AMERICAN COLLEGE OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE COMPETENCIES – 2008

INTRODUCTION

The American College of Occupational and Environmental Medicine (ACOEM) recognized the need for defining important competencies for occupational and environmental medicine (OEM) physicians and in 1998 published its original set of OEM competencies. With medical advances and evolving issues of international and national importance, these competencies have been updated.

Basic competencies set the minimum expectations for physicians. Although being competent in a subject may not mean that it is a current element of an individual physician's practice, the physician must have the knowledge base and skill so that they could include it in their practice. Continued medical education is expected of all physicians, and directing their efforts to state-of-the-art occupational and environmental medicine is crucial. The listing of competencies by ACOEM assists practicing physicians in their efforts to keep current and to serve as knowledgeable representatives of the specialty.

For the purpose of this document, competency is defined as "possession of sufficient physical, intellectual and behavioral qualifications (i.e., knowledge, skills, abilities, and attitudes) to perform a task or serve in a role which adequately accomplishes a desired outcome." In order for OEM physicians to have a solid identity for employers, government agencies, health care organizations, and other health practitioners, a short list of core competencies is essential. This document presents a list of 10 core competencies that identify the areas of medicine that are the basis of the OEM specialty.

The core competencies identify broad definitions of content that must be further clarified. A listing of the skills that would be expected with each competency is crucial. Because of the diversity of occupational and environmental medicine practitioners, there are a host of skills that define the speciality. This approach of identifying core competencies accompanied by extensive clarification will provide assistance to training programs as well as to those organizations and businesses that will be starting or expanding occupational and environmental services.

The process used to arrive at the competencies was straightforward. The committee that developed this document represents diverse practices including academics, corporate, private practice, government, and residency directors. The OEM competencies in use by other organizations and countries were evaluated, as well as other current publications as outlined in the reference materials. Input was sought by experts in specific content area.

A physician specializing in occupational and environmental medicine is expected to be competent in all ten core competencies, while a non-OEM physician may have a few of the listed skills. In addition to the specific OEM competencies, there are important skills that those practicing OEM may obtain but which are not an aspect of the basic foundation of OEM. Competencies that are expected of all physicians are also separated out from the OEM specific competencies.

The 10 core competencies are listed and defined on the next few pages. Explanatory attachments include:

A. The skill sets for each of the 10 core competencies

B. Additional skills of OEM physicians

C. Fundamental skills of all physicians

D. Reference materials

E. Acknowledgements.

THE ACOEM TEN CORE COMPETENCIES:

1. Clinical Occupational and Environmental Medicine
2. OEM Related Law and Regulations
3. Environmental Health
4. Work Fitness and Disability Integration
5. Toxicology
6. Hazard Recognition, Evaluation, and Control
7. Disaster Preparedness and Emergency Management
8. Health and Productivity
9. Public Health, Surveillance, and Disease Prevention
10. OEM Related Management and Administration

CORE COMPETENCIES DEFINED

1. *Clinical Occupational and Environmental Medicine:* The physician has the knowledge and skills to provide evidence based clinical evaluation and treatment for injuries and illnesses that are occupationally or environmentally related.
2. *OEM Related Law and Regulations:* The physician has the knowledge and skills necessary to comply with regulations important to occupational and environmental health. This most often includes those regulations essential to workers' compensation, accommodation of disabilities, public health, worker safety, and environmental health and safety.
3. *Environmental Health:* The physician has the knowledge and skills necessary to recognize potential environmental causes of concern to the individual as well as to community health. Environmental issues most often include air, water, or ground contamination by natural or artificial pollutants. The physician has knowledge of the health effects of the broad physical and social environment, which includes housing, urban development, land-use and transportation, industry, and agriculture.
4. *Work Fitness and Disability Integration:* The physician has the knowledge and skills to determine if a worker can safely be at work and complete required job tasks. The physician has the knowledge and skills necessary to provide guidance to the employee and employer when there is a need for integration of an employee with a disability into the workplace.
5. *Toxicology:* The physician has the knowledge and skills to recognize, evaluate, and treat exposures to toxins at work or in the general environment. This most often includes interpretation of laboratory or environmental monitoring test results as well as applying toxicokinetic data.
6. *Hazard Recognition, Evaluation, and Control:* The physician has the knowledge and skills necessary to assess if there is risk of an adverse event from exposure to physical, chemical, or biological hazards in the workplace or environment. If there is a risk with exposure, then that risk can be characterized with recommendations for control measures.
7. *Disaster Preparedness and Emergency Management:* The physician has the knowledge and skills to plan for mitigation of, response to, and recovery from disasters at specific worksite as well as for the community at large. Emergency management most often includes resource mobilization, risk communication, and collaboration with local, state, or federal agencies.
8. *Health and Productivity:* A physician will be able to identify and address individual and organizational factors in the workplace in order to optimize the health of the worker and enhance productivity. These issues most often include absenteeism, presenteeism, health enhancement, and population health management.
9. *Public Health, Surveillance, and Disease Prevention:* The physician has the knowledge and skill to develop, evaluate, and manage medical surveillance programs for the work place as well as the general public. The physician has the knowledge and skills to apply primary, secondary, and tertiary preventive methods.
10. *OEM Related Management and Administration:* The physician has the administrative and management knowledge and skills to plan, design, implement, manage, and evaluate comprehensive occupational and environmental health programs and projects.

ATTACHMENT A – ACOEM OEM CORE COMPETENCIES AND SKILL SETS DEFINED

1. CLINICAL OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

The physician has the knowledge and skills to provide evidence based clinical evaluation and treatment for injuries and illnesses that are occupationally or environmentally related. The physician provides clinical care with an understanding of the workplace, work exposures, and relevant statutes, such as workers' compensation. Throughout the course of care, the physician seeks to maximize the patient's functional recovery.

