/2000 Recertified in Cardiovascular Disease and Clinical Cardiac
Electrophysiology

MEDICAL LICENSURE

State of Ohio, 61193 (1991-present)

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HONORS AND AWARDS

1979 Phi Beta Kappa
1980 Hart Lyman Prize for academic excellence
1981 Summa Cum Laude, Molecular Biophysics and Biochemistry, with Distinction in the Major

PREVIOUS PROFESSIONAL POSITIONS AND APPOINTMENTS

7/1991-9/1998	Case Western Reserve University, Senior Instructor of Medicine
9/1991-7/1997	Mount Sinai Medical Center, Associate Staff
2/1994-2/1999	Saint Luke's Medical Center, Courtesy Staff
8/1994-6/2001	Southwest General Health Center, Associate Staff
12/1994-1/1999	Lakewood Hospital, Courtesy Staff
2/1997-2/1999	Deaconess Hospital, Provisional Staff

INSTITUTIONAL, DEPARTMENTAL, AND DIVISIONAL ADMINISTRATIVE RESPONSIBILITIES, COMMITTEE MEMBERSHIPS, AND OTHER ACTIVITIES

Director of Cardiac Electrophysiology, MetroHealth Medical Center, 7/1/91-7/1/99
Continuing Medical Education Committee, MHMC, 1996-1999
GCRC Committee, MHMC, 1999
CPR Committee, MHMC, 1991-1998
Telemetry Services Planning Task Force, MHMC, 1993-1995
Institutional Review Committee, Southwest General Health Center, 1997-2001

PROFESSIONAL AND SOCIETY MEMBERSHIPS

Fellow of the American College of Cardiology
North American Society of Pacing and Electrophysiology-Member
American Heart Association, Member of the Council on Clinical Cardiology
Cardiac Electrophysiology Society-Member
Northeastern Ohio Society of Pacing and Electrophysiology-Member of Board of Directors (1993-2002)
Northeastern Ohio Society of Pacing and Electrophysiology, President (4/2002-present)

CLINICAL PRACTICE, INTERESTS, AND ACCOMPLISHMENTS

From 1991-1999, I established and directed the clinical electrophysiologic program at MetroHealth Medical Center. This service grew to include six full-time electrophysiologists. During that time period we also established arrhythmia consultation services and electrophysiologic laboratories at multiple hospitals in the region. My current practice continues to include inpatient arrhythmia consultations and procedures (primarily device implantation) at 5 community hospitals as well as MetroHealth Medical Center. In addition, I have outpatient practices at MetroHealth Medical Center, Saint Vincent Charity Hospital, and the MetroHealth Strongsville facility. My chief clinical interests include management of arrhythmias and prevention of sudden death in patients with myocardial dysfunction and in individuals with a family history of serious arrhythmias, especially those with congenital long QT syndrome.

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RESEARCH INTERESTS

1. Congenital long QT syndrome
2. Noninvasive strategies for assessing risk of sudden cardiac death, especially T wave alternans and heart rate variability analysis

