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Diagnostic Proficiency Testing

Centre: United Kingdom

Final Report 2021

prepared by
Mrs Joanne Croft

Note: This annual report is intended for participants of the ERNDIM DPT UK scheme. The contents should not be used for any publication without permission of the Scientific Advisor.

The fact that your laboratory participates in ERNDIM schemes is not confidential, however, the raw data and performance scores are confidential and will only be shared within ERNDIM for the purpose of evaluating your laboratories performance, unless ERNDIM is required to disclose performance data by a relevant government agency. For details please see the terms and conditions on page18 and the ERNDIM Privacy Policy on www.erndim.org.

In 2021, 21 labs participated in the UK Diagnostic Proficiency Testing Scheme (there is an error in the database – the total number of labs appears to be 22).

1. Geographical distribution of participants

For the first survey, 21 and second survey 21 laboratories submitted results.

Country	Number of participants	Country	Number of participants
Australia	1	New Zealand	2
Ireland	1	Spain	1
Netherlands	1	United Kingdom	16

2. Design and logistics of the scheme including sample information

The scheme has been designed and planned by Joanne Croft as Scientific Advisor and coordinated by CSCQ as scheme organiser (sub-contractor on behalf of ERNDIM), both appointed by and according to procedures laid down the ERNDIM Board.
CSCQ dispatches DPT EQA samples to the scheme participants and provides a website for on-line submission of results and access to scheme reports. Existing DPT scheme participants can log on to the CSCQ results submission website at:
https://cscq.hcuge.ch/cscq/ERNDIM/Initial/Initial.php

2 surveys	Round 1: patients A, B and C
	Round 2: patients D, E and F

[1] If this report is not Version 1 for this scheme year, go to APPENDIX 1 for details of the changes made since the last version of this document.

Origin of patients: all urine samples have been provided by the scheme organizers or specified participants.

Patient A: Alpha-mannosidosis – Dr Ruijter, Rotterdam. This sample has been sent to all labs participating in the DPT scheme.
Patient B: Succinic semialdehyde dehydrogenase deficiency (SSADH deficiency) – Sheffield Children's NHS Foundation, Sheffield, UK
Patient C: Mucopolysaccharidosis Type 2 (Hunter syndrome) – Sheffield Children's NHS Foundation Trust, Sheffield, UK
Patient D: HMG CoA lyase deficiency – Sheffield Children's NHS Foundation Trust, Sheffield, UK
Patient E: No inborn error of metabolism. – Sheffield Children's NHS Foundation Trust, Sheffield, UK
Patient F: Citrullinaemia Type 1 – Sheffield Children's NHS Foundation Trust, Sheffield, UK

The samples have been heat-treated. They were pre-analysed in our institute after 3 days incubation at ambient temperature (to mimic possible changes that might arise during transport). In all six samples the typical metabolic profiles were preserved after this process.
Mailing: samples were sent by DHL; FedEx or the Swiss Post at room temperature.

3. Tests

Analyses of amino acids, organic acids, mucopolysaccharides, oligosaccharides and purines/pyrimidines were required in 2021.

4. Schedule of the scheme

- Feb 9 2021: shipment of samples of Survey 1 and Survey 2 and of the clinical data by e-mail
- March 8 2021: analysis start and website submission availability open for Survey 1
- March 29 2021: deadline for result submission (Survey 1)
- April 2021: interim report of Survey 1 sent by e mail
- June 7 2021: analysis start and website submission availability open for Survey 2
- June 28 2021: deadline for result submission (Survey 2)
- August 2021: interim report of Survey 2 sent by e-mail
- September 2 2021: UK DPT Participants Workshop held on-line
- November 12 2021: Qualitative schemes critical error meeting held on-line
- November 25 and 26 2021: ERNDIM SAB meeting held on-line
- January 2022: Annual report with final scoring issued by e-mail

5. Results

21 of 21 labs returned results for both surveys (the lab in the table below which appears to have not returned any results is present in error).

	Survey 1	**Survey 2**
Receipt of results	21	21
No answer	1	1

6. Web site reporting

The website reporting system is compulsory for all centres. Please read carefully the following advice:

- Selection of tests: **don't select a test if you will not perform it**, otherwise the evaluation program includes it in the report.
- Results
  - Give quantitative data as much as possible.
  - Enter the key metabolites with the evaluation **in the tables** even if you don't give quantitative data.
  - If the profile is normal: enter "Normal profile" in "Key metabolites".
  - **Don't enter results in the "comments" window**, **otherwise your results will not be included in the evaluation program.**

- Recommendations = **advice for further investigation**.
  - Scored together with the interpretative score.
  - Advice for treatment are not scored.
  - **Don't give advice for further investigation in "Comments on diagnosis"**: it will not be included in the evaluation program.

7. Scoring and evaluation of results

Information regarding procedures for establishment of assigned values, statistical analysis, interpretation of statistical analysis etc. can be found in generic documents on the ERNDIM website.
The scoring system has been established by the International Scientific Advisory Board of ERNDIM. Two criteria are evaluated: 1) analytical performance, 2) interpretative proficiency also considering recommendations for further investigations.

