

## **4.10 OCCUPATIONAL MEDICAL SCREENING AND SURVEILLANCE**

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Medical screening and medical surveillance are two fundamental strategies for optimizing employee health. Although the terms are often used interchangeably, they are quite distinct concepts. Medical screening is, in essence, only one component of a comprehensive medical surveillance program. The fundamental purpose of screening is early diagnosis and treatment of the individual. Thus it has a clinical focus. The fundamental purpose of surveillance is to detect and eliminate the underlying causes such as hazards or exposures of any discovered trends. Thus it has a prevention focus. Both can contribute significantly to the success of work-site health and safety programs.

Screening is a method for detecting disease or body dysfunction before an individual would normally seek medical care. Screening tests are usually administered to individuals without current symptoms, but who may be at high risk for certain adverse health outcomes.

Surveillance is the analysis of health information to look for problems that may be occurring in the workplace that require targeted prevention. Thus it serves as a feedback loop to park management. Surveillance may be based on a single case or sentinel event, but more typically uses screening results from the group of employees being evaluated to look for abnormal trends in health status. Surveillance can also be conducted on a single employee over time. Review of group results helps to identify potential problem areas and the effectiveness of existing work-site preventive strategies.

### **National Park Service Occupational Medical Screening and Surveillance Policy**

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National Park Service work environments and occupational activities can expose personnel to hazardous chemical, physical and biological agents with the potential for disease or injury. Parks will provide occupational medical screening and surveillance to identify work-related diseases or conditions through baseline and periodic examinations at an early stage when modifying the exposure or providing medical intervention could arrest disease progression or prevent recurrences.

#### **Scope**

This section addresses criteria for inclusion of employees in medical screening and surveillance. It does not attempt to prescribe specific physical examination or testing protocols. Where agent-specific screening and surveillance protocols are prescribed by OSHA regulation or sections of DM 485 and RM50B, they will be used. This program applies to all National Park Service employees and volunteers exposed to hazardous agents. Employee medical standards and optional employee health promotion programs are not covered in this section.

## References

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1. DOI, 2000. Occupational Medicine Program Handbook.
2. DOI. 1999. Safety and Occupational Health Program. Department Manual 485.
3. 29 CFR 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.
4. 29 CFR 1910.1000, Air Contaminants.
5. 29 CFR 1910.1001, Asbestos.
6. 29 CFR 1926.1101, Asbestos.
7. 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.
8. 29 CFR 1910.134, Respiratory Protection.
9. 29 CFR 1926.62, Lead in Construction.
10. 29 CFR 1910.1030, Bloodborne Pathogens.
11. 29 CFR 1910.95, Occupational Noise Exposure.
12. American Conference of Governmental Industrial Hygienists. 2003. Documentation of the Threshold Limit Values and Biological Exposure Indices.
13. American Conference of Governmental Industrial Hygienists. 2003. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

## Definitions

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*Action level (AL)* means the level of worker exposure to a hazardous agent determined by workplace exposure assessment, at or above which occupational medical surveillance examinations or screening will be performed. Action levels prescribed by OSHA will take precedence. In the absence of an OSHA-defined AL, the AL will be 50% of the most stringent of the current OSHA permissible exposure limit (PEL) or the most current American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV).

*Permissible Exposure Limit (PEL)* means the employee's permitted exposure to any material listed in Tables Z-1, Z-2 or Z-3 of OSHA regulation 29 CFR 1910.1000.

*Threshold Limit Value (TLV)* means the airborne concentration of a substance that represents conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects. TLVs are recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH).

*Time-Weighted Average (TWA)* means the concentration of a stressor or hazard, which has been averaged for the time duration of the sample. It is most commonly expressed as an average concentration for a normal eight-hour workday.

*Emergency Exposure* means any occurrence, such as, but not limited to, equipment failure, rupture of containers or failure of control equipment, that may result in an unexpected release and exposure to a hazardous substance or condition.

