

Arsenic Biomonitoring Fact Sheet

Key points

- Inorganic form (occupational exposures) is highly toxic and a human carcinogen, while the organic form (dietary) is generally nontoxic.¹
- Speciation should be performed to separate inorganic and organic levels.
- Recent (<72h) seafood consumption (organic) may cause high total urine arsenic levels, but only has a small effect on inorganic levels.
- Urinary arsenic levels reflect recent exposure and are cleared from the body within days (inorganic and organic half-life, 10 and 20 hours).

Best practices

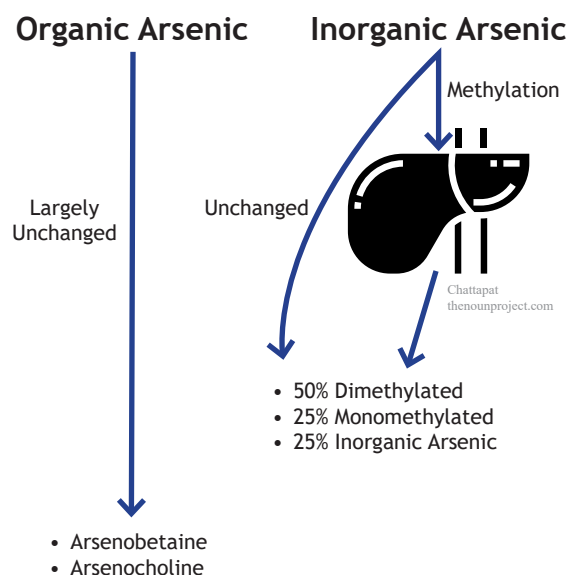
- Spot urine tests are a reliable biomeasure for recent exposure and are the recommended tests by the ACGIH for arsenic biomonitoring.²
- Due to its short half-life, urine arsenic levels should be collected at the end of a workweek and shift to best monitor occupational exposure.
- Speciation (inorganic vs organic species) should always be performed to properly assess occupational exposure.
- Occupational exposure is measured by the sum of inorganic acid (III and V) and its metabolites (MMAv and DMAv).
- Measuring techniques vary by lab. Consult your local lab on its speciation capabilities and result interpretation.

Urine Biomonitoring Levels

	BEI ^a	NHANES 95th ^b
Monomethyl arsenic acid (MMAv)	Add together ↓	1.47 µg As/L
Dimethyl arsenic acid (DMAv)		11.4 µg As/L
Arsenic (III, arsenites)		1.01 µg As/L
Arsenic (V, arsenates)		< LOD ^c
Total inorganic	35 µg As/L	13.4 µg As/L
Arsenobetaine	-	39.5 µg As/L
Arsenocholine	-	0.22 µg As/L
Total organic	No BEI	

a. ACGIH Biologic Exposure Indicie: <https://www.acgih.org/science/tlv-bei-guidelines/>
b. NHANES 2017-2018 95th percentile: urine species levels (creatinine corrected)
c. Below limit of detection

Renal Elimination



1. ATSDR. Toxicological Profile For Arsenic. Agency for Toxic Substances and Disease Registry. <https://www.atsdr.cdc.gov/toxprofiledocs/index.html>. Published March 7, 2023.
2. ACGIH. Arsenic and soluble inorganic compounds (BEI)*. ACGIH. <https://www.acgih.org/arsenic-and-soluble-inorganic-compounds/>. Published April 10, 2023.
3. CDC. NHANES: National Report on Human Exposure to Environmental Chemicals. Centers for Disease Control and Prevention. <https://www.cdc.gov/exposurereport/index.html>. Published April 20, 2023