A	Analytical performance	Correct results of the appropriate tests	2
		Partially correct or non-standard methods	1
		Unsatisfactory or misleading	0
I	Interpretative proficiency & Recommendations	Good (diagnosis was established)	2
		Helpful but incomplete	1
		Misleading or wrong diagnosis	0

The total score is calculated as a sum of these two criteria. The maximum to be achieved is 4 points per sample. The scores were calculated only for laboratories submitting results.

Scoring and certificate of participation: scoring is carried by a second assessor who changes every year as well as by the scientific advisor. The results of DPT UK 2021 have been also scored by Dr Deborah Mathis, from DPT Switzerland. At the SAB meeting on 25/26th November 2021, the definitive scores have been finalized. The concept of critical error was introduced in 2014. A critical error is defined as an error resulting from seriously misleading analytical findings and /or interpretations with serious clinical consequences for the patient. Thus labs failing to make a correct diagnosis of a sample considered as eligible for this category will be deemed not to have reached a satisfactory performance even if their total points for the year exceed the limit set at the SAB. For 2021, the SAB decided that for Sample A, labs who failed to perform oligosaccharide analysis AND who did not recommend performing this or another test which might detect the condition had to be considered as making a critical error. Non-identification of the large peak of 3 hydroxy 3 methyl glutaric acid in Sample D was deemed to be a critical error and for Sample F failure to identify the increased concentration of citrulline was deemed to be a critical error.

A certificate of participation will be issued and it will be additionally noted whether the participant has received a performance support letter. This performance support letter is sent out if the performance is evaluated as unsatisfactory. Three performance support letters will be sent by the Scheme Advisor for 2021. Any partial submitters will receive a letter from the ERNDIM Executive Administrator, Sara Gardner.

7.1. Score for satisfactory performance

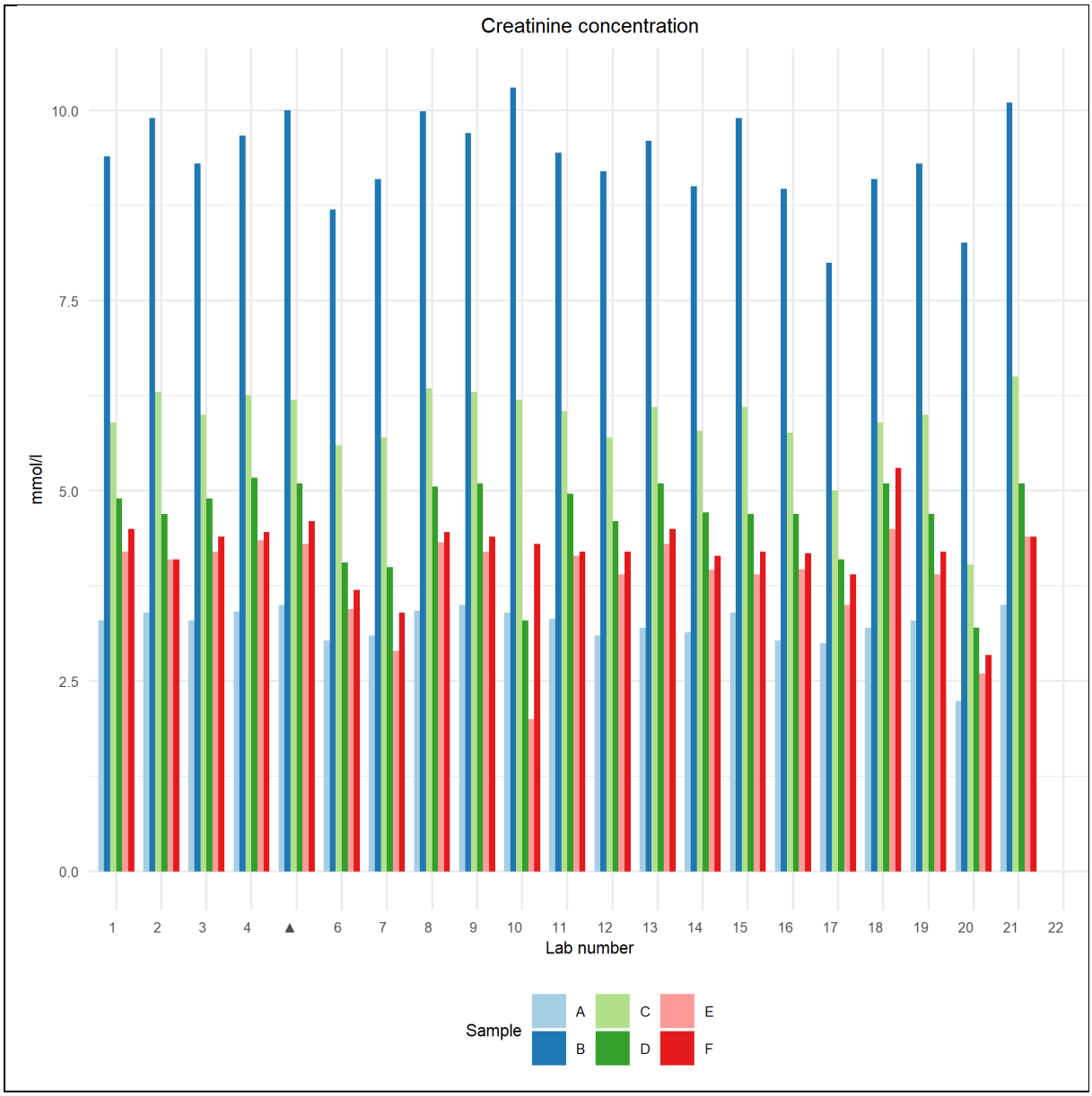
At least 15 points from the maximum of 24 (62%).

