ERNDIM number «ERNDIM_Number»

Department of Clinical Chemistry and Newborn Screening
Ms M Downing
Dr J R Bonham
Professor R J Pollitt
Telephone (+)44 114 271 7404
Fax (+)44 114 270 6121
The Children's Hospital
Sheffield
S10 2TH
UK
E-mail: Sheffield_urine_organics_EQA@sch.nhs.uk

23rd March 2012

ERNDIM QAP for qualitative urinary organic acid analysis

Annual Report 2011 (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 registered participants

	2011	***2010***	***2009***	***2008***	***2007***	***2006***	***2005***
Argentina	2	2	2	1	2	1	1
Australia	6	6	6	6	6	6	6
Belgium	5	6	7	5	5	4	6
Brazil	2	-	1	1	1	1	1
Canada	1	1	1	1	1	1	0
Columbia	1	1	1	-	-	-	-
Czech Republic	1	-	-	-	-	-	-
Democratic Republic of China	2	2	1	1	1	1	1
Finland	1	1	1	1	1	1	1
France	15	13	13	14	13	11	12
Germany†	1	1	1	1	1	1	1
Israel	3	4	3	2	2	2	2
Japan	1	1	1	1	1	1	0
Lebanon	1	1	1	1	1	1	1
Malaysia	3	4	3	3	2	2	1
New Zealand	1	1	1	1	2	2	1
People's Republic of China	10	7	7	6	6	4	4
Portugal	2	2	2	2	2	2	2
Republic of Korea	1	1	1	1	1	1	1
Republic of Ireland	1	1	1	1	1	1	1
Republic of Singapore	1	1	1	1	-	-	-
South Africa	2	2	1	1	-	-	-
Spain	6	6	6	5	5	5	5
Turkey	3	3	2	2	-	-	-
United Kingdom	18	19	20	20	20	21	21
USA	3	3	4	4	4	2	1
Venezuela	1	1	1	1	1	1	0
Vietnam	1	-	-	-	-	-	
TOTAL	**95**	**90**	**89**	**83**	**79**	**72**	**69**

† Heidelberg laboratory

Samples and results

Three sets of three samples (numbered 187-195) were dispatched together in April 2011. Laboratories were asked to analyse the sets at intervals during the year as if they were separate circulations. Eighty-one laboratories (85%) returned results for all three sets, eight returned only two, three 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**
187 8-Month-old boy with developmental delay *Normal*	1	-	-	3	87
188 2-Year-old boy. Lethargic, metabolic acidosis *Malonyl-CoA carboxylase deficiency*	-	-	-	-	91
189 2-Year-old girl presenting as Reye syndrome *3-Hydroxy-3-methylglutaryl-CoA lyase deficiency*	-	5	-	-	86
190 6-Month-old with hypotonia *Mild multiple acyl-CoA dehydrogenase deficiency, ETHE1 deficiency, or riboflavin transport defect*	6	3	7	6	63
191 8-year-old boy with learning difficulties *Intermittent Maple Syrup Urine Disease*	8	-	1	1	75
192 18-year-old male with intermittent episodes of ataxia *Normal*	-	-	-	1	84
193 6 year old with macrocephaly and mental retardation *Fumarate hydratase deficiency*	1	3	6	4	71
194 8 month old boy with growth retardation and anaemia *Normal*	-	-	1	1	83
195 Teenager admitted in a hypoglycaemic coma following alcohol abuse. Sample taken after recovery. *Medium-chain acyl-CoA dehydrogenase deficiency*	15	-	-	-	70

Penalty points due to sample transposition are disregarded for this table

Table 3: Cumulative scores for 2009 - 2011 (current Sheffield participants only)

The average score is **per sample reported**. The maximum annual scores were 18.

