TABLE I.
Comparison of Amounts of Rat Tissue and Q_{O_2} Values in Standard and in Micro Vessels.

Tissue	Micro vessel		Macro vessel	
	Tissue wt, mg*	Q_{O_2}†	Tissue wt, mg*	Q_{O_2}†
Diaphragm	40	0.98	150	1.02
Heart	40	0.76		
Skeletal muscle	60	0.57	300	0.45
Kidney	15	3.32	80	3.25
Liver	40	1.29	200	1.34
Thyroid	20	0.95		

* Wet weights are used throughout.
† cu mm O_2/mg wet wt/hr.

5-fold one would anticipate from the difference in constants. There is little reason for using the micro-vessels for a tissue as metabolically active as kidney, because of the great care required in weighing the approximately 15 mg samples. The real value is in such cases as skeletal muscle, with a low rate of metabolism, or thyroid gland, with so little total tissue available.

Summary. A micro modification of the standard Warburg vessel for the study of gaseous exchange of tissues has been described. As would be anticipated from the decrease in size from 17 ml to about 3 ml, the amounts of tissue required for satisfactory results can be reduced to about one-fifth those usually used.

An advantage over other more sensitive apparatus is that the manometer supports are interchangeable with the standard Barcroft-Warburg supports, so the same water-bath and shaking device can be used for both.

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Administration of Folic Acid to Patients Without Anemia.* (17444)

HARVEY POLIAKOFF, ALBERT STERNBACH, WILLIAM H. WALKER, ROBERT L. KASCHT AND LEO M. MEYER.

From the Medical Division, Goldwater Memorial Hospital, Welfare Island, and the Medical Service, St. John's Episcopal Hospital, Brooklyn, N. Y.

In view of reports[1-11] showing the appearance of neurologic disease following folic

TABLE I.
Distribution of Cases Treated for More Than One Year. ♂ 24 ♀ 21.

Age	No.
10-19	1
20-29	3
30-39	8
40-49	8
50-59	8
60-69	9
70-79	7
80-89	1

* The folic acid used in this study was furnished by the Lederle Laboratories Division, American Cyanamid Company.

1 Davidson, L. S. P., and Girdwood, R. H., *Lancet*, 1948, **254**, 360.

2 Hall, B. E., and Watkins, C. H., *J. Lab. and Clin. Med.*, 1947, **32**, 622.

3 Heinle, R. W., and Welch, A. D., *J.A.M.A.*, 1947, **133**, 739.

4 Jacobson, S. D., Berman, L., Axelrod, A. R., and vander Heide, E. C., *J.A.M.A.*, 1948, **137**, 825.

5 Meyer, L. M., *Bull. N. Y. Acad. Med.*, 1946, **22**, 484.

6 Meyer, L. M., *Blood*, 1947, **2**, 50.

7 Meyer, L. M., *Am. J. Clin. Path.*, 1948, **18**, 811.

8 Ross, J. F., Belding, H., and Paegel, B. L., *Blood*, 1948, **3**, 68.

9 Vilter, C. F., Vilter, R. W., and Spies, T. D., *Proc. Central Soc. Clin. Research*, 1946, **19**, 26.

10 Vilter, C. F., Vilter, R. W., and Spies, T. D., *J. Lab. and Clin. Med.*, 1947, **32**, 262.

TABLE II.
Hematologic Data on Cases Treated for More than One Year.

	Avg before treatment	Avg after treatment	Increased cases	Decreased cases
Hb.	12.1 g	12.2 g	24	21
R.B.C.	4,540,000	4,480,000	17	28
W.B.C.	7,100	6,900		

acid administration to patients having macrocytic anemia, a long-term study in nonpernicious anemia persons was instituted.

Methods. Seventy individuals were studied for periods of from 5 to 13 months each, for a total of 768 patient months. Forty-five of the 70 were followed for more than one year. The cases were selected from hospital and outpatient population. Patients suffering from the following diseases were included, such as: rheumatoid arthritis, hypertension, rectal polyp, epidydimitis, alcohol neuropathy, lues, tracheitis, neurasthenia, bronchiectasis, cholecystitis, bronchial asthma, osteoarthritis, Beck's sarcoid, cretinism and arteriosclerosis. The criteria used in selection were availability for follow-up and ability to cooperate. To reduce variables, no patients with pernicious anemia or diabetes mellitus were accepted. No attempt was made to alter general disease, as regards diet and medication. Table I shows age and sex distribution of the 45 cases studied for more than one year. Each person was given 20 mg of folic acid daily, orally, in the form of one tablet. During the period of study some patients improved from their primary disease and were discharged. This accounts for the variability in period of survey. At monthly intervals all cases were checked for hematologic data and neurologic status, which included a complete blood count and hemoglobin, gait, tendon reflexes, touch, vibration, and temperature sense, Romberg sign and muscle grip.

Results. There were no changes noted during the period of study in the group of 70 patients No patient developed any subjective or objective sign of combined sclerosis or peripheral neuritis. Hematologic data are given for the sake of completeness. Table II shows averages of hemoglobin, red cell count and white cell count for the 45 patients studied over one year. No interpretation can be offered since diet, medication and primary disease variables must be as significant as folic acid administration.

Comment. It is known from several studies[2-6,8-11] that folic acid does not protect the pernicious anemia patient from combined sclerosis. Other reports[1,7] have shown the appearance of combined sclerosis symptoms in patients with macrocytic anemia of gastrointestinal origin on folic acid therapy. No reports have demonstrated appearance of neurologic disease in non-macrocytic anemia patients taking folic acid. This long-term study, constituting 768 patient-months on 20 mg daily dosage of folic acid showed no neurologic toxicity. Most patients taking the drug reported a feeling of well-being. The blood counts in these non-macrocytic anemia patients were not significantly changed.

Summary. A study of long-term folic acid administration in 70 non-macrocytic anemia patients was made. Signs related to sub-acute combined sclerosis or peripheral neuritis did not develop in any of the group.

[11] Wagley, P. F., *New England J. of Med.*, 1948, **238**, 11.

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