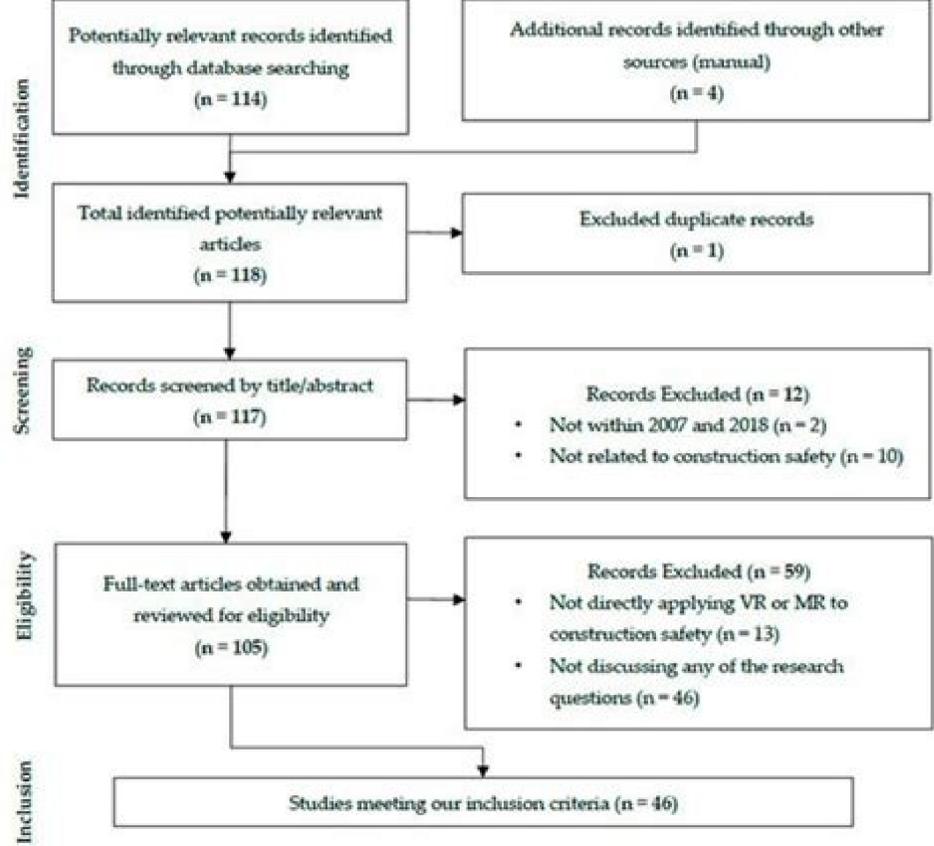


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# Robert Smith

## Health and Safety Manager/Executive

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**PERSONAL STATEMENT**

To ensure the growth of an organization through the effective application of experience within position-related tasks and through education.

**WORK EXPERIENCE**

**Health and Safety Manager/Executive**  
**Cardinal Corporation - December 2013 - 2020**

- Responsibilities:*
- Assisted Regional Health & Safety Manager with the implementation and maintenance of the regional safety management systems and overall company programs.
  - Worked with onsite managers, site employees, subcontractors, vendors, and other individual health and safety professionals to resolve day to day safety issues. Reduced risk and control hazards by performing site audits to ensure compliance and continuous improvement.
  - Coordinated the collection of data to ensure reporting requirements were met.
  - Supported the implementation and maintenance of safety management systems and internal controls.
  - Coached and trained employees and managers in Safe Working Practices.
  - Facilitated and coordinated technical training for employees and managers on site.
  - Supported business continuity planning and site emergency preparedness.

**Health And Safety Manager**  
**ABC Corporation - 2010 - 2013**

- Responsibilities:*
- Duties Provided safety, industrial hygiene, and environmental support for VRCA, Natchiz, Alaska Petroleum Contractors, Petro Marine and Prudhoe Bay Commercial Center in Alaska arctic operations.
  - Ensured compliance with DOT, EPA, OSHA, USCG, and client safety and industrial hygiene standards.
  - Oversaw the safety, health, and environmental of personnel for the winter explorations with ice roads, mobile crews, and mobile cat-camps.
  - Managed safety for those personnel on exploration of Exxon Thetas Island, and Arco Alpine discoveries.
  - Developed standards for DOT drug screening/testing of personnel to include alcohol breath analyzer testing.
  - Developed, managed, and trained personnel in safety, environmental, and health programs necessary to support the various contracts with North Slope producers.
  - This is Dummy Description data. Replace with job description relevant to your current role.

**SKILLS**  
 Computer-literate, performer with extensive software.

**LANGUAGES**  
 English (Native)  
 French (Professional)  
 Spanish (Professional)

**INTERESTS**  
 Climbing  
 Snowboarding  
 Cooking  
 Reading

**REFERENCES**  
 Reference - 1 (Company Name)  
 Reference - 2 (Company Name)

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You are being re-directed, if nothing happens, please follow this link [Risk management](#) is the process of formulating and implementing a course of action to mitigate the hazards determined in the risk-assessment process to be important (NRC 1983). The identification of the hazards is discussed in Chapters 3 and 4, and the process of determining the risk associated with them (risk assessment) is discussed in Chapter 5. Recognized hazards can be managed with a variety of adjustments in work practices, equipment, and facilities. In some cases, key modifications focus on engineering controls (facilities and equipment), in others on administrative changes (such as delegation of decision-making authority to the right level or revision of established safety procedures), and in still others on adoption of new safety-related devices, protective equipment, or research methods. Training programs must be adjusted in concert with these changes to ensure their effectiveness. Clearly, different people must be involved to achieve appropriate advances in the various elements that contribute to improved worker health and safety. Basic and applied research may also be needed to identify, evaluate, and develop the means to deal with specific new hazards and to ensure their practicality and usability in the workplace (Samet and Burke 1998). It is important to recognize that many factors influence risk management. Public values, politics, economics, legal issues, and technical concerns can all influence the risk-management process locally (as in adjusting standard operating procedures) or nationally (as in adjusting guidelines and regulations). In some cases, external influences force over-conservative risk-management decisions and actions; more often, these influences, especially fiscal constraints, lead to less than optimal risk-management decisions and actions. To be effective, risk management must have two elements: a specific occupational health and safety plan and an appropriate safety culture and working environment. Safety culture is often taken for granted, although it is critical in building an effective risk-management system and a healthful overall work environment. At a basic level, safety culture is the way the institutional administration and workers in an organization feel about risk; feelings, attitudes, and perceptions about risk will influence how it is managed. The safety culture sets the tone of an organization, influencing the consciousness of its people as they conduct their daily activities. The safety culture encompasses an organization's tolerance of risk in its daily operating activities and decision-making processes. The greater the degree to which the administration recognizes the need for effective risk-management in the organization, the greater will be its commitment to the establishment of standards and protocols for identifying, assessing, and managing risks, and the more beneficial the risk-management program will be. This chapter deals with the foundation of risk management—successful OHS and possible solutions specifically applicable to work environments involving nonhuman primates are described. While there are no fundamental differences in the OHS based on the size of a facility, there are some key differences in developing an OHS for large institutions, such as a primate center, versus a small vivarium that may have only limited numbers of nonhuman primates. The critical differences are likely to be in the inability of smaller institutions to allocate resources and personnel to the OHS that may be available at larger institutions specializing in nonhuman primates. These limitations can be addressed in part by obtaining the commitment of the institutional official prior to acquiring the animals and presenting a plan to identify the resources that will be required to properly work with the species in question. The allocation of adequate resources also depends on the oversight of the IACUC, which has