ERNDIM QUANTITATIVE ORGANIC ACIDS IN URINE: HIGHLIGHTS AND RECOMMENDATIONS

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Introduction

Can you use your organic acids profiling results for therapeutic monitoring?

The ERNDIM Quantitative Organic Acids in Urine EQA scheme assesses accuracy, recovery, precision, linearity and inter-laboratory variance (CV%) of guantitative measurements for 20 common and selected organic acids relevant to IEMs

Scheme Details

- · 8 samples of lyophilised human urine spiked with physiologically relevant levels of 20 organic acids
- Results submitted via ERNDIM interactive website
- · 107 participants from 33 Countries worldwide (2013)
- Scheme operated since 1993
- · Cost (2013): 270 EURO

- Participants' Annual Report
 - · Performance based on 4 parameters: Accuracy + Precision + Linearity . Recovery
 - · The parameters are scored for each analyte; those falling outside the 95th percentile for all laboratories are indicated with red shading
 - Two or more parameters with red shading or insufficient submissions are equated to unsatisfactory performance for that particular analyte
 - Green shading indicates satisfactory performance for that analyte

Analyte	Accuracy (mrsn)		Precision (conschepticates)		Linearity (r)		Recovery (weathed analyze)		Data all labs	
	Your Lab	All labs	Your Lab	All labe	Your Lab	All labe	Your Lab	All labe		Interial: cr
2 Of Guinicasis	145	145	12.5%	17.8%	0.993	0.991	81%	78%	\mathcal{A}	32.1%
3 methylolutaric add	60.3	65.1	6.4%	9,4%	0.995	0.992	92%	101%	68	20.5%
3-00-Bolyncianal	1459	1100	9.0%	21.6%	0.999	0.997	100%	87%	74	41.6%
2 OH Isovala is ask	205	200	16.1%	22,6%	0.985	0.571	112%	100%	68	46.2%
n kine na sysie andel	26.0	88.8	17.1%	24,0446	0.900	0.000	6196	NNS.	144	NAUNC
Adjustand	299	280	15,2%	11.9%	0.995	0.994	107%	96%	70	24,0%
Ocelinic	\$205	3222	4.5%	3.1%	N/A	0.399	N/A	99%	73	6.17%
Operationals with		56.0	10,056	1.1.176	0.992	0.880	11176	A.1%	-	46.80%
Ethylmologic and	09.7	95.9	9.7%	10.2%	0.998	0.597	9,156	100%	87	25,055
Fama wasi	55.6	60.8	3.6%	13.7%	0.999	0.995	90%	94%	76	28.9%
Gatencian d	99,9	100	0.7%	9,6%	0.999	0.995	97%	92%	87	24.4%
Gigodic wat	189	215	11.1%	17,356	0.906	0.503	72%	82%	69	39,055
Honorovichering	N/A	32.1	37.5%	16.6%	N/A	0.572	N/A	106%	62	38.5%
Kennegi dan sest	364	357	3.5%	17,1%	0.999	0.995	9459	84%	71	37,0%
Malecand	144	109	11.0%	10.7%	0.996	0.804	54%	00%	44	56,3%
Metholinalarie axid	1345	1540	9.2%	13.3%	0.998	0.596	80%	92%	100	31.8%
Neorine at word	227	236	45,458	19,555	0.977	0.505	9/159	90%	49	35.4%
N antideporte and	4510	2651	50.0%	26.5%	0.976	0.591	128%	75%	62	77.6%
terestatemic axis	2092	21/9	16.7%	19.2%	0.997	0.997	78%	78%	66	53,4%
Selten a stad	321	290	21,1%	15,1%	0.909	0.594	125%	99%	74	34.9%
talaricarid	200	265	24.4%	12.3%	0.988	0.596	10/%	97%	78	25.4%
tiablabaine	65.9	90.0	14.5%	19.1%	0.985	0.582	715	60%	53	48.4%
Overall	211	612	10.000	10.00					-	

Variation within and between labs

- precision all metabolites ŝ ces intra la s CVA -inter lab CV% aefficient of variation 80% 605 40% 20% 0% 2008 2005 2010 2012
- Large analyte-dependent differences in intralab CV% (precision): <10% to > 25%
- Inter-lab CV% discrepantly high as compared to intra-lab CV%: lack of method standardization
- A positive trend is seen for inter-lab CV% in the period 2008-2012



Example of Detailed Report

ERNE	DIMQA	- Analyte In	Detail
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Scheme participation



Only 50% of the labs that participate in the Diagnostic Proficiency Scheme (ERNDIM Qualitative Organic Acids Schemes) participate in the Qualitative schemes. Does this mean that half of the labs does not care about accurate and precise guantification?

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Feedback

- General
- · 8 Monthly reports plus annual report
- Certificate issued once a year by ERNDIM Board
- Personalized:
- Letters of support to poor-performers
- Offer training



- Accurate and precise quantification is important for therapeutic monitoring but also for diagnosis, e.g. subtle rises of ethylmalonic acid in SCAD or EPEMA, and 3hydroxisovaleric acid in biotinidase deficiency
- · Surprisingly, only half of labs that use organic acids for clinical diagnosis feel the need to (quality-control if they can) report quantitative results
- From 2008-2012, the analytical performance in the Quantitative Organic Acids in Urine EQA scheme steadily improved, indicating the educational value of participation to such quantitative scheme.
- Inter-lab imprecisions remain, disproportionately high, calling for further standardization.

Ask your lab how they perform in ERNDIM EQA schemes! For further information please contact: admin@erndim.org www.erndim.org



FRNG

QUALITY ASSURANCE IN LABORATORY TESTING FOR IEM

Ethylmalonic acid

= 59 µmol/L (20

concentration = median

mmol/mol creatinine)

Close to diagnostic

threshold for EPEMA (ETH1 mutation ~ 35-45 mmol/mol

5 labs (7%) reported

below consensus

values more than 3SD

value: risk of missing

2 labs (3%) reported

positive ETH1

diagnosis

more than 3SD above

consensus: risk of false

40

20 25

Consensus

creatinine)

ETH1