ERNDIM number 000

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ERNDIM QAP for qualitative urinary organic acid analysis

Annual Report 2010 (Sheffield)

Participation

Active participants (reporting on at least one set of samples in the year) are shown in Table 1. The number of participants continues to grow. New applicants are distributed between the Sheffield and Heidelberg qualitative urinary organic acid schemes which are run separately. The two organising laboratories each participate in the other's scheme.

Table 1: Geographical distribution of participants

	2010	*2009*	*2008*	*2007*	*2006*	*2005*	*2004*
Argentina	2	2	1	2	1	1	1
Australia	6	6	6	6	6	6	6
Belgium	6	7	5	5	4	6	6
Brazil	-	1	1	1	1	1	1
Canada	1	1	1	1	1	0	0
Columbia	1	1	-	-	-	-	-
Democratic Republic of China	2	1	1	1	1	1	1
Finland	1	1	1	1	1	1	1
France	13	13	14	13	11	12	13
Germany†	1	1	1	1	1	1	1
Israel	4	3	2	2	2	2	2
Japan	1	1	1	1	1	0	0
Lebanon	1	1	1	1	1	1	1
Malaysia	4	3	3	2	2	1	1
New Zealand	1	1	1	2	2	1	0
People's Republic of China	7	7	6	6	4	4	4
Portugal	2	2	2	2	2	2	2
Republic of Korea	1	1	1	1	1	1	0
Republic of Ireland	1	1	1	1	1	1	1
Republic of Singapore	1	1	1	-	-	-	-
South Africa	2	1	1	-	-	-	-
Spain	6	6	5	5	5	5	5
Turkey	3	2	2	-	-	-	-
United Kingdom	19	20	20	20	21	21	21
USA	3	4	4	4	2	1	0
Venezuela	1	1	1	1	1	0	0
TOTAL	**90**	**89**	**83**	**79**	**72**	**69**	**67**

† Heidelberg laboratory

Samples and results

Three sets of three samples (numbered 178-186) were dispatched together in April 2010. Laboratories were asked to analyse the sets at intervals during the year as if they were separate circulations. Eighty-one laboratories (90%) returned results for all three sets, four returned only two, two laboratories made only a single return, and three made no return.

Scoring of results

To enable data reduction the results were scored as shown below:

Satisfactory	2	Helpful but incomplete	1
Not helpful	0	Slightly misleading	-1
Misleading	-2	Failing to return a result	0

Two points are deducted for transposed sample numbers.

Table 2: Distribution of scores for individual samples (laboratories making returns)

Sample	Scores				
	-2	**-1**	**0**	**1**	**2**
178 5-year old boy with renal stones *Normal*	1	1	2	1	82
179 Cardiomyopathy in a 2-year old boy *3-Methylglutaconic aciduria type 2 (Barth syndrome)*	1	-	1	5	80
180 10-year old female with developmental delay *Succinic semialdehyde dehydrogenase deficiency*	12	1	0	1	73
181 6-month old boy, hypotonia and irritability. *Glutaric aciduria type 1*	-	-	-	2	80
182 8-year old boy, learning difficulties. *Normal*	-	-	1	-	81
183 Epilepsy in a 3-year old girl. *Metabolites of valproic acid and phenobarbitone present but no diagnostic abnormality*	2	1	1	2	76
184 Reye-like symptoms following illness in a 2 year old boy. *3-Methylcrotonyl-CoA carboxylase deficiency*	-	-	-	1	84
185 Acidotic 5-month-old boy, unwilling to feed. *Propionyl-CoA carboxylase deficiency*	8	2	4	1	69
186 Seven-year-old boy with behavioural problems. *Normal*	1	-	-	-	84

Penalty points due to sample transposition are disregarded for this table

Table 3: Cumulative scores for 2008 - 2010 (current Sheffield participants only)
The average score is **per sample reported**. The maximum annual scores were 18.