RESEARCH GRANTS AWARDED

- 1992-1993 Federal Aviation Administration Contract, Tolerance of medically treated hypertensives to moderate hypoxic and acceleration stresses (**Principal Investigator**, direct costs \$101,344).
- 1993-1995 Federal Aviation Administration Contract, Tolerance of medically treated hypertensives to moderate hypoxic and acceleration stresses, follow-up study (**Principal Investigator**, direct costs \$60,000).
- 1995-2001 NIH-NHLBI, Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM), Principal Investigator is Leon Greene, multicenter trial.
- 6/97-12/2002 NIH-NHLBI, Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT), Principal Investigator is Gust Bardy, multicenter trial, direct costs \$84,000.
- 1997-2000 NIH RO1 Grant-in-Aid, Cocaine Exposed Infants, Principal Investigator is Sudhir Ken Mehta, direct costs \$1,200,465; 10% effort.
- 7/99-12/2001 Muscular Dystrophy Association Neuromuscular Disease Research Grant, Cardiovascular Effect of Noninvasive Positive Pressure Ventilation in Duchenne Muscular Dystrophy, Principal Investigator is David Connuck, direct costs \$17,360; 2% effort.
- 2000 Mount Sinai Medical Society Fund, QT Prolongation in Postpartum Women (**Principal Investigator**, direct costs \$6650).
- 9/2000-8/2003 NIH-NHLBI R01-HL-64862, Prognostic Significance of T Wave Alternans, Principal Investigator is Daniel Bloomfield, direct costs \$13,636.
- 7/2001-6/2003 American Heart Association Affiliate Beginning Grant-in-Aid 0160212B, Phenotype/Genotype Discordance in the Long QT Syndrome (**Principal Investigator**, direct costs \$88,000, 30% effort).

Industry-Sponsored

- 1993-1994 Merck Research Laboratories, Multi-Center Comparison of MK-499 vs. Sotalol in Patients with Inducible Sustained Ventricular Tachycardia.
- 1995-1997 Procter & Gamble Pharmaceuticals, Multi-Center Assessment of the Safety and Efficacy of Azimilide Dihydrochloride for the Prophylactic Treatment of Symptomatic Atrial Fibrillation/Flutter and/or Symptomatic Paroxysmal Supraventricular Tachycardia.
- 1998-1999 Cambridge Heart, A Prospective Multi-Center Study to Compare the Effectiveness of T Wave Alternans to Signal-Averaged Electrocardiography in Predicting Susceptibility to Ventricular Arrhythmias.
- 5/2001-5/2003 St. Jude Medical, Alternans Before Cardioverter Defibrillator Trial (ABCD), Principal Investigator is Otto Costantini, direct costs \$41,850; co-investigator and core laboratory committee (interpretation of electrophysiologic studies).

COMMUNITY ACTIVITIES

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December 5, 2001, Heartbeats Fast and Slow 2001, Program Director

September 8, 1999, Heartbeats Fast and Slow 1999, Program Director

July 21, 1999, HEART RHYTHM PROBLEMS: What's new in diagnosis and treatment? Parma
Community General Hospital

February 14, 1995, AHA Sponsored Talk for Deans and Directors of Nursing Schools, What is New in
Electrophysiology

September 15, 1992, "Wired for Life" (Support Group for Patients and Families with ICDs), What's
Happening to my Heart's Rhythm?

BIBLIOGRAPHY

Published Manuscripts:

Kaufman ES, Bosner MS, Bigger JT Jr, Stein PK, Kleiger RE, Rolnitzky LM, Steinman RC, Fleiss JL.
Effects of digoxin and enalapril on heart period variability and response to head-up tilt in normal
subjects. *Am J Cardiol* 1993;72:95-99.

Finkelhor RS, Karwa P, Kaufman ES, Bahler RC. The relationship of autonomic function to age-related
changes in left ventricular filling in normal subjects. *Eur Heart J* 1995;16:1716-1720.

Bloomfield DM, Kaufman ES, Bigger JT Jr, Fleiss J, Rolnitzky L, Steinman R. Passive head-up tilt and
actively standing up produce similar overall changes in autonomic balance. *Am Heart J*
1997;134:316-320.

Kaufman ES, Mackall JA, Julka B, Drabek C, Rosenbaum DS. Influence of heart rate and sympathetic
stimulation on arrhythmogenic T-wave alternans. *Am J Physiol Heart Circ Physiol*
2000;279(3):H1248-H1255.

Ficker E, Thomas D, Viswanathan PC, Dennis AT, Priori SG, Napolitano C, Memmi M, Wible BA,
Kaufman ES, Iyengar S, Schwartz PJ, Rudy Y, Brown AM. Novel characteristics of a
misprocessed mutant HERG channel linked to hereditary long QT syndrome. *Am J Physiol Heart
Circ Physiol* 2000;279(4):H1748-H1756.

