Tentative Interim Amendment

NFPA® 1582

Standard on Comprehensive Occupational Medical Program for Fire Departments

2022 Edition

Reference: Various paragraphs
TIA 22-1
(SC 23-3-12 / TIA Log #1689)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2022 edition. The TIA was processed by the Technical Committee on Emergency Responders Occupational Health, and was issued by the Standards Council on March 21, 2023, with an effective date of April 10, 2023.

1. Revise paragraph 1.2.1 item (1) to read as follows:

1.2.1 The standard specifies the following information:

(1) Minimal medical requirements for candidates and members as delineated in Chapter ~~6~~9

(2) …

2. Revise section 2.3.1 and renumber subsequent sections to read as follows:

~~**2.3.1 ASA Publications.** Acoustical Society of America, 35 Pinelawn Road, Suite 114 E, Melville, NY 11747-3177.~~

~~ANSI/ASA S3.6, Specification for Audiometers, 2018.~~

~~**2.3.2**~~ **2.3.1 CDC Publications.** Centers for Disease Control and Prevention, 1600 Clifton Road, Atlanta, GA 30333.

"Poliomyelitis Prevention in the United States: …

~~**2.3.3**~~ **2.3.2 IAFF/IAFC Publications.** International Association of Fire Fighters, 1750 New York Avenue, Suite 300, NW, Washington, DC 20005-5395; International Association of Fire Chiefs, 4025 Fair Ridge Drive, Suite 300, Fairfax, VA 22033-2868. http://www.iafc.org

…

3. Revise section 2.3.5 to read as follows:

2.3.5 Other Publications.

~~American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, https://www.psychiatry.org/psychiatrists/practice/dsm.~~

International Council of Ophthalmology, "International Clinical Diabetic Retinopathy Disease Severity Scale," San Francisco, CA, October 2002, http://www.icoph.org/standards/pdrdetail.html.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

4. Delete sections 3.3.2, 3.3.3, and 3.3.14 as shown here:

~~**3.3.2 Category A Medical Condition.** See 3.3.14.1.~~

~~**3.3.3 Category B Medical Condition.** See 3.3.14.2.~~

~~**3.3.14 Medical Condition Classifications.**~~

~~**3.3.14.1 Category A Medical Condition.** A medical condition that would preclude a person from performing as a member in a training or emergency operational environment by presenting a significant risk to the safety and health of the person or others.~~

~~**3.3.14.2 Category B Medical Condition.** A medical condition that, based on its severity or degree, could preclude a person from performing as a member in a training or emergency operational environment by presenting a significant risk to the safety and health of the person or others.~~

5. Revise section 3.3.5 to read as follows:

3.3.5 Essential Job Task. Task or assigned duty that is critical to successful performance of the job. *(See Chapter 5 and Section ~~9.1~~ <u>9.3</u>.)*

6. Add a new definition in Chapter 3 for "Individual" to read as follows:

<u>**3.3.X Individual.** A candidate or member.</u>

7. Delete section 3.3.17 as shown here:

~~**3.3.17 Medically Certified.** A determination by the fire department physician that the candidate or current member meets the medical requirements of this standard.~~

8. Revise paragraph 4.2.1 to read as follows:

4.2.1 The fire department physician shall fulfill the following responsibilities:

(1) Understand the physiological, psychological, and environmental demands placed on firefighters
(2) Evaluate ~~fire department candidates and members~~ <u>individuals</u> to identify medical conditions that could affect their ability to safely respond to and participate in emergency operations
(3) Utilize the essential job task descriptions supplied by the fire department to determine ~~a candidate's or a member's~~ <u>an individual's</u> medical certification
(4) Identify and report <u>job restrictions associated with any essential job tasks that cannot be safely and effectively performed by the individual due to a medical condition(s) or physical fitness</u> ~~the presence of Category A or disqualifying Category B medical conditions if present in candidates~~
(5) Inform the fire chief or his/her designee whether or not the ~~candidate or current member~~ <u>individual</u> is medically certified to safely perform the essential job tasks
(6) Report the results of the medical evaluation to the ~~candidate or current member~~ <u>individual</u>, including any medical condition(s) identified during the medical evaluation, and the recommendation as to whether the ~~candidate or current member~~ <u>individual</u> is medically certified to safely perform the essential job tasks
(7) Forward copies of any abnormal results along with patient instructions regarding primary care follow-up to ~~candidates or current members~~ <u>individuals</u> who were instructed to seek (as appropriate) medical follow-up to address any medical conditions, or lab abnormalities, identified during the medical evaluation
(8) Review results of the annual occupational fitness evaluation as described in Chapter 8
(9) Provide or arrange for a prescriptive rehabilitation and/or fitness program when indicated to aid a member's recovery from illness or injury and enhance his/her ability to safely perform essential job tasks
(10) Participate in injury prevention and health promotion programs for firefighters

9. Revise section 5.1.1 to read as follows:

5.1.1 The fire department shall evaluate the following ~~14~~ essential job tasks against the types and levels of emergency services provided to the local community by the fire department, the types of structures and occupancies in the community, and the configuration of the fire department to determine which tasks apply to ~~their department members and candidates~~ <u>individuals</u>:

(1)* Wearing personal protective equipment (PPE) …
(2) <u>Wearing the respirators required by the jurisdiction (e.g., N-95, half-face elastomeric, PAPR, SCBA)</u>~~an SCBA~~, which includes a demand-valve-type positive-pressure facepiece or ~~HEPA~~ filter ~~mask~~<u>respirator</u>, ~~which requires the ability to tolerate~~ <u>achieving a successful fit-test and tolerating</u> increased respiratory workloads
(3) Exposure to toxic fumes, irritants, particulates, biological …
(4) Climbing at least six flights of stairs or walking a similarly …
(5) Wearing PPE and SCBA that is encapsulating and insulated, …
(6) Working alone while wearing PPE and ~~SCBA~~<u>respirators required by the jurisdiction</u>, searching, finding, and rescue-dragging or carrying victims ~~ranging from newborns to adults weighing over 165 lb (75 kg)~~ to safety ~~despite~~ <u>in</u> hazardous conditions and low visibility
(7) While wearing PPE and SCBA, advancing water-filled hose lines …
(8) While wearing PPE and SCBA, climbing ladders, operating from heights, …
(9) Unpredictable, prolonged periods of extreme physical exertion as required …
(10) Operating fire apparatus or other vehicles in an emergency mode with …
(11) Critical, time-sensitive, complex problem solving during physical exertion in stressful, …

(12) Ability to communicate (i.e., give and comprehend written or verbal orders) while wearing PPE and ~~SCBA~~ respirators required by the jurisdiction, under conditions of high background noise, poor visibility, and drenching from hose lines or fixed protection systems (e.g., sprinklers)
(13) Functioning as an integral component of a team, where sudden incapacitation ~~of a member~~ can result in mission failure or in risk of injury or death to members of the public or other team members
(14) Working in shifts, including during nighttime, that can extend beyond 12 hours
(15) Performing EMS tasks, such as CPR or lifting or moving patients, while wearing PPE and respirators required by the jurisdiction

10. ***Replace*** *all of Chapter 6 and related Annex A material with the following:*

Chapter 6 Reserved

11. *Revise sections 8.2.2.1.2, 8.2.2.1.3, and 8.2.2.1.4 to read as follows:*

8.2.2.1.2* At levels below 12 METs and not less than 10 METs, a ~~firefighter~~ member shall be counseled to improve his/her fitness.

A.8.2.2.1.2 A prescribed aerobic program might be a consideration.

8.2.2.1.3* At levels ~~below~~ less than 10 METs and greater than 8 METs, the fire department physician shall do both of the following:
(1) After performing an individualized evaluation to determine if the firefighter can safely and effectively perform essential job tasks 1, 2, 4, 5, 6, 7, 8, 9, and 13, recommend to the AHJ any applicable job restrictions associated with these specific essential job tasks that cannot be safely and effectively performed by the member due to a medical condition(s) or physical fitness
(2) Require the member to participate ~~participation~~ in a prescribed aerobic fitness program ~~shall be required~~.

A.8.2.2.1.3 An individualized evaluation is based on the physical intensity level typically required to perform the essential job tasks in that jurisdiction. Such evaluations could include a simulated work evaluation, such as a candidate physical ability test (CPAT), or a functional skills test that mirrors the tasks performed in that jurisdiction.

8.2.2.1.4 At levels at or below 8 METs, the fire department physician shall do both of the following:
(1) Recommend to the AHJ that the member is restricted from performing ~~a prescribed aerobic fitness program shall be required, and the AHJ shall be advised to consider restriction from~~ essential job tasks 1, 2, 4, 5, 6, 7, 8, 9, and 13~~.~~
(2) Require the member to participate in a prescribed aerobic fitness program

12. ***Replace*** *all of Chapter 9 and related Annex A material with the following:*

Chapter 9 Occupational Medical Evaluations

9.1 Medical Evaluation. Occupational medical evaluations shall be conducted at baseline and annually thereafter.

9.1.1* The occupational medical evaluation shall be an individualized assessment of the individual's ability to safely and effectively perform the essential job tasks in accordance with Section 9.3.

A.9.1.1 Individuals should be evaluated as to their ability to safely and effectively perform the essential job tasks in Chapter 5. The medical history should include the individual's known health problems, such as major illnesses, surgeries, medication use, and allergies. Symptom review is also important for detecting early signs of illness. A medical history should also include a personal health history, a health habit history, an immunization history, and a reproductive history.

An occupational history should be obtained to collect information about the person's past and current occupational and environmental exposures.

An individual, while wearing full protective clothing (i.e., turnout coat and pants, helmet, boots, and gloves) and SCBA, is required to safely and effectively perform a variety of essential job tasks that require strength, endurance, aerobic capacity, cognitive skills, and communication skills. For those not familiar with the essential job tasks, see Chapter 5. The following specific details inherent to the activities in essential job task 1 are offered:
(1) Lifting and carrying tools and equipment (e.g., axe, Halligan tool, pike pole, chain saw, circular saw, rabbet tool, high-rise pack, and hose) that weigh between 7 lb and 20 lb (3.2 kg and 9 kg) and are used in a chopping motion over the head, extended in front of the body, or in a push/pull motion.
(2) Advancing a 1¾ in. (45 mm) or a 2½ in. (65 mm) diameter hose line, which requires lifting, carrying, and pulling the hose at grade, below or above grade, or up ladders. In addition to the weight of the hose itself, a 50 ft (15 m)

section of charged 1¾ in. (45 mm) hose contains approximately 90 lb (41 kg) of water, and a 50 ft (15 m) section of 2½ in. (65 mm) hose holds approximately 130 lb (59 kg) of water.
(3) Performing forcible entry while utilizing tools and equipment (e.g., axe, Halligan tool, chain saw, circular saw, or rabbet tool) that requires chopping, pulling, or operating these items to open doors, windows, or other barriers to gain access to victims, possible victims, or to initiate firefighting operations.
(4) Performing ventilation (horizontal or vertical) utilizing tools and equipment (e.g., axe, circular saw, chain saw, pike pole) while operating on a flat or pitched roof or operating off a ground or aerial ladder. This task requires the firefighter to chop or push tools through roofs, walls, or windows.

Other essential job tasks that could be performed can include search and rescue operations and other emergency response actions under stressful conditions, including working in extremely hot and cold environments for prolonged time periods.

9.1.2* The occupational medical evaluation shall include a medical history, examination, and any medical tests required to assess medical conditions that can affect an individual's ability to safely and effectively perform the essential job tasks.

A.9.1.2 Physical examination should include the following:
(1) Checking vital signs [e.g., temperature, pulse, respiratory rate, and blood pressure (BP)]
(2) Head, eyes, ears, nose, and throat exams
(3) Neck exam
(4) Cardiovascular exam
(5) Pulmonary exam
(6) Breast exam, conducted by the fire department physician or the individual's own physician
(7) Gastrointestinal exam (includes rectal exam, conducted by the fire department physician or the individual's own physician, for masses or occult blood)
(8) Genitourinary exam, conducted by the fire department physician or the individual's own physician (includes pap smear, testicular exam, rectal exam for prostate mass)
(9) Checking for hernias
(10) Lymphatic exam of palpable lymph nodes
(11) Neurological exam
(12) Musculoskeletal exam
(13) Checking the skin (includes screening for skin cancers)
(14) Vision testing

The individual is permitted to choose which physician conducts the breast exam in A.9.1.2(6), the rectal exam(s) in A.9.1.2(7) and A.9.1.2(8), and the genitourinary exam A.9.1.2(8).

Blood pressure should be measured according to the seven recommendations of the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 7). Blood pressure should be measured with a properly calibrated and validated instrument. Patients should be seated quietly in a chair for at least 5 minutes, with their feet on the floor and the arm supported at heart level. An appropriately sized cuff (i.e., cuff bladder encircling at least 80 percent of the arm) should be used to ensure accuracy, and at least two measurements should be made. Systolic blood pressure is the point at which the first of two or more sounds is heard (phase 1), and diastolic blood pressure is the point before the disappearance of sounds (phase 5).

Laboratory tests on individuals should include the following:
(1) Blood tests, including the following:
  (a) CBC with differential, RBC indices and morphology, and platelet count
  (b) Electrolytes (Na, K, Cl, HCO_3, or CO_2)
  (c) Renal function (BUN, creatinine)
  (d) Glucose
  (e) Liver function tests (ALT, AST, direct and indirect bilirubin, alkaline phosphatase)
  (f) Total cholesterol, HDL, LDL, clinically useful lipid ratios (e.g., total cholesterol to HDL cholesterol ratio), and triglycerides
(2) Urinalysis, with a dipstick test for glucose, ketones, leukocyte esterase, protein, blood, and bilirubin.
(3) Audiometric exam to assess hearing in each ear at each of the following frequencies: 500 Hz, 1000 Hz, 2000 Hz, 3000 Hz, 4000 Hz, 6000 Hz, and 8000 Hz. Comparison to prior results should be corrected for age as permitted by OSHA. Baseline audiometry is performed in accordance with 29 CFR 1910.95, "Occupational noise exposure." The basics of this standard include the following:
  (a) The first audiogram (this will probably be done during the individual's pre-placement exam) is the baseline audiogram.

(b) If a subsequent audiogram shows improved auditory acuity over the baseline, then the subsequent audiogram becomes the new baseline. All audiograms should be done with no exposure to industrial noise for the preceding 14 hours.