Laboratory OA Number	2010			2009		2008		2008-10
	No. of returns	Late returns	Total score	No of returns	Total score	No. of returns	Total Score	Average score
3	3	0	18	3	13	3	14	1.67
4	3	0	18	3	9	3	14	1.52
5	3	0	10	3	16	3	16	1.56
6	3	0	18	3	18	3	18	2.00
7	3	0	18	3	18	3	14	1.85
10	3	0	18	3	15	3	16	1.81
11	3	0	16	3	12	3	14	1.56
12	3	1	14	3	18	3	18	1.85
13	3	0	15	3	18	3	16	1.81
14	3	0	18	3	18	3	18	2.00
15	3	0	18	3	18	3	14	1.85
17	3	0	18	3	17	3	18	1.96
18	3	0	18	3	18	3	18	2.00
19	3	2	18	2	10	3	16	1.83
21	3	1	18	3	14	3	18	1.85
24	3	0	18	3	18	3	18	2.00
25	3	0	18	3	18	3	14	1.85
26	3	0	18	3	18	3	18	2.00
27	3	0	14	3	18	3	16	1.78
29	3	0	18	3	18	3	17	1.96
31	3	0	18	3	18	3	17	1.96
32	3	0	18	3	18	3	15	1.89
35	3	0	17	3	18	3	18	1.96
38	3	0	18	3	18	3	18	2.00
44	3	1	18	3	18	3	18	2.00
48	3	0	13	3	18	3	16	1.74
49	3	0	10	3	18	3	18	1.70
51	3	0	18	3	18	3	17	1.96
52	1	1	10	3	18	3	18	1.92
65	3	0	18	3	15	3	18	1.89
66	3	0	18	3	18	3	18	2.00
83	3	1	18	3	17	3	15	1.85
85	3	0	18	3	18	2	12	2.00
86	3	0	18	3	18	3	18	2.00
88	2	0	12	3	18	3	18	2.00
92	3	1	18	3	18	3	18	2.00
93	3	1	18	3	17	3	14	1.81
94	3	0	16	3	14	3	17	1.74
96	3	1	18	3	14	3	18	1.85
98	3	0	18	3	14	3	17	1.81
101	3	0	18	3	18	3	18	2.00
102	3	0	18	3	18	3	18	2.00
104	3	1	15	3	18	3	18	1.89

Laboratory OA Number	2010			2009		2008		2008-10
	No. of returns	Late returns	Total score	No of returns	Total score	No. of returns	Total Score	Average score
106	3	0	15	3	16	3	18	1.81
108	3	0	18	3	15	3	13	1.70
111	3	0	18	3	18	3	16	1.93
113	3	0	13	3	3	3	14	1.11
119	3	0	18	3	18	3	18	2.00
120	3	0	18	3	18	3	16	1.93
126	3	1	14	2	9	2	14	1.76
128	3	1	14	3	13	1	2	1.38
130	3	0	18	3	14	3	17	1.81
132	3	0	18	3	14	3	16	1.78
133	3	2	17	0	0	3	17	1.89
134	3	0	18	0	0	3	15	1.83
135	3	0	18	3	18	3	17	1.96
137	3	0	18	3	18	3	18	2.00
138	3	0	17	3	9	2	10	1.50
139	3	0	18	3	15	3	16	1.81
141	3	3	7	0	0	2	4	0.73
142	2	0	12	3	18	3	13	1.79
143	3	0	18	3	18	3	13	1.81
144	3	0	18	3	14	3	18	1.85
146	3	0	16	3	12	3	13	1.52
147	2	0	18	3	15	3	9	1.75
148	3	0	18	3	18	3	13	1.81
149	3	0	18	3	14	3	11	1.59
150	2	0	12	3	14	2	10	1.71
151	3	1	18	1	6	1	4	1.87
152	3	3	12	3	-2	3	14	0.89
153	3	0	13	1	6	2	11	1.67
154	3	0	14	3	18	3	11	1.59
155	3	2	18	3	18	3	18	2.00
156	3	0	18	3	18	3	14	1.85
157	3	1	9	3	6	3	8	0.85
158	3	2	18	3	18	3	12	1.78
159	3	0	10	3	15	3	16	1.52
160	3	1	16					
163	3	1	6	2	1			
164	3	0	12	3	16			
165	3	0	7	3	6			
166	3	0	13	3	18			
167	3	0	12					
168	3	0	13					
170	3	0	18					
171	1	0	6					
172	3	0	18					

Your Laboratory OA Number in the above Table is NNN

Commentary

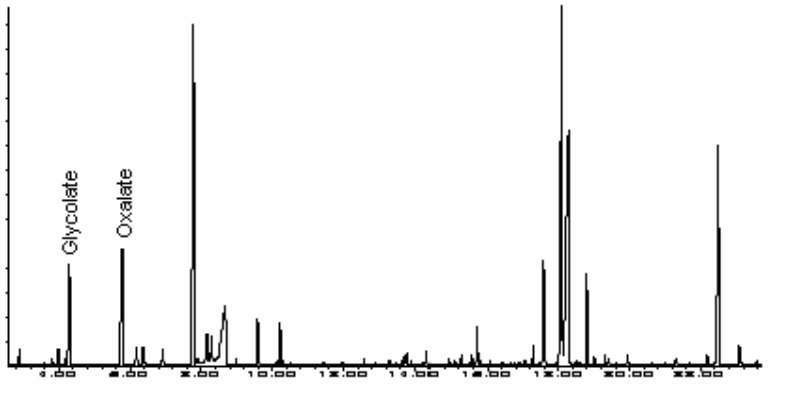
Unusually this year we circulated the same sample three times (numbers 178, 182 and 186) but with different clinical descriptions. For sample 178 the clinical problem was the presence of renal stones. Most participants reported the sample as normal but suggested appropriate additional investigations, including urine amino acids, purines, and quantitative oxalate. Three participants made tentative diagnoses of hyperoxaluria type1 for this sample, though not for samples 182 and 186. Two other laboratories noted increased glycolate and/or oxalate in other samples of this urine but did not consider these to have diagnostic significance. The urine was from a healthy 10-year-old relative of one of the laboratory staff.