Gold MR, Bloomfield DM, Anderson KP, El-Sherif NE, Wilber DJ, Groh WJ, Estes NAM, Kaufman ES,
Greenberg ML, Rosenbaum DS. A comparison of T-wave alternans, signal averaged
electrocardiography and programmed ventricular stimulation for arrhythmia risk stratification. *J
Am Coll Cardiol* 2000;36:2247-53.

Kaufman ES, Priori SG, Napolitano C, Schwartz PJ, Iyengar S, Elston RC, Schnell AH, Gorodeski EZ,
Rammohan G, Bahhur NO, Connuck D, Verrilli L, Rosenbaum DS, Brown AM.
Electrocardiographic prediction of abnormal genotype in congenital long QT syndrome: experience
in 101 related family members. *J Cardiovasc Electrophysiol* 2001;12:455-461.

Mehta SK, Super DM, Salvator A, Singer L, Connuck D, Fradley LG, Harcar-Sevcik RA, Kaufman ES.
Heart rate variability in cocaine-exposed newborn infants. *American Heart
J* 2001;142:828-32.

- Mehta SK, Super DM, Connuck D, Salvator A, Singer L, Fradley LG, Harcar-Sevcik RA, Kirchner HL, Kaufman ES. Heart rate variability in healthy newborn infants. *Am J Cardiol* 2002;89:50-53.
- Benhorin J, Moss AJ, Bak M, Zareba W, Kaufman ES, Kerem B, Towbin JA, Priori S, Kass RS, Attali B, Brown AM, Ficker E. Variable expression of long QT syndrome among gene carriers from families with five different HERG mutations. *Ann Noninvasive Electrocardiol* 2002;7:40-6.
- Moss AJ, Zareba W, Kaufman ES, Gattman E, Peterson DR, Benhorin J, Towbin JA, Keating MT, Priori SG, Schwartz PJ, Vincent GM, Robinson JL, Andrews ML, Feng C, Hall WJ, Medina A, Zhang L, Wang Z. Increased risk of arrhythmic events in long QT syndrome with mutations in the pore region of the human ether-a-go-go-related gene potassium channel. *Circulation* 2002;105:794-799.
- Perkiömäki JS, Zareba W, Nomura A, Andrews M, Kaufman ES, Moss AJ. Repolarization dynamics in patients with long QT syndrome. *J Cardiovasc Electrophysiol* 2002;13:651-656.
- Mehta SK, Super DM, Salvator A, Fradley LG, Connuck D, Kaufman ES. Heart rate variability by triangular index in infants exposed prenatally to cocaine. *Ann Noninvasive Electrocardiol* 2002;7:374-8.
- Mehta SK, Super DM, Connuck D, Kirchner HL, Salvator A, Singer L, Goetz-Fradley L, Kaufman ES. Autonomic alterations in cocaine-exposed infants. *Am Heart J*, accepted for publication.
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- Clancy RM, Kaufman E, Cannon PJ. Augmented prostaglandin E2 synthesis by human monocyte macrophages incubated with modified forms of LDL. *Circulation* 1989;80S:II-454.
- Kaufman ES, Homma S. The significance of the color-flow Doppler finding of trace mitral regurgitation: a one-year follow-up study. *J Am Soc Echo* 1990;3:218.
- Bosner MS, Kaufman ES, Stein PK, Kleiger RE, Bigger JT, Rolnitzky LM, Fleiss JL, Steinman R. The effect of enalapril and digoxin on heart period variability in normal subjects. *Circulation* 1991;84S:II-616.
- Kaufman ES, Bigger JT Jr, Fleiss JL, Rolnitzky LM, Steinman R. Lying and standing versus passive upright tilt to assess autonomic responsiveness. *J Am Coll Cardiol* 1992;19:368A.

