

Ammonia – [24 Hrs Urine/Plasma] Analysis

Objective

The objective of this test is to measure ammonia levels in 24-hour urine or plasma samples. Ammonia testing helps assess liver function, diagnose hepatic encephalopathy, and evaluate metabolic disorders involving the urea cycle.

Materials and Methods

Materials:

- Plasma or 24-hour urine sample from patient
- Ammonia assay reagents (enzymatic methods)
- Spectrophotometer or automated biochemical analyzer
- Standard laboratory equipment (centrifuge, pipettes, volumetric containers)

Methods:

1. Sample Collection: For plasma, collect blood in heparinized tubes and place on ice; for urine, collect all urine over 24 hours.
2. Processing: Separate plasma immediately; for urine, measure total volume and aliquot for analysis.
3. Measurement: Perform enzymatic assay using glutamate dehydrogenase to quantify ammonia levels.
4. Quality Control: Use calibration standards and controls to ensure accuracy and precision.
5. Interpretation: Compare ammonia concentrations to reference ranges and correlate with clinical symptoms of hyperammonemia or liver dysfunction.

Results

- Normal plasma ammonia: 15–45 $\mu\text{mol/L}$
- Normal 24-hour urine ammonia: 400–1000 mg/day (varies by lab)
- Elevated levels: Suggest hepatic failure, urea cycle disorders, or severe metabolic derangements

Conclusion

Ammonia testing in plasma or 24-hour urine is crucial for evaluating liver function and diagnosing hyperammonemia-related disorders. Results must be interpreted with clinical findings and other biochemical tests to ensure accurate diagnosis and management.