responsibility for review of occupational health in the vivarium. Housing of nonhuman primates in a conventional research vivarium may require facility modifications and renovations. In some cases, depending on the species in question, it may be possible to address occupational health and safety concerns by use of appropriate personal protective equipment and modifications to existing standard operating procedures (SOPs). All facilities that plan to house nonhuman primates should identify the specific requirements for nonhuman-primate husbandry and incorporate these features into the design and construction of the facility. The housing of small numbers of primates requires specialized training for employees (relative to the existing training program). Nonhuman primates require a controlled-access space with rigorous attention to SOPs for safe handling and husbandry. In a facility dedicated to nonhuman primates all employees are part of the "culture" of working with primates, while in a traditional vivarium nonhuman primates represent unusual species that may cause increased levels of curiosity among vivarium workers and affiliated research staff. The establishment of strict SOPs and mechanisms of controlled access are critical to reducing this problem. An occupational health and safety plan must be developed with consideration of the specific nonhuman-primate species in use due to differences in the size and strength of the animals, the special husbandry practices required, and the risk of human exposure to zoonotic infectious agents. These factors all vary with the nonhuman-primate species in use. These considerations ultimately influence the resources required to maintain nonhuman primates and the necessary elements of the occupational health and safety plan. At the end of this chapter are checklists (Tables 7-1 through 7-11) to determine if the essential elements of an occupational health and safety plan are being addressed at an institution. The number of elements needed in the plan will depend in part on the size of the institution, the species and numbers of animals housed, and the nature of the research being conducted. It is not essential that each institution have a full-time occupational health professional on staff. It is essential, however, that each institution have an established relationship with a professional who can provide the necessary expertise for plan development and operation. The complexity of using nonhuman primates in research requires a seamless integration of several institutional positions and programs, including the institutional official, the IACUC, the vivarium management team, the environmental health and safety program, the occupational health and safety program, and the investigator. The close phylogenetic relationship of human and nonhuman primates and the infectious agents endemic in many primate populations require that access to nonhuman-primate colonies be restricted in order to protect both human and animal health. Controlled access depends on administrative support from the institutional official and associated support staff. There must also be administrative support to enable personnel to conduct training and safety programs. Smaller facilities that do not have the resources to support training and safety staff positions should establish effective systems for employee training and safety monitoring. Occupational health and safety and environmental health and safety consultants should be thoroughly familiar with the occupational hazards associated with working with nonhuman primates, particularly with respect to infectious hazards, such as that represented by B virus. Finally the institution should make a commitment to the costs associated with tuberculin testing, employee screening, vaccinations, and health assessment for respirator use when required. These costs may be addressed through a process of direct cost recovery or through the allocation of indirect costs from research grants. The critical point is that the elements of the occupational health and safety plan are incorporated into the costs for the animal care program. Some procedures are required by law; others may be elective, but all are prudent for any comprehensive occupational health and safety plan. Table 7-1 provides a checklist for essential administrative features of an occupational health and safety plan. The design and operation of a nonhuman-primate vivarium are critical features of an occupational health and safety plan. Although well-trained staff and efficient SOPs can address errors in facility design, such errors can have long-term consequences for cost, efficiency, and, in the most serious outcome, risk to employees. The facility design issues for nonhuman-primate vivariums are, in general, similar to those for more generic facilities, although some aspects require increased attention when larger nonhuman primates are housed. Security is paramount. Controlled access through conventional locks, key cards, or other devices is critical. Entry by personnel who have not completed occupational health screening can present a risk to the animal population; but, more important, can present an immediate risk of physical injury to people unfamiliar with the strength or reflexes of nonhuman primates. Nonhuman-primate species require varying cage sizes and