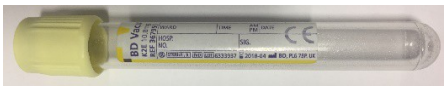
Ammonia

Synonyms	NH3
Clinical Indication	Hyperammoniaemia is a hallmark feature of urea cycle defects (ornithine transcarbamylase deficiency, citrullinaemia etc). Ammonia is also significantly increased in other inherited metabolic disorders such as organic acidaemias and fatty acid oxidation defects. Some acquired disorders such as liver impairment or failure and certain drugs such as valproate also give rise to hyperammonaemia In addition, 'transient hyperammoniaemia of the newborn' can present in the first 48 hours with levels usually in excess of 1,500 umol/L. Any child with encephalopathy of unknown cause should have ammonia measured as one of the first line biochemical investigations. Initial symptoms of hyperammoniaemia may include lethargy, refusal of feeds, vomiting, irritability, seizures and tachypnoea (ammonia is a respiratory stimulant and presence of respiratory alkalosis is an important sign).
Part of Profile / See Also	
Request Form	Combined Pathology manual Blood form or ICE request
Availability / Frequency of Analysis	Analysed urgently if specific criteria met.
Turnaround Time	Same day
Patient Preparation	None required
Sample Requirements	
Specimen Type	Plasma
Volume	1.0 ml
Container	Or  Paediatric pink top (EDTA)  Purple Top (EDTA). Or  Lemon top (EDTA) **Samples must be transported to the laboratory immediately (within 30minutes).**

Reference Range & Units

Age Range	Ammonia (umol/L)
0-1 month	Sick or prem <150 Neonate <100 (1)

Up to 16 years	<50 (1)
Adult	16-53 (2)

(1) Pathology Harmony
(2) Thermo Fisher

Interferences

The most common cause of a raised ammonia is artefactual due either to poor sample collection or a delay in transport to the laboratory. Haemolysis is an important cause of raised ammonia.
Data provided by Beckman demonstrates no interference up to a lipaemic index of 1 (50 mg/dL intralipid, if this indice is breached the ammonia result should be removed as per current practice.
Icteric index raised to ≥5. Based on ammonia icteric index verification July 2020 study by Helen Valentine.

Interpretation & Clinical Decision Value (if applicable)

Sick preterm neonates, in the absence of an inherited metabolic disorder, may have moderate elevation of ammonia (up to 200 umol/L), particularly if there is infection or hypoxia.

Refer to MetBioNet guidelines for investigation of hyperammonaemia.

References

UK National Metabolic Biochemistry Network*: Guidelines for the Investigation of Hyperammonaemia.*
Pathology Harmony

Test code

AMMO

Lab Handling

There has been a change to the sample stability criteria for ammonia following a product alert from ThermoFisher.

All samples up to 12h old will be run - winpath automatically adds the comment to inform user of the need for a repeat. samples over 12h should be brought to the duty biochemist to decide whether to run. once separated and stored at 4'c, samples can be analysed within 3h as per IFU.

Samples are stable for 2 hours post collection (prior to centrifugation).
Samples are stable for 3 hours post centrifugation.
Samples must only be stored refrigerated prior to analysis – freezing samples is no longer suitable.
If we are unable to process samples within 3 hours, they must be transferred to the alternate ESL for analysis.

ALL ammonia requests should be processed.

For samples considered old, the sample should be analysed with the comment:

- *"Please note, this ammonia result may be falsely elevated due to delay in sample receipt. It is strongly recommended to repeat ammonia analysis with the sample brought to the lab within 30 minutes".*

Where the haemolysis index is ≥1 AND the result is above the reference range, an auto-comment is appended underneath the result:

- *"Please note, this ammonia result may be falsely elevated due to haemolysed sample. It is strongly recommended to repeat ammonia analysis to confirm hyperammonaemia".*