Bismuth

Atomic number 83
Atomic weight 208.98

Collection

- Blood 2 mL Plastic tube
  Anticoagulant: EDTA
- Urine 20 mL Sterile Universal

Send empty container together with any sample type if uncertain about possible contamination

Reference ranges

<table>
<thead>
<tr>
<th></th>
<th>Serum/plasma</th>
<th>Blood</th>
<th>Urine</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>m/L</td>
<td>nmol/L</td>
<td>nmol/L</td>
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<tr>
<td>Reference</td>
<td>Less than 3.3</td>
<td>Less than 5 nmol/L</td>
<td>Less than 0.2 nmol/L</td>
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<td></td>
<td></td>
<td></td>
<td>nmol/24 h</td>
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<tr>
<td></td>
<td></td>
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<td>&lt;0.72</td>
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<tr>
<td></td>
<td></td>
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<td>nmol/mmol creatinine</td>
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<td>&lt;0.1</td>
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Notes

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<tr>
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<th>Blood</th>
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<tbody>
<tr>
<td>Acceptable during therapy</td>
<td>Up to 250 nmol/L</td>
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<tr>
<td>Therapeutic warning level</td>
<td>250-500 nmol/L</td>
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<tr>
<td>Risk of toxicity</td>
<td>Greater than 500 nmol/L</td>
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References

Clinical

Sources:

Bismuth occurs in its native form and in minerals such as bismite (bismite oxide) usually associated with sulphide ores of lead and copper. Most bismuth is incorporated into low-melting alloys. The remainder is used for catalysts, pigments in cosmetics, pharmaceuticals (e.g. treatment of peptic ulcer disease) and industrial chemicals.

Biology:

Bismuth compounds are moderately absorbed through the respiratory and gastrointestinal tracts and there is some absorption through the skin although no quantitative data is available.

Ingested bismuth is largely eliminated unabsorbed in faeces. Absorbed bismuth is mainly excreted in the urine.

The biological half-life of bismuth is variable depending on the tissue compartment, but is approximately 6 days.

Toxicity:

The toxicity of bismuth can be overlooked. It can cause acute renal failure secondary to tubular necrosis – glomeruli are relatively unaffected. A neurological syndrome exists characterised by confusion, tremor, clumsiness, myoclonic jerks and gait disturbance (median bismuth concentration reported approximately 3000 nmol/l). Occasionally dermatological manifestations occur with rosea-like eruptions and stomatitis.

Although the placenta is permeable to bismuth no teratogenicity has been reported.

Laboratory indices:

Urine is the matrix of choice for suspected bismuth toxicity (because of rapid renal clearance) although blood can be measured in the presence of renal failure.

References: