

# Mercury (Hg) Toxicity: Investigations

**Blood and urine are the most common biological fluids utilised for analysis in the process of evaluating mercury exposures**

<b>GENERAL</b>	<b>Investigation of suspected Hg exposures (interpreting concentrations in biological fluids)</b>		
<p><i>A urine or blood Hg concentration more than 500 nmol/L (100 ug/L) suggests significant Hg exposure and should be investigated</i></p> <ul style="list-style-type: none"> <li>- Hg concentrations in blood and urine vary significantly amongst healthy individuals</li> <li>- There is poor correlation between blood / urine Hg concentration and degree of clinical toxicity</li> <li>- Regular seafood ingestion may lead to mild elevated blood Hg concentrations</li> <li>- <i>Chelation assisted provocative urine mercury testing has no role in the management of Hg exposures and should not be utilised</i></li> </ul>	Suspected source	Test	Interpretation
	Seafood (fish) (Methylmercury – Organic Hg)	Whole blood (preferred test)	<ul style="list-style-type: none"> <li>• There is no need to discontinue seafood intake prior to whole blood Hg measurement.</li> <li>• Blood Hg concentration of less than 25 nmol/L (5 ug/L): 95% of unexposed population</li> <li>• Up to 250 nmol/L (50 ug/L): possible with excessive predatory fish intake</li> <li>• More than 500 nmol/L (100 ug/L): Overt neurological toxicity usually observed.</li> </ul>
	<p>Vapour from broken thermometers, fluorescent lamps, industrial processes (Elemental Hg)</p> <p>Ayurvedic remedies, skin lightening creams, some industrial processes (Inorganic Hg)</p>	<p>Spot urine (preferred test)</p> <p>Whole blood</p>	<ul style="list-style-type: none"> <li>• Urine Hg concentrations lag weeks – months behind blood following chronic exposures (and therefore may under-estimate exposure)</li> <li>• Blood sampled within hours of exposure may overestimate body burden of Hg.</li> <li>• Blood Hg concentration of less than 25 nmol/L (5 ug/L): found in 95% of unexposed population.</li> <li>• Creatinine corrected spot urine concentration of less than 1.4 nmol/mmol creatinine (2.5 ug/g creatinine): found in 95% of unexposed population.</li> <li>• Blood or urine (non-creatinine corrected) Hg concentration more than 500 nmol/L (100 ug/L): significant neurological toxicity usually observed.</li> <li>• Subtle adverse effects may be apparent at lower Hg concentrations in chronic exposures.</li> <li>• An elevated spot urine Hg concentration may confirm exposure.</li> </ul>
	Subcutaneous injection or large ingestion (with aspiration) of elemental Hg	Spot urine  Whole blood	<ul style="list-style-type: none"> <li>• Blood or urine Hg concentrations more than 5000 nmol/L (1000 ug/L) may be seen following deliberate subcutaneous injection of Hg, however there is poor correlation with observed clinical toxicity.</li> </ul>
<p><b>RADIOLOGY</b></p> <ul style="list-style-type: none"> <li>- Plain films may be useful to estimate the body burden of injected or inhaled elemental Hg</li> <li>- CXR / CT may demonstrate alveolar damage following exposure to elemental Hg vapour</li> <li>- MRI brain may be useful in suspected organic Hg toxicity</li> </ul>	Vaccines (ethylmercury – inorganic Hg) Dental amalgam (elemental Hg)	Generally, not indicated	<ul style="list-style-type: none"> <li>• Ethylmercury containing vaccinations have been endorsed as safe by WHO.</li> <li>• Patients with extensive dental amalgam may have higher blood/urine Hg concentrations compared to the general population, there is no published evidence demonstrating that this cause adverse health outcomes</li> </ul>
	- In significant inorganic and elemental Hg poisoning, 24-hour urine analysis may inform the response to chelation		