If your laboratory is assigned poor performance and you wish to appeal against this classification please email the ERNDIM Administration Office (admin@erndim.org), with full details of the reason for your appeal, within one month receiving your Performance Support Letter. Details of how to appeal poor performance are included in the Performance Support Letter sent to poor performing laboratories.

8. Results of samples and evaluation of reporting

8.1. Creatinine measurement for all samples

Creatinine concentrations provided for each sample by each participating laboratory are shown in the graph below. Agreement between laboratories is good.



8.2. Patient A

Alpha-mannosidosis.

Patient details provided to participants

A 36 year old male with craniosynostosis, dysmorphic facial features, retardation and deafness.

Patient details

A 36 year old male with craniosyntosis, dysmorphic facial features, retardation and deafness.

Performing oligosaccharide analysis (either by TLC or mass spectrometry) revealed an abnormal oligosaccharide pattern.

Analytical performance
15/21 labs performed oligosaccharide analysis, with all 15 reporting an abnormal pattern and concluding to the correct diagnosis. Of the other 6 labs, only 1 did not recommend doing any further investigations which would have possibly led to the correct diagnosis being identified e.g. urine oligosaccharide analysis, white cell enzyme analysis. Failure to recommend any suitable further testing has been deemed by the Scientific Advisory Board as a critical error.

Diagnosis / Interpretative proficiency
Most likely diagnosis

Alpha mannosidosis	15
No significant abnormality found	6

Alternative diagnosis

Other oligosaccharide disorder	2
Exclude alpha mannosidosis based on clinical details	1

Recommendations

Many laboratories suggested enzyme testing and molecular genetic analysis of the MAN2B1 gene.

Scoring

- Analytical
  - Abnormal oligosaccharide pattern (score 2)
- Interpretation
  - Alpha mannosidosis as a first diagnosis (score 2).
  - Oligosaccharide not specified or wrong type (score 1).
  - Recommendation to perform oligosaccharide analysis (but not done) (score 1)

Overall impression

The overall performance for this sample was 76%, which is the lowest for all the samples distributed in 2021 in the UK DPT scheme. Those who performed oligosaccharide analysis scored 4 marks for this sample suggesting that the issue is with laboratories not considering to perform oligosaccharide analysis.

8.3. Patient B

Succinic semialdehyde dehydrogenase deficiency (SSADH deficiency)

Patient details provided to participants

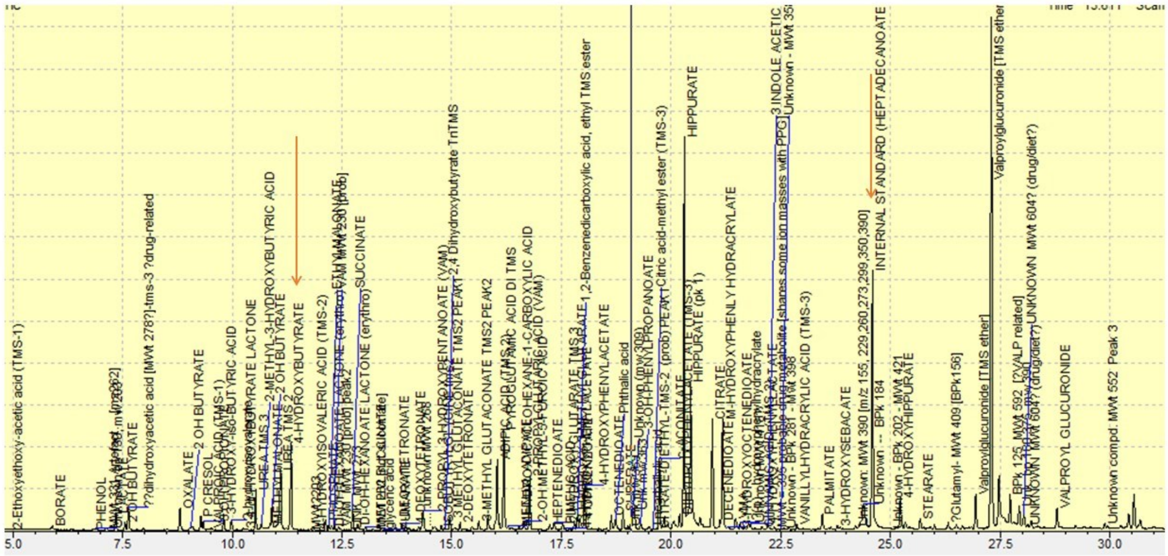
Epilepsy, developmental delay, hypotonia. On treatment.