Laboratory number	2011		2010		2009		2009-2011
	No of returns	Total score	No of returns	Total score	No of returns	Total score	Average score
3	3	17	3	18	3	13	1.78
4	3	16	3	18	3	9	1.59
5	3	18	3	10	3	16	1.63
6	3	18	3	18	3	18	2.00
7	3	18	3	18	3	18	2.00
10	3	13	3	18	3	15	1.70
11	3	18	3	16	3	12	1.70
12	2	12	3	14	3	18	1.83
13	3	18	3	15	3	18	1.89
14	3	17	3	18	3	18	1.96
15	3	18	3	18	3	18	2.00
17	3	14	3	18	3	17	1.81
18	3	18	3	18	3	18	2.00
19	3	15	3	18	2	10	1.79
21	3	18	3	18	3	14	1.85
24	3	18	3	18	3	18	2.00
25	3	18	3	18	3	18	2.00
26	3	17	3	18	3	18	1.96
27	3	16	3	14	3	18	1.78
29	3	13	3	18	3	18	1.81
31	3	18	3	18	3	18	2.00
32	3	18	3	18	3	18	2.00
35	3	18	3	17	3	18	1.96
38	3	18	3	18	3	18	2.00
48	3	18	3	13	3	18	1.81
49	2	12	3	10	3	18	1.67
51	3	18	3	18	3	18	2.00
52	2	12	2	10	3	18	1.90
65	3	18	3	18	3	15	1.89
66	3	15	3	18	3	18	1.89
83	3	15	3	18	3	17	1.85
85	3	18	3	18	3	18	2.00
86	3	18	3	18	3	18	2.00
88	3	14	2	12	3	18	1.83
90	2	13	-	-	-	-	
92	3	18	3	18	3	18	2.00
93	3	17	3	18	3	17	1.93
94	3	18	3	16	3	14	1.78
96	3	18	3	18	3	14	1.85
98	3	18	3	18	3	14	1.85
101	3	18	3	18	3	18	2.00
102	3	18	3	18	3	18	2.00
104	3	7	3	15	3	18	1.48
106	3	18	3	15	3	16	1.81
108	3	18	3	18	3	15	1.89
111	3	18	3	18	3	18	2.00
113	3	10	3	13	3	3	0.96
114	2	3	-	-	3	14	

Laboratory number	2011		2010		2009		2009-2011
	No of returns	Total score	No of returns	Total score	No of returns	Total score	Average score
119	3	18	3	18	3	18	2.00
120	3	18	3	18	3	18	2.00
121	3	14					
126	3	15	3	14	2	9	1.58
128	3	10	3	14	3	13	1.37
130	3	18	3	18	3	14	1.85
132	3	18	3	18	3	14	1.85
133	1	6	3	17	0	0	1.92
134	3	18	3	18	0	0	2.00
135	3	18	3	18	3	18	2.00
137	3	18	3	18	3	18	2.00
138	3	8	3	17	3	9	1.26
139	3	18	3	18	3	15	1.89
141	1	6	3	7	-	-	1.08
142	2	9	2	12	3	18	1.86
143	3	16	3	18	3	18	1.93
144	3	15	3	18	3	14	1.74
146	3	13	3	16	3	12	1.52
147	3	14	2	18	3	15	1.96
148	3	16	3	18	3	18	1.93
149	3	14	3	18	3	14	1.70
151	2	12	3	18	1	6	2.00
152	1	6	3	12	3	-2	0.76
153	3	7	3	13	1	6	1.24
154	3	13	3	14	3	18	1.67
155	3	14	3	18	3	18	1.85
156	3	16	3	18	3	18	1.93
157	3	18	3	9	3	6	1.22
158	3	14	3	18	3	18	1.85
159	3	16	3	10	3	15	1.52
160	3	17	3	14	-	-	
163	3	13	3	6	2	1	0.83
164	3	18	3	12	3	16	1.70
165	3	8	3	7	3	6	0.78
166	3	12	3	13	3	18	1.59
167	3	6	3	12	-	-	
168	3	18	3	13	-	-	
170	3	14	3	18	-	-	
172	3	15	3	18	-	-	
175	3	15	-	-	-	-	
177	3	16	-	-	-	-	
178	3	6	-	-	-	-	
179	3	16	-	-	-	-	
180	2	8	-	-	-	-	

Your Laboratory OA Number in the above Table is 999

Commentary

Overall this year's samples were slightly more challenging than those in 2010 (Figure 1). Average scores for four samples (numbers 190, 191, 193 and 195) were below 85% of the possible maximum . The scores for samples 191 (intermittent maple syrup urine disease) and 195 (medium-chain acyl-CoA dehydrogenase deficiency) were clustered at the extremes (+2 and -2), the main problem being failure to detect (or to appreciate the significance of) the pathognomic metabolites. For samples 190 and 196 the scores were more evenly spread: the analytical findings left room for ambiguity and scores reflected also the adequacy of interpretation and appropriateness of suggestions for further investigation. As far as the latter are concerned, the covering letter sent out with the 2011 samples gave the following guidance: "The 'Further investigations' box should indicate any additional investigations you consider necessary to interpret or confirm conclusions based on the analytical results. The 'Additional comments' box may be used for caveats or to suggest other lines of investigation based on the clinical presentation rather than the analytical findings." Ideally, in both cases, suggestions should follow a logical hierarchy with simple group investigations such as amino acid chromatography or blood-spot acylcarnitine profiling (if indicated) taking precedence over much more specific investigations such as gene sequencing.