(4) Pulmonary function testing (i.e., spirometry) is conducted to measure the individual's forced vital capacity (FVC), forced expiratory volume in 1 second (FEV_1), and the absolute FEV_1/FVC ratio. FEV_1 and FVC results will be expressed as the absolute value (liters or milliliters) and as percent of predicted based on age, height, sex, and race/ethnicity using NHANES III normative equations, with the acceptable threshold being 80 percent of predicted or greater. FEV_1/FVC ratio results are expressed as the absolute FEV_1 value divided by the absolute FVC value, with 0.70 as the acceptable threshold value. However, because these norms are population-based, it is possible for individuals to be normal just below these thresholds or to have minimal but potentially significant abnormalities just above these thresholds. When percent of predicted FEV_1 or FVC values are minimally below threshold (typically 74 percent to 79 percent of predicted), the lower limits of normal (LLN) for the appropriate population can, at the discretion of the physician, be used instead of the 80 percent of predicted threshold value. For example, the LLN might be more appropriate for taller and older individuals. *(See F.2.5.)*

(5) Chest radiography (chest x-ray posterior-anterior and lateral views).

(6) A resting 12-lead electrocardiogram (ECG).

(7) Immunizations and infectious disease screening for the following:
   (a) Tuberculosis screen, purified protein derivative (PPD) tuberculin skin test, or an equivalent blood test
   (b) Hepatitis C virus screen (baseline)
   (c) Hepatitis B virus vaccinations and antibody titers, if appropriate
   (d) Tetanus, diphtheria, pertussis (TDAP) vaccine (booster every 10 years)
   (e) Measles, mumps, rubella (MMR) vaccine or antibody titers
   (f) Polio vaccine offered to uniformed personnel if vaccination, effective antibody titer, or disease is not documented
   (g) Hepatitis A vaccine due to contaminated water exposures during normal firefighting activities, not just hazmat/rescue activities
   (h) Varicella vaccine, offered to all nonimmune personnel
   (i) Influenza vaccine, seasonal and novel, offered to all personnel
   (j) COVID-19 vaccination

9.1.3 The occupational medical evaluation shall include an assessment of and motivation for wellness and fitness necessary to safely and effectively perform the essential job tasks.

9.2 Medical Conditions Affecting Ability to Perform Essential Job Tasks.
Following the occupational medical evaluation, any essential tasks that the individual is not able to safely and effectively perform shall be reported to the AHJ.

9.3 Essential Job Tasks of a Firefighter.

9.3.1 The fire department physician shall use the list of essential job tasks in 5.1.1 in evaluating the ability of an individual to safely and effectively perform each essential job task.

9.3.2 Only job tasks that are essential for the position description provided by the AHJ shall be used to determine the medical qualifications of the individual.

9.3.3 Special Teams.

9.3.3.1* In addition to the essential job tasks specified in Chapter 5, individuals of specialized teams, such as hazardous materials units, dive teams, technical rescue teams, EMS teams, or units supporting tactical law enforcement operations, shall be evaluated for their ability to perform essential job tasks and wear specialized PPE related to the duties of those specialized teams.

A.9.3.3.1 Evaluation for specialized essential job tasks and PPE would only pertain to an individual's evaluation if, in their jurisdiction, their job requires them to perform these specialized duties, such as hazardous materials units, dive teams, technical rescue teams, EMS teams, or units supporting tactical law enforcement operations.

9.3.3.2 Prior to an occupational medical evaluation of individuals of specialized teams, the authority having jurisdiction shall provide both of the following to the fire department physician:
(1) A list of any specialized essential job tasks associated with the specialized team
(2) A description of the risks associated with the essential job tasks and specialized PPE, as well as any additional medical or physical requirements that are not enumerated in this standard, such as increased weight, environmental

isolation, sensory deprivation, metabolic cost, or dehydration potential above levels experienced with standard fire suppression PPE

9.3.3.3 Prior to the occupational medical evaluation of individuals of specialized teams, the fire department physician shall review the information provided by the authority having jurisdiction to determine medical examination criteria for any specialized essential job tasks.

9.3.4 Medical evaluations that require the individual to undergo physical exertion shall be conducted in accordance with the following:

(1) Testing shall be conducted using an appropriate maximal or submaximal protocol. *(See A.8.2.2.1.1.)*
(2) The workload/oxygen consumption level for the exercise shall be the individual's maximum aerobic capacity.
(3) For individuals with an aerobic capacity greater than 12 metabolic equivalents (METs), the evaluation shall be permitted to stop after a workload/oxygen consumption level of 12 METs is achieved.
(4) *For individuals with an aerobic capacity less than 10 METs and greater than 8 METs, the fire department physician shall, after performing an individualized evaluation to determine if the individual is able to safely and effectively perform essential job tasks 1, 2, 4, 5, 6, 7, 8, 9, and 13, recommend to the AHJ any applicable job restrictions associated with these specific essential job tasks that cannot be safely and effectively performed by the individual due to a medical condition(s) or physical fitness. (*See Table 9.7, Condition (21).*)
(5) * For individuals with an aerobic capacity at or below 8 METs, the fire department physician shall recommend to the AHJ that the individual is restricted from performing essential job tasks 1, 2, 4, 5, 6, 7, 8, 9, and 13.

A.9.3.4(4) An individualized evaluation is based on the physical intensity level typically required to perform the essential job tasks in that jurisdiction. Such evaluations could include a simulated work evaluation, such as a candidate physical ability test (CPAT), or a functional skills test that mirrors the tasks performed in that jurisdiction.

A.9.3.4(5) If an individual with an aerobic capacity at or below 8 METs is a candidate, the fire department physician's recommendation to the AHJ can be to restrict the candidate from performing essential job tasks 1, 2, 4, 5, 6, 7, 8, 9, and 13 during an academy training program. In accordance with 9.4.7, the AHJ determines the candidate's employment status.

9.4* Fire Department Physician Role. After completing the occupational medical evaluation, the fire department physician shall report to the AHJ any applicable job restrictions associated with specific essential job tasks that cannot be safely and effectively performed by the individual due to a medical condition(s) or physical fitness.

A.9.4 Chapter 9 provides medical guidance to fire department physicians for determining an individual's ability to safely and effectively perform the essential job tasks using an individual medical assessment for the conditions listed.

9.4.1 The fire department physician shall perform an individualized assessment of the individual.

9.4.2 The fire department physician shall be responsible for determining the medical qualification status of the individual in accordance with the following:

(1) *No restriction:* There are no essential job tasks that the individual cannot safely and effectively perform
(2) *Permanent restriction:* There are specific essential job tasks that the individual cannot safely and effectively perform due to a permanent or long-term medical condition
(3) *Temporary restriction:* There are specific essential job tasks that the individual cannot safely and effectively perform due to a medical condition that the fire department physician considers could be temporary, allowing the individual to return for reevaluation if allowed within that jurisdiction by the AHJ.

9.4.3 Removal of an individual from permanent or temporary restriction status shall be approved by the fire department physician.

9.4.4 The fire department physician shall provide the AHJ a written statement that identifies the specific essential job task(s) the individual is restricted from performing.

9.4.5 The fire department physician shall not make a recommendation regarding the individual's employment in the fire department.

9.4.6 There shall be no blanket exclusions.

9.4.7* The AHJ shall determine the individual's employment status in consideration of any restrictions identified by the fire department physician and whether any reasonable accommodations might permit the individual to safely and effectively perform the essential job tasks. (*See Annex B for additional legal considerations.*)

A.9.4.7 Possible accommodations to provide qualified individuals with disabilities include reasonable modifications or adjustments to the work environment or the manner or circumstances under which the essential job tasks are customarily performed. These can include, but are not limited to, changes in assignment, provision of special devices to assist the individual in accommodating the medical disability, revision of standard operating procedures, and allowance of special techniques.

9.5* Medical Conditions Involving the Eyes, Ears, Nose, Mouth, or Throat.
The physician shall report any applicable job restrictions associated with the conditions in Table 9.5.

Table 9.5 Medical Conditions Involving the Eyes, Ears, Nose, Mouth, or Throat

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
Disorders of the Eyes or Vision*			
(1)* Loss of far visual acuity	Meets either of the following criteria: a) Has worse than 20/100 binocular vision, uncorrected b) Has worse than 20/40 binocular vision, corrected with hard or soft contact lenses or spectacles	Has 20/40 or better binocular vision, corrected with soft contact lenses, regardless of uncorrected visual acuity	6, 8, 10, 12
(2)* Loss of color vision	Has monochromatic vision resulting in inability to use thermal imaging cameras	-	6, 10
(3)* Surgery and treatment	Had radial keratotomy or Lasik within 2 weeks or had repair of retinal detachment within 3 months	-	6, 8, 10
(4)* Loss of depth perception	Has monocular vision stereopsis without fusional capacity	Is able to accommodate for depth perception with at least 6 months experience after loss of binocular vision	10
(5) Loss of peripheral vision	Has less than 110 degrees in the horizontal meridian in either eye	-	10
(6) Loss of near visual acuity	Has worse than 20/40 binocular, corrected vision	-	6, 8, 10, 12
Disorders of the Ears or Hearing*			
(7)* Hearing loss	Meets any of the following criteria: a) Is unable to hear or understand the spoken voice under conditions of high background noise b) Is unable to hear, recognize, or localize cries for assistance or audible alarms c) Has average hearing loss of 40 dB or more at 500 Hz, 1000 Hz, 2000 Hz, and 3000 Hz, in the unaided, better ear *(see 9.5.1)*	-	2, 6, 8, 10, 12, 13
(8)* Asymmetric (unequal) hearing loss	Is unable to localize cries for assistance or audible alarms	-	6
(9) Abnormal hearing, including the following: a) Atresia, stenosis, or tumor of the auditory canal b) *External otitis, recurrent c) *Agenesis or traumatic deformity of the auricle d) *Mastoiditis or surgical deformity of the mastoid e) *Ménière's disease, labyrinthitis, or tinnitus f) *Otitis media, recurrent or chronic g) Surgical procedures to correct or improve hearing or other conditions of the ear	Meets either of the following criteria: a) Is unable to hear or understand the spoken voice under conditions of high background noise b) Is unable to hear, recognize, or localize cries for assistance or audible alarms	-	2, 6, 8, 10, 12, 13,

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(10)* Vertigo, ataxia, or disturbance of gait or balance	Is unable to tandem gait walk	-	1, 8, 10, 13
Disorders of the Nose, Mouth, or Throat.			
(11)* Deformity of nose, mouth, or jaw	Is unable to successfully pass a respirator fit test	-	1, 2, 3, 4, 5, 6, 7, 8, 12, 15
(12) Aphonia (inability to speak)	Is unable to communicate verbally	-	12, 13
(13) Chronic disease of the nose, nasopharynx, oropharynx, or mouth, including the following: a) *Allergic rhinitis b) *Epistaxis, recurrent c) *Sinusitis, recurrent d) *Dysphonia e) *Anosmia f) Nasopharyngeal polyposis	Meets any of the following criteria: a) Is unable to successfully wear PPE for extended periods of time while performing firefighting tasks b) Is unable to communicate clearly while wearing PPE c) Is unable to identify the presence of smoke or chemicals by smell	-	1, 2, 3, 5, 8, 12, 13
(14)* Obstructive sleep apnea	Has apnea hypopnea index greater than 15, with clinically significant oxygen desaturation or with toxic arrhythmias	Meets all the following provisions: a) If treatment is indicated, has medical records demonstrating compliance b) Experiences no excessive daytime sleepiness c) Has a signed statement from a sleep specialist (sleep, pulmonary, or neurology), indicating that the individual can safely and effectively perform the essential job tasks	10, 11, 14

*Additional information is provided in A.9.5.

A.9.5 The following information pertains to the conditions marked with an asterisk in Table 9.5.

Disorders of the Eyes or Vision.

Diseases of the eye such as retinal detachment, progressive retinopathy, optic neuritis (severe or progressive), macular degeneration, cataracts, and glaucoma can result in the failure to read placards and street signs or to see and respond to imminently hazardous situations. For certain conditions, evaluation of visual acuity and visual fields with consultation by an ophthalmologist is suggested.

Ophthalmological procedures such as radial keratotomy and repair of retinal detachment require sufficient time (approximately 2 weeks for radial keratotomy and Lasik-type surgery and 3 months for retinal detachment) to allow stabilization of visual acuity and to ensure that there are no postsurgical complications. Individuals should be cleared for duty by the ophthalmologic surgeon who understands the essential job tasks associated with firefighting. These ophthalmological procedures can result in the failure to be able to read placards and street signs or to see and respond to imminently hazardous situations.

The fire service physician should also consider any color vision deficiency of the individual in view of the color vision requirements of the individual's essential job tasks in a given fire department.

(1) Loss of far visual acuity. Inadequate far visual acuity can result in the failure to be able to read placards and street signs or to see and respond to imminently hazardous situations.

(2) Loss of color vision. Monochromatic vision does not refer to abnormal color perception such as red/green color blindness. Persons with severe color vision loss will likely fail the acuity requirement. However, it is felt that within most cases this condition will not affect the ability to safely and effectively perform the essential job tasks. The fire service physician should consider the color vision deficiency of the individual and consider the color vision requirements of the individual's job and reach an individual determination.

(3) Surgery and treatment. Sufficient time (approximately 2 weeks for radial keratotomy and Lasik-type surgeries, and 3 months for retinal detachment) must have passed to allow stabilization of visual acuity and to ensure that there are no postsurgical complications. These ophthalmological procedures can result in the failure to be able to read placards and street signs or to see and respond to imminently hazardous situations.

(4) Loss of depth perception. Most persons with monocular vision, after a 6-month accommodation period, are able to function well. There is some loss of depth perception and peripheral vision. The loss of depth perception has not been shown to be of a type that will affect an individual's ability to safely and effectively perform essential job tasks. Some very specialized tasks can be difficult to safely perform, and the fire service physician should consider the depth of field deficiency of the individual and consider the depth of field requirements of the individual's job to reach an individual determination. It should be noted that the FAA will award all classes of pilot's licenses to monocular pilots. The loss of peripheral vision is compensated for by increased scanning and head movements. There are studies that show some detriment of driving function in the driving lab. In view of this and the increased dependence on visual cues when driving emergency vehicles, monocular firefighters should be restricted from driving fire apparatus and other emergency vehicles.

A DOT/CDL exemption for monocular vision can be obtained after passing a special test. But this exemption is not applicable to firefighters because it specifically excludes the driving of vehicles with passengers (e.g., fire trucks) and does not apply to emergency response driving.

Disorders of the Ears or Hearing.

Firefighters should have adequate hearing to hear a victim cry for help, to hear a PASS alarm, to hear noises associated with imminent collapse, or to hear noise associated with changes in the fire pattern. Hearing and the ability to localize sounds is crucial in a firefighting environment where smoke often minimizes visual cues and there is a high degree of background noise and stress-related distractions. Firefighters should be able to hear fire department portable and vehicle radio communications. They should be able to hear, discriminate, and localize safety-related acoustic cues, such as air horns; sirens; screams, collapsing walls, beams, or timbers; or gas leaks, to safely and effectively safely perform the essential job tasks required for fire suppression and fire rescue activities.