## **Program Elements**

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1. *Assess Worker Exposures.* Occupational exposure assessment (Section 4.1) and job hazard analysis (Section 3.1) of workplaces shall be conducted to identify all potential exposures and other worker safety and health risks, and establish complete workplace exposure profiles.
2. *Identify Workers Requiring Medical Screening or Surveillance.* There are three methods for identifying workers at risk of work-related health problems and determining who will be provided medical screening or surveillance. They are: by job title, by workplace or task, and by individual exposure.
  - a. Job titles and job descriptions can be used to characterize the basic tasks, hazardous exposures and health outcomes likely to be experienced by the majority of workers in a specific occupational group. This type of grouping assumes that all workers will have similar job demands, experience similar stresses, have the same exposures to hazardous agents and suffer the same health effects. One example of such a grouping may be all workers serving as members of a hazardous materials spill response team. Table 4.X-1 lists occupational groups for which medical screening and surveillance must be provided.

**Table 4.X-1 Occupational Groups Requiring Medical Screening or Surveillance**

HAZARD	REFERENCE	MEDICAL SURVEILLANCE CRITERIA	EXAM TYPE AND FREQUENCY*
Hazardous Waste Site Workers & Emergency Responders	• 29 CFR 1910.120	All Employees at risk for exposure: • Above PEL > 30 days • If no PEL exp > 30 days • If Respirator used • Possible Overexposure • Hazmat Team Members	• Initial Baseline • Annual Periodic • Emergency Exposure • Termination of Exposure
Respiratory Protection	• 29 CFR 1910.134 • RM 50B, Sec 4.3	• All workers wearing respirators	Initial Medical Clearance Periodic (see Section 4.3 and OSHA standard for additional information)

\*See OSHA Standard for further information. \*\*See NFPA 1582 for further information.

- b. Individual exposures are determined during industrial hygiene exposure assessment or workplace monitoring that quantifies job demands, stresses and hazardous exposures for each individual. For example, personal breathing zone samples collected during an industrial hygiene survey of a spray-painting task that is normally conducted once a week showed exposure consistently greater than the AL.
  
- c. Hazardous agents present in the workplace can be characterized during exposure assessment and job hazard analysis. Based on the workplace or task assessment, an assumption may be made that all workers assigned to that workplace or task are potentially exposed to the levels of hazards found at the time the workplace was evaluated. For example all tree crew workers are likely to be routinely exposed to hazardous noise greater than the AL. Tables 4.X-2 and 4.X-3 provide summary lists of regulated hazardous agents requiring medical screening and surveillance of exposed employees.

**Table 4.X-2 OSHA Regulated Chemical Agents Requiring Medical Surveillance or Screening\***

HAZARDOUS CHEMICAL	REGULATION	MEDICAL SURVEILLANCE CRITERIA	EXAM TYPE & FREQUENCY
Arsenic-Inorganic	• 29 CFR 1910.1018	Exposure at or above the AL for more than 30 days per year without regard to respirator use**	• Initial Baseline Periodic** • Emergency Exposure • Termination of Exposure • Termination of Employment
Asbestos	• 29 CFR 1910.1001 • 29 CFR 1915.1001 • 29 CFR 1926.1101 • RM 50B Sec 4.X	Exposure at or above PEL 30 days per year	• Initial Baseline • Annual Periodic
Benzene	• 29 CFR 1910.1028	Employees exposed: • at or above AL 30 days/year • at or above PEL 10 days/year • at or above 10 PPM 30 days/year prior to 1987 • to >0.1% benzene solvent as tire building machine operators	• Initial Baseline • Annual Periodic** • Emergency Exposure
Cadmium	• 29 CFR 1910.1027	Employees who are or may be exposed: • at or above AL 30 days/ year • previous exposure above AL total of 60 months	• Initial Baseline • Periodic** • Emergency Exposure • Termination of Exposure**
Ethylene Oxide	• 29 CFR 1910.1047	For all employees who are or may be exposed at or above AL >30 days/year	• Initial Baseline • Annual Periodic • Emergency Exposure • Termination of Exposure • Termination of Employment
Formaldehyde	• 29 CFR 1910.1048	All employees exposed at or above AL or exceeding the STEL	• Initial Baseline • Annual Periodic • Emergency Exposure
Lead	• 29 CFR 1910.1025 • 29 CFR 1926.62 • RM 50B, Sec X	Employees who are or may be exposed above the AL for 30 days/year	• Initial Baseline • Periodic** • Emergency Exposure
Organophosphate & Carbamate Pesticides	• 29 CFR 1910.1000	For all employees who are or may be exposed at or above AL >30 day/year	• Initial Baseline • Quarterly Periodic • Emergency Exposure

\*This table reflects chemical agents to which NPS employees are most likely to be exposed. It does not provide a complete listing of OSHA-regulated chemicals. See 29 CFR 1910.1000, Tables Z1, Z2 and Z3 for a complete list of regulated chemicals.