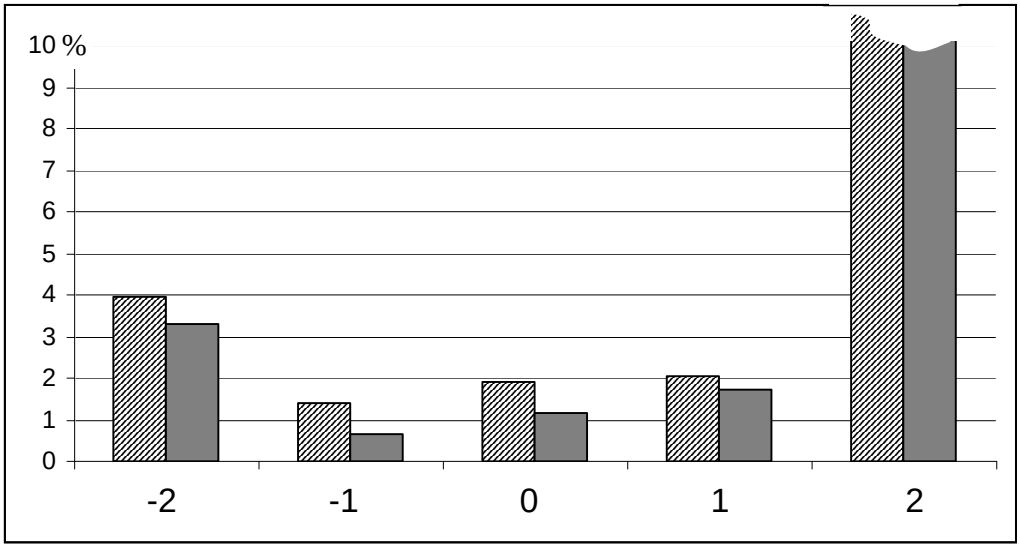

Figure 1: Distribution of scores for individual samples, 2010 grey, 2011 cross-hatched.

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 2) may be a better guide.

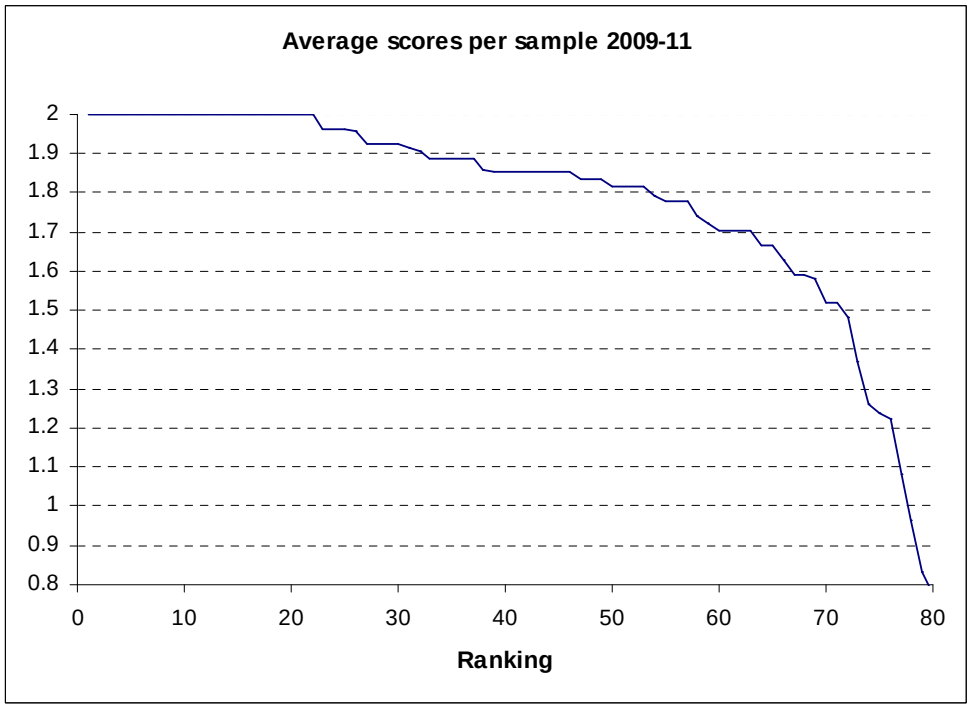

Figure 2: Distribution of average scores for centres contributing throughout 2009-2011

We have retained the same criteria for "Satisfactory Performance" in 2011 as in 2010. 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 seven 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.

Communication

For 2011 we sent the entire set of nine urine samples as a single consignment, to be analysed and reported in three sets. We have repeated this procedure with the 2012 samples. 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. As a further precaution in 2012 we will send out a second reminder to participants whose returns have still not been received.

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 organiser