These essential job tasks need to be safely and effectively performed under conditions of extreme background noise and SCBA noise as typically found at the incident scene. The inability to hear sounds of low intensity or to distinguish voice from background noise can lead to failure to respond to imminently hazardous situations and thus lead to life-threatening sudden incapacitation to the individual or others that depend on the individual.

Currently, no hearing tests will allow the fire department physician to accurately predict whether the firefighter will be able to safely and effectively perform essential job tasks. Job-specific hearing tests should be individualized for each department and its specific job functions. The following list of hearing-specific tasks can assist to direct development of hearing protocols:

(1) Understanding spoken commands, both over the radio and while wearing SCBA
(2) Hearing alarm signals, including building evacuation, low air alarm on the SCBA, and PASS alarms
(3) Hearing and locating the source of calls for assistance from victims or other firefighters

All of these tasks will need to be safely and effectively performed with reasonably simulated incident scene background noise and SCBA noise. The inability to hear sounds of low intensity or to distinguish voice from background noise can lead to failure to respond to imminently hazardous situations. *(See 5.1.1.)*

(7) Hearing loss. Audiometric pure-tone threshold testing includes the frequencies 500 Hz, 1000 Hz, 2000 Hz, 3000 Hz, 4000 Hz, and 6000 Hz. Tests are performed using audiometric instrumentation calibrated to ANSI/ASA S3.6, *Specification for Audiometers.*

There are several reasons that the use of hearing assistive devices might not be appropriate for the hearing-impaired individual, including the following:

(1) Hearing assistive devices do not restore normal hearing.
(2) Hearing assistive devices cannot compensate for asymmetrical hearing loss, and thus will not totally resolve the difficulty in sound localization of those with asymmetric hearing loss.
(3) Hearing assistive devices will improve hearing in noise (e.g., fire scene, rescue scene, traffic), but this noise will always be the most challenging environment for a hearing-impaired individual.
(4) It is unknown if hearing assistive devices will continue to function normally when exposed to the heat, moisture, and smoke of the fire scene.

Understanding these limitations, hearing assistive devices will improve a hearing-impaired individual's hearing functioning. Thus, it is the consensus of the technical committee that individuals should be allowed to use hearing assistive devices if their unaided average hearing loss in the unaided better ear is better than 40 decibels (dB) at 500 Hz, 1000 Hz, 2000 Hz, and 3000 Hz. If the device fails, the individual will still have sufficient hearing acuity to meet the minimum hearing standard.

(8) Asymmetric (unequal) hearing loss. Unequal hearing can result in the inability to localize sounds, leading to failure in the ability to safely and effectively perform search and rescue and other localization tasks. There is no validated data to determine at what point sound localization is impaired to the point that a firefighter will not be able to safely and effectively perform search and rescue tasks or other sound localization tasks. Thus, a simulation of these tasks should be performed if there is any question of inadequacy.

(9)(b) External otitis, recurrent. Severe external otitis — that is, recurrent loss of hearing — can result in the inability to hear sounds of low intensity or to distinguish voice from background noise, leading to failure to respond to imminently hazardous situations.
(9)(c) Agenesis or traumatic deformity of the auricle. Severe agenesis or traumatic deformity of the auricle can result in the inability to properly wear protective equipment and the inability to hear sounds of low intensity or to distinguish voice from background noise, leading to failure to respond to imminently hazardous situations.

(9)(d) Mastoiditis or surgical deformity of the mastoid. Severe mastoiditis or surgical deformity of the mastoid can result in the inability to properly wear protective equipment and the inability to hear sounds of low intensity or to distinguish voice from background noise, leading to failure to respond to imminently hazardous situations.

(9)(e) Ménière's disease, labyrinthitis, or tinnitus. Ménière's syndrome or severe labyrinthitis can result in the potential for sudden incapacitation and the inability to safely and effectively perform job functions due to limitations of balance.

(9)(f) Otitis media, recurrent or chronic. Otitis media (chronic) can result in frequent episodes of pain and the inability to hear sounds of low intensity or to distinguish voice from background noise, leading to failure to respond to imminently hazardous situations.

(10) Vertigo, ataxia, or disturbance of gait or balance. Intact gait and balance are required to safely and effectively perform essential job tasks such as climbing stairs, carrying heavy items (e.g., tools, equipment, victims, stretchers), climbing ladders, and walking on narrow/elevated/inclined areas (e.g., roofs). A firefighter's balance can be further stressed by the need to safely and effectively perform these essential job tasks while wearing personal protective clothing and SCBA.

Any symptomatic balance disturbance, vertigo, change of gait and coordination, or history of these that has not resolved completely should be fully investigated. Examples include, but are not limited to, Ménière's syndrome, severe labyrinthitis, and cerebellar syndromes. Current use of medications needs careful evaluation to be certain that the condition is completely controlled and that the side effects of the medication do not impose additional unacceptable risks for the safe and effective performance of essential job tasks.

Disorders of the Nose, Mouth, or Throat.

(11) Deformity of nose, mouth, or jaw. A congenital or acquired deformity can result in the inability to pass a respirator fit test or the inability to safely and effectively wear personal protective equipment.

The firefighter works in hazardous environments, both on the fireground and during other emergency operations. Heavy debris can fall on the firefighter. The helmet offers some protection when it fits well and is worn properly. The firefighter with a defect in the skull is more vulnerable to head trauma and life-threatening sudden incapacitation.

The firefighter is also exposed to biological aerosols, particulates, smoke, and hazardous materials. The face, nasal, oropharyngeal, and dental structures should be of sufficient structure and function to allow the proper use and fit-testing of required respiratory protection for the jurisdiction (N-95, P-100, SCBA, and so forth) and other protective clothing and gear.

Orthodontic and certain other maxillofacial appliances or prostheses can preclude safe and effective use of protective equipment and compromise nutritional or hydration status or ability to communicate.

Pharyngeal or laryngeal stenosis, mass, or accessory tissues can interfere with speech, communication, or respiration, which will not permit the safe and effective performance of essential tasks on the fire ground and during emergency operations, especially when wearing a respirator.

(13)(a) Allergic rhinitis. Allergic rhinitis can result in frequent episodes of pain, and the inability to safely and effectively perform essential job tasks due to limitations of endurance and the inability to wear SCBA from facial pain, sinus congestion, or coughing.

(13)(b) Epistaxis, recurrent. Severe and recurrent epistaxis can prevent safe and effective performance of essential job tasks due to the inability to wear SCBA on the fireground.

(13)(c) Sinusitis, recurrent. Recurrent sinusitis, if severe or requiring repeated hospitalizations or repeat surgery, can interfere with the safe and effective performance of essential job tasks due to inability to effectively wear SCBA or limitations of pain, endurance, or respiration.

(13)(d) Dysphonia. Severe dysphonia can result in the inability to communicate effectively due to oropharyngeal dysfunction.

(13)(e) Anosmia. Anosmia (i.e., loss of smell) can interfere with the ability to safely and effectively perform essential job tasks on the fireground. Evaluation of anosmia is difficult, as objective testing is not available in most medical settings.

(14) Obstructive sleep apnea. Untreated obstructive sleep apnea is associated with fatigue, cognitive defects, pulmonary hypertension, hypertrophic heart disease, arrhythmias, and early onset dementia. These issues can reduce the ability to safely and effectively perform essential job tasks. Risk factors for developing obstructive sleep apnea include male gender, increased body mass index (BMI), short/wide neck, or narrow throat. Screening questionnaires, such as the Berlin Questionnaire (assessing snoring, fatigue, obesity, and hypertension) can be used to determine those who require formal sleep testing. In those with obstructive sleep apnea, additional testing is required to determine the level of positive pressure (via CPAP or BIPAP) required to overcome the obstruction. When treatment is prescribed, compliance can be assessed using home monitoring devices attached to the CPAP or BIPAP machine. Target organ damage can be screened for by cardiac echo for evidence of pulmonary hypertension or right ventricular hypertrophy.

Mild obstructive sleep apnea (i.e., apnea hypopnea index of less than 15, without clinically significant oxygen desaturation and without toxic arrhythmias) might not require treatment if asymptomatic.

9.5.1 A hearing assistive device(s) shall be permitted if the individual meets the minimum hearing standard without the device(s).

9.6* Medical Conditions Involving the Lungs, Chest, and Respiratory System. The physician shall report any applicable job restrictions associated with the conditions in Table 9.6 based on the physician's consideration of the following guidance:

(1) Efficient breathing and respiratory gas exchange are required to safely and effectively perform essential job tasks 1, 2, 3, 4, 5, 6, 7, 9, and 13.
(2) Wearing protective clothing increases the oxygen consumption required to perform these tasks and, therefore, increases the respiratory workload.
(3) SCBA is a positive-pressure demand valve respirator that provides a barrier against the inhalation of noxious or toxic gases and particulate matter but at increased metabolic cost due to its weight and increased respiratory workload (i.e., resistance and dead space).
(4) If respiratory function or gas exchange is already compromised (i.e., increased work of breathing from structural or functional abnormalities, hypoxia, or hypercapnia) prior to the performance of essential job tasks, then the increased oxygen demand of strenuous physical exertion, while wearing PPE or SCBA, leads to early onset of fatigue or respiratory insufficiency.
(5) Lung, chest wall, and respiratory disorders can compromise the individual's ability to safely and effectively perform essential job tasks 1, 2, 3, 4, 5, 6, 7, 9, and 13.

Table 9.6 Medical Conditions Involving the Lungs, Chest, and Respiratory System

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Tracheostomy, not sealed	Is unable to successfully pass a respirator fit test	-	1, 2, 3, 4, 5, 6, 7, 8, 12, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
	Is unable to communicate due to oropharyngeal dysfunction	-	12, 15
	Is unable to clear secretions or inhaled particulate matter	-	3
(2)* Chronic cough (productive or nonproductive with or without hemoptysis)	Is unable to wear a respirator continuously and without interruption or to safely and effectively perform in an irritant environment due to any of the following: a) The severity of the cough b) The impact of irritants and SCBA use on cough severity c) The impact of cough severity on the ability to wear a respirator, especially SCBA d) The impact of cough severity on the ability to safely and effectively perform strenuous exertion	-	2, 3
(3)* Asthma	-	Meets all the following provisions annually or at the frequency indicated: a) Has no bronchospasm and does not use or require bronchodilator rescue medications during exertion, temperature or humidity extremes, irritant exposures, fire suppression, or hazmat or training activities b) Has not required systemic corticosteroids, emergency room treatment, or hospital admission for asthma or other pulmonary disease in the past 2 years c) Shows reserve in pulmonary function (i.e., both FVC and FEV_1 greater than or equal to 80% of predicted) without a bronchodilator response (i.e., an increase in FEV_1 from baseline by at least 12% and at least 200 ml), measured off all bronchodilators on the day of testing d) If a bronchial challenge test is indicated, has a normal or negative response of less than 20% decline in FEV_1 from baseline for provocative challenge testing (e.g., for methacholine provocation a PC_{20} greater than 8 mg/ml is considered normal, as response at dose greater than 8 mg/ml might not be clinically significant), or less than 13% decline in FEV_1 from baseline for exercise challenge testing using cold air e) Has a signed statement from a pulmonary or asthma specialist that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks without the use of bronchodilator rescue medications	1, 2, 3, 4, 5, 6, 7, 9, 13, 15
(4)* Allergic lower respiratory disorders	Has allergic trigger(s) that could be encountered during performance of essential job tasks	Meets the special provisions for asthma in (3)	1, 2, 3, 4, 5, 6, 7, 9, 13, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(5)* Chronic obstructive pulmonary disease (COPD)	Has pulmonary function tests with an absolute FEV_1/FVC ratio less than 0.70 and an FEV_1 less than 70% predicted measured off all bronchodilators on the day of testing	Meets all the following provisions annually or at the frequency indicated: a) Has 60% or greater of predicted FEV_1 and no bronchodilator response (i.e., an increase in FEV_1 from baseline by at least 12% and at least 200 ml), measured off all bronchodilators on the day of testing b) Has no bronchospasm and does not use or require bronchodilator rescue medications during exertion; temperature or humidity extremes; irritant exposures; or fire suppression, hazmat, or training activities c) Has not required systemic corticosteroids, emergency room treatment, or hospital admission for COPD or other pulmonary disease in the past 2 years d) Has experienced continuous tobacco cessation for more than 3 months e) Does not have a chronic cough that compromises the performance of the essential job tasks *[see (4)]* f) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following *(see 9.3.4)*: i. Bronchospasm ii. A decline in FEV_1 to less than 60% predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4% from baseline or to below 90%) iv. Cardiac ischemia or toxic arrhythmias g) Has a signed statement and medical records from a pulmonary specialist, indicating that the individual meets the criteria specified in (a) through (f) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 15
(6)* Hypoxemic disorders, moderate to severe	Has oxygen saturation less than 90%, measured at rest and corrected to sea level on room air	-	1, 2, 3, 4, 5, 6, 7, 9, 13, 15
(7) Exertional-related oxygen desaturation	Has either of the following: a) An oxygen saturation of 90% to 94%, corrected to sea level on room air, at rest b) A drop in oxygen saturation by 4% from baseline during exercise or physical exertion	Meets all the following provisions annually or at the frequency indicated: a) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following (*see 9.3.4*): i. Bronchospasm ii. A decline in FEV_1 to less than 60% predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4% from baseline or to below 90%) iv. Cardiac ischemia or toxic arrhythmias b) Has a signed statement and medical records from a pulmonary specialist, indicating that the individual meets (a) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 9, 13, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(8)* Hypercapnic disorders	Has elevated carbon dioxide with serum P_{CO2} greater than or equal to 45 mm Hg	-	1, 2, 3, 4, 5, 6, 7, 9, 13, 15
(9)* Pulmonary hypertension	Has mean pulmonary arterial pressure greater than 20 mm Hg	Meets all the following provisions annually or at the frequency indicated: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Is not hypoxemic at rest *[see (6) and (7)]* d) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following (*see 9.3.4*): i. Bronchospasm ii. A decline in FEV_1 to less than 60% predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4% from baseline or to below 90%) iv. Cardiac ischemia or toxic arrhythmias e) Has a signed statement and medical records from a pulmonary or cardiology specialist, indicating that the individual meets (a) through (d) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 15
(10) Tracheal stenosis or tracheomalacia	Has pulmonary function (FVC or FEV_1) less than 70% predicted without the use of bronchodilators	Meets all the following provisions annually or at the frequency indicated: a) Has 60% or greater of predicted FEV_1 without the use of bronchodilators b) Inspiratory flow volume loop and inspiratory flow rates normal or minimally reduced. c) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following (*see 9.3.4*): i. Bronchospasm ii. A decline in FEV_1 to less than 60% predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4 percent from baseline or to below 90 percent) iv. Cardiac ischemia or toxic arrhythmias d) Has a signed statement and medical records from a pulmonary specialist, indicating that the individual meets (a) through (c) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(11) Pulmonary resection surgery, chest wall surgery, or pneumothorax	Meets any of the following criteria: a) Has not had time for healing and pain resolution (typically 3 months) b) Has pulmonary function tests (FVC or FEV_1) less than 70% predicted without the use of bronchodilators c) Has hypoxemia *[see (8)]* d) Has diffusing capacity (DLCO) less than 60% predicted e) Has not received clearance by a thoracic surgeon or pulmonary specialist	Meets all the following provisions annually or at the frequency indicated, after time for healing and pain resolution (typically 3 months) and with clearance by a thoracic surgeon or pulmonary specialist: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Is not hypoxemic at rest *[see (6) and (7)]* d) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following (*see 9.3.4*): i. Bronchospasm ii. A decline in FEV_1 to less than 60% predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4% from baseline or to below 90%) iv. Cardiac ischemia or toxic arrhythmias	1, 2, 4, 5, 6, 7, 13
(12)* Spontaneous pneumothorax	Meets any of the following criteria: a) Has not had time for healing and pain resolution (typically 3 months) b) Has pulmonary function tests (FVC or FEV_1) less than 70% predicted without the use of bronchodilators c) Has elevated risk for recurrence due to cystic or bullous lung disease as indicated with chest CT imaging	Meets all the following provisions after time for healing and pain resolution (typically 3 months) and with clearance by the thoracic surgeon: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]* d) Has minimal or surgically corrected cystic or bullous disease as demonstrated on a chest CT scan e) Is not required to perform SCUBA diving as part of the individual's essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 13
(13) Chest wall deformity, fibrothorax, or diaphragm abnormalities	Has pulmonary function (FVC or FEV_1) less than 70% predicted without the use of bronchodilators	Meets all the following provisions: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]*	1, 2, 4, 5, 6, 7, 8
(14)* Pleural effusion(s)	Meets any of the following criteria: a) Has not had time for healing and pain resolution (typically 3 months) b) Has pulmonary function tests (FVC or FEV_1) less than 70% of predicted without the use of bronchodilators c) Has hypoxemia *[see (8)]* d) Has not received clearance by a thoracic surgeon or pulmonary, cardiology, or oncology specialist, depending on the etiology of the effusion	Meets all the following provisions after time for healing and pain resolution (typically 3 months) and with clearance by the thoracic surgeon or pulmonary, cardiology, or oncology specialist: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]* d) Has no evidence of congestive heart failure or cardiomyopathy due to any etiology, including any disease leading to a lower-than-normal left or right ventricular ejection fraction *(see section specific to the underlying disease)* e) Has no evidence of an underlying cancer as the cause of the effusion(s)	1, 2, 4, 5, 6, 7, 8