complexity of caging systems. Many of the species used in research require large heavy cages, which can present substantial ergonomic hazards for employees; facility design and caging systems should incorporate features that minimize these hazards. For example, the use of rolling racks and cage elevators for wall-hung cages can help to reduce muscle and back strain. If the husbandry system requires animal transport via cages or tunnels, these should be designed to minimize heavy lifting above shoulder level. Hydraulic lift tables on wheels can be very useful for large primates such as baboons and chimpanzees. These can ease transport of large primates, sometimes dropping to within 4 inches of the floor. Wall and floor surfaces should be constructed of materials that are resistant to chemicals and cleaning agents and may be easily cleaned. Floor surfaces should be designed to provide traction to help personnel avoid injuries from slips and falls. Special attention should be paid to floor surfaces in such support facilities as procedure rooms, the cage-washing facility, the veterinary clinic, and the necropsy area. Sinks for hand washing, eye wash stations, and showers should be placed to ensure ready access for employees involved in chemical splashes or spills. Employees should also have ready access to disinfectant stations, bite-scratch kits, and emergency kits. Locker rooms, break areas, and employee lounges should be designed to minimize cross-contamination between these areas and the employees' personal clothes and food items. The separation of clean areas from "dirty" areas of a locker room by some sort of stepover design is optimal. All personnel working in nonhuman-primate facilities should have access to a shower. Lounges should be readily accessible to ensure that employees do not eat, drink, or smoke in animal areas. The size and complexity of nonhuman-primate housing areas require provisions for power failures or other mechanical breakdowns. In addition to basic considerations of animal care, these provisions are critical for employee safety. Emergency lighting helps to prevent accidents and severe injuries during blackouts. In quarantine facilities or containment facilities (for example, ABSL 3 holding rooms), negative air pressure is essential to prevent worker exposure to pathogens or toxic compounds. Such facilities should have redundant power and mechanical systems. Table 7-2 provides a checklist for facility design and operations. Exposure control is key to the safe operation of nonhuman-primate vivariums. Exposure control is developed in a hierarchic structure to ensure worker safety: engineering controls, work practices, and personal protective equipment. Each element is an important part of the safety plan. The ideal is that no potential exposure route is limited by a single control. Rather, engineering controls, work practices, and personal protective equipment should provide a layered safety net to prevent worker injury. Engineering controls are integrally related to facility design and operation such as directional air flow and double door access barriers. Engineering control features for animal rooms and laboratories also include biosafety cabinets to limit aerosol exposures, chemical fume hoods in laboratories to limit exposure to chemicals, covers on electrical outlets where water is used to wash down rooms, covers on the cage wash pit, and downdraft tables in necropsy suites. Design and operation of the vivarium should minimize repetitive motions and activities that can lead to ergonomic injuries; this is particularly relevant to such activities as cage transport, animal transport, and animal restraint. Table 7-3 provides a checklist for engineering controls. Optimizing work practices for employee safety is a matter of providing the engineering controls described above and integrating them with employee training and facility SOPs. Strict adherence to safe work practices is a key element of employee safety. The first element of safe work practices is personal hygiene. Several studies (Gopal and others 2002; King and others 1999) have identified hand washing as essential for preventing infections in human hospitals and animal facilities. Employees should be familiar with routes of infection and recognize that handling objects with gloves and then touching persons or objects with the outside of the gloves creates the potential for personnel exposure to pathogens. Personal hygiene should be encouraged by providing workers with dedicated clothing or protective wear, such as jump suits, laboratory coats, and other clothing that can be left at the workplace. Housekeeping is also a basic element of safe work practices. A clean, uncluttered work area facilitates sanitation and disinfection and minimizes chances of personnel exposure to pathogens. Keeping animal rooms and laboratories free of clutter reduces the potential for falls and injuries. Some measures, such as sticky mats and footbaths, may be useful in specific circumstances but must be accompanied by a commitment to maintenance and regular replacement. Sound work practices can optimize worker safety in the cleaning of cages. Use of low-velocity hoses to minimize aerosol formation can help to reduce potential exposures but must be balanced with husbandry needs. Dry cleaning and cage-pan