Clinical – General

1. Obtain brief, as well as comprehensive, patient histories, with an emphasis on occupation and exposure.
2. Identify the potential relationship between patient symptoms and occupational/environmental exposures.
3. Diagnose and manage occupational/environmental illnesses and injuries with the use of consultants in related disciplines when indicated.
4. Identify non-occupational/environmental factors that may contribute to occupational/environmental disease or injury.
5. Refer and follow up or manage patients with serious occupational or environmental injuries and illnesses.
6. Elicit patients' concerns about exposures and establish a therapeutic alliance incorporating risk communication.
7. Report all findings to affected individuals and pertinent information to organizations and employers as appropriate (considering medical confidentiality issues), advocating for the health and safety of patients and employees.
8. Apply clinical practice guidelines in one's practice of medicine.
9. Diagnose and manage injuries associated with physical hazards including heat (e.g., heat stress, heat stroke, heat syncope, heat exhaustion, and heat cramps), cold (e.g., hypothermia, frostbite, chilblains, and immersion foot), radiation, lasers, and vibration.

Clinical – Cardiology

Individuals with underlying cardiac risk factors and disease may encounter special concerns in safety-sensitive jobs, while working around certain chemical agents, and in performing exertional labor. OEM physicians assist patients, employers, primary care physicians and cardiologists in the secondary and tertiary prevention of cardiac disease, as well as the accommodation of workers with cardiac concerns. The perspective of the OEM physician is particularly useful in placing workers in special assignments such as emergency response, hazardous waste, forklift, and respirator use.

1. Recognize, evaluate, and manage the cardiac effects of chemical asphyxiants such as carbon monoxide, methylene chloride, and cyanide.
2. Evaluate a person's ability to perform exertional work after a major cardiac event such as a myocardial infarction or coronary artery bypass graft surgery.

Clinical – Dermatology

Occupational dermatoses are one of the leading causes of occupational disease in the United States. Dermatoses also occur as a result of exposure to hazardous compounds in the home environment. OEM physicians can provide early recognition, diagnosis, and management of these disorders and make necessary recommendations to minimize their occurrence both in the workplace and at home.

1. Differentiate occupational skin disorders by history, examination, and diagnostic evaluation.
    - Diagnose and determine the cause of allergic contact dermatitis (including urticaria), particularly those caused by common antigens such as latex, epoxy monomer, and nickel.
    - Diagnose primary irritant-induced dermatoses.
    - Diagnose actinic skin damage, as well as photosensitization dermatitis, including cases due to exposure to coal tar, psoralens, and polychlorinated biphenyls (PCBs).
    - Diagnose occupational acne, including chloracne.

- Differentiate work-aggravated dermatoses.
- Diagnose occupational cutaneous infections (e.g., herpetic whitlows).
- Identify skin neoplasias, especially as caused by coal tar, ultraviolet radiation, or ionizing radiation.
- Diagnose occupational pigmentary disorders, including vitiligo.

2. Manage occupational and environmental skin injuries and dermatoses.
   - Treat and prevent recurrence of contact dermatitis.
   - Treat chemical burns, including those caused by caustics, acids, and hydrofluoric acid.
   - Manage occupational bullae and calluses.
   - Manage folliculitis barbae in workers who may be required to shave.

Clinical – Emergency Medicine and Surgery

The OEM physician has the knowledge and skill to provide acute medical care for a wide variety of common injuries and illnesses, as well as to stabilize and refer individuals for emergency care.

1. Establish emergency procedures and protocols for the clinical management of individuals involved in hazardous materials incidents, including substance-specific first-aid and medical management protocols.
2. Recognize and institute appropriate emergency care for life-threatening respiratory, CNS, renal, cardiac, or other target organ failure, pending the identification of a specific exposure agent.
3. Diagnose and manage the work-related implications of surgical conditions.

Clinical – Hematology/Oncology

Occupational and environmental exposures may have potential to cause adverse hematologic effects or may be carcinogenic. The OEM physician has the knowledge and skills to evaluate, diagnose, and prevent the hematologic and carcinogenic effects of occupational and environmental exposures.

1. Interpret hematologic laboratory studies in the context of medical surveillance and post-exposure examinations.
2. Perform clinical evaluations to detect the health effects of exposure to hematologic toxins such as benzene, lead, and arsine.
3. Evaluate patients, clinical data, and exposure data to render opinions regarding causation in cases of suspect occupational or environmental cancer.

Clinical – Infectious Disease

Bloodborne, waterborne, and airborne pathogens pose unique challenges for travelers and in occupational and/or environmental settings. Early recognition and preventive action by the OEM physician can minimize their spread, health effects, and recurrences.

1. Identify, manage, and prevent bloodborne, airborne, waterborne, foodborne, and fomiteborne pathogen exposure and associated illnesses.
2. Identify, manage, and prevent diseases of travelers.
3. Identify, manage, and prevent infestations and zoonotic conditions.

Clinical – Musculoskeletal

Musculoskeletal injuries comprise a majority of the acute occupational injuries seen by the OEM physician and cause major productivity, financial, and human losses for employees and employers alike. Thorough understanding of the anatomy, physiology, and pathology of the musculoskeletal system, as well as appropriate diagnostic and management skills, are essential. OEM physicians are able to correlate clinical conditions with functional capacity in relation to activities of daily living and work. Applying the principles of epidemiology and ergonomics enables the OEM physician to facilitate the development of programs to prevent these conditions.

1. Perform focused and comprehensive musculoskeletal evaluations, including the history, physical examination, laboratory studies, and the investigation of occupational risk factors.