Patient details

Epilepsy, developmental delay and hypotonia. Male, 9 years old at diagnosis. Sample collected at the age of 39 years while on treatment.

Analytical performance

All laboratories performed organic acid analysis with all participants correctly identifying the increased excretion of 4 hydroxy butyric acid.



Sample B - organic acid chromatogram showing peak of 4 hydroxybutyrate

Diagnosis / Interpretative proficiency

Most likely diagnosis

Succinic semialdehyde dehydrogenase deficiency (SSADH) 21

Alternative diagnosis

Taking gamma hydroxy butyrate 8

7 laboratories also mentioned the increased pyroglutamate found in this sample.

Recommendations

All 21 participants recommended to confirm the diagnosis by mutation analysis of the ALDH5A1 gene. 8 recommended enzyme analysis. 17 participants suggested (urgent) referral to a metabolic clinician. 7/21 mentioned testing of siblings/family studies. 7/21 mentioned the increased pyroglutamate seen on the organic acid trace. 3 asked for a repeat sample and 2 suggested treating with vigabatrin.

Scoring

- Analytical – increase of 4 hydroxy butyrate (score 2)
- Interpretation – succinic semialdehyde dehydrogenase deficiency (SSADH) (score 2)

Overall impression

This was an easy sample with all participants scoring 4 marks.

8.4. Patient C

Mucopolysaccharidosis Type 2 (Hunter syndrome)

Patient details provided to participants

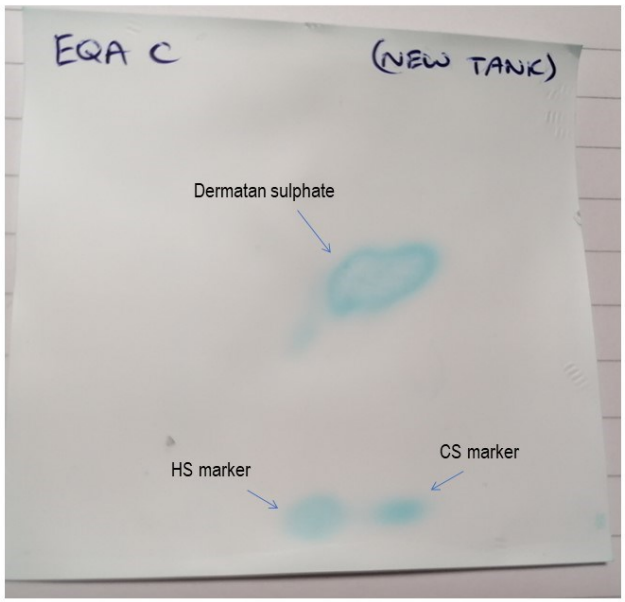
Joint stiffness and developmental delay.

Patient details

4 year old male presenting with joint stiffness and developmental delay. Sample collected at 4 years of age.

Analytical performance

All laboratories performed glycosaminoglycan analysis with all those who performed GAG fractionation scoring 2 marks for analysis. Only 2 laboratories did not perform GAG fractionation but both did recommend getting this analysis performed.



Sample C: GAG electrophoresis showing dermatan sulphate

Diagnosis / Interpretative proficiency

Most likely diagnosis

Mucopolysaccharidosis type 2 (or 1,2,6 or 7)	20
Mucopolysaccharidosis (type not stated)	1

Recommendations

GAG fractionation if not done (2 participants), send for 2D electrophoresis (4 participants), request for repeat urine sample (7 participants). To confirm the MPS type, 18 participants suggested enzyme analysis, 13 participants suggested mutation analysis (with all participants suggesting at least one of these options, and 10 suggesting both). Referral to a metabolic clinician (14 participants), review of/testing of siblings (8 participants) and 2 participants mentioned the availability of enzyme replacement therapy.

Scoring

- **Analytical**
  - Increased dermatan sulphate – score 2
  - Increased glycosaminoglycans with recommendation to do electrophoresis/fractionation – score 1

- **Interpretation**
  - MPS2 (or MPS1, 2, 6 or 7) – score 2
  - MPS (but not defined or wrong one) – score 1

Overall impression

Performance for this sample was good with 96% overall proficiency. Only 2 laboratories did not score 4 marks for this sample. One laboratory who did not perform GAG fractionation concluded to the correct diagnosis presumably based on the clinical information provided.