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(15) Bronchiectasis or bronchiolitis obliterans	Has pulmonary function (FVC or FEV_1) less than 70% predicted without the use of bronchodilators	Meets all the following provisions annually: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]* d) Does not have a chronic cough that compromises the performance of the essential job tasks *[see (4)]*	1, 2, 3, 4, 5, 6, 7, 8
(16) Interstitial lung diseases	Meets any of the following criteria: a) Has pulmonary function (FVC or FEV_1) less than 70% of predicted without the use of bronchodilators b) Has hypoxemia *[see (8)]* c) Has diffusing capacity (DLCO) less than 60% of predicted	Meets all the following provisions annually or at the frequency indicated: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]* d) Does not have a chronic cough that compromises the performance of the essential job tasks *[see (4)]* e) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of any of the following (*see 9.3.4*): i. Bronchospasm ii. A decline in FEV_1 to less than 60% of predicted iii. Oxygen desaturation (i.e., a fall in oxygen saturation on room air by 4% from baseline or to below 90%) iv. Cardiac ischemia or toxic arrhythmias f) Has a signed statement and medical records from a pulmonary specialist, indicating that the individual meets the criteria specified in (a) through (d) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8
(17)* Sarcoidosis	Meets any of the following criteria: a) Has pulmonary function (FVC or FEV_1) less than 70% predicted without the use of bronchodilators b) Has hypoxemia *[see (8)]* c) Has diffusing capacity (DLCO) less than 60% predicted d) Has visual impairment *(see Section 9.5)* e) Has cardiac dysfunction (e.g., cardiomyopathy or arrhythmia) at rest or exercise f) Has other moderate to severe end-organ dysfunction g) Needs treatment with systemic corticosteroids or other immunosuppressive medications	Meets all the following provisions annually: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (8)]* d) Has no evidence of end-organ dysfunction e) Has normal cardiac function and electrical rhythm activity as assessed with electrocardiogram and echocardiography f) Has not been prescribed immunosuppressive medications (e.g., high-dose systemic corticosteroids, methotrexate, or TNF-alpha blockers) for at least 3 months g) Has a signed statement and medical records from a pulmonary specialist, indicating that the individual meets the provisions specified in (a) through (f) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(18)* Pulmonary embolism	Meets any of the following criteria: a) Has hypoxemia *[see (8)]* b) Is currently prescribed anticoagulation medication *(see Section 9.13)* c) Has persistent blood clots d) Has high risk for recurrent pulmonary embolism	Meets all the following provisions: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (8)]* d) Is not currently prescribed anticoagulation medication *(see Section 9.13)* e) Has resolved or controlled the underlying risk factor for pulmonary embolism	1, 2, 3, 4, 5, 6, 7, 8, 13
(19) Cystic lung diseases	Meets any of the following criteria: a) Has pulmonary function (FVC or FEV_1) less than 70% predicted without the use of bronchodilators b) Has hypoxemia *[see (8)]* c) Has diffusing capacity (DLCO) less than 60% predicted	Meets all the following provisions: a) Has 60% or greater of predicted FVC without the use of bronchodilators b) Has 60% or greater of predicted diffusing capacity (DLCO) c) Has no hypoxemia *[see (6) and (7)]* d) Has minimal or surgically corrected cystic or bullous disease as demonstrated on a chest CT scan e) Is not required to perform SCUBA diving as part of the individual's essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 13
(20) Tuberculosis	See Section 9.16	See Section 9.16	1, 2, 3, 4, 5, 6, 7, 8, 13
(21) Lung cancer	See Section 9.20	See Section 9.20	See Section 9.20
(22) Lung transplant *(also see Section 9.13 for anti-rejection medication)*	-	-	1, 2, 3, 4, 5, 6, 7, 9, 13, 15

*Additional information is provided in A.9.6.

A.9.6 Respiratory insufficiency, no matter the cause, has the potential for toxic arrhythmias, cardiac ischemia (i.e., oxygen delivery), decreased respiratory and cardiac function (i.e., oxygen delivery to tissues), acidosis, and life-threatening sudden incapacitation.

The following information pertains to the conditions marked with an asterisk in Table 9.6.

(2) Chronic cough (productive or non-productive with or without hemoptysis). The cause of chronic cough or hemoptysis needs to be evaluated, as the underlying conditions can also produce increased work of breathing, gas exchange abnormalities, or airway hyperreactivity. An SCBA respirator can be an irritant due its air supply being cold and dry.

(3) Asthma. Asthma, defined as reversible bronchospasm, can be temporary or chronic. “Temporary asthma,” more accurately referred to as acute bronchitis with wheezing, is a brief episode, lasting days to months, usually following allergic or infectious exposure. When this occurs without prior history, it most likely will resolve over the next few weeks or months. Such temporary incidents, once resolved, do not compromise the individual's ability to safely and effectively perform essential job tasks. In contrast, true asthma is a chronic condition with a clinical history of recurrent reversible bronchospasm or longstanding, persistent reversible bronchospasm. For asthmatics, exposure to smoke or other irritants on the fire ground or a hazardous materials environment or to cold, dry air from SCBA has a high probability of causing acute asthma attacks and can also worsen the progression of the underlying obstructive inflammatory disease. If this occurs in an environment that is immediately dangerous to life and health (e.g., interior fire suppression or certain hazardous materials operations), it can have potentially devastating consequences for the firefighter, the team, or the mission. There are no studies that support or deny that asthma in this environment can be prevented or adequately controlled by anti-inflammatory medications (e.g., inhaled corticosteroids, cromolyn, leukotriene modifiers). It is not acceptable to use or rely on bronchodilator medications for this purpose because in a hazardous environment, SCBA cannot be removed to use a rescue inhaler. There are no studies that support or deny that the use of such medications is preventive or effective in a fire/smoke environment, and several studies have implicated the use of beta-agonists (i.e., short- and long-acting bronchodilators) as an independent risk for sudden death and myocardial infarction in the United States, Canada, Britain, New Zealand, and Australia.

Identifying asthmatics who are not only stable in a normal environment but also do not have asthmatic attacks in a fire or irritant environment is difficult. Because the clinical definition of asthma is reversible bronchospasm, spirometry or pulmonary function testing performed in the absence of a clinical attack is expected to be normal and might not even show a bronchodilator response. Only if performed during an attack will spirometry or other pulmonary function tests show obstructive airway flow limitations with a positive bronchodilator response (i.e., greater than 12 percent and 200 mL increase in FEV_1). Therefore, in these firefighters who report good control without asthma exacerbations on the fire ground, spirometry should show adequate reserve (e.g., FVC and FEV_1 greater than or equal to 80 percent of predicted), without significant bronchodilator response when performed off bronchodilators on the day of testing. For population studies, pulmonary function is considered normal when greater than or equal to 80 percent of predicted, but for an individual with a history of asthmatic bronchospasm who is being considered for job tasks performed in a potentially irritant environment, it is reasonable diligence to require pulmonary function with a greater specificity for demonstrating adequate reserve (i.e., greater than or equal to 90 percent of predicted). The first time this individual is evaluated for asthma control, challenge testing should be performed to demonstrate no evidence for clinically significant airway hyperreactivity [i.e., to be normal or negative there should be less than 20 percent decline in FEV_1 with provocative challenge testing to cold air, exercise (*see 9.3.4*), or a methacholine (PC_{20} greater than 8 mg/ml is considered normal, as response at doses greater than 8 mg/ml might not be clinically significant)]. Challenge testing should be performed off bronchodilators the day of testing. If the individual reports good control only when taking prescribed control medications (e.g., inhaled corticosteroids, cromolyn, or leukotriene modifiers), then consideration should be given to continuing these medications during the testing. The individual should not use bronchodilators (short- or long-acting bronchodilators) the day of testing because these medications could undermine the purpose of this test — that is, demonstrating normal pulmonary function without clinically significant bronchodilator response or airway hyperreactivity. Challenge testing should be performed only by an experienced specialist. Testing should not be performed on individuals without a history suggestive of asthma, since there is no indication for testing. It should never be performed in individuals with moderate to severe pulmonary dysfunction, as these individuals have already demonstrated that they cannot safely perform essential job tasks, and further testing might induce life-threatening bronchospasm. Challenge testing should not be performed annually and should be repeated only if clinically indicated.

The physician should consider the following when evaluating the individual's **ability to safety and effectively perform the essential job tasks:**

(1) Exposures to exertion, temperature extremes, cold dry air from SCBA, combustion by-products, irritants, and particulate matter are all potent provokers of asthma attacks.
(2) Bronchodilator medications are not maintenance therapy to control symptoms in the irritant environment of the fireground or hazardous materials incident scene because their use has not been approved by the FDA for use on the fireground or hazardous materials incident scene and because several studies in the United States, Canada, Britain, New Zealand, and Australia have implicated the frequent use of beta-agonists (i.e., short- and long-acting bronchodilators) as an independent predictor or risk for sudden death and myocardial infarction.
(3) There is a high probability that acute hyperreactivity in this environment can induce immediate or progressive clinical asthma (i.e., bronchospasm and wheeze) that can lead to sudden incapacitation from status asthmaticus or cardiac ischemia.
(4) The individual's work history, as well as clinical findings on annual evaluation, should be used as an assessment of the individual's practical ability to safely and effectively perform essential job tasks 1, 2, 3, 4, 5, 6, 7, 9, 13, and 15.

(4) Allergic lower respiratory disorders. An individual with current or recent history of allergic-induced, reversible bronchospasm is no different from a nonallergic asthmatic in his/her ability to safely perform the essential job tasks associated with nonallergic irritant exposures, as the majority will remain hyperreactive for 4 to 8 weeks after allergic-induced bronchospasm. Two caveats exist. First, some individuals could have a distant history of allergic asthma, are unlikely to be exposed to this allergen again, or have successfully been desensitized by an allergist. These individuals, if asymptomatic off asthma medications for 2 months, can perform all essential job tasks with reasonable safety. If asthma is still suspected, then the individual should be evaluated accordingly. Provocative challenge testing should only be to general irritants (e.g., cold air, exercise, or methacholine). Specific allergen challenge testing should not be performed, as the risk for life-threatening asthma outweighs the benefit. Second, individuals can have allergic rhinitis, sinus or skin conditions without a history, or suspicion of clinical asthma. These individuals do not need specialized pulmonary testing.

(5) Chronic obstructive pulmonary disease (COPD). Chronic obstructive pulmonary disease is characterized by postbronchodilator spirometry demonstrating an FEV_1/FVC ratio of less than 0.70 (absolute ratio rather than percent of predicted) and an FEV_1 less than 70 percent of predicted (based on age, height, sex, and race/ethnicity). Moderate to severe chronic obstructive pulmonary disease is characterized by post-bronchodilator spirometry demonstrating an FEV_1/FVC ratio of less than 0.70 (absolute ratio rather than percent of predicted) and an FEV_1 less than 60 percent of predicted (based on age, height, sex, and race/ethnicity). Additional tests that can be of value are lung volumes, gas exchange parameters (e.g., diffusing capacity (DLCO), oxygen saturation, arterial blood gases), chest radiograph, and

chest CT scan. With moderate to severe chronic obstructive pulmonary disease, elevated respiratory workload and lack of respiratory reserve will not provide adequate gas exchange for the safe performance of essential job tasks. Working in this environment has the potential for increasing carbon monoxide levels, decreasing oxygen levels, and reducing oxygen delivery, and the extent of this reduction and resulting risk is directly related to the degree of dysfunctional gas exchange already present prior to the performance of essential job tasks. It also has the likely potential for acutely aggravating pre-existing airway hyperreactivity commonly found in patients with moderate to severe chronic obstructive pulmonary diseases (e.g., bronchitis), which in this environment can induce sudden incapacitation from respiratory insufficiency or cardiac ischemia. In contrast, individuals with chronic obstructive pulmonary disease (e.g., postbronchodilator spirometry demonstrating an absolute FEV_1/FVC ratio less than 0.70 and an FEV_1 between 60 and 70 percent of predicted) and without airway hyperreactivity might be able to safely and effectively perform essential job tasks if they meet all of the special provisions for no restriction in Table 9.6.