Table 4: Reports of metabolites associated with hyperoxaluria type 1

Laboratory	Sample 178	Sample 182	Sample 186
A	-	Glycolate + oxalate	Glycolate
B	-	Oxalate	-
C	* Glycolate	Glycolate	-
D	* Glycolate + oxalate	-	-
E	* Oxalate	Oxalate	-

**Tentative diagnosis of hyperoxaluria type 1*

It can be difficult to diagnose hyperoxaluria type 1 from a random urine sample as oxalate has limited solubility and glycolate is excreted only in moderate amounts. The trace below is from urine of an affected child (circulated in 2004 as sample 130). Seven of the sixty-three participants returning results for this sample regarded it as normal.



It is important to take clinical indications into account when interpreting chromatograms. However, both glycolate and oxalate occur in small amounts in normal urine and, as shown in Table 4, it is possible to be mislead by metabolite patterns which would otherwise be regarded as normal.

Certificates of Participation and Performance

We are required to define "Participation" and "Satisfactory Performance" for the purpose of the ERNDIM Annual Certificate which covers all ERNDIM schemes. For this urinary organic acid scheme we have defined "Participation" as requiring at least two returns during the year. Defining "Satisfactory Performance" is more problematical as in some years there are more difficult samples than in others. The longer-term average score (Table 3, Figure 1) may be a better guide.

We have retained the same criteria for "Satisfactory Performance" in 2010 as in 2009. Thus a score of 11 or more based on three returns (maximum possible score 18), or of 7 or more where only two returns have been received (maximum possible score 12) has been classed as satisfactory. On this basis five of the eighty-one qualifying participants have been deemed unsatisfactory. We will be sending individual letters, drawing attention to areas that appear particularly problematical, to laboratories failing these formal "Satisfactory Performance" criteria. However, such criteria are always somewhat arbitrary and in practice even a single missed or wrong diagnosis can be highly damaging. Thus the reason(s) for failure to correctly report on any of the samples in the scheme should be investigated locally and appropriate remedial action taken.

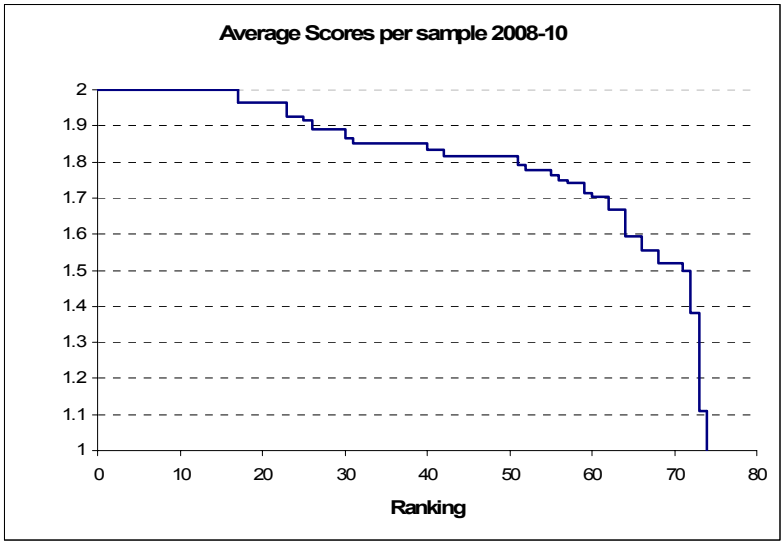


Figure 1: Distribution of average scores for centres contributing throughout 2008-2010

Communication

For 2010 we sent the entire set of nine urine samples as a single consignment, to be analysed and reported in three sets. We sent out E-mail reminders to participants whose reports were outstanding after the closing dates. This revealed that a small number of returns had indeed gone missing in the mail and that a slightly larger number of laboratories had overlooked the closing date or lost their response forms – a disadvantage of sending all the samples out together.

We will repeat this procedure with the 2011 samples and will send you advisory E-mails when they have been dispatched. The contact that we have for your laboratory is ******* with the E-mail address -----. If either of these needs updating pleased send details to us at **Sheffield_urine_organics_EQA@sch.nhs.uk** quoting also your ERNDIM number.

We thank Lynne Darwin for administering our participant database and dealing with the returns, and Joyce Allen for preparing and dispatching the samples. We hope that you continue to find this scheme useful.

Yours sincerely

Dr J R Bonham Ms M Downing Professor R J Pollitt

Scheme organisers