

Specimen ID:  
Control ID:

Acct #: 17452095 Phone: (800) 539-6119 Rte: 00  
Walk-In Lab, LLC  
1645 Tiffany Lane  
Mandeville LA 70448

### Patient Details

DOB:  
Age(y/m/d):  
Gender: SSN:  
Patient ID:

### Specimen Details

Date collected:  
Date entered:  
Date reported:

### Physician Details

Ordering: F AN  
Referring:  
ID: 1558345843  
NPI: 1558345843

### General Comments & Additional Information

Alternate Control Number:  
Total Volume: Not Provided

Alternate Patient ID: Not Provided  
Fasting: No

### Ordered Items

Anemia, Megaloblastic, Serum; Venipuncture

Anemia, Megaloblastic, Serum

Test Name	Value	Units	Reference Range	Flags
Methylmalonic Acid, Serum	277	nmol/L	0 - 378	01
2-Methylcitric Acid, Serum	243	nmol/L	60 - 228	High 01
Homocysteine, Serum	7.7	umol/L	5.1 - 13.9	01
Cystathionine, Serum	2092	nmol/L	44 - 342	High 01

### Reference Ranges:

Vitamin Status:	Normal	% High	B12 Deficiency	% High	Folate Def.	% High
Serum Metabolite	Range	Values	Range	Values	Range	Values
Methylmalonic Acid	0-378	<1	379-200,000	>95	0- 378	<1
2-Methylcitric Acid	60-228	<3	229- 15,000	>80	60- 228	<3
Homocysteine	5.1-13.9	<3	14- 500	>95	14- 250	>95
Cystathionine	44-342	<3	343- 4,000	>80	343-18,000	>80

Continued:

NOTE 2) Serum Methylmalonic Acid and Homocysteine are the primary metabolic tests for diagnosing and distinguishing between B12 and folate deficiency. They can be used in conjunction with the serum B12 which is usually low or low normal (<350 pg/mL) in B12 deficiency and the serum Folate which is usually low or low normal (<5 ng/mL) in folate deficiency. 2-Methylcitric acid and cystathionine provide confirmatory evidence for such deficiencies. Homocysteine and especially cystathionine may also be high in B6 deficiency.

NOTE 3) Elevated levels of serum metabolites will correct to normal after treatment with the appropriate vitamin but will not correct after treatment with the wrong vitamin, even in pharmacologic amounts.

NOTE 4) Any of the four metabolites can be elevated due to renal insufficiency or intravascular volume depletion. This occurs most commonly in the case of 2-Methylcitric Acid and Cystathionine. Elevated metabolite levels do not correct with B12, Folate or

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TESTS	RESULT	FLAG	UNITS	REFERENCE	INTERVAL	LAB
	B6 treatment unless vitamin deficiency coexists.					
NOTE 5)	Serum metabolite levels can be rechecked 5 to 15 days after vitamin therapy.					
NOTE 6)	Normal ranges 6 hours post oral Methionine load (100 MG L-Methionine/KG BODY WT.) are as follows: Homocysteine 16.5-45.7 mcmoles/liter and Cystathionine 424-2500 nmoles/liter. Methylmalonic Acid and 2-Methylcitric Acid do not change after a Methionine load.					

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For inquiries, the physician may contact **Branch: 504-828-2666 Lab: 800-762-4344**