removal should be evaluated by the safety officer and management to minimize ergonomic stress and optimize infection control. SOPs and training are essential in the handling and transport of animals. Transport of animals depends on appropriate caging or transport boxes, which must be designed to house the animals properly while minimizing ergonomic and infection hazards. Specialized restraint equipment should be used only if the workers and the animals have been trained. Animals should be handled directly only when under anesthesia, if this is possible. If animals are to be captured in a net or restrained by hand, personnel should be provided with appropriate safety equipment and training. If animals are to be transported through common use hallways and facilities (e.g., transport to an imaging facility in a hospital), SOPs should be developed for how to safely transport the animal, as well as a response to exposure plan for non-animal using individuals that are exposed during transport. SOPs should also be developed for cleaning of common use equipment (e.g., MRI machine) and facilities. The research environment often includes sharp instruments, such as needles, scalpel blades, and catheters. Needle-less or protected-needle systems should be used whenever possible to reduce the potential for injury and exposure to pathogens. Safe work practices should include appropriate signage, and provision of containers for sharps disposal. Waste from nonhuman primates should be objectively assessed by the safety committee to ensure proper disposal of infectious material generated in either routine husbandry or research. Employee training should include safe operation of steam autoclaves and other equipment designed to decontaminate infectious waste generated in the vivarium as well as appropriate use of biohazard bags for disposal. It should also include appropriate disposal procedures for radioactive waste and hazardous chemicals. Table 7-4 provides a checklist for safe work practices. The final element of worker safety is the proper use of PPE. Many nonhuman primates are intelligent and very quick—they can intentionally or unintentionally inflict severe injury necessitating the need for engineering controls and SOPs even in the absence of potentially infectious hazards. Worker safety is dependent first upon facility design and appropriate caging systems, but PPE is also essential. It should not be viewed as the sole element or used as a substitute for proper facility design, appropriate equipment, and safe work practices. Determination of appropriate PPE will depend on the nonhuman-primate species, the work environment, and the type of research being conducted. The minimal personal protective equipment for working with nonhuman primates should be dedicated clothing, gloves, and mask. Workers must be trained in the proper use of these and other personal protective equipment. Eye and mucous membrane protection are critical in nonhuman-primate work settings. Various kinds of protective eyewear and face shields are commonly used in many laboratories and vivariums, including nonhuman-primate vivariums. The function of this personal protective equipment is primarily to prevent exposure from droplets, projectiles, and chemicals in the workplace. As early as 1988, recommendations were issued by the CDC that "masks and protective eyewear or face shields" should be used by personnel working with nonhuman primates either naturally or experimentally infected with simian immunodeficiency virus (CDC 1988). In the NRC report Occupational Health and Safety in the Care and Use of Research Animals (NRC 1997), it is recommended that "personnel who work with nonhuman primates should wear face shields and other protective garments and equipment appropriate for the circumstances and species involved." Following a fatal human case of B virus encephalitis caused by an ocular exposure to body fluid from a rhesus macaque, the NIOSH and the CDC issued recommendations that protective eyewear should be mandatory for individuals working with macaques (CDC 1998; NIOSH 1999). The CDC issued further recommendations on eye and face protection in the CDC-NIH document Biosafety in Microbiological and Biomedical Laboratories (CDC-NIH 1999), where it is recommended that appropriate eye and face protection be based on risk assessment in the setting at hand. In view of these differences between various published recommendations and the differences in usual practice in various nonhuman-primate facilities, it seems prudent to define a common practice standard, a common recommendation suitable for universal use. This has been done, as follows: Eye and face protection should be mandatory for individuals working with macaques. Eye and face protection are highly recommended for individuals working with other Old World monkeys and apes based on a splash exposure assessment, on the recognition of human infection by other viruses such as SIV. Eye and face protection for individuals working with other nonhuman primates should be decided on the basis of sound institutional review of the hazards, that is sound risk assessment, and appropriate overall risk management protocols and proactive management practices. The mandatory requirement for eye protection when working with macaque species should be implemented in