2. Select appropriate diagnostic tests in the evaluation of patients with musculoskeletal conditions using evidence based guidelines.
3. Identify, manage, and prevent acute and chronic musculoskeletal disorders and their associated disabilities, and determine when such conditions are work-related.
    - Diagnose, manage, and prevent spine disorders, including low back pain.
    - Diagnose, manage, and prevent cumulative trauma disorders, with attention to specificity of diagnosis and etiology, and both occupational and non-occupational risk factors.
    - Diagnose, manage, and prevent joint and extremity injuries and disorders.
4. Prescribe ergonomic interventions and appropriate rehabilitation services for an injured worker.
5. Identify delayed recovery and manage chronic musculoskeletal pain syndromes.

Clinical – Neurology

Occupational and environmental exposures can cause acute and chronic effects on the central and peripheral nervous systems. The OEM physician has the skills and knowledge to evaluate, diagnose, and prevent exposure-related neurologic conditions and to facilitate the placement of workers with neurologic disorders.

1. Perform focused neurological and mental status examinations in the evaluation of occupational/ environmental injuries or illnesses.
2. When indicated, select and utilize the results of neurological and mental status examination procedures or consultations in the evaluation of occupational or environmental injuries or illnesses.
    - Such studies may include magnetic resonance imaging, computed tomography, central nervous system (CNS) electrodiagnostic studies (e.g., electroencephalogram, evoked potentials), peripheral nerve electrophysiologic studies (e.g., nerve-conduction studies; electromyography), or neuropsychological batteries.

Clinical – Ophthalmology

The OEM physician has the clinical and administrative knowledge and skills to: 1) evaluate and treat occupational eye injuries; 2) develop and implement vision screening and protection programs; and 3) use information from the eye examination, such as visual acuity tests, to assist in the proper placement of workers.

1. Identify the need for specialized ophthalmologic services and surveillance (e.g., lasers, ethambutol use).
2. Recognize and treat occupational eye diseases and injuries and refer to an ophthalmologist when appropriate.
    - Diagnose and manage infectious and irritative conjunctivitis.
    - Diagnose and treat ultraviolet photokeratitis.
    - Identify and remove superficial foreign bodies from the eye, with follow-up care as indicated.
    - Identify and treat ocular chemical exposures and burns (including alkali, acid, and hydrofluoric acid).
    - Use fluorescein stain to evaluate the cornea when indicated.

Clinical – Otolaryngology

The OEM physician has the clinical knowledge and skills to identify, evaluate, diagnose, and manage the care of patients with common occupational and environmental otolaryngological conditions.

1. Diagnose and manage nasopharyngeal conditions caused or aggravated by occupational and environmental exposure, including allergies, rhinitis, pharyngitis, vocal cord dysfunction, laryngeal polyps, and granulomata.
2. Evaluate and manage a patient with hearing loss or other occupationally related otologic conditions.
    - Identify, clinically manage, and prevent further injury to individuals with noise-induced hearing loss.
    - Evaluate and manage individuals with external otitis related to, or complicated by, the use of hearing protection.
3. Perform and interpret an audiogram, identify a standard threshold shift, and implement appropriate treatment and preventive interventions.

Clinical – Psychiatry

The OEM physician has the clinical and administrative knowledge and skill to recognize, evaluate, and assist in the management or triage of workers with psychological or drug-related problems presenting in the workplace and to identify occupational and environmental factors that may affect mental hygiene.

1. Identify the troubled or psychologically impaired employee and manage or refer appropriately to community resources, including employee assistance programs.
2. Identify and interpret danger signs of the violent, homicidal, or suicidal employee, manage the situation, and refer appropriately. Participate in the design of violence prevention and response programs.
3. Diagnose and manage workers who may be under the influence of psychoactive chemicals at work (e.g., industrial exposure, medications, recreational drugs, alcohol).
4. Identify and assist in the management of psychological stressors in the workplace.

Clinical – Pulmonary

With a thorough understanding of the anatomy, physiology, and pathology of the respiratory system, the OEM physician is able to assess the causes and occupational impact of respiratory disorders and pulmonary impairment.

1. Prevent, identify, diagnose, treat and/or refer occupational/environmental lung disorders, including:
   - Occupational asthma and bronchoreactivity (e.g., toluene diisocyanate sensitization, exposure to inhaled allergens, byssinosis, reactive airways dysfunction syndrome [RADS]).
   - Pneumoconioses (e.g., silicosis, coal workers' pneumoconiosis, asbestosis, hard-metal disease, benign radio-opaque pneumoconiosis, chronic beryllium disease).
   - Irritant inhalations (e.g., acids, alkalis, oxides of nitrogen, phosgene, phosphine).
   - Chronic obstructive pulmonary disease (COPD).
   - Hypersensitivity pneumonitis.
2. Manage work restrictions for both occupational and non-occupational lung diseases.
3. Perform and interpret a spirogram according to American Thoracic Society/European Respiratory Society standards.
4. For the work-up of occupational or environmental related pulmonary conditions, order and interpret the appropriate diagnostic tests, including:
   - Peak-flow testing and post-shift spirometry in the assessment of exposure-related bronchoreactivity
   - Post-bronchodilator pulmonary function testing in the assessment of bronchoreactivity.
   - Methacholine and specific challenge testing in the assessment of exposure-related bronchoreactivity.
   - Exercise disability tests in the assessment of pulmonary impairment.
   - Pulmonary function testing.
   - Imaging studies (e.g., chest radiographs, magnetic resonance imaging, computed tomography, plain tomography).
   - Allergy testing.
5. Interpret x-ray results reported by an International Labor Organization (ILO) B-Reader.
6. Perform respirator certification examinations tailored to the anticipated workplace exposures, to the exertional demands of the job, and to the type of respiratory protection used.

Clinical – Reproductive Medicine

The OEM physician has the clinical knowledge and skill to advise patients about reproductive risks of occupational and environmental exposures; the effects of exposure and work on fertility, pregnancy, and the fetus; and the ability of the pregnant worker to perform work.

1. Identify potential adverse reproductive outcomes to both men and women from chemical, biological, physical, biomechanical, and psychological exposures and provide advice to employees and employers regarding the management of such exposures.
2. Identify and utilize up-to-date sources of reproductive toxicology information.