\*\*See OSHA Standard for further information.

**Table 4.X-3 OSHA Regulated Physical and Biological Agents Requiring Medical Surveillance or Screening**

HAZARD AGENT	REFERENCE	MEDICAL SURVEILLANCE CRITERIA	EXAM TYPE & FREQUENCY
Bloodborne Pathogens	• 1910.1030 • RM 50B, Sec 4.	Employees occupationally exposed blood or OPIM during an exposure incident	• Emergency Exposure
Noise	• 1910.95 • RM50 B, Sec 4.2	When Noise Exposure is 85 dBA 8 hr TWA or greater	• Initial Baseline • Annual Periodic • Termination of Exposure
Heat Stress	• RM50B, Sec 4.X	Employees exceeding heat stress screening criteria	• Periodic during exposure

3. *Provide Medical Screening and Surveillance.*

Parks will provide medical screening and surveillance to all employees who meet applicable criteria. Mandated medical surveillance requirements for each of the OSHA-regulated programs are listed in the applicable OSHA standards. Additional tests and evaluations may be required at the discretion of the physician or healthcare professional consistent with sound medical practice.

OSHA Regulation 29 CFR 1910.1000 contains the Z Tables that list stressors that have permissible exposure limits (PELs). Some of these stressors have specific regulations that mandate medical surveillance requirements. The remainder of these stressors do not have any medical surveillance requirements put forth in specific regulations. Parks with employees exposed to these stressors above the action level (AL) are required to perform medical surveillance examinations. The scope of these medical screening examinations will be determined by the examining physician based on the nature and extent of exposure of the worker.

The following list summarizes factors to be considered when determining examination content and developing examination protocols.

- Specific job tasks and/or requirements.
- Workplace risk factors (exposures).
- Physical agents.
- Chemical agents.
- Biological agents.
- Other.
- Personal risk factors (medical status).
- Target organ systems and potential health risks.
- Potential public health and safety impact.
- Legal and regulatory requirements.
- Employee health promotion and personnel programs.

## Types of Evaluation

*Initial or Baseline.* These evaluations are performed before placement in a specific job to assess whether the worker will be able to perform the job capably and safely and to obtain baseline measurements for future comparison. Ideally, these medical evaluations should be done before commencement of work.

*Periodic.* These evaluations are conducted at scheduled intervals. Periodic examinations may include an interval history, physical examination and clinical and biological screening tests. The scope of these examinations is determined by regulatory guidance and professional healthcare practice standards.

*Emergency (Acute) Exposure.* These evaluations are required when the applicable short-term exposure limit (STEL) or ceiling limit of a substance is exceeded. The requirement applies whether or not the worker exhibits any overt symptoms of acute exposure. Emergency exposure evaluations are also required when a worker exhibits adverse effects following an acute exposure to a suspected hazardous substance.

*Termination of Exposure.* These evaluations are performed when exposure to a specific hazard has ceased. Exposure to specific hazards may cease when a worker is reassigned, a process is changed or the worker leaves employment. Some federal regulations require termination of exposure examinations (e.g., Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120).

*Termination of Employment.* These evaluations are designed to assess pertinent aspects of the worker's health when the employee leaves employment. Documentation of examination results may be beneficial in assessing the relationship of any future medical problems to an exposure in the workplace. This is particularly applicable to those conditions that are chronic or that may have long latency periods. Some federal regulations require termination-of-employment evaluations (e.g., asbestos, 29 CFR 1910.1001).

## Medical Opinions

A medical examination alone cannot determine an individual's ability to perform the essential duties of a particular position. The responsibility for making this determination rests solely with the park management. Medical information may be an essential element in determining an individual's suitability for job tasks. However, management has the obligation to consider issues that are not strictly medical, such as reasonable accommodation or assessment of undue hardship on the operation of park operations.