8.5. Patient D

HMG CoA lyase deficiency

Patient details provided to participants

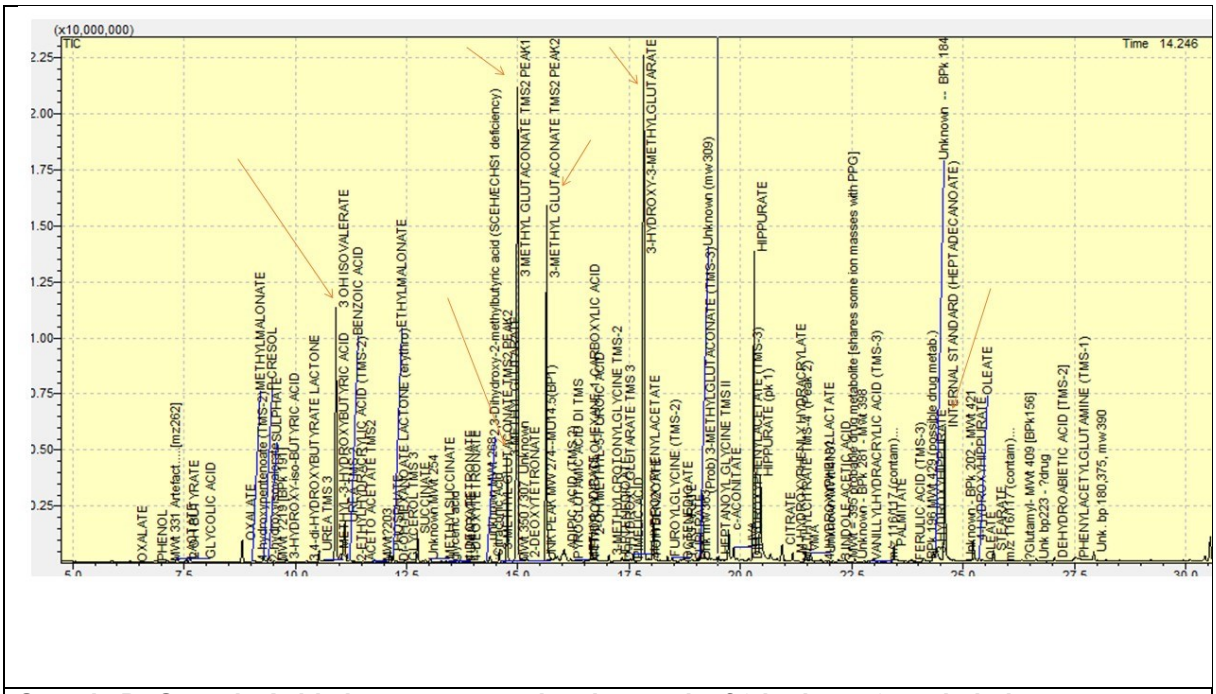
Hypoglycaemia

Patient details

Female patient presenting at 6 years of age with hypoglycaemia. Sample collected at 6 years of age.

Analytical performance

All labs performed organic acid analysis with all but one reporting the increased 3 hydroxy 3 methyl glutarate. As can be seen from the organic acid chromatogram, this peak was the largest and should not have been missed. Failure to identify this has been deemed as a critical error by the Scientific Advisory Board.



Sample D: Organic Acid chromatogram showing peak of 3 hydroxy 3 methyl glutarate

Diagnosis / Interpretative proficiency
Most likely diagnosis

HMG CoA lyase deficiency	19
3 methylglutaconic aciduria	2

Recommendations
20/21 participants gave helpful recommendations

- 16/20 – molecular analysis (of the HMGCL gene)
- 14/20 – acylcarnitine analysis to help confirm diagnosis/check carnitine status (increased 3 hydroxyisovalerylcarnitine (C5OH) and C6DC)
- 17/20- urgent referral to metabolic clinician/team (or ensure under care of such)
- 8/20 – test siblings/family members (or referral to Clinical Genetics)
- 8/20 – check blood ammonia

The laboratory who did not detect the increased 3 hydroxy 3 methylglutarate asked for a repeat urine and suggested a gene panel designed to differentiate 3 methylglutaconic acidurias.

The remaining participant gave no recommendations for this sample. While recommendations aren't scored it is a good idea not to leave this section blank as it is sometimes used if there are any issues with scoring the analysis and interpretation.

Scoring

- **Analytical**
- Detecting increased concentration of 3 hydroxy 3 methylglutarate and 3 methylglutaconate (score 2)
- Failing to detect the increased 3 hydroxy 3 methylglutarate (critical error)

- **Interpretation**
- HMG CoA lyase deficiency (score 2)
- 3methylglutaconic aciduria (score 0)

Overall impression

Overall proficiency for this sample was 94%. 1 laboratory identified the increased concentration of 3 hydroxy 3 methylglutarate but seemingly did not take this into account when concluding to a diagnosis (they gave 3 methylglutaconic aciduria as their diagnosis).

8.6. Patient E

Adult with no inborn error of metabolism.

Patient details provided to participants

Joint stiffness

Patient details

30 year old female with joint stiffness. This sample was collected from a healthy member of laboratory staff.

Analytical performance

19 of 21 participants scored 2 marks for analysis. 2 participants scored 1 for analysis. Both reported abnormal glycosaminoglycans (with 1 concluding this was significant).