2. OEM RELATED LAW AND REGULATIONS

The OEM physician complies with and has the knowledge and skills to help bring organizations into compliance with state and federal regulations relating to OEM, as well as general public health laws. The physician is further able to effectively utilize the services of government agencies to facilitate the protection of worker and public health.

The OEM physician is a recognized expert on issues relating to the causation of occupational and environmental injuries and illnesses, as well as the ability to perform work with or without reasonable accommodations. As a result, the physician is frequently called upon to provide expert testimony, to draft reports that render an unbiased expert opinion on contested cases, and to provide peer review.

1. Comply with and explain applicable regulations, as well as their interpretation and enforcement, to employers, employees, and patients.
    - OSHA regulations, including the General Duty Clause
    - Legislation and regulations protecting the employment rights of persons with disabilities (e.g., ADA)
    - DOT regulations including those of Federal Highway Administration and Federal Railroad Administration
    - FAA regulations
    - EPA regulations
    - Family Medical Leave Act
    - Other federal regulations
    - State and local regulations
2. Respond to the requirements of employee/community right-to-know regulations and advise individuals about their rights to access information.
3. Understand and protect patients' legal rights to confidentiality of medical records information.
4. Recognize and address ethical dilemmas in the practice of OEM, using relevant guidelines, such as the ACOEM, Association of Occupational and Environmental Clinics, International Commission on Occupational Health, and AMA codes of ethics.
    - Educate employers, clients, attorneys, employees, and their representatives on the ethical issues and the codes that apply to the practice of OEM.
5. Advise employees and employers about the basic elements of workers' compensation (WC) law, complete the necessary forms, and file WC claims.
6. Report cases of occupational injury, illness, and/or death according to existing regulations.
7. Provide medical-legal reports and expert opinions and testimony on OEM issues.
8. Advise on policies and procedures relating to the protection of fertility for both men and women and for the placement of pregnant or lactating workers.
9. Explain the rights of an employee or citizen in requesting assistance from a government agency or in filing a complaint.

3. ENVIRONMENTAL HEALTH

The physician has the knowledge and skills necessary to recognize potential chemical, physical, and biological environmental causes of health concern to the individual as well as to community health. Environmental issues most often include air, water, or ground contamination by natural or artificial pollutants. The physician has knowledge of the health effects of the broad physical and social environment, which includes housing, urban development, land-use and transportation, industry, and agriculture.

1. Identify sources and routes of environmental exposure and recommend methods of reducing environmental health risks.
    - Identify and manage population exposure to environmental toxins (e.g., heavy metals, solvents, pesticides, asbestos, silica, carbon monoxide, hydrogen sulfide, dioxin, PCBs).
    - Identify and manage concerns about the health effects of human exposure to contaminated water, sewage, and human waste.

- Explain outdoor air pollution sources and health effects.
- Explain the causes, health effects, and controls for indoor air pollution, including “sick building syndrome” and “building-related illness.”
- Explain water pollution sources and health effects.
- Explain health risks associated with exposure to hazardous waste.
- Explain the risks associated with household chemicals.
- Explain and control the health risks associated with exposure to radon and ultraviolet radiation.
- Explain the psychological effects associated with acute or chronic exposure to actual or perceived environmental hazards.

2. Advise individuals and communities about the reproductive implications of environmental exposure.
3. Manage health effects associated with air, water, or ground contamination by natural or artificial pollutants.
4. Recommend, interpret and explain the results of environmental monitoring.

4. WORK FITNESS AND DISABILITY INTEGRATION

The physician has the knowledge and skills to determine if a worker can safely be at work and complete required job tasks. The physician has the knowledge and skills necessary to provide guidance to the employee and employer when there is a need for integration of an employee with a disability into the workplace. The OEM physician has the expertise to determine work fitness based upon the work capacity of the worker and the functional requirements of the job.

1. Design and implement integrated systems of disability prevention and management.
   - Develop protocols for early identification of the disabled employee and the risk factors for delayed recovery.
   - Assure quality in the diagnostic process.
   - Establish and apply protocols for the implementation of appropriate therapeutic plans.
   - Design systems to identify and manage the impact of psychological conditions, substance abuse, and family stresses on the natural history of illness and injury.
   - Track progress against prognostic indicators.
   - Identify and manage delayed recovery.
   - Communicate recommendations for temporary (transitional work) or permanent accommodations for disabled workers.
   - Prescribe preventive maintenance plans for recovered employees and track compliance.
2. Design protocols for pre-placement and return-to-work evaluations.
   - Implement stay at work and early return to work protocols.
3. Design and implement protocols to evaluate employees for conditions creating an undue risk to self or others in the workplace, in compliance with the Americans with Disabilities Act (ADA).
   - Explain and make clinical decisions as well as placement/accommodation recommendations relating to the concept of “direct threat” as defined under the ADA.
   - Translate impairment assessments into safe work functional capacity statements for the use of employers in placing employees in jobs.
   - Express impairment in terms required by relevant legal or benefit systems.
4. Address employment concerns for patients with medical conditions such as:
   - cardiac conditions such as hypertension, coronary artery disease, heart failure, arrhythmias, etc.
   - post-treatment, including post-operative, of musculoskeletal injuries.
   - neurologic conditions such as seizure disorders, cerebrovascular accidents, neuromuscular disorders, and mental impairments.
5. Conduct evaluations to determine fitness for duty in compliance with applicable regulations including the ADA.

- Perform fitness for duty examinations and baseline clinical assessments for workers with potential for exposures to include:
  - Heavy exertional work or work that stresses the musculoskeletal system.
  - Other physical hazards.
    - Chemical hazards.
    - Biological hazards.
    - Travelers.
    - any other environment or capacity where concern is identified.
- Perform Department of Transportation (DOT) examinations.