(6) Hypoxemic disorders, moderate to severe, and (7) Exertional-related oxygen desaturation. The physician should consider the following when evaluating the individual**'s ability to safely and effectively perform the essential job tasks:**

(1) A resting oxygen saturation of 90 percent to 94 percent corrected to sea level requires measurement at a minimum workload *(see 9.3.4)* to determine if desaturation (i.e., decrease in oxygen saturation by greater than or equal to 4 percent from baseline or to less than 90 percent) occurs at baseline and annually.
(2) Hypoxia can be the result of central regulatory disturbances, obstructive sleep apnea, asthma, chronic obstructive airways diseases, interstitial lung disease, pulmonary hypertension, chronic pulmonary embolism, and so forth.
(3) Under firefighting conditions, gas exchange abnormalities and respiratory insufficiency, no matter the cause, have the potential for life-threatening sudden incapacitation from cardiopulmonary insufficiency.

(8) Hypercapnic disorders. Hypercapnia can be the result of central regulatory disturbance, medications, obstructive sleep apnea, severe asthma, end-stage chronic obstructive airways diseases, or end-stage interstitial lung disease. In this environment, gas exchange abnormalities and respiratory insufficiency no matter the cause have the potential for life-threatening sudden incapacitation from cardiopulmonary insufficiency.

(9) Pulmonary hypertension. Pulmonary hypertension can be the result of medications, obstructive sleep apnea, end-stage chronic obstructive airways diseases, end-stage interstitial lung disease, thromboembolic disease, or heart disease.

(12) Spontaneous pneumothorax. Individuals who are otherwise not restricted can safely resume firefighting duties as long as they have recovered from their pneumothorax (with or without surgery) and their pulmonary function has returned to acceptable limits. Most patients with spontaneous pneumothorax have cysts or bullous disease from congenital or infectious etiology. Some have bullous disease due to chronic pulmonary disease. Usually, those with congenital or infectious cause will have pulmonary function tests that are compatible with the safe use of SCBA while those with chronic pulmonary disease can have pulmonary function tests that are not compatible with the safe performance of essential job tasks 1, 2, 3, 4, 5, and 7. Regardless of cause, many (10 percent to 20 percent) will have a recurrence on the same side unless surgically corrected. After the pneumothorax has resolved, surgical correction of underlying cystic/bullous disease is not a prerequisite for returning to firefighting duty as long as pulmonary function allows for the safe use of SCBA.

(14) Pleural effusion(s). Significant pleural effusions should be referred for diagnostic tests, as new or increasing effusions can be a sign of cardiac, liver, or renal disease, pneumonia, empyema, tuberculosis, or cancer. When these illnesses are severe enough to cause pleural effusions, they compromise the ability to safely perform essential job tasks due to limitations of endurance or inability to safely wear SCBA. Regardless of the cause for the pleural effusion, pulmonary function tests should be assessed. An FVC between 60 percent and 69 percent of predicted compromises the member's ability to safely perform essential job tasks unless a more complete evaluation of gas exchange and exercise capacity shows the ability to exercise *(see 9.3.4)* without evidence of hypoxia or exercise desaturation. An FVC less than 60 percent of predicted compromises the individual's ability to safely perform essential job tasks.

(17) Sarcoidosis. Sarcoidosis is an autoimmune disease that can affect any organ in the body. In most cases, it can spontaneously resolve or remain quiescent without any resulting impairment of organ function. In some cases, however, sarcoidosis can result in moderate or severe pulmonary dysfunction, significant visual impairment, cardiac dysfunction (e.g., cardiomyopathy or arrhythmia) at rest or exercise, or other moderate to severe end-organ dysfunction. Such cases typically require lifelong treatment with systemic corticosteroids or other immunosuppressive agents, such as methotrexate, adalimumab, or infliximab.

The physician should consider the following when evaluating the individual**'s ability to safely and effectively perform the essential job tasks:**

(1) Most patients with sarcoidosis are asymptomatic with abnormal chest imaging studies but normal function. Nearly 40% of patients resolve spontaneously.
(2) If functional assessment by individual examination, pulmonary function tests, ECG, Holter ECG, and echocardiogram are normal, the candidate is capable of performing essential job tasks.
(3) Moderate to severe restriction or hypoxia compromises the candidate's ability to safely and effectively perform essential job tasks unless a more complete evaluation of gas exchange and exercise capacity shows the ability to exercise at a minimum workload without evidence of exercise hemoglobin oxygen desaturation.
(4) Cardiac function should be formally assessed with echocardiography, Holter ECG, and ECG. If results are indeterminate, cardiac consultations and additional testing (e.g., cardiac MRI with GAD contrast, PET scan, electrophysiologic studies) should be obtained. Cardiomyopathy or toxic cardiac arrhythmias will cause the candidate to be unqualified to safely and effectively perform the essential job tasks.
(5) For individuals with persistent active disease, evaluation of end-organ function is critical if life-threatening sudden incapacitation is to be avoided.

(18) Pulmonary embolism. Most patients, after suffering a pulmonary embolism, return to normal function.

9.7* Medical Conditions Involving the Cardiovascular System. The physician shall report any applicable job restrictions associated with the conditions in Table 9.7.

Table 9.7 Medical Conditions Involving the Cardiovascular System

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1)* Coronary artery disease	-	Meets the following provisions annually or at the frequency indicated: a) Has absence of angina pectoris, even if relieved by medication b) Has absence of stenosis in any coronary artery (i.e., greater than 70% lumen diameter narrowing) following treatment c) Every 2 to 3 years, as medically indicated, has normal left ventricular ejection fraction as measured by radionuclide scan, contrast ventriculography, or echocardiography d) Every 2 to 3 years, as medically indicated, has maximal exercise tolerance *(see 9.3.4)* e) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response observed by radionuclide stress test *(see 9.3.4)* f) Has control of modifiable risk factor(s) for acute coronary plaque rupture g) Had no myocardial infarction within the previous 6 months h) Had no coronary artery bypass surgery within the previous 6 months i) Had no angioplasty, with or without stent placement, within the previous 3 months j) Is not currently prescribed anticoagulation medication, regardless of dose *(see Section 9.13 for anticoagulation medication)* k) Has completed cardiac rehab, if indicated l) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (j) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13, 15
(2) Myocardial infarction or coronary revascularization procedure	-	Meets the following provisions: a) Has no exercise-induced myocardial ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when a radionuclide stress test is performed *(see 9.3.4)* b) Is not currently prescribed anticoagulation medication, regardless of dose *(see Section 9.13 for anticoagulation medication)*	1, 2, 4, 5, 6, 7, 8, 13, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(3) Congestive heart failure (CHF)	Has CHF due to any etiology, including any disease leading to a lower than normal left or right ventricular ejection fraction, even if corrected by medication	Meets the following provisions every 2 to 3 years, as medically indicated: a) Has no structural abnormalities as demonstrated by cardiac imaging b) Has normal left ventricular function as demonstrated by cardiac imaging c) Has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* d) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks If due to a reversible process (e.g., hyperthyroidism, anemia), has no abnormality in cardiac performance off all cardiac medications	1, 2, 4, 5, 6, 7, 8, 13, 15
(4) Restrictive cardiomyopathy and constrictive pericarditis	Has heart failure	Meets the following provisions every 2 to 3 years, as medically indicated: a) Has no structural abnormalities as demonstrated by cardiac imaging b) Has normal left ventricular function as demonstrated by cardiac imaging c) Has no exercise-induced evidence of toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* d) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 9, 13, 15
(5)* Acute pericarditis, acute endocarditis, and acute myocarditis	-	Meets the following provisions every 2 to 3 years, as medically indicated: a) Has no structural abnormalities as demonstrated by cardiac imaging b) Has normal left ventricular function as demonstrated by cardiac imaging c) Has no exercise-induced evidence of toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* d) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(6) Chronic pericarditis, endocarditis, or myocarditis	Has heart failure, valvular incompetence, or arrhythmias	Meets the following provisions every 2 to 3 years, as medically indicated: a) Has no structural abnormalities as demonstrated by cardiac imaging b) Has normal left ventricular function as demonstrated by cardiac imaging c) Has no exercise-induced evidence of toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* d) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13, 15
(7)* Hypertrophic obstructive cardiomyopathy	-	Meets the following provisions annually or at the frequency indicated: a) Has no history of syncope b) Has no history of cardiac arrest c) Has no history of toxic arrhythmias, including recent monitoring by Holter or loop recorder d) Has left ventricle thickness of less than 30 mm as demonstrated by cardiac imaging e) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* f) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (e) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13, 15
(8)* Recurrent syncope	-	Has no recurrence within the last 2 years *(if the underlying cause is identified, see the relevant section for that condition)*	13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(9)* Pacemaker or automatic implantable defibrillator	-	Meets the following provisions annually or at the frequency indicated: a) Is no longer dependent on the pacemaker or automatic defibrillator (even if still implanted) b) Is not currently prescribed cardiac anti-arrhythmic medication and has no inducible toxic arrhythmias as determined by a cardiologist with testing (e.g., 24-hour or longer duration loop recorders, or electrophysiology testing) c) Has no structural abnormalities as demonstrated by cardiac imaging d) Has normal left ventricular function as demonstrated by cardiac imaging e) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)* f) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (e) and can safely and effectively perform the essential job tasks	13
(10) Mitral valve stenosis, moderate to severe	Has valve area less than or equal to 1.5 cm^2 or pulmonary artery systolic pressure greater than 35 mm Hg	-	1, 2, 4, 5, 6, 7, 8, 13
(11)* Mitral valve insufficiency, moderate to severe	Has left ventricular dysfunction	-	1, 2, 4, 5, 6, 7, 8, 13
(12) Aortic valve stenosis, moderate to severe	Has mean aortic valvular gradient greater than or equal to 20 mm Hg or valve area less than or equal to 1.0 cm^2	-	1, 2, 4, 5, 6, 7, 8, 13
(13) Aortic valve insufficiency	Has moderate to severe insufficiency	-	1, 2, 4, 5, 6, 7, 8, 13
(14) Prosthetic cardiac valves or valve repair *(see Section 9.13 for anticoagulation medication)*	-	Meets the following provisions annually: a) Is not currently prescribed anticoagulation medication, regardless of dose *(see Section 9.13)* b) Has normal function of the prosthetic or repaired valve as demonstrated by cardiac imaging c) Has normal left ventricular function as demonstrated by cardiac imaging d) Has a signed statement and medical records from a cardiologist or thoracic surgeon, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13
(15)* Wolff-Parkinson-White (WPW) syndrome	Has WPW with structural heart disease	-	13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
	Has WPW without structural heart disease but with a history of supraventricular tachycardia (SVT)	Meets the following provisions annually: a) Is treated successfully with ablation b) Is not currently prescribed cardiac anti-arrhythmic medication and has no toxic arrhythmias present as determined by a cardiologist with testing (e.g., 24-hour or longer duration loop recorders, or electrophysiology testing) c) Has no structural abnormalities as demonstrated by cardiac imaging d) Has normal left ventricular function as demonstrated by cardiac imaging e) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks	13
(16)* Toxic arrhythmias	Has supraventricular arrhythmias, atrial fibrillation, atrial flutter, or paroxysmal atrial tachycardias where persistent or recurrent	Meets the following provisions annually or at the frequency indicated: a) Has normal function and no structural abnormalities as demonstrated by cardiac imaging b) Is not currently prescribed cardiac anti-arrhythmic medication and has no toxic arrhythmias present as determined by a cardiologist with testing (e.g., 24-hour or longer duration loop recorders, or electrophysiology testing) c) Is not currently prescribed anticoagulation medication d) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging, off cardiac medications *(see 9.3.4)* e) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks	8, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
	Has ventricular arrhythmias (e.g., ventricular tachycardia and ventricular fibrillation) where persistent or recurrent or frequent toxic appearing ectopy	Meets the following provisions annually or at the frequency indicated: a) Has normal function and no structural abnormalities as demonstrated by cardiac imaging b) Is not currently prescribed cardiac anti-arrhythmic medication and has no toxic arrhythmias present as determined by a cardiologist with testing (e.g., 24-hour or longer duration loop recorders, or electrophysiology testing) c) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging, off cardiac medications *(see 9.3.4)* d) Every 2 to 3 years, as medically indicated, shows that ventricular ectopy, if present, resolves with increasing levels of exercise e) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks	13
(17) Atrioventricular block	Has third-degree or complete atrioventricular block	Meets the following provisions annually or at the frequency indicated: a) Has no structural abnormalities as demonstrated by cardiac imaging b) Has normal left ventricular function as demonstrated by cardiac imaging c) Has no evidence for sinus pause greater than 3 seconds d) Has normal increase in heart rate with exercise in the absence of a mechanical pacemaker e) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging *(see 9.3.4)*	13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(18)* Hypertension, moderate to severe	Has systolic pressure greater than or equal to 160 mm Hg or diastolic pressure greater than or equal to 100 mm Hg	Meets the following provisions annually or at the frequency indicated: a) Has controlled normal blood pressure as demonstrated by three normal readings over at least a 30-day period b) Has a risk of ASCVD under 10% as determined by the ACC/AHA Heart Risk Calculator c) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of left ventricular systolic dysfunction, ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, or abnormal blood pressure response when subjected to stress testing *(see 9.3.4)* d) Has no restrictions associated with end-organ damage *(see the section of this chapter that corresponds to the specific organ that is damaged)*	1, 2, 4, 5, 6, 7, 9, 13, 15
(19)* Hypertension, mild	Has systolic blood pressure of 140 to 159 mm Hg or diastolic blood pressure of 90 to 99 mm Hg and either of the following: a) Evidence of end-organ damage b) 10% or greater risk of ASCVD over the next 10 years, as determined by using the 10-year ACC/AHA Heart Risk Calculator *(For mild hypertension with neither of the above conditions, see 9.7.1.)*	Meets the following provisions annually or at the frequency indicated: a) Is referred to their primary care physician to ensure that their blood pressure is controlled (i.e., three normal readings over at least a 30-day period), to screen for end-organ damage, and to address underlying co-morbidities and the possible need for lifestyle modifications b) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of left ventricular systolic dysfunction, ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, or abnormal blood pressure response *(see 9.3.4)* c) Has no restrictions associated with end-organ damage *(see the section of this chapter that corresponds to the specific organ that is damaged)*	1, 2, 4, 5, 6, 7, 9, 13, 15
(20)* Metabolic syndrome	-	Meets the following provisions annually or at the frequency indicated: a) Has control of modifiable risk factor(s) b) Has aerobic capacity of 12 METs or higher c) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response *(see 9.3.4)*	1, 2, 4, 5, 6, 7, 13
(21)* Low aerobic capacity	Has aerobic capacity less than 8 METs, as demonstrated during the individual's most recent fitness evaluation *(see Chapter 8)* or medical stress test, if required to evaluate a medical condition *(see 9.3.4)*	-	1, 2, 4, 5, 6, 7, 8, 9, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(22) Congenital abnormalities of the heart, aorta, or other major vessels	Has a history of a cardiovascular congenital abnormality that has been treated by surgery but with residual complications or that has not been treated by surgery, leaving residuals or complications	-	1, 2, 4, 5, 6, 7, 8, 13
(23) Cardiac hypertrophy	-	Meets the following provisions annually or at the frequency indicated: a) Has normal or only minimally reduced left ventricular function as demonstrated by cardiac imaging b) Has normal increase in heart rate with exercise in the absence of a mechanical pacemaker c) Every 2 to 3 years, as medically indicated, has normal blood pressure at rest d) Every 2 to 3 years, as medically indicated, has no exercise-induced evidence of ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure when subjected to stress testing with imaging, off cardiac medications *(see 9.3.4)* e) Has a signed statement and medical records from a cardiologist, indicating that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 13
(24) Heart transplant *(see Section 9.13 for antirejection medication)*	-	-	1, 2, 4, 5, 6, 7, 13
Vascular Disorders*			
(25) Aortic dilation or aneurysm (i.e., thoracic aortic aneurysm or abdominal aortic dilation or aneurysm greater than or equal to 4.5 cm)	-	Meets the following provisions annually or at the frequency indicated: a) Has controlled normal blood pressure as demonstrated by three normal readings over at least a 30-day period b) Every 1 to 2 years, has stable aortic measurement as demonstrated by cardiac imaging c) Has a signed statement and medical records from a cardiologist, thoracic surgeon, or vascular surgeon, indicating that the individual meets the provisions specified in (a) and (b) and can safely and effectively perform the essential job tasks d) If the thoracic or abdominal aortic aneurysm is surgically repaired, has no complications after 6 months of postsurgical healing and meets (a) through (c)	1, 4, 5, 6, 7, 13
(26)* Carotid artery disease	Is symptomatic and has reduction in blood flow of greater than 70%	-	13
(27) Thoracic outlet syndrome	Is symptomatic	-	1, 13
(28) Peripheral vascular disease (arterial or venous)	Is symptomatic (e.g., claudication, Raynaud's phenomenon) or has severe peripheral edema	-	1, 4, 5, 6, 7, 9, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(29) Thrombophlebitis or deep venous thrombosis	Has persistent or recurrent condition or is prescribed anticoagulation medication, regardless of dose *(see Section 9.13 for anticoagulation medication)*	Meets both of the following: a) Is able to wear PPE b) Has no restrictions related to any underlying cause c) Is not currently prescribed anticoagulation medication, regardless of dose *(see Section 9.13 for anticoagulation medication)*	1, 4, 5, 6, 7, 9, 13
(30) Circulatory instability, as indicated by orthostatic hypotension or persistent tachycardia	-	-	13
(31) Chronic, severe lymphedema or massive edema of any type (e.g., due to lymphadenopathy, severe venous valvular incompetency, endocrine abnormalities, or low flow states)	-	Meets both of the following: a) Is able to wear PPE b) Has no restrictions related to any underlying cause	1, 2, 4, 5, 6, 7, 9, 13
(32) Congenital or acquired lesions of the aorta or major blood vessels	Has a lesion that interferes with circulation or increases the potential for life-threatening sudden incapacitation	-	1, 4, 7, 13