The role of medical personnel is limited to determining whether the individual meets the medical requirements of the position and can, from a medical standpoint, perform the job capably and safely. Medical determinations should fall in one of the following three categories.

*Qualified.* The worker is capable, from a medical standpoint, of performing the required tasks. Allowing the individual to perform the job will not pose a significant risk to personal health and safety or the health and safety of others.

*Qualified with Restriction.* The worker is capable of performing the job without risk to personal health or others only with some accommodation or restriction. When this determination is made, the examining healthcare practitioner should provide a list of recommended accommodations or restrictions and the expected duration of their application.

*Not Qualified.* The worker is not capable of performing essential tasks or cannot perform them safely.

4. *Inform Workers of the Results.* All workers must be informed of the results of their occupational medical screening and surveillance evaluations, even if all results are normal, as soon as possible. OSHA is very specific with regard to informing employees. For example, employees must be notified in writing within 21 days if a significant threshold shift is detected. Results of blood tests for lead must be provided to the employee within five days of the park receiving analysis results. In the absence of specific regulated notifications, workers will be informed of the results of evaluations no later than 30 days after they are received by the park. Documentation of patient notification should be noted in the medical record. All personnel with significant abnormalities must be further evaluated or referred for evaluation as appropriate. One of the primary reasons for performing occupational medical examinations is to detect job-related abnormalities at an early stage to reverse or halt progression by modifying exposure. If abnormalities are not fully evaluated and reviewed, potential opportunities for prevention are lost.

#### 5. *Medical Removal and Protections.*

It is the responsibility of the park to ensure a safe and healthy working environment. Once a work-related illness or injury is identified that could be further exacerbated by continued exposure to a workplace hazard or condition, immediate evaluation is required to determine whether the worker must be at least temporarily removed from further exposure. Removal from a workplace or restriction from job tasks is warranted under the following conditions:

- A medical condition prevents the worker from performing the essential functions of the job and no reasonable accommodation would enable the worker to perform the job.
- Allowing the worker to perform the job would endanger the health or safety of other workers or the public.
- Placing or retaining the individual in the job poses a significant risk to the worker's personal health or safety.



The examining practitioner should prepare a case summary on all workers determined to be medically unsuited for their job and file this case summary in the workers' medical records. The appointing official must be informed of the disqualifying recommendation. The case summary, as confidential medical information, should be provided to management only when necessary and authorized. The following information should be included in all case summaries:

1. *Diagnosis.* The diagnosis must be justified in accordance with established diagnostic criteria.
2. *History.* The history of the disqualifying condition(s) including references to findings from previous examinations, treatment and responses to treatment.
3. *Clinical findings.* The clinical findings including results of any laboratory tests, X-rays or special evaluations performed.
4. *Prognosis.* The prognosis must clearly state the medical basis for concluding that the individual is incapable or unsafe, plans or recommendations for future treatment, and an estimate of the expected date of full or partial recovery. If recovery is not expected, this should also be clearly indicated. The prognosis must also include an explanation of the impact of the medical condition on overall activities both on and off the job, the reasons why restrictions or accommodations will not enable the individual to perform the job, and an explanation of the medical basis for any conclusions.

Examples of medical conditions which support the removal of the worker are:

For workers exposed to benzene, any of the following:

- The hemoglobin/hematocrit falls below the laboratory's normal limit and/or these indices show a persistent downward trend from the individual's pre-exposure norm (provided these findings cannot be explained by other means).
- The thrombocyte (platelet) count varies more than 20% below the employee's most recent prior values or falls below the laboratory's normal limit.
- The leukocyte count is below 4,000 per mm<sup>3</sup> or there is an abnormal differential count.

For workers exposed to lead: A blood lead level at or above 50 ug/dl of whole blood.

For workers exposed to noise: A loss of hearing of > 25 dB in either ear at one or more of the speech frequencies (500, 1000, 2000 or 3000 Hz), compared with the current reference audiogram.

For workers exposed to organophosphate pesticides: cholinesterase level at or below 50% of the pre-exposure baseline.

Pregnancy is not a reason for automatic medical removal from the workplace. A decision to remove or restrict a pregnant woman must be based on sound clinical judgment after careful consideration of the workplace environment and the woman's physical capabilities. The woman's prenatal healthcare provider should be apprised early of potential workplace hazards and available safety precautions.