6. Assess impairment ratings in accordance with the American Medical Association (AMA) *Guides to the Evaluation of Permanent Impairment*.
7. Recommend appropriate accommodations and job placements for pregnant employees.
8. Identify and manage the impact of psychological conditions on ability to work and on the natural history of occupational and environmental illnesses and injuries.
   - Take a psychiatric and psychosocial history and perform a mental status examination.
   - Specify restrictions and accommodations for employees with psychiatric conditions, in compliance with the ADA.
   - Specify restrictions and accommodations for employees taking psychotropic medications.
   - Identify and treat or refer individuals with psychopathology aggravating and/or presenting as other medical conditions.

5. TOXICOLOGY

The physician has the knowledge and skills to recognize, evaluate, and treat exposures to toxins at work or in the general environment. This most often includes interpretation of laboratory or environmental monitoring test results as well as applying toxicokinetic data. Hazardous material exposures occur at work, at home, and in the general environment. Clinical acumen as well as knowledge of hazardous material databases equip the OEM physician to identify, manage, and prevent occupational and environmental toxicity. General principles of clinical toxicology underlie emergency, non-urgent, and target organ-specific medical management.

1. Determine the nature and extent of potential occupational and environmental chemical exposures, considering routes of exposure and routes of absorption.
   - Use appropriate written and computerized databases (e.g., MSDSs, Registry of Toxic Effects of Chemical Substances [RTECS]) to identify the hazardous ingredients of chemical agents.
   - Identify the physical characteristics of hazardous agents (e.g., liquid/gas/vapor/particulate).
   - Estimate the likely degree of absorption based upon circumstances of exposure, considering factors such as the nature of the substance, the route of exposure, concomitant exposures, and characteristics of the patient (e.g., age, susceptibility factors).
2. Detect, insofar as possible, preclinical or clinical effects arising from chemical exposure and implement appropriate preventive measures.
   - Identify, obtain, and evaluate biomarkers or other tests to assess exposure and/or health effects, including biological monitoring techniques that assay the substance, its metabolites, or other indices.
   - Identify clinical or biochemical evidence of target organ damage when exposure hazard is recognized.
3. Evaluate, treat, and/or properly refer persons whose health may be affected by acute or chronic contact with occupational and environmental chemicals.
   - Identify the likely toxic exposure on the basis of clinical signs and symptoms.
   - Identify chronic health effects (e.g., hepatotoxicity, asthma, central and peripheral nervous system toxicity, interstitial fibrosis) resulting from toxic exposure and obtain necessary confirmatory testing.
   - Manage medical care and secondary preventive measures for individuals chronically affected by toxic exposure.
4. Assess clinical, worksite, and environmental data, along with literature reviews in the performance of patient evaluations.

- Obtain detailed exposure information including exposure histories, MSDSs, industrial hygiene reports, and other data.
- Evaluate the severity of exposure to hazardous agents, considering dose/response relationships.
- Interpret exposure data in the context of the scientific literature (human and animal) and the patient's presentation.

5. Understand, explain, and be able to apply toxicokinetic data (including absorption, metabolism, storage, and excretion) to clinical and employment-related decision-making.
6. Determine if a person has a health condition that increases risk from the effects of exposure to chemical, physical, or biological agents.
7. Distinguish health effects of exposure to chemicals from other etiologies.
8. Use occupational and environmental information resources to conduct a literature search or to research the health effects of a chemical substance.
9. Interpret and apply the medical, toxicological, and environmental literatures.

6. HAZARD RECOGNITION, EVALUATION, AND CONTROL

The physician has the knowledge and skills necessary to assess if there is risk of an adverse event from exposure to physical, chemical, or biological hazards in the workplace or environment. If there is a risk with exposure, then that risk can be characterized with recommendations for control measures. The OEM physician has the knowledge and skills to evaluate the impact of such exposures on the health of individual workers, patients, and the public. The physician may collaborate with other professionals, such as industrial hygienists, safety engineers, ergonomists, and occupational health nurses, on such efforts.

1. Characterize existing and potential occupational and environmental hazards within defined populations.
   - Perform a workplace walkthrough assessment of occupational health and safety concerns.
   - Perform an environmental site visit.
2. Evaluate and interpret the results of industrial hygiene surveys.
3. Interpret and apply Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs), the American Conference of Governmental Industrial hygienists (ACGIH) threshold limit values (TLVs) and biologic exposure indices (BEIs), Environmental Protection Agency standards, and other criteria in the assessment of chemical and physical hazard exposures.
4. Apply ergonomic principles to optimize comfort and reduce risk at work, including evaluation and redesign of hazardous lifting jobs, repetitive motion work, and jobs with special visual demands.
5. Advise Employers and Employees regarding industrial hygiene controls, such as work practices, respirator use, and engineering controls.
6. Recommend and implement policies and control measures to reduce or mitigate safety and health hazards.
   - Identify and minimize exposure to ionizing radiation (e.g., radon, x-ray, radioisotopes).
   - Identify and minimize exposure to non-ionizing radiation (e.g., ultraviolet, infrared, microwave, radiofrequency, electromagnetic).
   - Appropriately engage the services of a radiation protection officer and health physicist.
   - Prevent, diagnose, and manage health effects associated with high-altitude living and working.
   - Explain the hazards of barotrauma and decompression sickness.
7. Design and manage a hearing conservation program for workers exposed to loud noise.
   - Advise employees and employers regarding the use of hearing protection.
   - Design programs to comply with the OSHA noise standard.
8. Assist employees and employers with the management of the effects of shift work, jet lag, and other chronobiological stressors.
9. Perform a risk assessment.
   - Explain the basic methodology of risk assessment.
   - Identify exposure-related health hazards.
   - Assess dose-response relationships.
   - Evaluate levels of exposure.
   - Characterize risk.

