

A Personal Research Odyssey

Jack H. Medalie MD, MPH
Cleveland, Ohio

The *Journal of Family Practice* is pleased to publish the acceptance speech of Dr Jack Medalie, the 1998 recipient of the Maurice Wood Award for Lifetime Contribution to Primary Care Research. This address was delivered on November 6, 1998, at the 26th Annual Meeting of the North American Primary Care Research Group (NAPCRG) in Montreal. This prestigious annual award honors the person who has, throughout his or her career, made the greatest contribution to primary care research and related fields. Researchers from all nations, working in all professional and scientific disciplines are eligible to receive

the award. The award is named in honor of Dr Maurice Wood, an early pioneer and leader in primary care research in North America and founder of NAPCRG. The Wood Award is supported by donations from friends of primary care research across North America and around the world. For more information, contact NAPCRG at: PO Box 8729, Kansas City, Missouri 64114; 1-800-274-2237; E-mail: napcrgr@stfm.org.

KEY WORDS: Physician-patient relations; family; caregivers; counseling. (*J Fam Pract* 1999; 48:508-512)

I am honored to receive the Wood Award and join the ranks of the wonderful previous awardees: Curtis Hames, the late Martin Bass, and Frans Huygen. It is especially thrilling to receive an award in the name of Maurice Wood, a man whom I have respected and admired for many years. All of us who have been honored by this award share at least one characteristic with Dr Wood: our research efforts resulted from experiences and problems that we encountered in clinical practice.

RURAL PRACTICE

NAUSEA AND ABORTION

During my student days at medical school, I was involved in microscopical cellular research of lymphocytes and lymph glands.¹ Following graduation, my scholarly work resulted in individual case reports,² until I went into practice in a rural area. There, a large proportion of my patients were pregnant women, so we investigated anemia of pregnancy³ and preparation for childbirth.⁴ During this time, I noticed that the women who aborted in the first trimester rarely experienced nausea or vomiting, so I closely observed the next 100 women in our office who were at that stage of their pregnancies. Table 1 shows that of the 48 women who had mild or no nausea and no vomiting, 11 had a threatened abortion and 11 had completed abortions; of the 52 women with moderate or severe nausea and vomiting, however, only 1 had a threatened abortion. This was published in *Lancet*⁵ and caused quite a stir, especially when Dr Eastman, the Chairman of

Obstetrics and Gynecology at Johns Hopkins, wrote a long editorial saying that our research findings confirmed his clinical impression.

THE HIDDEN PATIENT

My patient orientation was changed by an unfortunate clinical experience.⁶ A new patient had a myocardial infarction and I visited him in his home twice a week for 4 weeks. He had an attentive wife, and progressed well, though he preferred to spend all his time in bed. One night I received an urgent call to his home. On my arrival, I was amazed to see him at the door pointing to the bedroom. There I found his wife, dead. She had committed suicide. Despite numerous home visits, I had completely missed their relationship problem and her need of help. I related this story at a professional meeting some time later, and a professor of medicine counseled me not to be upset, because the wife wasn't my patient.

The incident changed my clinical practice. I began to use family trees and family folders, and offered family-pregnancy packages (including a general physical for the husband or significant other), and couple and family counseling. The remark by my colleague also led me to the concept of the caregiver as the hidden patient. This means that whenever there is a person with a serious acute or chronic disease or condition, the caregiving responsibility usually falls to one person. That person must receive sufficient

Submitted April 1, 1999.

This material was previously presented at the annual North American Primary Care Research Group meeting, Montreal, Canada, November 1998.

All comments should be addressed to Jack H. Medalie, MD, MPH, Department of Family Medicine, Case Western University, 10900 Euclid Avenue, Cleveland, OH 44106-7136.

TABLE 1

First Trimester of Pregnancy

Patients	Nausea and Vomiting	
	None or Mild	Moderate or Severe
No. of women	48	52
Threatened abortions	11	1
Complete abortions	11	0

emotional and practical support; otherwise there is a high probability that he or she will become a hidden patient, and will develop either overt or covert signs of illness or disease during or soon after the patient's illness.⁷

MEDICAL DIRECTOR

BREASTFEEDING

I moved from the rural practice into a position as the medical director of a health center in Jerusalem, Israel, where I worked with a number of family-oriented physicians and nurses. Our record-keeping was very detailed, which enabled us to extract the records and publish the results of a 6-year study of the health center.⁸

At the time, breastfeeding was not encouraged in Western countries, but it was very prevalent in our community in Israel. So, we studied the effects of breastfeeding. Table 2 shows that the duration of breastfeeding was directly associated with a lower number of all types of morbidity: upper respiratory infection, gastroenteritis, otitis media, tonsillitis, and so forth.⁸ Similarly, duration of breastfeeding was associated with lower consulting rates for child-rearing problems. Was this due to better bonding, the transfer of immunity, or both?

