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**Lab Dept:** Urine/Stool

**Test Name:** METANEPHRINES FRACTIONATED, TIMED URINE

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***General Information***

**Lab Order Codes:** METP

**Synonyms:** Metanephrines, Urine, 24 hour collection

**CPT Codes:** 83835 – Metanephrines

**Test Includes:** Metanephrines Total 24 hr urine, Normetanephrines 24 hr urine, Metanephrine 24 hr urine, and Creatinine 24 hr urine

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***Logistics***

**Test Indications:** A first and second-order screening test for the presumptive diagnosis of catecholamine-secreting pheochromocytomas and paragangliomas.

Confirming positive plasma metanephrine results.

**Lab Testing Sections:** Urine/Stool - Sendouts

**Referred to:** Mayo Medical Laboratories (Test# 83006/METAF)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 2 days, test set up Monday - Saturday

**Special Instructions:** See [Patient Preparation](#)

A 24 hour urine container with either 10 g (pediatric 3 g) boric acid or 25 mL (pediatric 15 mL) of 50% acetic acid should be obtained from the laboratory at the start of collection.

Submit an entire 24-hour urine collection. Refrigerate specimen during and after collection.

**Note:** Starting and ending times of collection are required for a timed urine collection and must be documented electronically or on the proper request form.

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## ***Specimen***

<b>Specimen Type:</b>	Urine, timed
<b>Container:</b>	Plastic leakproof container with either 10 g (pediatric 3 g) boric acid or 25 mL (pediatric 15 mL) of 50% acetic acid should be obtained at the start of collection. Urine GUARD® collection container is preferred for a timed urine sample.
<b>Draw Volume:</b>	Submit an entire 24-hour urine collection
<b>Processed Volume:</b>	10 mL (Minimum: 2 mL) aliquot from a 24 hour urine collection
<b>Collection:</b>	For timed urine collections, empty the bladder, discard the voided sample, and note the start time. Collect all urine voided for the specified time period. At the end of the period, note the finishing time, add the last voided sample to the container by emptying the bladder. Bring the refrigerated container to the lab. Make sure all specimens submitted to the laboratory are properly labeled with the patient's name, medical record number and date of birth.
<b>Special Processing:</b>	Lab Staff: Mix 24 hour urine with preservative well. Measure total volume and document. Remove 10 mL (Minimum: 5 mL) aliquot into a 13 mL urine tube. Store and ship specimen at refrigerated temperatures. Forward promptly.
<b>Patient Preparation:</b>	Tricyclic antidepressants (TCA), labetalol, and sotalol medications may elevate levels of metanephrines producing results which cannot be interpreted. If clinically feasible, it is optimal to discontinue these medications at least 1 week before collection. For advice on assessing the risk of removing patients from these medications and alternatives, you may consider consultation with a specialist in endocrinology or hypertension.
<b>Sample Rejection:</b>	Specimens other than urine; mislabeled or unlabeled specimens

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## ***Interpretive***

### **Reference Range:**

<b>Metanephrine (mcg/24 hrs)</b>		
<b>Age</b>	<b>Males (mcg/24 hrs)</b>	<b>Females (mcg/24 hrs)</b>
Normotensives		
0 – 2 years:	Not established	Not established
3 – 8 years:	29 - 92	18 - 144
9 – 12 years:	59 - 188	43 - 122

13 – 17 years:	69 - 221	33 - 185
≥18 years:	44 - 261	30 – 180
Hypotensives		
All ages:	<400	<400
<b>Normetanephrine (mcg/24 hrs)</b>		
<b>Age</b>	<b>Males (mcg/24 hrs)</b>	<b>Females (mcg/24 hrs)</b>
Normotensives		
0 – 2 years:	Not established	Not established
3 – 8 years:	34 – 169	29 – 145
9 – 12 years:	84 – 422	55 – 277
13 – 17 years:	91 – 456	57 – 286
18 – 29 years:	103 – 390	103 – 390
30 – 39 years:	111 – 419	111 – 419
40 – 49 years:	119 – 451	119 – 451
50 – 59 years:	128 – 484	128 – 484
60 – 69 years:	138 – 521	138 – 521
≥70 years:	148 – 560	148 – 560
Hypertensives		
All ages:	<900	<900
<b>Total Metanephrine (mcg/24 hrs)</b>		
<b>Age</b>	<b>Males (mcg/24 hrs)</b>	<b>Females (mcg/24 hrs)</b>
Normotensives		
0 – 2 years:	Not established	Not established

3 – 8 years:	47 – 223	57 – 210
9 – 12 years:	201 – 528	107 – 394
13 – 17 years:	120 – 603	113 – 414
18 – 29 years:	190 – 583	142 – 510
30 – 39 years:	200 – 614	149 – 535
40 – 49 years:	211 – 646	156 – 561
50 – 59 years:	222 – 680	164 – 588
60 – 69 years:	233 – 716	171 – 616
≥70 years:	246 – 753	180 – 646
Hypertensives		
All ages:	<1300	<1300
<p><b>Interpretation:</b> Increased metanephrine/normetanephrine levels are found in patients with pheochromocytoma and tumors derived from neural crest cells.</p> <p>Total urine metanephrines <math>\leq</math>1300 mcg/24 hours can be detected in non-pheochromocytoma hypersensitive patients.</p> <p>Further clinical investigation (e.g., radiographic studies) are warranted in patients whose total urinary metanephrine levels are &gt;1300 mcg/24 hours (approximately 2 times the upper limit of normal). For patients with total urinary metanephrine levels of &lt;1300 mcg/24 hours further investigations may also be indicated if either the normetanephrine or the metanephrine fraction of the total metanephrines exceed their respective upper limit for hypertensive patients. Finally repeat testing or further investigations may occasionally be indicated in patients with urinary metanephrine levels below the hypertensive cut-off, or even normal levels, if there is a very high clinical index of suspicion.</p>		

**Critical Values:**

N/A

**Limitations:**

See [Patient Preparation](#)

Significant physical stress (e.g. hypertensive stroke) may elevate levels of metanephrines.

This test utilizes a high-performance liquid chromatography/tandem mass spectrometry (LC-MS/MS) method and is not affected by the interfering substances that affected the previously utilized spectrophotometric (Pisano reaction) method (i.e., diatrizoate, chlorpromazine, hydrazine derivatives, imipramine, MAO inhibitors, methyl dopa, phenacetin, ephedrine, or epinephrine).

This method is also not subject to the known interference of acetaminophen (seen with the plasma metanephrine high-performance liquid chromatography [HPLC]-EC method.)

**Methodology:**

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)  
Stable Isotope Dilution Analysis

**References:**

[Mayo Medical Laboratories](#) January 2013

**Updates:**

3/18/2004: Test moved from Specialty Laboratories to Mayo Medical Laboratories.

7/12/2010: Units update from ug/24 hours to mcg/24 hours.