10. Communicate to target groups including health professionals, the public, and the media, in a clear and effective manner both orally and in writing, the levels of risk from real or potential hazards and the rationale for selected interventions.
    - Manage communication and reactions to a perceived or actual cluster of disease.
    - Manage communication and reactions to an episode of mass psychogenic illness.
    - Manage communication and reaction to widespread exposure or perceived exposure to toxic materials.
    - Explain the health impact of global environmental changes, including global warming, ozone depletion, ultraviolet radiation exposure, and persistent organic chemicals.
    - Manage communication with communities affected by pesticide applications, hazardous waste sites, transportation accidents, and other environmental and industrial exposures.
    - Explain the controversies associated with electromagnetic field exposure.
11. Assess the workplace and environment for potential hazards and address the need for personal protective equipment and other exposure control methods.
    - Identify and control occupational/environmental risk factors for the development of skin disorders.
    - Assess the workplace for potential hazards to the eye and address issues of eye protection, including the use of safety glasses and contact lenses.
    - Describe the key elements of a good respirator program.
    - Identify the visual requirements for various occupations (including regulatory requirements), and correlate these requirements with job tasks and job hazards in determining fitness for duty and accommodations.

7. DISASTER PREPAREDNESS AND EMERGENCY MANAGEMENT

The physician has the knowledge and skills to plan for mitigation of, response to, and recovery from disasters at specific worksite as well as for the community at large. Emergency management most often includes resource mobilization, risk communication, and collaboration with local, state, or federal agencies.

1. Describe specific threats, including a broad range of chemical, biological, radiological and physical hazards. (See ACOEM's position statement on "Disaster Preparedness and Emergency Management as a Core Competency in Occupational and Environmental Medicine.")
2. Apply knowledge of personal protection and other applied approaches to health protection and the skills to evaluate the adequacy of protection at the individual level.
    - Describe and develop a plan for implementing appropriate personal safety for the responders.
    - Design and implement a plan for addressing the mental health needs of the responders.
3. Participate in the development of emergency or disaster plans for the workplace and/or the community.
    - Applying knowledge of occupational hazards, the workplace, and community resources, work with local medical and community resources in developing an appropriate disaster response plan.
    - Develop emergency response plans ranging from developing patient treatment protocols for a specific chemical to evacuation and community planning for catastrophic industrial emergencies.
4. Design and implement a plan for the mitigation of a disaster incident at the worksite or general community.
5. Establish emergency procedures and protocols for the clinical management of individuals involved in disaster incidents, including specific medical management protocols.
6. Design and implement a medical recovery plan for mass casualty events in industry or general community.
7. Design and/or conduct an outbreak and/or cluster investigation.
    - Design a pandemic preparedness plan for an organization.
8. Maintain a thorough understanding of the National Response Plan and Incident Command Structure.

8. HEALTH AND PRODUCTIVITY

A physician will be able to identify and address individual and organizational factors in the workplace in order to optimize the health of the worker and enhance productivity. These issues most often include absenteeism, presenteeism, health enhancement, and population health management.

1. Design, implement and evaluate worksite health-promotion and disease-prevention programs, incorporating DHHS and other authoritative guidelines as appropriate.

2. Describe the appropriate use and limitations of health risk assessment and screening for well populations and the applications of screening, assessment, and early intervention for targeted high-risk groups.
3. Counsel employees about health risks and lifestyle.
4. Communicate current medical, environmental, and/or other scientific knowledge effectively to target groups, including patients, employees, employers, unions, community groups, and the media.
5. Recognize the effects of cultural, ethnic, and social factors, including health beliefs and practices, on the health and safety of workers.
6. Accommodate cultural, ethnic, educational, and language variations among workers when providing information on occupational hazard prevention, disease prevention, and health promotion.

9. PUBLIC HEALTH, SURVEILLANCE, AND DISEASE PREVENTION

The physician has the knowledge and skill to develop, evaluate, and manage medical surveillance programs for the work place as well as the general public. The physician has the knowledge and skills to apply primary, secondary, and tertiary preventive methods.

1. Develop, implement, evaluate, and refine screening programs for groups to identify risks for disease or injury and opportunities to promote wellness.
   - Characterize the population to identify target exposures, risk factors, and/or conditions of concern.
   - Assess the utility of screening tools.
   - Assess the screening programs using standard criteria.
   - Assess resources.
   - Create structures (clinic staffing, etc.).
   - Report results.
2. Design and implement proactive systems of care that effectively reach all members of a population, including those at high risk and those who do not normally seek care.
3. Design and conduct surveillance programs in workplace and/or community settings.
   - Develop and implement medical surveillance programs in the workplace and/or in communities exposed to environmental contamination.
     - Utilize biomarkers to identify exposure, within limitations of the methodology, and interpret results in both clinical and public health contexts.
   - Develop and implement medical surveillance programs in the workplace to protect workers, ensuring compliance with applicable regulations when appropriate.
     - Address specific work classifications such as hazardous waste workers.
     - Target specific organ systems for prevention of occupational disease, such as lung diseases.
     - Utilize and interpret routine screening results in establishing fitness for duty in various occupational settings, such as screening for near, distance, and color vision.
   - Intervene in response to positive findings when indicated, in order to measurably improve health outcomes.
     - Interpret abnormal laboratory findings in asymptomatic workers and recommend further evaluation and/or treatment as indicated.
     - Evaluate the effectiveness of surveillance and screening programs.
4. Recognize and investigate potential sentinel events.
5. Review, interpret, and explain the public health and clinical implications of epidemiological studies that address occupational hazards.
6. Apply validated epidemiologic and biostatistical principles and techniques to analyze injury/illness data in a defined worker and community populations.
7. Apply individual or community-based interventions to prevent or mitigate exposure and/or resultant health effects.
   - Characterize the population to identify target conditions or exposures.
   - Prioritize areas for prevention and mitigation.
   - Identify efficient and effective interventions.