NUMBER OF PHYSICIAN CONTACTS

In Israel, we also paid a great deal of attention to relationships within the family and recorded our impressions. The analysts were able to classify whether the majority of family relationships were satisfactory. The results showed that children from families with unsatisfactory relationships had a far greater number of contacts for all types of morbidity compared with those from families with satisfactory relationships. There is a similar association between family relationships and child-rearing problems, with unsatisfactory relationships leading to a much higher annual consulting rate (21.3% vs 15.7%).⁸

We were also able to define the characteristics of families who had a high number of physician contacts. These were welfare families with 2 or 3 children born in a recent 5-year period and an unemployed husband. Every year there was a group of high-contact adults and children, but the intercorrelations between years decreased to almost nil for the children, and quite considerably for the adults too. This meant that although there was always a group of patients who had a high frequency of physician contacts, over a long period (>5 years) the individual members of the group change.⁸ The question that we were not able to answer was: Was this a natural phenomenon or was it due to the activities of the health center?

HEPATITIS A INFECTIONS IN CHILDREN

At the health center, my scope of practice widened to include community aspects of diseases like polio-

TABLE 2

Morbidity Contacts of Breast-Fed Infants at 6-Year Follow-up

Duration of Breast Feeding	n	Annual Median No. of Contacts for All Morbidity	Consulting Rates for Child-Rearing Problems, %
3 weeks to 3 months	57	10.5	21.7
4 to 11 months	162	7.0	17.2
More than 12 months	108	4.0	12.8

myelitis,^{9,10} tuberculosis, and hepatitis. In one of our published studies on hepatitis,¹¹ my colleagues and I included individual patients, their families, and their neighborhood when dealing with hepatitis A infections. There were 84 cases diagnosed over the 6-year period. Of these 84, 43 patients were younger than 5 years old. The parents of all but 2 of these children were from North Africa or the Middle East, while the infected adults were mainly from Europe or America. The peak incidence occurred in the cold months from October to January, with a second smaller peak in July. This was surprising, because if the transmission was by the oral-hand-fecal route, we would have expected the major peak to have been in the summer when gastroenteritis was at its highest level. During a small epidemic among the young children, we found that the probable mode of transmission was a playground where children shared their food with each other. When we asked what the patients thought the disease was caused by, we found that the North Africans believed that their children became ill after they were frightened by something. The parents reported quickly trying to get rid of the frightening agent, after which the child recovered. They recounted examples to prove this.¹¹

EVALUATION

Using mortality, morbidity, immunization, and hospitalization rates, we evaluated the medical care given at the center during a 6-year period. Compared with the usual standard of care in the country at the time, our rates were much better, and a large sum of money had been saved, mainly through decreased rate and length of stay of hospitalizations.¹²

PROJECT DIRECTOR

ISCHEMIC HEART DISEASE STUDY

My next research adventure (after receiving a master's degree in public health from Harvard) was as principal investigator and project director of a prospective study of ischemic heart disease of 10,000 working men older than 40 years that was funded by the National Institutes of Health (NIH). We monitored the men intensively for 5 years, and then followed their mortality for another 21 years.¹³ It was a fascinating experience, working with a multidisciplinary team to produce new questionnaires

TABLE 3

Angina Pectoris Risk Factors

Risk Factor	Standard Beta Coefficient	P
Anxiety	0.29	<.01
Family problems	0.25	<.01
Total cholesterol	0.24	<.01
Blood pressure	0.20	<.01
Age	0.18	<.01
ECG changes	0.14	<.01
Diabetes	0.10	<.05

Note: N = 7587; angina pectoris cases = 224.
ECG denotes electrocardiogram.

TABLE 4

Five-Year Angina Pectoris Incidence per 1000 Men

Anxiety Index and Family Problems		Blood Pressure and Total Cholesterol Levels	
		Both low	Both high
		Both low	12
Both high	39	97	

TABLE 5

Five-Year Incidence of Duodenal Ulcer

Variables	Odds Ratio
Smoking	1.64
Age	1.85
Salary	1.50
Systolic blood pressure	1.58
Current family problems	1.60
Wife's love and support	2.06
Restrain retaliation when hurt by coworkers	1.89

Note: Multiple logistic regression (N = 8458).
This table was originally published in Am J Epidemiol 1992; 136:1280-7.

