

**Audit Template**

|  |  |
| --- | --- |
| **Audit Title:**  An Audit on Intermediary Metabolites in the Thames Region | |
| **Lead Auditor:**  Dr Nikola Costa | **Audit date(s):**  Sept 2012 |
| Please indicate if **Regional /**  Please indicate which hospital & location or region  **Thames Audit Group** | **Report Author:**  Name: Dr Nikola Costa  Email: Nikola.costa@gosh.nhs.uk |
| **Aims of the Audit:**  An audit was conducted in the Thames Region to investigate how laboratories conduct analyses of intermediary metabolites. The metabolites of interest included glucose, non-esterified fatty acids, beta-hydroxybutyrate, acetoacetate, lactate, pyruvate and ammonia. The aim was to identify common practices of their analysis, including sample types, sample handling and transportation, methods, reference ranges and clinical interpretation. The responses were used to devise Best Practice Guidelines for the analysis of these metabolites. | |
| **Audit Method and Outcome(s):**  An audit questionnaire was distributed by e-mail to the laboratories of the Thames region and responses collated. Participating laboratories were asked about their provision for analysis of the intermediary metabolites listed above, and their common practices regarding the pre- and post-analytical processes, including point-of-care testing. The findings of the audit were presented to the region in a half day meeting. The results of the audit were discussed and best practice guidelines for analysis of these metabolites were agreed and distributed.  A total of 26 laboratories responded to the audit and their questionnaire answers were collated. A number of similarities were noted between all laboratories with regard to their recommendations for specific sample types for each of the analytes. However the audit also highlighted many differences in the pre- and post-analytical handling of the samples, in particular how or when the samples should be transported or received within the laboratory, the use of sample indices, phoning limits and reporting interpretive comments. | |
| **Audit Recommendations / Standards:**   1. Plasma and CSF glucose samples should be collected into fluoride/oxalate sample tubes, with plasma separated within 2 hours of collection. 2. Plasma glucose samples should be assessed for haemolysis, ideally using autoanalysers indices, and comments added regarding extent of potential interference at differing levels of haemolysis, i.e slight/moderate/gross haemolysis, withholding results at grossly haemolysed levels. 3. Plasma glucose phoning levels should follow the RCPath guideline of <2.5 mmol/L &>25 mmol/L, although limits may be modified for paediatric patients (<3.0, >13 mmol/L) and known diabetics (<2.5, >30 mmoL/L). 4. NEFA and BOHB analysis should ideally be requested together (with the exception of BOHB alone if monitoring patients on a ketogenic diet) and a time-matched glucose result should be provided to enable interpretation. 5. NEFA/BOHB ideal sample types are LiHep or fluoride/oxalate and should be separated and stored at -20°C (<6 mo). 6. Blood lactate/pyruvate ratio analysis should only be performed on samples collected into LiHep or fluoride/oxalate tubes which should then be immediately precipitated using perchloric acid (or within 1hr of collection). CSF lactate/pyruvate ratio samples can be collected into plain tubes then PCA-treated. The PCA extracts should be then stored frozen until analysis. 7. Similarly, blood acetoacetate analysis should only be performed on samples collected into LiHep or fluoride/oxalate tubes which are immediately precipitated using perchloric acid (or within 1hr of collection). 8. Plasma and CSF samples for lactate analysis should be collected into fluoride/oxalate tubes and analysed within 1 hour of collection or plasma separated and frozen if analysis cannot be performed within 1 hour. 9. Plasma/blood ammonia analysis should be available 24/7 and measured in ANY patient with acutely presenting neurological symptoms of unknown cause. 10. Phoning limits for plasma/blood ammonia results should be in place for     1. premature neonate: >150 umol/L     2. term neonate (< 1month of age): > 100 umol/L     3. infant/child:> 40 umol/L     4. Adults:>32 umol/L 11. Plasma ammonia samples should be collected into pre-chilled LiHep or EDTA sample tubes, transported to the laboratory on ice and analysed with 30 mins of collection. If this is not possible, the plasma should be separated within 30 mins and frozen until analysis. Notable exception: those labs using whole blood ammonia checkers (e.g. POCT device), samples should not be kept on ice. 12. Ammonia specimen tubes should be checked regularly for contamination. 13. Ammonia samples should be assessed for haemolysis (again, ideally by autoanalyser indices) and comments reported regarding the validity of the result for varying levels of haemolysis. Results on grossly haemolysed samples should not be reported and a repeat sample should be requested immediately. 14. Patients with abnormal ammonia results should have repeat samples requested and analysed, and patients whose ammonia >150 umol/L should have repeat samples analysed within 4 hours. | |
| **Please indicate to whom and when audit presented &/or circulated&/or published:**  Audit findings presented at the meeting of the Thames Audit Group on 23rdNovember 2012.A poster of the audit findings was also presented at EuroLabFocus, Liverpool, 2014. | |
| **Audit recommendations / standards ratified by … and when:**  Recommendations ratified by the Thames Audit Group committee on 7th May 2013. | |
| **Date of audit report:**  23rd November 2012 | |
| **Audit documents for upload to http://www.acb.org.uk/whatwedo/science/audit.aspx** | |