Diagnosis / Interpretative proficiency

Most likely diagnosis

No significant abnormality	20
Mucopolysaccharidosis	1

Alternative diagnosis

Rheumatoid arthritis	1
Follow up with oligosaccharides	1
Cannot exclude a mild form of lysosomal storage disorder	1

Recommendations

Recommendations varied from none provided to quite a long list (though the lists were shorter than seen in previous years). Excluding the laboratory who gave mucopolysaccharidosis as the diagnosis:

- 4/20 – none given
- 7/20 – performing GAG fractionation and / or asking for a repeat urine (presumably based on clinical details and faint patterns seen on GAG electrophoresis which could not be reliably interpreted)
- 3/20 – white cell enzymes
- 3/20 – plasma for amino acids (2 labs stated increased lysine in the urine but interpreted this as not significant)

Scoring

Analytical

- Performing at least 3 analyses (not including the 'pre-investigations') and finding no significant abnormality (score 2)

Interpretation

- Concluding no significant abnormality (or a similar comment) (score 2)
- Leaving the diagnosis section blank or putting n/a (score 0)

Overall impression

Overall proficiency for this sample was good (95%).

8.7. Patient F

Citrullinaemia Type 1

Patient details provided to participants

Vomiting and sleepy. On treatment

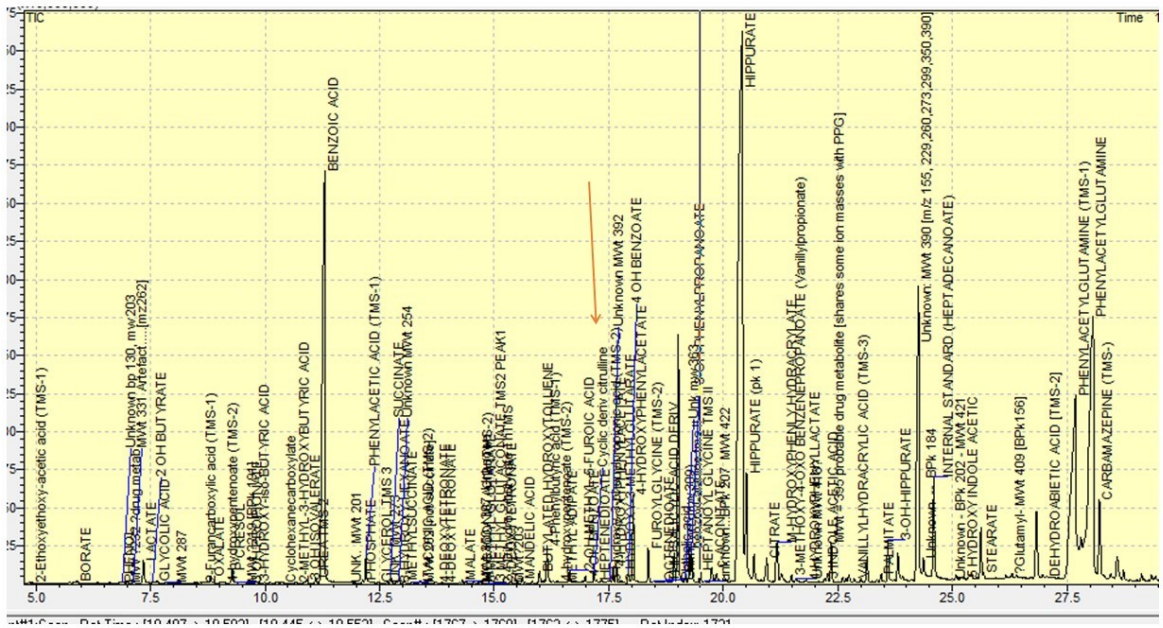
Patient details

Male patient diagnosed at 1 month of age after presenting with vomiting and being sleepy. Sample collected at 33 years of age while on treatment.

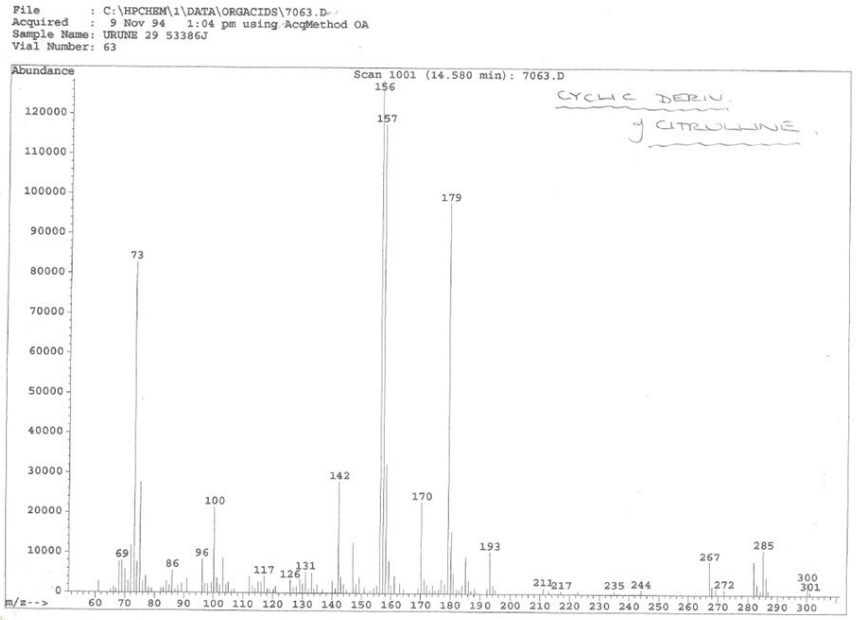
Analytical performance

All labs performed amino acid analysis, with 20 of 21 correctly identifying the increased concentration of citrulline. The remaining participant failed to detect the increased citrulline. This was probably due to the large amount of glycine also present in the sample. There was no orotic acid detected by our laboratory.