the context of the institutional animal management program and experimental use. The variety of different housing and experimental environments precludes listing appropriate eye protection for all the situations that may be encountered in a research facility. The use of eye protection with macaques should still be based on an institutional risk assessment and determination of the degree of risk of splashes and mucous membrane or ocular exposure. When animal husbandry or experimental protocols require working in close proximity with awake primates (manual restraint or restraint equipment) it is appropriate to be conservative in requiring routine use of eye protection. It is also recognized that new employees or employees with less than 2 years of experience may be at higher risk for injury or exposure (bin Zakaria and others 1996). The higher risk for new personnel may warrant a standard requirement for use of PPE, regardless of tasks being performed. This decision is best made at the institutional level by the process of risk assessment and proactive management. Importantly, personal protective equipment must protect workers from potential exposures while not compromising their dexterity or vision. Excessive personal protective equipment can present ergonomic hazards and hazards associated with heat stress in work environments that are not temperature-controlled. All workers must be trained in the use of PPE. If there are specific requirements for the illness/injury warrants it, the program must involve an occupational health professional to determine whether the use of a respirator is contraindicated in workers with pre-existing medical conditions or health concerns. The proper respiratory device should be selected and fit testing should also be done, if appropriate (e.g., for N-95 (29 CFR 1910.134). Table 7-5 provides a checklist for PPE use. Worker education and training constitute a core element of an occupational health and safety program. Because this aspect of the program is critical in nonhuman-primate facilities, it is addressed in detail in Chapter 8. Table 7-6 provides a checklist for education and training. The occupational health aspect of the occupational health and safety program can be divided into two elements. The first, preventive medicine, includes preplacement medical evaluations, follow-up periodic and episodic health evaluation, appropriate immunizations and serum banking. The second is an appropriate response system in the event of an employee injury. Appropriate first aid and medical care must be immediately available to deal with worker injuries and exposures in the nonhuman-primate facility. The preventive preplacement medical evaluation typically used to screen workers entering a nonhuman-primate facility originated with the intent to protect the health of the employees as well as the animals (Muchmore 1975). This evaluation may consist of a questionnaire followed by a physical examination if a need is established. Health questionnaires should be confidential and evaluated by appropriate occupational health professionals. Information collected in a questionnaire may include previous or ongoing medical problems, current medications, allergy history, prior immunizations, and previous results of tuberculin skin testing. The evaluation may identify pre-existing conditions that might modify an employee's risk profile (NRC 1997), such as tuberculosis or potential pregnancy in women of child-bearing years. The preplacement medical evaluation may also serve as an opportunity to educate the employee about potential hazards of working with nonhuman primates (NRC 1997). Such evaluations also establish a link for the employee with the appropriate occupational health professional. It is desirable that employees recognize the occupational health professional as a resource in addressing their concerns in the work environment. The recognition of immunocompromised or pregnant persons may be difficult because of patient confidentiality laws and regulations, but such persons are at special risk so all workers must be informed of this (Rayburn 1990). Employees should be advised to communicate with the institutional occupational health professional, who can then communicate with the employee's personal physician. Anesthetic gases, radiation, and certain infectious diseases are well-recognized risks for pregnant employees, and in most cases alternative work assignments are appropriate. Table 7-7 provides a checklist for occupational health issues. A health screen is also necessary if workers will be required, as part of their daily duties, to wear respirators rated by the National Institute for Occupational Safety and Health. A respirator may rarely pose an additional hazard if workers suffer from heart disease, respiratory illness, or diabetes (Szeinuk and others 2000). The facility may use periodic health evaluations to evaluate the success of its occupational health and safety program in reducing occupational illness and injury (NRC 1997). The nature and frequency of these periodic evaluations should be based upon the nature of potential hazards; in NHP facilities, these periodic evaluations should be focused on physical injuries as well as illnesses arising from exposure to relevant infectious agents. Mild symptoms of health alterations may be indicative