*Additional information is provided in A.9.7.

A.9.7 Firefighting activities have a high static component (i.e., inducing predominantly an increase in blood pressure) and a moderate to high dynamic component (i.e., inducing predominantly an increase in heart rate). Sports with a similar set of demands include wrestling, body building, and boxing. Recommendations made by the task force with respect to athletic activities that have these physical demands (high static, moderate dynamic) have been followed in this document.

Performance of the aerobic and anaerobic essential job tasks in a stressful, noxious fire or rescue environment with low oxygen, high carbon monoxide, and numerous toxic gases has significant risk for acutely aggravating pre-existing arrhythmias and cardiac ischemia (oxygen delivery) and decreasing cardiac valve or muscle function (oxygen supply). To protect from this environment requires that the firefighter wear personal protective equipment (PPE) and SCBA. The PPE provides a thermal barrier at the cost of added weight, encapsulation, dehydration, and increased metabolic cost for a given workload. The SCBA is a positive-pressure demand valve respirator that provides a barrier against the inhalation of noxious/toxic gases and particulate matter but at increased metabolic cost due to its weight and increased respiratory workload. The high static component and moderate to high dynamic component of firefighting activities increase physiologic stress and cardiac demand and can precipitate acute cardiac collapse, heart attack, syncope (blackout), or sudden death. In the absence of sudden death, the fact that the firefighter was operating in an isolated, dangerous environment when a cardiac event occurred would make the subsequent risk for such an event leading to death unacceptably high for that firefighter, for victims that depend upon that firefighter, or for other firefighters who not only depend upon that firefighter but can also be called upon to rescue that firefighter.

The following information pertains to the conditions marked with an asterisk in Table 9.7.

(1) Coronary artery disease. Following a myocardial infarction or a coronary revascularization procedure, a radionuclide stress test should be performed to evaluate exercise tolerance and the presence of exercise-induced myocardial ischemia or ventricular arrhythmias. For detection of ischemia, imaging with radionuclide, when available, is superior to imaging by echo.

***(5) Acute pericarditis, acute endocarditis, and acute myocarditis.* In nearly all cases, the individual will require medical leave early on, until the condition stabilizes.**

(7) Hypertrophic obstructive cardiomyopathy. Those without any of the risk factors in special provisions (a) through (d) have a less than 1 percent risk of sudden death.

(8) Recurrent syncope. A first episode of syncope must be fully evaluated to determine that the underlying cause does not compromise a firefighter's ability to safely and effectively perform essential job tasks. Underlying neurologic, cardiovascular, circulatory, or endocrine disturbance must be ruled out. If after evaluation there is no evidence for

underlying disease, exam is normal, and there has been no reoccurrence, then the individual need not be restricted from performing essential job tasks. If underlying disease is present and not reversible, then the individual's ability to safely and effectively perform the essential job tasks is compromised due to risk for life-threatening sudden incapacitation. *(For additional recommendations, see the section relevant to the underlying disease.)* If recurrent and no underlying disease, then the individual's ability to safely and effectively perform the essential job tasks might be compromised.

(9) Pacemaker or automatic implantable defibrillator. This technology has not been FDA approved for operating effectively under conditions commonly found on the fireground (electromagnetic interference). In addition, the requirement for pacemaker or implantable defibrillator defines the underlying cardiac condition as life-threatening. Many pacemakers do not have the ability to automatically increase heart rate upon demand during the essential job tasks performed on the fireground.

(11) Mitral valve insufficiency, moderate to severe. Mitral valve prolapse only interferes with safe performance of critical job tasks if associated with arrhythmias or if moderate to severe mitral regurgitation is present.

(15) Wolff-Parkinson-White (WPW) syndrome. Evaluation with ECG, Holter monitor, loop recorder, or stress test should be further supplemented with electrophysiology study (EPS), when appropriate. If rapid supraventricular tachycardia is inducible and surgical ablation is successful, there is no medical reason to restrict the individual from performing essential job task 13.

(16) Toxic arrhythmias. Toxic arrhythmias include supraventricular arrhythmias, atrial fibrillation, atrial flutter, paroxysmal tachycardias, ventricular tachycardia, and ventricular fibrillation. Even if rate controlled (with or without medication), the added catecholamine stress and dehydration produced when performing essential job tasks on the fireground makes the potential for life-threatening sudden incapacitation associated with this rhythm disturbance too great a risk. If persistent or recurrent, these arrhythmias, even if rate controlled, can result in embolic events, which prevent the safe and effective performance of essential job tasks on the fireground or during emergency responses.

Paroxysmal atrial tachycardia can sometimes be resolved with modification of diet or treatment of other underlying noncardiac conditions.

(18,19) Hypertension, moderate to severe; mild. Individuals with prehypertension (systolic 120–139 mm Hg or diastolic 80–89 mm Hg), mild hypertension (systolic 140 to 159 mm Hg or diastolic 90 to 99 mm Hg), or moderate to severe hypertension (systolic 160 mm Hg or greater or diastolic 100 mm Hg or greater) should be referred to their primary care physician for evaluation, lifestyle modification, and treatment.

Individuals with mild hypertension whose blood pressure returns to either prehypertension or normal with lifestyle modification or approved medications can return to an annual medical evaluation without restrictions.

Moderate to severe hypertension can damage the eye (e.g., retinopathy), the kidneys (e.g., nephropathy), the vascular system (e.g., stroke, transient ischemic attack, peripheral artery disease), and the heart (e.g., left ventricular hypertrophy, heart failure). These hypertension complications are known as end-organ damage. The cardiovascular complications are associated with an increased risk of sudden incapacitation and sudden death (Koren et al. 1991). **When the systolic blood pressure is 160 mm Hg or higher or the diastolic blood pressure is 100 mm Hg or higher, there is a high risk for cardiovascular diseases such as myocardial infarction or stroke and for end-organ damage. Increased risk for atherosclerotic cardiovascular disease (ASCVD) is defined as a 10 percent or greater risk of ASCVD over the next 10 years, as determined using the 10-year ACC/AHA heart risk calculator,** understanding that, as with any algorithm, limitations can exist when applied to groups different from those used for the validation. For example, the 10-year ACC/AHA algorithm has not been validated in younger adults (i.e., below age 40) where the prevalence of atherosclerotic heart disease is much lower. In younger adults, application of this algorithm might be reasonable for disease prevention, but its use for work restriction is unproven and should be considered only as part of an individual evaluation**.** Furthermore, cardiac complications are frequently asymptomatic, and valid screening tests are not fast or inexpensive. Therefore, determining which individuals to screen for cardiac complications [such as echocardiogram for left ventricular hypertrophy or for measurement of left ventricular ejection fraction (heart failure) or stress imaging for ACSVD] should be based on the severity and the duration of hypertension and the presence of other comorbidities.

For individuals with long-standing hypertension whose blood pressure has not been controlled, additional evaluation for possible end-organ damage should be considered, including all the following:

(1) Complete patient history for symptoms of heart failure (e.g., shortness of breath upon exertion) or transient ischemic attacks (TIAs)
(2) Dilated eye examination for retinopathy
(3) Blood creatinine measurement for nephropathy

(4) Tests for left ventricular hypertrophy (Use of the resting ECG to detect left ventricular hypertrophy is insensitive, e.g., 5 percent sensitivity, so echocardiogram is the currently accepted test for diagnosing left ventricular hypertrophy.)

The cardiac and vascular complications of hypertensions are associated with an increased risk of sudden incapacitation and sudden cardiac death (Koren et al. 1991). With proper evaluation, lifestyle modification, or treatment, these complications can be avoided. Lifestyle modification includes weight reduction, dietary plan, reduction in dietary sodium, an increase in aerobic physical activity, and moderation in alcohol consumption [Chobanian 2003].

Because of the high risk of a sudden cardiovascular event (e.g., due to undiagnosed cardiac disease), individuals with moderate to severe hypertension or with end-organ damage should be restricted until their blood pressure can be brought under control and end-organ damage can be assessed *(see section for the organ damage involved)*.

(20) Metabolic syndrome. Metabolic syndrome includes three or more of the following components:

(1) Abdominal obesity, defined as a waist circumference greater than 102 cm (40 in.) in men or greater than 88 cm (35 in.) in women
(2) High triglyceride levels of more than 150 mg/dl
(3) HDL cholesterol level of less than 40 mg/dl for men, <50 mg/dl for women
(4) Systolic blood pressure greater than 130 mmHg or a diastolic blood pressure greater than 80 mmHg
(5) Fasting blood glucose levels greater than 100 mg/dl

Metabolic syndrome is associated with reduced aerobic capacity that interferes with the ability to train to be a firefighter and to safely and effectively perform essential job tasks.

A body mass index (BMI) of 30 or greater has a high predictive value for the metabolic syndrome. BMI adjusts body weight based on a person's height but cannot differentiate between muscle mass and fat burden.

Individuals with metabolic syndrome are at increased risk for cardiovascular ischemic disease, diabetes, and accelerated hypertension that could result in sudden incapacitation from myocardial infarction or stroke.

Individuals with metabolic syndrome should receive a cardiac stress test. Individuals should be counseled as to lifestyle adjustments, receive an exercise prescription, and be referred to their personal physician for treatment of their elevated cholesterol, triglycerides, insulin-resistant hyperglycemia, or hypertension.

(21) Low aerobic capacity. An evaluation of aerobic capacity should be performed after appropriate medical evaluation *(see A.8.2.2.1.1)*.

Vascular Disorders.

Vascular disorders include any disorder of the vascular (i.e., arterial or venous) system including, but not limited to, aneurysm, peripheral vascular insufficiency, and thromboembolic disease. Heart rate, blood pressure, and shear forces on vessel walls are increased when performing many of the essential job tasks, thereby increasing the risk of acute dissection, rupture, or embolic phenomena that can result in life-threatening sudden incapacitation.

(26) Carotid artery disease. Carotid endarterectomy and carotid artery stenting are effective long-term stroke prevention strategies in symptomatic patients with flow obstruction greater than 70 percent. However, uncertainty remains regarding the optimal technique for long-term prevention of vascular events in asymptomatic patients with flow obstruction greater than 70 percent and whether either is sufficiently better than medical therapy.

9.7.1 Mild Hypertension.

If an individual has mild hypertension (i.e., systolic blood pressure of 140 to 159 mm Hg or diastolic blood pressure of 90 to 99 mm Hg), no evidence of end-organ damage, and less than 10 percent risk of ASCVD over the next 10 years, as determined by using the 10-year ACC/AHA Heart Risk Calculator, the fire department physician shall refer the individual to their primary care physician to ensure that their blood pressure is controlled (i.e., three normal readings over at least a 30-day period), to screen for end-organ damage, and to address underlying comorbidities and the possible need for lifestyle modifications.

9.8* Medical Conditions Involving the Endocrine System and Metabolic Function. The physician shall report any applicable job restrictions associated with the conditions in Table 9.8.

