

**MEDICAL SCREENING PROTOCOL
FOR THE FORMER WORKER MEDICAL SCREENING PROGRAM
U.S. DEPARTMENT OF ENERGY**

General Principles:

- 1) The purpose of the medical evaluation component of the U.S. Department of Energy (DOE) Former Worker Medical Screening Program (FWP) is to provide interested former workers with targeted testing to screen for selected adverse health effects potentially related to their work in DOE operations. The program does not test for all potentially work-related conditions; for example, screening for work-related musculoskeletal conditions is not included in the medical evaluation.
- 2) The following table is intended to identify work-related health outcomes of relevance to DOE workers for which there are screening tests that are reasonably likely to be effective and beneficial to program participants. For example, a chest x-ray for screening for lung cancer for workers exposed to asbestos, beryllium, silica, chromium, or nickel is not included, because there is no evidence that it is effective for early detection in at-risk populations.
- 3) The selection of specific medical evaluations is based on the collection of a detailed occupational history for each worker.
- 4) This protocol is intended to ensure consistency of approach in the medical evaluation of participants.
- 5) This protocol is not intended to dictate the clinical practice of medicine.
- 6) This protocol is not intended to substitute for periodic health maintenance/disease screening examinations by a former worker's personal physician. However, as a secondary goal the examination may include assessments that contribute to general health.
- 7) Follow-up medical evaluation and treatment are not within the scope of the FWP.
- 8) This protocol was developed by consensus of the cooperative agreement awardees and the DOE officials associated with the FWP.
- 9) The medical evaluation protocol may be changed only by or with the approval of DOE.
- 10) The protocol will be reviewed and updated at least every two years by a committee established by DOE and the FWP.

Recommended Medical Screening Protocol for Selected Occupational Health Conditions
of DOE Workers For Which Screening and/or Early Detection
is Reasonably Likely to be Effective and Beneficial*

Hazard(s)	Target Organ(s)	Health Outcome(s)	Medical Evaluation	Re-screening through FWP
Asbestos	Lung	<ul style="list-style-type: none"> Asbestosis Other non-malignant respiratory disease 	<ul style="list-style-type: none"> Chest radiograph with B-reading Spirometry Physical examination 	Up to every 3 years
Beryllium	Lung	<ul style="list-style-type: none"> Sensitization Chronic Beryllium Disease (CBD) 	<ul style="list-style-type: none"> Chest radiograph with B-reading (if symptomatic) Physical examination Beryllium Lymphocyte Proliferation Test (BeLPT), with repeat testing for other that normal results 	<ul style="list-style-type: none"> Up to every 3 years if asymptomatic If new symptoms develop or worker is very concerned in interim, BeLPT can be performed
Plutonium, Lung Deposition of	Lung	Pulmonary Fibrosis	Chest radiograph	Up to every 3 years
Silica	Lung	Silicosis	See Asbestos above	Up to every 3 years
<ul style="list-style-type: none"> Epoxy resins Methylene dianiline Other known bladder carcinogen 	Bladder	Carcinoma	Urine cytology, plus additional biomarker supported by current research. Protocol should be tailored to specific exposure and approved by the DOE review process. ¹	Up to every 3 years
<ul style="list-style-type: none"> Ionizing radiation Chemicals (e.g., benzene) 	Hematopoetic	Leukemia or non-malignant conditions	Complete blood count (CBC) with differential	Up to every 3 years
<ul style="list-style-type: none"> Asbestos Ionizing radiation 	Gastrointestinal system	Carcinoma	Stool for occult blood ²	Up to every 3 years ³

* Lung cancer screening (CT scanning) is offered at a few sites to DOE workers who have elevated lung cancer risk. It is provided on a limited basis as part of the DOE FWP but is not included in this protocol.

¹ When screening for bladder cancer is included, the participant should also receive recommendations for periodic screening. Initial screening will be supported by the FWP.

² Recommend in letter that individuals discuss colonoscopy with PMD, per ACS guidelines

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Hazard(s)	Target Organ(s)	Health Outcome(s)	Medical Evaluation	Re-screening through FWP
Diesel Exhaust	Lung	Chronic obstructive lung disease	<ul style="list-style-type: none"> Respiratory symptoms questionnaire Spirometry 	Up to every 3 years
Welding	Lung	<ul style="list-style-type: none"> Asthma Chronic obstructive lung disease 	<ul style="list-style-type: none"> Respiratory symptoms questionnaire Spirometry 	Up to every 3 years for COPD
Chromium	Lung	Asthma	Respiratory symptoms questionnaire, plus spirometry, as indicated	No
Formaldehyde	Lung	Asthma	Respiratory symptoms questionnaire, plus spirometry, as indicated	No
Metal Working Fluids	Lung	Asthma	Respiratory symptoms questionnaire, plus spirometry, as indicated	No
Nickel	Lung	Asthma	Respiratory symptoms questionnaire, plus spirometry, as indicated	No
Respiratory irritants	Lung	Chronic obstructive lung disease	Respiratory symptoms questionnaire, plus spirometry, as indicated	Up to every 3 years
<ul style="list-style-type: none"> Radioactive iodine External ionizing radiation 	Thyroid	thyroid disease	<ul style="list-style-type: none"> Physical examination (i.e., palpation of the thyroid) Thyroid-stimulating hormone (TSH) 	Up to every 3 years
<ul style="list-style-type: none"> Solvents Lead Mercury 	Central Nervous System	Chronic neurologic disease	Clinical evaluation	No
Ionizing radiation	Female Breast	Cancer	Recommend mammography by personal physician for women 40 years of age or older ⁴	Recommend mammography by personal physician for women 40 years of age or older ⁵

⁴ Communication to participant should recommend annual screening for women 40 years of age or older.

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Hazard(s)	Target Organ(s)	Health Outcome(s)	Medical Evaluation	Re-screening through FWP
Carbon tetrachloride and other chlorinated solvents	Liver	Hepatocellular injury and insufficiency	<ul style="list-style-type: none"> • Bilirubin • Transaminases 	No
Hydrazine	Liver	Hepatocellular injury	Transaminases	No
<ul style="list-style-type: none"> • Cadmium • Chromium • Lead 	Kidneys	Chronic renal insufficiency	Serum creatinine	No
<ul style="list-style-type: none"> • Nickel • Chromium • Formaldehyde 	Skin	<ul style="list-style-type: none"> • Dermatitis • Skin cancer • Cancer of the nasal mucosa 	Physical examination of the skin and nasal mucosa	No
Ionizing or ultraviolet radiation	Skin	Skin cancer	Physical examination of the skin ⁶	Up to every 3 years ⁷
Noise	Ears	Hearing Impairment	Audiometry	No
Laser, Class 3B and 4	Eyes, Skin	Cataracts, retinal burns	<ul style="list-style-type: none"> • Medical history of the eye and photosensitivity • Visual acuity (far and near) for both eyes • Amsler and Ishiharra⁸ 	No

⁶ Communication to participant should recommend annual screening with PMD for anyone at high risk for skin cancer.

⁷ Communication to participant should recommend annual screening with PMD for anyone at high risk for skin cancer.

⁸ In accordance with ANSI Z136.1 Standard for the Safe Use of Lasers, which states that "Laser eye examinations are performed to identify those laser users which may have a predisposition for vision related injury and to meet the medical monitoring requirements of the standard."