of a need for better preventive measures. The need for and design of periodic health evaluations should be determined by representatives of various oversight or advisory bodies associated with the institution—environmental health and safety program, occupational health service, office of human resources, animal facility director, etc. Decisions regarding the nature and frequency of periodic evaluations should be reviewed regularly, based upon changes in working conditions and exposures, injury and illness experience, and the availability of new guidelines for good occupational health practice (NRC 1997). Health evaluations should also be conducted in response to persistent symptoms, symptoms that indicate the onset of a work-related illness, or the occurrence of a work-related injury. These episodic evaluations should typically include a physical examination focused on the major complaint, and the employee may need to be referred to medical specialists if the illness/injury warrants it. Work-related injuries/illnesses that lead to medical evaluation and loss of work time should be reported to the occupational health information system (ELS 1986; NRC 1997). Another important component of the occupational health care system is the immunization program. The decision to immunize an employee is influenced by the potential risks the employee may face on the job and should be determined at the time of the preplacement evaluation, or at periodic or episodic evaluations. As required by the Occupational Safety and Health Administration Blood-borne Pathogens Standard (OSHA 1991), vaccinations must be offered to personnel who will be working with experimental pathogenic agents such as hepatitis B virus. Additional vaccines may be offered for tetanus, measles, and other etiologic agents that are applicable to the research program. The emphasis on serum-banking as a routine preventive medicine function has decreased over the last decade. A survey of 50 institutions conducting animal research demonstrated limited utilization of reference serum banks. (Lehner and others 1994). Sera from only 6% of personnel were used for epidemiological studies. Only 0.3% of sera stored was used for medical/legal or diagnostic purposes. Serum banking has value only when its purpose is to obtain data for the conduct of occupational risk assessments. Each institution should develop its own plan and assess the utility of an annual serum bank. The plan needs to consider a combination of factors such as chain of custody, confidentiality, resource requirements for long-term storage, and accessibility for serologic testing (NRC 1997). Most institutions do collect serum samples following an employee exposure, such as a bite, needle stick, or scratch where there is potential for occupationally acquired disease. As an important ancillary function provided by the occupational health service, periodic tuberculin skin testing using purified protein derivative (PPD) can help identify individuals that could potentially transmit tuberculosis to nonhuman primates and provide important baseline clinical information for future medical management decisions following a workplace exposure. Expert consensus panel recommendations for targeted tuberculin skin testing are outlined in various clinical guidelines ([www.cdc.gov/mmwr](http://www.cdc.gov/mmwr); Vol. 49, No. 6) and [www.cdc.gov/nchsftp/tb/pubs/1376.pdf](http://www.cdc.gov/nchsftp/tb/pubs/1376.pdf)). It is reasonable to assess all nonhuman-primate handlers upon initial entry to the workplace. A "two-step" tuberculin skin test is recommended for those employees not previously under periodic PPD testing (Sherman and Shimoda 2001). The frequency of periodic PPD skin testing for nonhuman-primate handlers will depend upon risk assessment for the particular facility. The principle function of employee tuberculosis screening is to protect the nonhuman-primate colony and this should be a prime consideration in determining the frequency of periodic PPD skin testing for employees. Additional considerations should include factors such as the likelihood of tuberculosis infection among the facility nonhuman-primate population, immune status of nonhuman primates being handled, nature of staff contact with nonhuman primates, experimental protocols being employed, and past experience with tuberculosis in the nonhuman-primate facility. An example of one large research institution's recommendations for periodic tuberculosis screening is provided in Box 7-1. Recommendations for Tuberculin Testing Procedures at the National Institutes of Health (NIH 2001). If the new worker has a previous positive intradermal skin test (with purified protein derivative, PPD), then no further skin testing should be done. Instead, (more...)The proper response to injuries and exposures involving macaques, which present the risk of B virus exposure, is described in Chapter 9. As stated in Chapter 9, this special case, often involving medical personnel (e.g., typical emergency department physicians) with little familiarity with the prevention of human B virus infection, requires adequate preplanning. All institutions housing macaques must have a defined plan to deal with occupational B virus exposures. Several aspects of exposure control depend upon specialized mechanical equipment. Examples