Table 9.8 Medical Conditions Involving the Endocrine System and Metabolic Function

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)

(1)* Type 1 diabetes mellitus	Requires treatment with insulin	Meets the following provisions annually or at the frequency indicated: a) Is maintained by a physician knowledgeable in current management of diabetes mellitus on a basal/bolus (i.e., can include subcutaneous insulin infusion pump) regimen using insulin analogs b) Has demonstrated over a period of at least 6 months the motivation and understanding required to closely monitor and control capillary blood glucose levels through nutritional therapy and insulin administration, including any experience and history dealing with erratic meal schedules, sleep disruption, and high aerobic and anaerobic workloads intrinsic to firefighting c) Has a dilated retinal exam by a qualified ophthalmologist or optometrist that shows no higher grade of diabetic retinopathy than mild nonproliferative (microaneurysms only), as indicated on the International Clinical Diabetic Retinopathy Disease Severity Scale d) Has normal renal function based on a calculated creatinine clearance greater than 60 mL/min using the Cockroft-Gault or similar formula and has absence of proteinuria (defined as 24-hour urine excretion of greater than or equal to 300 mg protein or greater than or equal to 300 mg of albumin per gram of creatinine in a random sample) e) Has no autonomic neuropathy (determined by evidence of gastroparesis, postural hypotension, or abnormal tests of heart rate variability) or peripheral neuropathy (determined by diminished ability to feel the vibration of a 128-Hz tuning fork or the light touch of a 10 g monofilament on the dorsum of the great toe proximal to the nail) f) Every 2 to 3 years, as medically indicated, has normal cardiac function without exercise-induced evidence of myocardial ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging *(see 9.3.4)* g) Has a signed statement and medical records from an endocrinologist or a physician with demonstrated knowledge in the current management of diabetes mellitus, indicating that the individual meets the following provisions: i. Is maintained on a stable basal/bolus regimen using insulin analogs and has demonstrated over a period of at least 6 months the motivation and understanding required to monitor and control capillary blood glucose levels through nutritional therapy and insulin administration despite varied activity schedules	5, 9, 13, 14

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
		ii. Has had hemoglobin A1C measured at least four times a year, at intervals of two to three months, over the last 12 months prior to evaluation if the diagnosis of diabetes has been present over 1 year iii. Does not have an increased risk of hypoglycemia due to alcohol use or other predisposing factors iv. Has had no episodes of severe hypoglycemia (i.e., requiring assistance of another) in the preceding year, with no more than two episodes of severe hypoglycemia in the preceding 3 years v. Is certified not to have a medical contraindication to firefighting training and operations h) Where a hemoglobin A1C reading of 8% or greater, is medically evaluated to determine if a condition exists in addition to diabetes that is responsible for the hemoglobin A1C not accurately reflecting average glucose levels, including evidence of a set schedule for blood glucose monitoring and a thorough review of data from such monitoring	

(2)* Type 2 diabetes mellitus that requires treatment with insulin	-		Meets the following provisions annually or at the frequency indicated: a) Is maintained by a physician knowledgeable in current management of diabetes mellitus on a basal/bolus (i.e., can include subcutaneous insulin infusion pump) regimen using insulin analogs b) Has demonstrated over a period of at least 3 months the motivation and understanding required to monitor and control capillary blood glucose levels through nutritional therapy and insulin administration, including any experience and history dealing with erratic meal schedules, sleep disruption, and high aerobic and anaerobic workloads intrinsic to firefighting c) Has a dilated retinal exam by a qualified ophthalmologist or optometrist that shows no higher grade of diabetic retinopathy than mild nonproliferative (microaneurysms only), as indicated on the International Clinical Diabetic Retinopathy Disease Severity Scale d) Has normal renal function based on a calculated creatinine clearance greater than 60 mL/min using the Cockroft-Gault or similar formula and has absence of proteinuria (defined as 24-hour urine excretion of greater than or equal to 300 mg protein or greater than or equal to 300 mg of albumin per gram of creatinine in a random sample) e) Has no autonomic neuropathy (determined by evidence of gastroparesis, postural hypotension, or abnormal tests of heart rate variability) or peripheral neuropathy (determined by diminished ability to feel the vibration of a 128-Hz tuning fork or the light touch of a 10 g monofilament on the dorsum of the great toe proximal to the nail) f) Every 2 to 3 years, as medically indicated, has normal cardiac function without exercise-induced evidence of myocardial ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging *(see 9.3.4)* g) Has a signed statement and medical records from an endocrinologist or a physician with demonstrated knowledge in the current management of diabetes mellitus, indicating that the individual meets the following provisions: i. Is maintained on a stable insulin regimen and has demonstrated over a period of at least 3 months the motivation and understanding required to monitor and control capillary blood glucose levels through nutritional therapy and insulin administration ii. Has had hemoglobin A1C measured at least four times a year, at intervals of two to three	5, 9, 13, 14

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
		months, over the last 12 months prior to evaluation if the diagnosis of diabetes has been present over 1 year iii. Does not have an increased risk of hypoglycemia due to alcohol use or other predisposing factors iv. Has had no episodes of severe hypoglycemia (i.e., requiring assistance of another) in the preceding year, with no more than one episode of severe hypoglycemia in the preceding 5 years v. Is certified not to have a medical contraindication to firefighting training and operations h) Where a hemoglobin A1C reading of 8% or greater, is medically evaluated to determine if a condition exists in addition to diabetes that is responsible for the hemoglobin A1C not accurately reflecting average glucose levels, including evidence of a set schedule for blood glucose monitoring and a thorough review of data from such monitoring	

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(3)* Type 2 diabetes mellitus that does not require insulin therapy and is able to control the condition with diet, exercise, or oral hypoglycemic agents	-	Meets the following provisions annually or at the frequency indicated: a) Has had hemoglobin A1C measured at least four times a year, at intervals of two to three months, over the last 12 months prior to evaluation if the diagnosis of diabetes has been present over 1 year b) If on oral hypoglycemic agents, has had no episodes of severe hypoglycemia (i.e., requiring assistance of another) in the preceding year c) Has a dilated retinal exam by a qualified ophthalmologist or optometrist that shows no higher grade of diabetic retinopathy than mild nonproliferative (microaneurysms only), as indicated on the International Clinical Diabetic Retinopathy Disease Severity Scale d) Has normal renal function based on a calculated creatinine clearance greater than 60 mL/min using the Cockroft-Gault or similar formula and has absence of proteinuria (defined as 24-hour urine excretion of greater than or equal to 300 mg protein or greater than or equal to 300 mg of albumin per gram of creatinine in a random sample) e) Has no autonomic neuropathy (determined by evidence of gastroparesis, postural hypotension, or abnormal tests of heart rate variability) or peripheral neuropathy (determined by diminished ability to feel the vibration of a 128-Hz tuning fork or the light touch of a 10 g monofilament on the dorsum of the great toe proximal to the nail) f) Every 2 to 3 years, as medically indicated, has normal cardiac function without exercise-induced evidence of myocardial ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging *(see 9.3.4)* g) Where a hemoglobin A1C reading of 8% or greater, is medically evaluated to determine if a condition exists in addition to diabetes that is responsible for the hemoglobin A1C not accurately reflecting average glucose levels, including evidence of a set schedule for blood glucose monitoring and a thorough review of data from such monitoring	5, 9, 13, 14
(4) Nutritional deficiencies, including those caused by congenital or acquired disorders of metabolism	Is unable to safely and effectively perform the essential job tasks due to severity and functional impact of a nutritional deficiency, based on the physician's assessment with consideration for percent of ideal body weight, body mass index (BMI), muscle strength, endurance, energy levels, and abilities to feed, hydrate, and absorb essential nutrients pre- and postfire activities	-	1, 5, 9, 13, 14

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(5)* Diseases of the adrenal gland, pituitary gland, parathyroid gland, or thyroid gland	Has untreated or uncontrolled disease(s) of the adrenal gland, pituitary gland, parathyroid gland, or thyroid gland	Has hyper- or hypohormonal disturbance that is controlled clinically with normal exam and normal serum levels, verified annually	1, 5, 9, 13, 14

*Additional information is provided in A.9.8.

A.9.8 All disorders of the hypothalamic-pituitary-adrenal axis can potentially affect firefighters because these hormonal systems play an essential role in maintaining homeostasis when exposed to physiologic and emotional stress while performing essential job tasks on the fireground or during emergency operations. Homeostatic regulation is further impaired under conditions of extreme temperature and dehydration, both of which are common when performing the essential job tasks of firefighting while wearing personal protective clothing on the fireground.

Without treatment, the risk of life-threatening dehydration, extreme alterations in body temperature, electrolyte disturbances, and muscle weakness while operating at a fire scene is unacceptably high. Mineralocorticoid deficiency also increases the risk of life-threatening hypotension and/or arrhythmias associated with exertion and dehydration. For this reason, untreated or uncorrected hypothalamic, hypopituitarism, hypothyroidism, hyperthyroidism, thyroid storm, hypoadrenalism, hyperadrenalism, parathyroidism, and other disorders of thyroid and adrenal function threaten an individual's ability to safely perform essential job tasks.

The following information pertains to the conditions marked with an asterisk in Table 9.8.

(1,2,3) Diabetes.

Type 1 diabetes was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes. Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin, which regulates blood glucose. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. Type 1 diabetes can account for 5 percent to 10 percent of all diagnosed cases of diabetes. To survive, people with Type 1 diabetes must have insulin delivered by a pump or injections.

Type 2 diabetes was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes can account for about 90 percent to 95 percent of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity. Type 2 diabetes is increasingly being diagnosed in children and adolescents. Many people with Type 2 diabetes can control their blood glucose by following a careful diet and exercise program, losing excess weight, and taking oral medication. Among adults with diagnosed diabetes, about 12 percent take both insulin and oral medications, 19 percent take insulin only, 53 percent take oral medications only, and 15 percent do not take either insulin or oral medications.

Diabetic individuals should be carefully monitored for control of blood sugar because lack of glycemic control increases the risk for dehydration, hypotension, and target organ damage (e.g., myocardial infarction), which can result in life-threatening sudden incapacitation during performance of essential job tasks. Such individuals should be monitored at regular intervals to ascertain that blood glucose and blood hemoglobin A1C levels remain under control. According to the American Diabetes Association 2010 guidelines, lowering hemoglobin A1C to below or around 7 percent has been shown to reduce microvascular and neuropathic complications of Type 1 and Type 2 diabetes. The recommendation for microvascular disease prevention in nonpregnant adults in general is for a hemoglobin A1C level of less than 7 percent. Exceptions to this 7 percent level would be any condition that exists in addition to diabetes that is responsible for the hemoglobin A1C not accurately reflecting average glucose levels (e.g., hemoglobinopathies such as sickle cell disease). Additional exceptions to this 7 percent level would occur in individuals already not meeting NFPA 1582 requirements (e.g., history of severe hypoglycemia or end-organ complications).

With medical control of diabetes, the risk of hypoglycemia (i.e., low blood sugar) becomes a major concern in regard to those with diabetes being or becoming firefighters. This risk is greatest in those with Type 1 diabetes.

In general, individuals treated with oral diabetes medications are at little risk of significant hypoglycemia. Individuals treated with metformin, alpha-glucosidase inhibitors, or thiazolidinediones alone or in combination with each other are at no risk of hypoglycemia, as these classes of drugs do not increase insulin levels. Individuals treated with sulfonylureas and related drugs have a risk of severe hypoglycemia less than 1 percent of the risk associated with insulin treatment. Individuals treated with diet and exercise alone (i.e., no oral diabetes medications or insulin) are at no risk of hypoglycemia.

Firefighting entails a unique set of conditions that need to be considered in regard to those with diabetes and the risks of hypoglycemia. Unpredictable meal schedules, periods of physical exertion, adrenergic stimulation, and sleep deprivation all present challenges to firefighters with diabetes. There are occasions when there is no safe access to food or other forms of oral glucose while wearing respiratory protection in a hazardous environment, and the typical symptoms of hypoglycemia might not be recognized as easily in the midst of fighting a fire. As well, it is not always possible to exit a hazard zone rapidly enough to treat hypoglycemic symptoms when detected. Individuals engaged in fire suppression are at greater risk than those engaged in other emergency activities (e.g., EMS, law enforcement) for this reason.

A review of current published data suggests that with careful individualized assessment it is possible to identify those with diabetes who can function fully as firefighters and who do not present a significant risk to themselves, their fellow firefighters, or to those they serve. Members that develop diabetes during their tenure can have difficulty adjusting or transitioning to normal duties.

The individualized assessment process and criteria included in Chapter 9 were set up to assure that only those who are managing their diabetes conscientiously using the most up-to-date approaches would be eligible to be a firefighter. In addition, certain patients have a greater tendency for significant hypoglycemia despite the quality of their diabetes management. Such individuals would not be good candidates to be firefighters and, accordingly, are excluded from service under the criteria in this standard.

This individualized assessment is possible in large part because a great deal of change has occurred in the treatment of diabetes in recent years. Previously, patients used insulins that were somewhat unpredictable in the time course of their action and generally took two injections per day. Today, there are insulins that are far more predictable and are either very long acting and essentially treat only endogenous glucose production (and therefore do not depend on a patient eating on a regular schedule) or are very rapid and therefore can be administered directly before, during, or even shortly after one eats, significantly decreasing the chance of insulin being taken and then the meal being interrupted due to firefighting duties.

Regimens now referred to as “basal bolus” are composed of a very long-acting basal (or background) insulin, which controls glucose levels overnight and in the absence of glucose intake and rapid-acting (bolus) insulins that are dosed just prior to, during, or even after meals based on blood glucose levels at that time, the amount of carbohydrate that the person expects to consume, and any anticipated change in physical activity patterns over the next number of hours.

These regimens have resulted in improved overall blood glucose control with significantly less risk of hypoglycemia for many patients.

Additional major advances in the size, speed, and sophistication of blood glucose meters provide for easy, accurate, and rapid assessment of blood glucose levels. Continuous glucose monitoring with electronic recordkeeping is readily available. Such monitoring techniques, as well as the generally increased self-awareness that accompanies consistent self-monitoring, enable the motivated firefighter with diabetes to assess blood glucose levels and ingest a safety net of carbohydrates before entering a hazardous environment. Similarly, major advances in insulin delivery systems have greatly increased the ability of the motivated individual with diabetes to achieve a level of diabetes self-management consistent with the duties of firefighting.

To get maximum effect from these medical advances, and to minimize the risk of hypoglycemia, individuals with diabetes must check their blood glucose level frequently (as recommended based on factors such as type of therapy and glycemic history), review these results on a regular basis, and see their diabetes care provider regularly for discussion in regard to any necessary changes in treatment. Evaluation of an individual needs to look for any of the known risk factors for serious hypoglycemia or evidence of any of the known microvascular (e.g., eye disease, kidney disease, or nerve disease) or macrovascular (e.g., cardiovascular disease, peripheral arterial disease) complications of diabetes. A stress test to a minimum workload is required because myocardial infarction remains the major cause of line-of-duty fatalities, and diabetes (Type 1 and Type 2) is not only a risk factor for myocardial ischemia but also for silent myocardial ischemia.

