MAYO CLINIC
Mayo Medical Laboratories

**TEST OBSOLETE**
**NOTIFICATION DATE:** September 20, 2010
**EFFECTIVE DATE:** Immediately

# FOLATE, RBC
# #9199

**EXPLANATION:** Mayo Medical Laboratories has been working on an educational package to help communicate our recommendation that red blood cell folate levels do not serve a unique purpose in the continuum of care. Prior to having this communication available, we received reagent from our current supplier that does not meet our validation standards. New reagent lot will not be available for 8-10 weeks. We therefore have decided to move forward with discontinuing our folate test on red blood cells and share our research findings.

The red blood cell folate (RCF) assay has historically been recommended as a more reliable indicator of tissue folate stores compared to the serum folate (SF) assay, as it is not affected by recent ingestion of food. However the complexity of the RCF assay results in unavoidable universal inherent problems with imprecision and accuracy, which are not encountered with SF measurements. Furthermore, following the advent of folic acid supplementation of many foods by the FDA in 1996, folate deficiency is increasingly rare. Few studies have looked at the utility of the RCF versus SF. We undertook a 10-year retrospective analysis of RCF and SF results to determine the clinical utility of RCF beyond that of the SF.

**Result from Mayo Clinic analysis:** A total of 152,166 SF and 15,708 RCF were performed over the decade of the study. The prevalence of folate deficiency using only SF values was 0.39% and 0.27% using only RCF. There were 1082 patients in which SF and RCF were ordered concurrently (Table 1).

**Table 1: Analysis of patients with paired SF and RCF using NHANES/CDC definition of folate deficiency**

| | | Serum Folate | |
|---|---|---|---|
| | | **Abnormal (<3.0 ng/ml)** | **Normal (>3.0 ng/ml)** |
| **RCF** | **Abnormal (<140 ng/ml)** | **1 (0.09%)** | **4 (0.4%)** |
| | **Normal (>140 ng/ml)** | **8 (0.7%)** | **1069 (98.8%)** |

Only 1 patient (0.09%) had both abnormal SF and RCF. Chart reviews of the 4 patients with a normal SF but low RCF were as follows: 1) a 6 year old (yo). male with known folic acid transporter deficiency treated with Leucovorin. 2) a 58 yo male with history of gout, hypertension, psoriasis, and hyperlipidemia with normal hemoglobin (Hb) and MCV. 3) a 65 yo male with chronic diarrhea and suspected alcohol abuse; slight macrocytosis (MCV=100.3 fL) but normal Hb. 4) 51 yo male with multifactorial gait disorder and alcohol abuse. There was a previous history of vitamin B12 deficiency but B12 levels were normal at this time. The CBC was notable for macrocytosis (MCV=115.1 fL) without anemia. In only patient 4 did the RCF value result in the institution of folic acid supplementation.

**Conclusion:** Folate deficiency in the current era of FDA mandated folic acid supplementation is exceedingly rare. The RCF provides no additional information beyond that provided by the SF in virtually all situations.

**RECOMMENDED ALTERNATIVE TEST: FOLATE, SERUM**

This test is available from each Mayo Medical Laboratories testing site or from your local laboratory.

Specimens currently being held at MML will be forwarded to Quest Diagnostics, Inc, Chantilly, Virginia

**ALTERNATIVE FOLATE, RBC TEST IF PHYSICIAN INSISTS ON FOLATE RBC:**

**UNIT CODE: 57194, FOLATE, RBC, QUEST 14178**

**SPECIMEN REQUIREMENTS**: Draw 1 ml EDTA lavender top tube. Protect sample from light and freeze immediately. Ship frozen.

**METHOD:** Immunoassay

**REFERENCE VALUE:** > 280 ng/mL

**LIST FEE:** $129.00

**CPT CODE**: 82747

**ANALYTIC TIME:** 1 day **DAY(S) SET-UP:** Monday - Friday

QUESTIONS: Contact your Mayo Medical Laboratories' Regional Manager or
Julie Breider, MML Laboratory Technologist Resource Coordinator
Telephone: 800-533-1710