TABLE 6

Total and HDL Cholesterol and Mortality at 7-Year Follow-up

Quintile	Myocardial Infarction		Sudden Death	
	TC	HDL	TC	HDL
1	7.8	12.6	5.4	5.6
3	9.8	10.2	4.5	4.2
5	20.7	7.8	5.6	2.4

Note: Rates per 1000, N = 6353 men.
TC, total cholesterol; HDL denotes high-density lipoprotein.

and instruments, creating our own laboratory, and coping with recording, storing, and analyzing a huge database.¹⁴⁻¹⁷

Some of the interesting new findings included psychosocial factors. Despite some lack of enthusiasm on the part of our NIH partners, we included numerous psychosocial and familial variables in our research that in many instances had significant associations with the outcome variables. Family problems, anxiety, and support proved to be very important in the development of many diseases, especially angina pectoris and duodenal ulcer (Table 3). The effect of a wife's love and support on the 5-year incidence of angina pectoris was seen when plotted against different levels of family problems. Angina rates were highest for men with a high level of family problems and low levels of love and support. However, men with high levels of family problems and love and support experienced significantly lower rates of angina pectoris.^{18,19} When study subjects had low anxiety levels and family problems, as well as low blood pressure and total cholesterol levels, they developed angina pectoris at the rate of 0.012 in the following 5 years. If, however, all variables were reported as high, the rate rose to 0.097 (Table 4).^{18,19}

In the top 7 variables related to the 5-year duodenal ulcer incidence, there are 4 psychosocial factors: salary, family problems, wife's love and support, and restraining retaliation when hurt by coworkers (Table 5). With a high degree of stress as reflected by family problems and a low level of support, the 5-year duodenal ulcer incidence rate was 0.074. However, a low level of family problems combined with good support produced a significantly lower duodenal ulcer rate of 0.027.²⁰

Cholesterol in High-Density Lipoprotein. We found the most convenient genetic marker for ischemic heart disease to be high-density lipoprotein (HDL). Previously, HDL was regarded as unimportant, because all the attention was focused on low-density lipoprotein (LDL) and total cholesterol. Our findings were initially regarded with scepticism, so it took some time before our results were accepted and published. We found HDL to be significantly inversely associated with the incidence of myocardial infarction, angina pectoris, type 2 diabetes, sudden death, smoking, physical activity, weight, and height.²¹

We also found that while total cholesterol (directly) and HDL (inversely) were both related to myocardial infarction mortality, only HDL was related to sudden death (Table 6).²¹

Silent Infarcts and Mortality. Unlike some later American studies, we (like Framingham) found that those subjects with silent infarcts had a significantly lower mortality rate compared with those with clinical infarcts during the following 7 years (7.7% vs 59.5%).²²

Blood Groups and Ischemic Heart Disease. Our data showed that those subjects with the blood group A1Bjka (ie, A1B Kidd negative) had much greater 5-year MI (0.125 vs 0.044) and AP (0.091 vs 0.036) incidences than those of other blood groups.²³ As far as we are aware, no other study has examined this association.

INTERMITTENT CLAUDICATION AND DIABETES MELLITUS

In the multiple logistic risk function of the 5-year diabetes incidence, we found that peripheral vascular disease with intermittent claudication (PVD-IC) was high on the list of variables related to the development of diabetes. Previously, it was thought that PVD-IC occurred only as a complication of diabetes, but our data showed it to be a risk factor as well (Table 7).^{24,25}

CHAIRMANSHIP

FAMILY MEDICINE

On completion of the intensive stage of the ischemic heart study, I was invited by Dean A. de Vries²⁶ to chair a newly created department of family medicine in Tel-Aviv. Eight years later Dean Fred Robbins invited me to develop a new department of family medicine at Case Western Reserve University and its 3 affiliated hospitals. So, for a 20-year period, my energies were absorbed by chairmanship duties, clinical practice, education, and administration, with very little time for personal research. During this time we managed, however, to complete and publish *Family Medicine: Principles and Applications*²⁷ and to create a research division at Case Western. Fortunately, we recruited Steve Zyzanski, a biostatistician, to head this endeavor. He was joined by a number of outstanding people (Kurt Stange, Sue Flocke, and Rob Williams, among others) who together have developed a number of important and productive projects

In our study of 138 family physicians in Northern Ohio,^{28,29} we looked at the extent to which a family focus was emphasized in the real world of community family practice. The project was a cross-sectional, multimethod study involving 4454 patient visits to 138 doctors. The methods used included direct observation by trained nurses, review of the medical records, patient exit questionnaires, physician's questionnaires, and practice environment checklists. The results confirmed Paul Fisher's contention that "the family is alive and well in family practice."

