TEST CHANGE

Cadmium Exposure Panel - OSHA

0025013, CD EXP

Specimen Requirements:	
Patient Preparation:	To avoid contamination, please collect specimens at the beginning of work shift. Blood and urine should be collected the same day. Urine: Diet, medication, and nutritional supplements may introduce interfering substances. Patients should be encouraged to discontinue nutritional supplements, vitamins, minerals, and non-essential over-the-counter medications (upon the advice of their physician). High concentrations of iodine may interfere with elemental testing. Collection of urine specimens from patients receiving iodinated or gadolinium-based contrast media should be avoided for a minimum of 72 hours post-exposure. Collection from patients with impaired kidney function should be avoided for a minimum of 14 days post contrast media exposure.
Collect:	Royal blue (K2EDTA) or royal blue (NaHep). AND minimum 40 mL urine using spot technique (single void) in an open-top urine collection cup.
Specimen Preparation:	Transfer specimens to the appropriate transport device using the Cadmium exposure kit, ARUP supply #16450, available online through eSupply using ARUP Connect(TM) or by contacting ARUP Client Services at (800) 522-2787. Blood: Transport 3 or 6 mL whole blood in the original collection tube. (Min: 0.5 mL) Urine for Beta-2-Microglobulin: Transfer 3 mL aliquot from original urine collection to an ARUP Standard Transport Tube. Adjust the pH of this specimen immediately after pouring off collection, so the pH is between 6 and 8. Use 1M HCl or 5 percent NaOH to adjust the urine pH. Label tube as beta2 Microglobulin. Freeze within one hour of collection. Urine for Cadmium: Transfer 7 mL aliquot from original urine collection to ARUP Trace Element-Free Transport Tubes (ARUP supply #43116). Available online through eSupply using ARUP Connect(TM) or by contacting ARUP Client Services at (800) 522-2787. (Min: 0.5 mL) Label tube as Cadmium. Urine for Creatinine: Transfer 2 mL aliquot from original urine collection to an ARUP Standard Transport Tube. (Min: 0.5 mL) Label tube as Creatinine.
Transport Temperature:	Blood: Refrigerated. Urine for Beta-2-Microglobulin: Frozen Urine for Cadmium: Refrigerated. Urine for Creatinine: Refrigerated.
Unacceptable Conditions:	Blood: Specimens collected in tubes other than royal blue

	(K2EDTA) or royal blue (NaHep). Specimens transported in containers other than royal blue (K2EDTA) or royal blue (NaHep) tube or trace element-free transport tube. Clotted specimens. Urine: Specimens transported in nontracenon-trace element -free transport tube (with the exception of the original device).Specimens collected within 72 hours after administration of iodinated or gadolinium-based contrast media. Specimens containing blood or fecal materials.
Remarks:	Record total volume and collection time interval on transport tube and on test request form.
Stability:	Blood: Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable Urine for Beta-2-Microglobulin: Ambient: 8 hours; Refrigerated: 48 hours; Frozen: 2 months Urine for Cadmium: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 year Urine for Creatinine: Ambient: 2 days; Refrigerated: 1 month; Frozen: 6 months
Methodology:	Quantitative Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)/Spectrophotometry/Chemiluminescent Immunoassay(CLIA)
Performed:	Mon-Fri
Reported:	1-5 days
Note:	
CPT Codes:	82300 x2; 82232
New York DOH Approval Status:	This test is New York DOH approved.

Interpretive Data:

Blood cadmium levels can be used to monitor acute toxicity and, in combination with cadmium urine and B-β2 microglobulin, is the preferred method for monitoring occupational exposure. Symptoms associated with cadmium toxicity vary based upon route of exposure and may include tubular proteinuria, fever, headache, dyspnea, chest pain, conjunctivitis, rhinitis, sore throat, and cough. Ingestion of cadmium in high concentration may cause vomiting, diarrhea, salivation, cramps, and abdominal pain.

Urine cadmium levels can be used to assess cadmium body burden. In chronic exposures, the kidneys are the primary target organ. Symptoms associated with cadmium toxicity vary based upon route of exposure and may include tubular proteinuria, fever, headache, dyspnea, chest pain, conjunctivitis, rhinitis, sore throat, and cough. Ingestion of cadmium in high concentration may cause vomiting, diarrhea, salivation, cramps, and abdominal pain.

Urine B-β2 mMicroglobulin is an early marker of irreversible kidney damage and disease.

Urine creatinine values less than 20 mg/dL represent very dilute urine and collections should be repeated.

~~This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.~~

CADMIUM ACTION LEVELS BEGINNING JANUARY 1999
(Federal Register 1999, Std. CFR, Part 1910. 1027 Appendix A)

Components	A	B	C
Cadmium, Urine (ug/g CRT)	{<=} 3	> 3 to {<=} 7	> 7
Cadmium, Blood (ug/L)	0-5	> 5 to {<=} 10	> 10
β2 Microglobulin, Urine (ug/g CRT)	{<=} 300	> 300 to {<=} 750	> 750*
Monitor	Annual	Semiannual	Quarterly
Medical Exam	Biennial	Annual	Semiannual
Reassess Cadmium exposure in less than two weeks	---------	Discretionary	Mandatory removal

*If an employee's β2 Microglobulin level is above 750 ug/g CRT, in order for mandatory medical removal to be required, either the employee's CdU level must also be >3 ug/g CRT or CdB level must also be >5 ug/L. The determination of discretionary or mandatory removal is made by the examining physician consistent with the medical surveillance specifications in the Federal Register 42456 to 42463. References: 1. US Department of Labor (2004). Cadmium. Occupational Safety and Health Administration. 3136-06R. 2. US Department of Labor (1999). Cadmium. Occupational Safety and Health Standards. 1910.1027

Reference Interval:

Test Number	Components	Reference Interval
	Cadmium, Urine - ratio to CRT	0.0-3.2 µg/g CRT
	Cadmium, Urine - per volume	0.0-1.0 µg/L
	Beta-2-Microglobulin, ratio to CRT	0-300 µg/g CRT
	Beta-2-Microglobulin, Urine	0-300 µg/L
	Cadmium, Whole Blood	Less than or equal to 5.0 µg/L