- Develop a strategy or plan for intervention.
- Implement the interventions.
- Evaluate the effectiveness of prescribed interventions.

8. Recommend and implement policies and control measures to address emerging infectious diseases of concern.

10. OEM RELATED MANAGEMENT AND ADMINISTRATION

The OEM physician has the administrative and management knowledge and skills to plan, design, implement, manage, and evaluate comprehensive occupational/environmental health programs, projects, and protocols that enhance the health, safety, and productivity of workers, their families, and members of the community. The spectrum of activities may vary substantially depending upon the physician's practice setting and the characteristics of the organization(s) served.

1. Design, implement, and evaluate clinical practice guidelines, quality management/quality improvement programs, utilization management, case management, and other activities to enhance an organization's performance.
2. Identify potential customers and develop a marketing plan for an occupational/environmental health program.
3. Communicate technical and clinical information to professional and lay audiences.
   - Give presentations to employees, employers, labor unions, and others on occupational and environmental health and safety topics.
4. Determine management information needs and apply medical informatics, electronic health and patient care data, management information systems, and other computer technologies to an OEM program.
   - Apply information systems to medical surveillance programs (e.g., scheduling exams, documenting clinical data, and tracking, reporting and analyzing outcomes).
   - Apply information systems to track worker disability and return-to-work.
   - Apply information systems to manage medical and exposure records.
   - Apply information systems to manage revenues and expenditures, including departmental budgets, billing, and collections.
   - Apply information systems for scheduling of occupational and environmental health services.
   - Use information technology (e.g., e-mail, local and wide area networks, Internet) to communicate with colleagues, clients, and others.
   - Use information technology to write reports (e.g., word processing), as well as to manage and present data (spreadsheets, databases, presentation graphics).
5. Establish protocols to manage patient records and protect confidentiality.
6. Work effectively as a team member with administrators, occupational health nurses, nurse practitioners, and physician assistants, demonstrating an understanding of their roles in an occupational health service.
7. Design cost-containment strategies for workers' compensation, health benefits, and disability management programs to allocate and manage clinical and financial resources.
   - Obtain necessary demographic and cost data.
   - Ensure patient/individual confidentiality in the process.
8. Evaluate the effectiveness of occupational health services and risk reduction methods.
   - Design and implement process and outcome measures and be able to benchmark with other organizations.
   - Apply techniques of process improvement.
   - Demonstrate program cost-effectiveness.
9. Work effectively with both labor and management to maximize workplace health, safety, and productivity.

ATTACHMENT B – ADDITIONAL SKILLS OF OEM PROFESSIONALS

There are other skills that are commonly seen in the OEM physician practices. The OEM physician may need to complete additional training or certifications in some areas. These other skills may include the following.

A. RESEARCH AND EDUCATION

The profession of medicine requires ongoing scholarly inquiry, lifelong learning, and the ability to teach others. If an OEM physician participates in research or education, the techniques and methodologies of research and education are required to be competent. Any OEM physician would benefit from practicing these skills in order to expand the knowledge of occupational and environmental hazards, to stay current and competent, and to communicate this knowledge in proper perspective to others.

1. Design and conduct a scientific investigation.
   - Formulate a hypothesis.
   - Perform a literature review.
   - Select and apply research design methods.
   - Seek and secure human or animal subjects review panel approval when indicated.
   - Identify and secure necessary resources.
   - Collect and prepare data for analysis.
   - Analyze data and present results in tabular, graphical, and verbal formats.
   - Draw conclusions, and discuss the implications of the research findings.
2. Write a report suitable for publication.
3. Design a curriculum, conduct a course, and evaluate learning outcomes.
4. Interpret and present technical and clinical data for a variety of audiences.
   - Apply principles of adult learning.
   - Handle oral presentations in a professional manner.
   - Prepare effective written reports for a variety of audiences.
   - Defend conclusions and recommendations, using appropriate data and logical reasoning.
   - Evaluate learning outcomes.

B. ADDITIONAL CLINICAL SKILLS

An OEM physician may develop competency in other clinical skills to enhance the quality of their medical practice. Skills may be learned by various means such as during residency training, additional continuing education courses, or going through a specialty organization's certification process.

1. Use patch tests to evaluate patients with contact dermatitis and other conditions.
   - Interpret patch test reports obtained from a dermatologist and use as a basis for establishing the etiology and nature of contact dermatitis and other potentially atopic conditions.
   - Apply and interpret patch tests.
2. Evaluate intraocular pressures or use a slit lamp to evaluate ophthalmologic conditions that may be work or environment related.
3. Perform ILO B-Readings.
4. Perform independent medical evaluations.
5. Perform Federal Aviation Administration (FAA) examinations.
6. Perform specialized evaluations to assess functional capacity.
7. Identify, manage, and prevent sexually transmitted infections and diseases.
8. Perform or arrange for cardiovascular diagnostic tests when indicated to evaluate fitness for duty.

C. ADDITIONAL MANAGEMENT AND ADMINISTRATIVE SKILLS

The OEM physician may be in a professional role that requires additional management or administrative skills. This is particularly true for those OEM physicians who are in a corporate or a governmental position, but are also an element of any practice.

1. Analyze the impact of managed care and other delivery/reimbursement models on the health of employee and dependent populations, provider needs and behaviors, and organizational performance.
2. Use appropriate management principles in conflict resolution, negotiation, consensus building, problem-solving, team building, and change management.
   - Partner with employers, labor unions, and others in addressing the health, safety and welfare of employees, their dependents, and retirees.
3. Use personnel management principles in selection, retention, promotion, motivation, appraisal, and discipline of employees, and in managing workforce diversity.
4. Manage professional liability risk for a health care organization.
   - Select and negotiate professional liability insurance coverage.
   - Respond to patient dissatisfaction or complaints.
   - Investigate allegations of malpractice.
5. Prepare a business plan for an occupational health service, program, or project.
   - Define an organization's or program's vision, mission, goals, objectives, and strategies.
   - Perform a SWOT (strengths, weaknesses, opportunities, threats) analysis.
   - Prepare an operational budget for an occupational/environmental health service or program.
   - Define staffing and personnel requirements for an occupational/environmental health service.
   - Specify facilities, equipment, and supplies required by an occupational/environmental health service.
   - Establish a pricing structure for occupational health services, including fee-for-service and capitated arrangements.
6. Design, implement, and evaluate substance abuse testing programs, performing medical review officer (MRO) functions as appropriate.
   - Serve as an MRO. (A listing of the specific competencies of the MRO can be obtained online from the Medical Review Officer Certification Council at www.mrocc.com.)

