

PR 007774	<b>CSF analysis of neurotransmitter metabolites (HVA, 5-HIAA, MHPG, 3-methoxy-tyrosine, L-Dopa)</b>	PAGE 1/3 VALID UNTIL : 01-01-2024
-----------	---	--------------------------------------

## How to send samples?

### Standardization of lumbar puncture

Time of lumbar puncture between 08:30 and 10:00 in the morning.

0 - 2 years: Use first two mls. for HVA and 5-HIAA determination.

2 - 12 years: Use first five mls. of CSF for routine investigations and subsequent 3 mls. for HVA and 5-HIAA.

> 12 years: Use first tube of 8 mls. for routine CSF investigations.  
Use subsequent 3 mls. for measurement of HVA and 5-HIAA.

Homovanillic acid (HVA), 5 hydroxy-indol-acetic acid (5-HIAA) and the noradrenaline catabolite MHPG can be measured in CSF. HVA and 5-HIAA both have considerable concentration gradients in the CSF:

HVA ratio ventricle: cisternal: lumbar = 8.5 : 3.8 : 1.0

5-HIAA ratio ventricle: cisternal: lumbar = 3.6 : 2.9 : 1.0

Furthermore, there is a daily rhythm in the concentration of these compounds. To improve the interpretation of measurements of HVA and 5-HIAA in CSF, standardization of the CSF sample is essential.

Please note that for analysis of pterins (neopterin, biopterin, sepiapterin) in CSF, another procedure should be followed and that CSF, collected and treated as above for neurotransmitter metabolite analysis, **cannot** be used for pterin analysis.

### Sending the sample

A centrifuged sample should be frozen as soon as possible and should be sent frozen (on dry ice) to our laboratory (see address below). A description of the clinical symptoms is appreciated.

### Address for sending material:

Radboud University Medical Center  
Radboudumc Diagnostic Laboratory  
Route 815  
Attn. TML, Neurochemistry, dr. MM Verbeek  
PO 9101  
6500 HB NIJMEGEN  
The Netherlands

Contact information :

phone: #31-24-3614567

fax: #31-24-3668754

e-mail: [marcel.verbeek@radboudumc.nl](mailto:marcel.verbeek@radboudumc.nl)

### Costs

Please inquire.

### Analysis frequency

Every two-three weeks.

### Turn-over time

Maximally 3.5 weeks .

PR 007774	<b>CSF analysis of neurotransmitter metabolites (HVA, 5-HIAA, MHPG, 3-methoxy-tyrosine, L-Dopa)</b>	PAGE 2/3 VALID UNTIL : 01-01-2024
-----------	---	--------------------------------------

**Reference values**

The laboratory has established age-related reference values (Clin Chem 1998 44(9): 1897-1904).

Analyte	Age	Reference range	Unit
HVA	0 - 4 mnths	543 - 1142	nmol/L
	4 - 8 mnths	478 - 895	nmol/L
	8 - 12 mnths	488 - 664	nmol/L
	1 - 2 yrs	429 - 789	nmol/L
	2 - 5 yrs	384 - 769	nmol/L
	5 - 8 yrs	346 - 716	nmol/L
	8 - 12 yrs	330 - 668	nmol/L
	12 - 15 yrs	211 - 540	nmol/L
	15 - 50 yrs	87 - 372	nmol/L
> 50 yrs	87 - 372	nmol/L	
5-HIAA	0 - 4 mnths	383 - 1028	nmol/L
	4 - 8 mnths	231 - 618	nmol/L
	8 - 12 mnths	190 - 301	nmol/L
	1 - 2 yrs	156 - 275	nmol/L
	2 - 5 yrs	110 - 265	nmol/L
	5 - 8 yrs	100 - 245	nmol/L
	8 - 12 yrs	109 - 214	nmol/L
	12 - 15 yrs	95 - 173	nmol/L
	15 - 50 yrs	58 - 190	nmol/L
> 50 yrs	58 - 190	nmol/L	
Ratio HVA/5-HIAA	0 - 4 mnths	0.8 - 1.9	-
	4 - 8 mnths	1.3 - 3.1	-
	8 - 12 mnths	2.1 - 2.9	-
	1 - 2 yrs	1.6 - 3.3	-
	2 - 5 yrs	1.8 - 4.4	-
	5 - 8 yrs	2.3 - 4.0	-
	8 - 12 yrs	1.9 - 3.8	-
	12 - 15 yrs	1.8 - 4.1	-
	15 - 50 yrs	1.2 - 3.1	-
> 50 yrs	1.2 - 3.1	-	
MHPG	0 - 4 mnths	84 - 277	nmol/L
	4 - 8 mnths	49 - 116	nmol/L
	8 - 12 mnths	40 - 71	nmol/L
	1 - 2 yrs	33 - 71	nmol/L
	2 - 5 yrs	35 - 64	nmol/L
	5 - 8 yrs	37 - 75	nmol/L
	8 - 12 yrs	32 - 68	nmol/L
	12 - 15 yrs	41 - 82	nmol/L
	15 - 50 yrs	29 - 64	nmol/L
> 50 yrs	38 - 70	nmol/L	
Analyte	Age	Reference range	Unit

PR 007774	<b>CSF analysis of neurotransmitter metabolites (HVA, 5-HIAA, MHPG, 3-methoxy-tyrosine, L-Dopa)</b>	PAGE 3/3 VALID UNTIL : 01-01-2024
-----------	---	--------------------------------------

Ratio HVA / MHPG	0 - 8 mnths	5.0 - 20	-
	8 mnths - 12 yrs	5.0 - 15	-
	12 - 15 yrs	3.0 - 12	-
	> 15 yrs	2.0 - 10	-
3-Methoxytyrosine	0 - 0,1 yrs	<325	nmol/L
	0,1 - 0,3 yrs	<200	nmol/L
	0.3 - 1 yrs	<100	nmol/L
	>1 yrs	<50	nmol/L
5-Hydroxy-tryptophan	All	< 25	nmol/L
L-dopa	0-5 yrs	< 30	nmol/L
	> 5 yrs	< 20	nmol/L