There was also a peak of cyclic derivative of citrulline by organic acid analysis (see chromatogram).



Sample F: organic acid chromatogram showing position of cyclic derivative of citrulline



Sample F: mass spectrum of cyclic derivative of citrulline

Diagnosis / Interpretative proficiency

Most likely diagnosis

Citrullinaemia Type 1	18
Non ketotic hyperglycinaemia	1
NAGS/CPS on citrulline treatment	2

Alternative diagnosis

Other urea cycle disorder on citrulline treatment	4
Citrullinaemia Type 2	2
Other urea cycle disorder	2

Recommendations

Excluding the laboratory who gave NKH as the diagnosis:

- 18/20 – plasma amino acids
- 17/20 – blood ammonia
- 15/20 – mutation analysis (of the ASS1 gene)
- 15/20 – refer to/ensure under the care of a metabolic clinician/team
- 5/20 – family testing

Requesting an urgent ammonia is vital. Plasma amino acids analysis will help with the diagnosis.

Scoring

Analytical

- Increased citrulline – score 2

Interpretation

- Citrullinaemia Type 1 - score 2
- Other urea cycle disorder – score 1

The marking scheme for this sample was changed following discussion at the Scientific Advisory Board meeting (I had originally awarded 1 mark for increased citrulline and 1 mark for detecting the cyclic derivative of citrulline on organic acid analysis).

Overall impression

Proficiency for this sample was 93%. One laboratory has made a critical error by failing to detect the increased concentration of citrulline.

9. Scores of participants

All data transfer, the submission of data as well as the request and viewing of reports proceed via the DPT-CSCQ results website. The results of your laboratory are confidential and only accessible to you (with your username and password). The anonymous scores of all laboratories are accessible to all participants and only in your version is your laboratory highlighted in the leftmost column.

Detailed scores – Round 1

Lab n°	Patient A Alpha-mannosidosis			Patient B Succinic semialdehyde dehydrogenase deficiency (SSADH deficiency)			Patient C Mucopolysaccharidosis Type 2 (Hunter syndrome)			
	A	I	Total	A	I	Total	A	I	Total	Total
1	0	0	0	2	2	4	2	2	4	8
2	2	2	4	2	2	4	2	2	4	12
3	2	2	4	2	2	4	2	2	4	12
4	0	1	1	2	2	4	2	2	4	9
5	2	2	4	2	2	4	2	2	4	12
6	2	2	4	2	2	4	1	1	2	10
7	2	2	4	2	2	4	2	2	4	12
8	2	2	4	2	2	4	2	2	4	12
9	2	2	4	2	2	4	2	2	4	12
10	0	1	1	2	2	4	2	2	4	9
11	0	0	0	2	2	4	2	2	4	8
12	2	2	4	2	2	4	2	2	4	12
13	2	2	4	2	2	4	2	2	4	12
14	0	1	1	2	2	4	1	2	3	8
15	2	2	4	2	2	4	2	2	4	12
16	2	2	4	2	2	4	2	2	4	12
17	0	1	1	2	2	4	2	2	4	9
18	2	2	4	2	2	4	2	2	4	12
19	2	2	4	2	2	4	2	2	4	12
20	2	2	4	2	2	4	2	2	4	12
21	2	2	4	2	2	4	2	2	4	12
22	--	--	--	--	--	--	--	--	--	0

Detailed scores – Round 2

Lab n°	Patient D HMG CoA lyase deficiency			Patient E No inborn error of metabolism.			Patient F Citrullinaemia Type 1			
	A	I	Total	A	I	Total	A	I	Total	Total
1	2	2	4	2	2	4	2	2	4	12
2	2	2	4	2	2	4	2	2	4	12
3	1	0	1	2	2	4	2	2	4	9
4	2	2	4	2	2	4	2	2	4	12
5	2	2	4	2	2	4	2	2	4	12
6	2	2	4	1	0	1	0	0	0	5
7	2	0	2	2	2	4	2	2	4	10
8	2	2	4	2	2	4	2	1	3	11
9	2	2	4	2	2	4	2	2	4	12
10	2	2	4	2	2	4	2	2	4	12
11	2	2	4	2	2	4	2	2	4	12
12	2	2	4	2	2	4	2	2	4	12
13	2	2	4	1	2	3	2	2	4	11
14	2	2	4	2	2	4	2	2	4	12
15	2	2	4	2	2	4	2	2	4	12
16	2	2	4	2	2	4	2	2	4	12
17	2	2	4	2	2	4	2	2	4	12
18	2	2	4	2	2	4	2	2	4	12
19	2	2	4	2	2	4	2	1	3	11
20	2	2	4	2	2	4	2	2	4	12
21	2	2	4	2	2	4	2	2	4	12
22	--	--	--	--	--	--	--	--	--	0