are air-handling systems with HEPA filtration, anesthetic machines, biosafety cabinets, fume hoods, cages, cage washers and autoclaves. Such equipment should be regularly maintained and, if necessary, recertified. Operational logs (for example, recording time/temperature) should be maintained for medical-waste decontamination equipment. Biosafety cabinets and fume hoods are typically subject to regular maintenance and recertification. Personnel should be trained so they can interpret abnormal readings of pressure gauges and other indicators used in containment facilities. Airflow monitors should be used regularly to verify air exchanges in animal rooms and to determine pressure differentials. Cages and equipment for restraining animals must be in good repair and proper functional state. Defective equipment must be taken out of service until repaired. Table 7-8 provides a checklist for equipment performance. Information management is essential in the development and maintenance of an OHS plan. A written plan is needed to identify the appropriate levels of training for all new employees. Training necessarily includes providing SOPs and written guidelines to new employees. There should be documentation that employees have read these materials as part of their training program. The institution must maintain its injury- and illness-prevention plan in accordance with state and federal regulations. Training must be documented to provide regulatory agencies and other oversight bodies with evidence that appropriate training is carried out regularly. Annual retraining is required in some circumstances by law or regulation. The retraining venue helps ensure that workers are familiar with changes or additions to the OHS plan and SOPs. The retraining venue is also an appropriate venue for reminding workers to review changes in their own health status; for example, a change in the condition of one's respiratory system or the presence of a new immunosuppressive disorder may necessitate a change in duties or a review by the occupational health physician. The institutional injury log is a critical database in assessing the efficacy of the occupational health and safety plan. Analysis of injury rates for different tasks and different types of housing systems can be invaluable in deciding whether to modify the OHS plan. The institutional injury database should include data that allow matching of risks to job classifications. By including data on both injury rates and populations at risk, occupational health and safety program professionals are able to determine the efficacy of their programs. The institutional injury database and safety inspection program must be integrated in a system that favors full follow-up and correction of problems. If identifying information is included in the injury database, this database should remain confidential and accessible only by the appropriate institutional officials. Table 7-9 provides a checklist for information management. Every nonhuman-primate facility should have an emergency action (disaster) plan. The plan must include the means for dealing with fires, power failures, earthquakes, floods, tornadoes, and other life-threatening emergencies. A specific plan should be developed for procedures to be used in the event of an animal escape; this plan should minimize employee hazards and risks. The emergency action plan should identify the responsibilities of in-house personnel and provide readily available lists of telephone numbers of additional expertise and resources. Practice drills of elements of the emergency action plan are necessary; this is especially the case for an animal escape. The proper response to injuries and exposures involving macaques, which present the risk of B virus exposure, is described in Chapter 9. As stated in Chapter 9, this special case, often involving medical personnel (e.g., typical emergency department physicians) with little familiarity with the prevention of human B virus infection, requires adequate preplanning. All institutions housing macaques must have a defined plan to deal with occupational B virus exposures. Table 7-10 provides a checklist for emergency procedures. The efficacy of the OHS program should be evaluated regularly. At a minimum, the IACUC and occupational health professionals should review the OHS plan as part of their semiannual reviews. Review of injury and illness logs should be a routine responsibility of the occupational health and safety program officer or a designee of the institutional official (for example, the director of the animal program) in the case of smaller facilities. If the nonhuman-primate facility is part of a large institution, it is often valuable to involve the institutional occupational health and safety program staff in this review. This provides a new perspective on program design and implementation and complements the perspective of the facility manager and senior staff. Effective program evaluation requires appropriate expertise to address risks associated with hazards that cannot be eliminated. It also requires full involvement of supervisors at all levels. This kind of program evaluation helps to develop a culture of safety throughout an institution. Table 7-11 provides a checklist for program evaluation.

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