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Kay GG, Eberle CA, Kaufman E, Hordinsky J. The effects of antihypertensive medication, hypoxia, and orthostatic stress on cognition. *Journal of the International Neuropsychological Society* 1996;2(1):63-64.

Helguera ME, Trohman RG, Pinski SL, Ellenbogen KA, Kaufman E, Tchou P. Radiofrequency ablation of the left bundle branch or its fascicles for treatment of interfascicular reentrant ventricular tachycardias. *PACE* 1998;21:843.

Biblo LA, Yuan Z, Kaufman ES, Lewis WR, Mackall JA, Rimm AA. "Lone" atrial flutter, insights to embolic risk. *PACE* 1998;21:918.

Gold MR, Bloomfield DM, Anderson KA, Wilber DJ, El-Sherif N, Estes NAMM, Groh WJ, Kaufman ES, Greenberg ML, Cohen RJ. T wave alternans predicts arrhythmia vulnerability in patients undergoing electrophysiology study. *Circulation* 1998;98:I-647.

Kaufman ES, Gorodeski EZ, Koide N, Verrilli LM, Rammohan G, Rosenbaum DS. Microvolt Level T-Wave Alternans is Prevalent in Subjects with Congenital Long QT Syndrome. *J Am Coll Cardiol* 1999;33:130A.

Gold MR, Bloomfield DM, Anderson KP, Wilber DJ, El-Sherif N, Estes NAM III, Groh WJ, Kaufman E, Cohen RJ. A Comparison of T Wave Alternans, Signal Averaged Electrocardiography and Electrophysiology Study to Predict Arrhythmia Vulnerability. *J Am Coll Cardiol* 1999;33:145A.

Quan KJ, Yuan Z, Kaufman ES, Lewis WR, Johnson NJ, Rimm AA, Biblo LA. Prognostic Differences Between Patients with Atrial Flutter and Atrial Fibrillation. *PACE* 1999;22:712.

Bloomfield DM, Gold MR, Anderson KP, Kaufman ES, El-Sherif N, Estes M, Greenberg ML, Groh W, Wilber DJ, Cohen RJ. A Comparison of T Wave Alternans and Signal-Averaged Electrocardiography in Predicting Outcome of Electrophysiology Testing. *PACE* 1999;22:751.

Bloomfield DM, Gold MR, Anderson KP, Wilber DJ, El-Sherif N, Estes M, Groh WJ, Kaufman ES, Greenberg ML, Rosenbaum DS, Dabbous OH, Cohen RJ. T Wave Alternans Predicts Events in Patients with Syncope Undergoing Electrophysiologic Testing. *Circulation* 1999;100:I-508.

Kaufman ES, Bahhur NO, Rammohan G, Gorodeski EZ, Schnell AH, Elston RC, Koide NS, Verrilli LM, Iyengar S, Napolitano C. The QT Interval Identifies Adults but not Children with a HERG Mutation. *Circulation* 1999;100:I-158.

Kaufman ES, Julka B, Drabek C, Rosenbaum DS. T-wave alternans bursting in patients at risk for sudden cardiac death. *J Am Coll Cardiol* 2000;35:113A.

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Perkiömäki JS, Zareba W, Nomura A, Andrews M, Kaufman ES, Moss AJ. Repolarization variability in patients with congenital long QT syndrome. *Circulation* 2001;104:II-691.

Chapters in Textbooks:

Rakita L, Vrobel TR, Kaufman ES. Electrocardiography. *In* Shoemaker WC, Ayres SM, Grenvik A, and Holbrook PR (eds). *Textbook of Critical Care*, Third edition, Philadelphia; WB Saunders, 1995.

Lewis, WR, Kaufman ES. ECG monitoring. *In* Webb A, Shapiro M, Singer M, and Suter P(eds). *Oxford Textbook of Critical Care*, Oxford University Press, Oxford, New York, Tokyo, 1999.