Total scores

Lab n°	A	B	C	D	E	F	Cumulative score	Cumulative score (%)	Critical error
1	0	4	4	4	4	4	20	83	CE
2	4	4	4	4	4	4	24	100	
3	4	4	4	1	4	4	21	88	CE
4	1	4	4	4	4	4	21	88	
5	4	4	4	4	4	4	24	100	
6	4	4	2	4	1	0	15	62	CE
7	4	4	4	2	4	4	22	92	
8	4	4	4	4	4	3	23	96	
9	4	4	4	4	4	4	24	100	
10	1	4	4	4	4	4	21	88	
11	0	4	4	4	4	4	20	83	
12	4	4	4	4	4	4	24	100	
13	4	4	4	4	3	4	23	96	
14	1	4	3	4	4	4	20	83	
15	4	4	4	4	4	4	24	100	
16	4	4	4	4	4	4	24	100	
17	1	4	4	4	4	4	21	88	
18	4	4	4	4	4	4	24	100	
19	4	4	4	4	4	3	23	96	
20	4	4	4	4	4	4	24	100	
21	4	4	4	4	4	4	24	100	
22	--	--	--	--	--	--	0	0	

Performance

	Number of labs	% total labs
Satisfactory performers (≥ 60 % of adequate responses)	18	82
Unsatisfactory performers (< 60 % adequate responses and/or critical error)	3	14
Partial and non-submitters	1	5

Overall Proficiency

Sample	Diagnosis	Analytical (%)	Interpretation (%)	Total (%)
DPT-US-2021-A	Alpha-mannosidosis	71	81	76
DPT-US-2021-B	Succinic semialdehyde dehydrogenase deficiency (SSADH deficiency)	100	100	100
DPT-US-2021-C	Mucopolysaccharidosis Type 2 (Hunter syndrome)	95	98	96
DPT-US-2021-D	HMG CoA lyase deficiency	98	90	94
DPT-US-2021-E	No inborn error of metabolism.	95	95	95
DPT-US-2021-F	Citrullinaemia Type 1	95	90	93

10. Annual meeting of participants

The ERNDIM DPT UK participant meeting was held on-line on the 2nd September 2021.

We remind you that attending the annual meeting/DPT workshop is an important part of the proficiency testing. The goal of the program is to **improve** the competence of the participating laboratories, which includes the critical review of all results with a discussion about improvements. It also gives participants the opportunity to challenge the Scientific Advisor on elements of the scheme.

Due to this year being an ICIEM meeting year, ERNDIM also held a participants meeting on-line over 2 days on the 21st and 22nd October 2021.

11. Information from the Executive Board and the Scientific Advisory Board

- **Change in Minimum score:** as from 2022, the minimum score each participant in the DPT scheme will have to achieve is increasing from 15/24 to 17/24.
- **Urine samples**: we remind you that every year, each participant must provide to the scheme organizer at least 300 ml of urine from a patient affected with an established inborn error of metabolism or “normal” urine, together with a short clinical report. If possible, please collect 1500 ml of urine: this sample can be sent to all labs participating to one of the DPT schemes. Each urine sample must be collected from a single patient (don’t send urine spiked with pathological compounds). Please don’t send a pool of urines, except if urine has been collected on a short period of time from the same patient. For “normal” urine, the sample must be collected from a symptomatic patient.

  As soon as possible after collection, the urine sample must be heated at 50 °C for 20 minutes. Make sure that this temperature is achieved in the entire urine sample, not only in the water bath. Send the urine by rapid mail or express transport to:

  Mrs Joanne Croft
  Dept of Clinical Chemistry
  Sheffield Children’s NHS Foundation
  Trust, Western Bank
  Sheffield, S10 2TH
  United Kingdom
  Tel: +44(0)114 271 7000 Ext 17267
  Fax: +44(0)114 276 6205
  Email: Joanne.Croft@sch.nhs.uk

  Please send us an e-mail on the day you send the samples.

12. Reminders

We remind you that to participate to the DPT-scheme, you must perform at least:

- Amino acids
- Organic acids
- Oligosaccharides
- Mucopolysaccharides
- Purines and pyrimidines

If you are not performing one of these assays, you can send the samples to another lab (cluster lab) but you are responsible for the results.
Please send quantitative data for amino acids and, as much as possible, for organic acids.

13. Proposed Schedule for 2022

Sample distribution	2 February 2022
Start of analysis of Survey 2021/1 Website open	March 14 2022
Survey 2021/1 - Results submission	April 4 2022
Survey 2021/1 - Reports	May 2022
Start of analysis of Survey 2021/2	June 6 2022
Survey 2021/2 – Results submission	June 28 2022
Survey 2021/2 - Reports	August 2022
Annual meeting of participants	August 30 Freiburg, Germany
Annual Report 2022	December 2022

14. ERNDIM certificate of participation

A combined certificate of participation covering all EQA schemes will be provided to all participants who take part in any ERNDIM scheme. For the DPT scheme this certificate will indicate if results were submitted and whether satisfactory performance was achieved in the scheme.

Date of report, 2022-01-02
Name and signature of Scientific Advisor

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APPENDIX 1. Change log (changes since the last version)

Version Number	Published	Amendments
1	26 April 2022	2021 annual report published

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