The most interesting finding was that family physicians in that study used 2 different approaches in dealing with families. One group took detailed family histories (especially of new patients) as a context for care of the individual patient. The second group did not spend much time with family histories but often investigated family problems in depth, since they used the family as the unit of

TABLE 7

Type 2 Diabetes Mellitus 5-Year Incidence Logistic Risk Function

Variable	Standard Beta Coefficient	P
Age	0.31	<.01
Weight/height ²	0.36	<.01
PVD-IC	0.18	<.01
Total cholesterol	0.15	<.01
Systolic blood pressure	0.10	<.05
Uric acid	0.13	<.05
Born in Europe	-0.20	<.01
Education	-0.22	<.01

PVD-IC denotes peripheral vascular disease with intermittent claudication.

care. Despite the fact that 10 of 138 physicians were adept at both these styles, the correlation between the factors was .03, which means that they were virtually independent of each other.

We wanted to know what effect these 2 styles have on patient satisfaction and preventive services, including counseling. We found, after adjusting for patient variables of age, sex, education, years as a patient, new patients, and health status, that there were a number of similarities as well as distinct differences in the activities and results from the physicians in these 2 groups.³⁰

Analysis revealed that patient satisfaction was positively associated with both styles (ie, a family focus of either style increased patient satisfaction). Further analysis of the charts, however, revealed that physicians emphasizing family history were significantly more up to date in their screening and counseling preventive services (Table 8).

In respect to the Components of Primary Care Index (developed by Sue Flocke), continuity of care, interpersonal communication, and coordination of care were significantly related to both factors. However, the patients felt that the physicians using the family orientation style knew them and their families well, while those using the

TABLE 8

Partial Correlation of Factor Scores with Patient Outcomes*

Variable	Family Orientation	Family History
Patient satisfaction: visit rating scale†	.16 (.06)	.18 (.04)
Preventive service delivery: screening services up to date	-.03 (ns)	.35 (.001)
Counseling services up to date	-.11 (ns)	.48 (.001)
In-depth knowledge of patient and family	.53 (.001)	0 (ns)

*Adjusted for age, race, education, years a patient, new patient, and health status.

†From the Medical Outcomes Study.

family history approach did not know them well.

This corresponds with the nurses' direct observations of the time spent in different activities during the physician-patient encounters, and is an example of competing demands during the interaction. In other words, with an average of 10 minutes of direct contact with the patient, emphasis on family history or family orientation does not allow for many other matters to be covered. The implications of this in these days of time-constrained medical care, with or without managed care, are: (1) if a physician uses the family history style he or she will be adequately covering preventive services, but should make certain that those patients needing more intensive family work would be referred to appropriate services; and (2) if the physician enjoys in-depth family work, he or she should make certain that somebody in the practice (eg, nurse) will monitor and maintain the recommended preventive services.

I have tried in this personal odyssey to cover some of the highlights of my research, as I traversed the trail from one level of research to another, from the cellular level to the individual-case level, from a family focus to a community approach, and then finally to a population level as exemplified by a cohort study and a network of family practices. Every level was challenging, stimulating, and exciting, but I never forgot the importance of the individual in his or her family.

It is now 53 years since I graduated from medical school, and I have been blessed with opportunities to work with some great mentors, outstanding colleagues, fellows, residents, and students. Last but not least, there were some wonderful patients, who taught me more than I taught them. None of this, however, would have been possible without the love and support of June, my wife of 50 years, our wonderful children, their spouses, and our grandchildren, some of whom are here today.