ATTACHEMENT C – FUNDAMENTAL EXPECTATIONS OF ALL PHYSICIANS

Beyond the competencies specific to occupational and environmental medicine, ACOEM has expectations that an OEM physician will maintain a high level of proficiency in those areas of medical practice that would be considered a basic foundation of excellence for any specialty. Priority skills are identified as they would relate to the practice of occupational and environmental medicine.

A. INTERPERSONAL AND COMMUNICATION SKILLS

Cultural, ethnic, socioeconomic, and occupational characteristics can influence an individual's definition and reaction to health, illness and injury. The OEM physician applies medical anthropologic and sociologic insights in order to communicate more effectively and to enhance safety, health, and productivity in the context of individual health behaviors, cultural beliefs, and social forces.

1. Interact with patients, employees, employers, and other clients to achieve health-related goals.
   - Manage an effective therapeutic alliance with the patient whose health is affected by a potentially toxic exposure or who fears that his or her health may be affected by toxic exposure.
2. Identify social, cultural, and ethnic issues that relate to policies, risks, research, and interventions in occupation and environmental medicine.

B. PROFESSIONALISM

The OEM physician uniquely interacts with patients, employees, employers, labor unions, attorneys, payers, and others in the community on issues relating to workers, the workplace, and the community environment. The attitudes, behaviors and image of the OEM physician must reflect and uphold the ethics, standards, and competencies of the specialty.

1. Apply principles of risk management to the practice of occupational and environmental medicine.
   - Ensure that patients clearly understand their medical conditions, their recommended and prescribed treatments, their work status (i.e., restrictions and accommodations), and the urgency of any follow-up plans.
   - Maintain clear, concise documentation of patient and employee encounters, including telephone encounters and encounters with company representatives on patient issues. Demonstrate that assessments and plans follow logically from clinical findings.
   - Review all diagnostic, screening, and surveillance studies ordered in the context of the individual's medical and occupational profile, including examining data for temporal or work-group trends, and do so in a timely manner.
   - Maintain communication with referral physicians that is adequate to ensure follow up on important clinical findings.
   - Consistently use informed consent and release of information documentation when indicated and ensure patient understanding before they apply their signature.
   - Interact with individuals with a clear understanding of when a doctor-patient relationship exists and when it does not.
   - Use appropriate procedures when terminating a doctor-patient relationship with difficult, non-compliant, or otherwise incompatible patients.
2. Apply time-management principles.
3. Develop and implement a personal lifelong learning plan.
4. Establish a working relationship with the employee's treating physician in the management of work-related health concerns.

C. PATIENT CARE AND MEDICAL KNOWLEDGE

In addition to OEM specific clinical skills, the physician is expected to have well developed basic skills that are applied in each clinical encounter to provide thorough, effective clinical care of the patient.

1. Perform complete or focused physical examinations as indicated by the presenting reason for the clinical encounter.
2. Select appropriate diagnostic studies in the evaluation of patients with an understanding of the indications for ordering such studies.

3. Identify abnormal diagnostic study results and refer for follow-up as appropriate.
4. Evaluate and treat medical conditions using evidence based medical guidelines, referring when indicated to consultants.
5. Identify medical and surgical emergencies and provide acute medical and surgical care in an emergency situation, referring as indicated.
6. Develop a differential diagnosis for occupational/environmental disorders, taking into account causal factors.
7. Provide clinical care and health counseling with an awareness of how cultural and social beliefs influence patient knowledge, attitudes, and behaviors.

D. PRACTICE-BASED LEARNING AND IMPROVEMENT

The OEM physician is expected to practice continual improvement by maintaining a high level of learning of current state of the art medicine. This knowledge should be applied to the practice of medicine by the OEM physician.

1. Maintain current medical, scientific, and regulatory knowledge, recognizing one's limits and seeking additional resources and learning as needed.
2. Document patient encounters accurately and completely.
3. Implement the philosophy and concepts of continuous quality improvement and statistical process control.
4. Manage data effectively.
   - Design a data-collection strategy.
   - Collect and prepare data for analysis.
   - Analyze data and present results in tabular, graphical, and verbal formats.
5. Provide peer reviews.

ATTACHMENT D – REFERENCES

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ACKNOWLEDGEMENTS

This document was developed by the ACOEM Special Committee on Competencies – Denece Kesler, MD, Chair; Mark Upfal, MD; Rudolph Tacoronti, MD; A. Nelson Avery, MD; Chris Martin, MD; Mark Singer, MD; Donald Wright, MD; Natalie Hartenbaum, MD; William Patterson, MD; John Dreyzehner, MD; Chip Carson, MD; Philip Harber, MD; and Consultant Members Robert McLellan, MD; and Robert Orford, MD. It was approved by the ACOEM Board of Directors on January 14, 2008.

The Special Committee on OEM Competencies would like to thank Pamela Hymel, MD; Ronald Loeppke, MD; T. Warner Hudson, MD; and the OEM Residency Directors for their contributions. The Committee would also like to thank Tee L. Guidotti, MD, who initiated this project by appointing the special committee at the onset of his presidency, and his successor, Robert McLellan, MD, who saw it through to successful conclusion.