REFERENCES

1. Medalie JH. Structure follows function in lymphocytes and lymph glands. Project in histology course for bachelor of science degree. University of Witwatersrand, South Africa, 1940.
2. Moses M, Medalie JH. An unusual purpuric syndrome. *S Afr Med J* 1950; 24:829-31.
3. Medalie JH. Haemoglobin levels of pregnant rural women. *J R Coll Gen Pract* 1965; 9:157-66.
4. Medalie JH, Medalie J. Preparation for childbirth: a community program as an aid in the adjustment of new immigrants. *Health Educ J* 1959; 17:180-90.
5. Medalie JH. Relationship between nausea and/or vomiting and abortion in early pregnancy. *Lancet* 1957; 1:117-9.
6. Medalie JH. The "hidden patient" incident that changed my professional life. In: Borkan J, Weiss S, Medalie JH, eds. *Unforgettable stories from primary care*. University of Wisconsin Press, Madison, Wis, 1999.
7. Medalie JH. The caregiver as the "hidden patient." In: Kahana E, Biegel DE, Wykle ML, eds. *Family caregiving across the lifespan*. Thousand Oaks, Calif: Sage Publications, 1994:312-30.
8. Mann KJ, Medalie JH, Lieber E, Groen JJ, Gutman L. Visits to doctors: a six-year medical-social study of a developing community. Jerusalem, Israel: Academic Press, 1970.
9. Bernkopf H, Medalie JH, Yekutieli M. Antibodies to poliomyelitis virus and socio-economic factors influencing their frequency in children in Israel. *Am J Trop Med Hyg* 1957; 6:697-703.
10. Bernkopf H, Medalie JH. Excretion of enteric viruses by children in Israel. *Harefuah* 1959; 57:299-301.
11. Medalie JH. Infective hepatitis: individual, familial and neighbourhood aspects. *J R Coll Gen Pract* 1962; 5:448-56.
12. Medalie JH, Mann KJ. Evaluation of medical care: methodological problems in a six-year follow-up of a family and community health center. *J Chron Dis* 1966; 19:17-33.
13. Groen JJ, Medalie JH, Neufeld HN, et al. An epidemiological investigation of hypertension and ischemic heart disease within a defined segment of the adult male population of Israel. *Isr J Med Sci* 1968; 4:177-94.
14. Medalie JH, Herman J. A chest pain questionnaire for use in an epidemiological investigation of ischemic heart disease. *Isr J Med Sci* 1964; 23:227-35.
15. Balogh M, Medalie JH, Smith H, et al. The development of a dietary questionnaire for an ischemic heart disease study. *Isr J Med Sci* 1968; 4:205-9.
16. Tsur B, Medalie JH, Balogh M, et al. Methods used for computer processing of dietary data in an ischemic heart disease project. *Isr J Med Sci* 1968; 4:204-10.
17. Michaelson IC, Eliakim A, Avshalem A, et al. An approach to the investigation of vascular changes in the fundus of the eye in hypertension and arteriosclerosis. *Excerpta Medica International Congress Series*. 1966; 146.
18. Medalie JH, Snyder M, Groen JJ, et al. Angina pectoris among 10,000 men: five-year incidence and univariate analysis. *Am J Med* 1973; 55:583-94.
19. Medalie JH, Goldbourt U. Angina pectoris among 10,000 men II: psychosocial and other risk factors as evidenced by a multivariate analysis of a five year incidence study. *Am J Med* 1976; 60:910-21.
20. Medalie JH, Stange KC, Zyzanski SJ, Goldbourt U. The importance of biopsychosocial factors in the development of duodenal ulcer in a cohort of middle-aged men. *Am J Epidemiol* 1992; 136:1280-7.
21. Goldbourt U, Medalie JH. High density lipoprotein cholesterol and incidence of coronary heart disease: the Israeli Ischemic Heart Disease Study. *Am J Epidemiol* 1979; 109:296-308.
22. Medalie JH, Goldbourt U. Unrecognized myocardial infarction: five-year incidence, mortality and risk factors. *Ann Intern Med* 1976; 84:526-31.
23. Medalie JH, Levene C, Papier C, et al. Blood groups, myocardial infarction and angina pectoris. *N Engl J Med* 1971; 285:1384.
24. Medalie JH, Papier C, Herman JB. Diabetes mellitus among 10,000 adult men I: five year incidence and associated variables. *Isr J Med Sci* 1974; 10:681-97.
25. Medalie JH, Papier C, Goldbourt U, et al. Diabetes mellitus among 10,000 adult men II: multivariate analysis. *Arch Intern Med* 1975; 135:811-7.
26. Medalie JH, De Vries A, Shachor S. Family medicine at the Tel-Aviv medical school. *Lancet* 1969; 1:979-81.
27. Medalie JH, ed. *Family Medicine: Principles and Applications*. Baltimore, Md: Williams and Wilkins, 1978.
28. Stange KC, Zyzanski SJ, Jaen CR, et al. Illuminating the "black box": a description of 4454 patient visits to 138 family physicians. *J Fam Pract* 1998; 46: 377-89.
29. Medalie JH, Zyzanski SJ, Langa D, Stange KC. The family in family practice: is it a reality? *J Fam Pract* 1998; 46:390-6.
30. Medalie JH, Zyzanski SJ, Stange KC. Unpublished data, 1998.