The individualized assessment demands a very close and good working relationship between the individual and the diabetes care provider. The experience of those who care for current firefighters with diabetes is that this works for a highly motivated individual who will do whatever it takes to perform his/her job at a high level and in a safe manner.

Recognizing that there is variability in the relationship between the hemoglobin A1C and the 3-month average blood glucose, we recommend that hemoglobin A1C levels greater than the 8 percent threshold be confirmed by a second determination before action is taken.

The physician evaluating an individual with a hemoglobin A1C >8 percent should consider a discordance between the A1C and the 3-month average glucose if any of the following conditions exists:

(1) A repeated value is below the threshold.
(2) A single A1C determination is discordant with prior or subsequent determinations with no other evidence of deterioration in glycemic control.
(3) The patient's reported capillary blood glucose determinations or venous glucose determinations in the physician's office are significantly lower than those reflected by the estimated average glucose (eAG) (eAG calculator available at http//professional.diabetes.org/glucosecalculator.aspx).
(4) The patient has a personal or family history or other evidence of a hemoglobinopathy.
(5) The patient is a member of an ethnic group with increased risk of hemoglobinopathy.

If the evaluating physician suspects that the A1C overestimates average blood glucose, further evaluation can include the following:

(1) A repeat HbA1C
(2) Prior HbA1C values
(3) Serum fructosamine determination
(4) Downloaded reports from a memory glucometer
(5) Downloaded reports from a 72-hour continuous glucose monitor
(6) Downloaded reports from a personal continuous glucose monitoring device

Possible explanations for discordance between the eAG based on A1C and the patient's true average glucose include the following:

(1) *Assay Precision.* The American College of Pathology accepts variation within 7 percent in A1C assays. Thus, a person with an A1C of 8 percent might have a value between 7.5 percent and 8.5 percent on repeat testing of the same sample. [Cohen 2010]
(2) *Hemoglobinopathies.* According to the National Diabetes Information Clearinghouse (NDIC): "With some assay methods, A1C tests in patients with hemoglobinopathies result in falsely high outcomes, overestimating actual average blood glucose levels for the previous 2 to 3 months. Physicians may then prescribe more aggressive treatments, resulting in increased episodes of hypoglycemia. Some assay methods used with some hemoglobinopathies may result in falsely low outcomes, leading to under-treatment of diabetes." Also according to the NDIC: "About one in 12 African Americans has sickle cell trait. About 14.7 percent of African Americans aged 20 years or older have diabetes. Therefore, many African Americans have both diabetes and sickle cell trait. People of Southeast Asian descent are at risk for having hemoglobin E (HbE), another hemoglobin variant."
(3) *Interindividual Variation.*
(4) *Clinical Studies.* A comparison of HbA1C with average glucose derived from 2 days of continuous monitoring and 3 months of 7-point glucose profiles at least three times a week. The confidence interval for average glucose with an A1C of 8 percent was 147–217 mg/dl. [Nathan 2008]
(5) *RBC Lifespan:* Hemoglobin A1C levels are a "snapshot" of what is truly a rolling average. Subclinical variation in RBC lifespan can have a significant effect on the relationship between mean glucose and A1C, with increases in average RBC lifespan increasing net glycosylation and decreases (as in some hemoglobinopathies or in recovery from hemorrhage or anemia) decreasing net glycosylation. [Herman and Cohen 2010, Cohen 2008]
(6) *RBC Glucose Transport.* Variations in transport across the RBC membrane result in different intracellular and extracellular glucose levels, thus affecting intracellular hemoglobin exposure to glucose and resultant glycosylation. [Khera 2008]
(7) *Variations in Glycosylation Rates.* Patients vary in activity of the glycosylation reaction; genetically determined "high" and "low" rates of glycosylation have been described in a number of studies, explaining about one-third of interindividual variation in A1C levels. [Hudson 1999, Snieder 2001, Hempe 2002, Cohen 2006, Soranzo 2010]
(8) *Interethnic Variation.* Numerous studies have identified the effect of ethnicity on the relationship between average glucose and A1C. In general, Caucasians have significantly lower A1C levels at comparable glucose. [Herman 2007, Cohen 2007, Viberti 2006, Herman 2009, Ziemer 2010, Kirk 2006]. This variability is independent of the effect of hemoglobinopathies noted in (2).

(5) Diseases of the adrenal gland, pituitary gland, parathyroid gland, or thyroid gland. The individual should be evaluated for absence of orthostatic hypotension, electrolyte disorders, ability to maintain hydration during exercise under extreme environmental conditions, and normal thyroxine levels with supplementation.

9.9* Medical Conditions Involving the Gastrointestinal Tract and Abdominal Viscera. The physician shall report any applicable job restrictions associated with the conditions in Table 9.9 based on physician's evaluation of the individual's nutrition regimen and a propensity for symptomatic dehydration, anemia, chronic diarrhea, or incapacitating pain syndromes.

Table 9.9 Medical Conditions Involving the Gastrointestinal Tract and Abdominal Viscera

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1)* Gastrointestinal disorders, including cholecystitis, gastritis, GI bleeding, inflammatory bowel disease or irritable bowel syndrome, intestinal obstruction, pancreatitis, diverticulitis, cirrhosis, or gastric or other GI ulcers, including Zollinger-Ellison syndrome	Has uncontrolled symptomatic dehydration, anemia, or incapacitating pain syndromes	Has symptoms under control without frequent acute flairs and without functional impairment, such as malnutrition, symptomatic dehydration, anemia, chronic diarrhea, or chronic pain syndrome	1, 5, 9, 13, 14
(2)* Gastrointestinal surgery (e.g., cholecystectomy, appendectomy, splenectomy), excluding transplant	-	Postoperatively, has healed without functional impairment, such as malnutrition, symptomatic dehydration, anemia, chronic diarrhea, or chronic pain syndrome	-
(3)* Abdominal wall, inguinal, or femoral hernia	Has high risk for incarceration and bowel strangulation during heavy exertion and lifting or for weakening of the abdominal wall musculature, as judged by the fire department physician	Has umbilical hernia that is small and asymptomatic or has abdominal wall hernia that has been surgically corrected and well-healed with surgeon's clearance for full lifting	1, 4, 6, 7, 13
(4) Liver transplant *(see Section 9.13 for anti-rejection medication)*	-	-	-
(5) Kidney disease	Has chronic, Stage 4 or greater kidney disease [glomerular filtration rate (GFR) < 30 ml/min]	-	9, 11, 13, 14, 15
(6) Hemodialysis or continuous ambulatory peritoneal dialysis	-	Meets the following provisions annually or at the frequency indicated: a) Has demonstrated, over a period of at least 6 months, the motivation and understanding required to adhere to the prescribed dialysis schedule while working b) On dialysis, has acceptable metabolic parameters (creatinine, BUN, Potassium, and so forth) c) Every 2 to 3 years, as medically indicated, has normal cardiac function without exercise-induced evidence of myocardial ischemia, toxic arrhythmias, hypoxia, exercise hemoglobin oxygen desaturation, left ventricular dysfunction, or abnormal blood pressure response when subjected to stress testing with imaging *(see 9.3.4)* d) Has a signed statement and medical records from a nephrologist or physician that manages the individual's dialysis, indicating that the individual can safely and effectively perform the essential job tasks	9, 11, 13, 14, 15
(7) Kidney transplant *(see Section 9.13 for anti-rejection medication)*	-	-	-

*Additional information is provided in A.9.9.

A.9.9 The following information pertains to the conditions marked with an asterisk in Table 9.9.

(1) Gastrointestinal disorders.

Cholecystitis (that which causes frequent pain due to stones or infection) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

Gastritis (that which causes recurrent pain and impairment) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

GI bleeding can cause fatigue or hemodynamic instability resulting in the inability to safely and effectively perform essential job tasks.

Inflammatory bowel disease (that which causes disabling pain or diarrhea) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks. It is a progressive illness leading to functional impairment.

Intestinal obstruction (that is, recent obstruction with impairment) can result in frequent episodes of pain, the inability to safely and effectively perform essential job tasks, and the potential for sudden incapacitation.

Pancreatitis (chronic or recurrent) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

Cirrhosis, hepatic or biliary (that which is symptomatic or in danger of bleeding), can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

A gastrointestinal ulcer (where symptoms are uncontrolled by drugs or surgery) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

(2) Gastrointestinal surgery (e.g., cholecystectomy, appendectomy, splenectomy), excluding transplant. To prevent infections, a pneumococcal vaccination regimen is recommended at regular intervals.

A history of gastrointestinal surgery or bowel resection (if frequent diarrhea precludes performance of duty) can result in frequent episodes of pain and the inability to safely and effectively perform essential job tasks.

(3) Abdominal wall, inguinal, or femoral hernia. The individual should be evaluated for persistent abnormality causing increased risk of infection or strangulation.

9.10* Medical Conditions Involving the Spine. The physician shall report any applicable job restrictions associated with the conditions in Table 9.10 based on physician's evaluation of peripheral motor weakness, loss of strength, loss of sensation, and loss of reflexes affecting endurance, strength, flexibility, pain, or gait.

Table 9.10 Medical Conditions Involving the Spine

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Any of the following spine conditions: a) Scoliosis of thoracic or lumbar spine with angle greater than or equal to 40 degrees b) Any spinal or skeletal condition producing sensory or motor deficit(s) or pain due to radiculopathy or nerve compression c) Any spinal or skeletal condition causing pain that frequently or recurrently requires narcotic analgesic medication d) Cervical vertebral fractures with multiple vertebral body compression greater than 25%; evidence of posterior element involvement, nerve root damage, disc involvement, dislocation (i.e., partial, moderate, severe), abnormal exam, ligament instability, symptomatic, or less than 6 months post injury or less than 1 year since surgery e) Thoracic vertebral fractures with vertebral body compression greater than 50%; evidence of posterior element involvement, nerve root damage, disc involvement, dislocation (e.g., severe — with or without surgery), abnormal exam, ligament instability, symptomatic, or less than 6 months post injury or less than 1 year since surgery f) Lumbosacral vertebral fractures with vertebral body compression greater than 50%; evidence of posterior element involvement, nerve root damage, disc involvement, dislocation (i.e., partial, moderate, severe), fragmentation, abnormal exam, ligament instability, symptomatic, or less than 6 months post injury or less than 1 year since surgery g) History of spine surgery or injury	-	Is evaluated to be able to safely and effectively perform the essential job tasks	1, 2, 4, 5, 6, 7, 8, 13
(2) Spinal fusion	-	-	1, 2, 4, 5, 6, 7, 8, 13
(3) Ankylosing spondylitis	-	-	1, 2, 4, 5, 6, 7, 8, 13
(4) Radiculopathy	-	-	1, 2, 4, 5, 6, 7, 8, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(5)* Spine structural abnormality, fracture, or dislocation that causes progressive or recurrent impairment	-	-	1, 2, 4, 5, 6, 7, 8, 13
(6) Disc herniation	Has herniation of nucleus pulposus or a history of laminectomy, discectomy, or single-level fusion dislocation	-	1, 2, 4, 5, 6, 7, 8, 13

*Additional information is provided in A.9.10.

A.9.10 Firefighters with active, ongoing, or recurrent spinal disorders can have difficulty due to reduced motor strength, sensation, and flexibility as well as problems with fatigue, coordination, gait, and equilibrium. The personal protective ensemble and SCBA can place the firefighter's spine at a biomechanical disadvantage due to added weight and altered center of gravity. Certain medications (e.g., narcotics and muscle relaxants) used to treat spinal conditions can frequently produce or worsen somnolence, discoordination, and disequilibrium. Neurologic dysfunction, regardless of cause, can produce sudden incapacitation, which when working in dangerous environments can result in life-threatening injuries.

The following information pertains to the conditions marked with an asterisk in Table 9.10.

(5) Spine structural abnormality, fracture, or dislocation that causes progressive or recurrent impairment. Spinal structural abnormality, a fracture, or a dislocation can also result in ligament instability, increasing the risk for future dislocation and neurologic compromise.

9.11* Medical Conditions Involving Orthopedics. The physician shall report any applicable job restrictions associated with the conditions in Table 9.11 with consideration of the following:

(1) Firefighters with active, ongoing, or recurrent orthopedic disorders can have difficulty due to reduced motor strength, sensation, and flexibility as well as problems with fatigue, coordination, gait, and equilibrium.
(2) PPE and SCBA can place the firefighter's involved extremity at a biomechanical disadvantage due to added weight and altered center of gravity.
(3) Certain medications (e.g., narcotics and muscle relaxants) used to treat orthopedic conditions can produce or worsen somnolence, discoordination, and disequilibrium.

Table 9.11 Medical Conditions Involving Orthopedics

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Amputation or congenital absence of arm, hand, or thumb	-	Has no impairment of grip and other physical abilities required to rapidly perform essential job tasks in an immediately dangerous to life and health (IDLH) environment	1, 4, 6, 7, 8, 13
(2) Amputation or congenital absence of finger(s), other than a thumb	-	Has no impairment of grip and other physical abilities required to rapidly perform essential job tasks in an immediately dangerous to life and health (IDLH) environment	1, 8
(3) Above-the-knee amputation or congenital absence of lower extremity limb (i.e., leg)	-	Has no impairment of ambulation and other weight-bearing activities required to rapidly perform essential job tasks in an IDLH environment	1, 4, 6, 7, 8, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(4) Below-the-knee amputation or congenital absence of lower extremity limb (i.e., leg or foot)	-	Meets the following provisions annually: a) Has a stable, unilateral BKA with at least the proximal third of the tibia present for a strong and stable attachment point with the prosthesis b) Is fitted with a prosthesis that will tolerate the conditions present in firefighting, when worn in conjunction with standard firefighting PPE c) Has at least 6 months of prosthetic use in a variety of physically demanding activities with no functional difficulties d) Has no significant inflammation, persistent pain, necrosis, or indications of instability at the amputee limb attachment point e) Demonstrates no disabling psychosocial issues pertaining to the loss of limb or use of prosthesis f) Has passed the department's physical ability test without accommodations or modification of the protocol g) Has a signed statement and medical records from a prosthetist or orthopedic specialist with expertise in the fitting and function of prosthetic limbs, indicating that the individual can safely and effectively perform the essential job tasks, including wearing PPE and SCBA while climbing ladders, operating from heights, and walking or crawling in the dark along narrow and uneven surfaces that might be wet or icy	1, 4, 6, 7, 8, 13
(5) Amputation or congenital absence of partial foot or toe(s)	-	Has no impairment of ambulation and other physical abilities required to rapidly perform essential job tasks in an IDLH environment	1, 4, 8
(6)* Single dislocation of a major joint	Has residual limitation of motion, depending upon degree, with or without surgery	-	1, 4, 6, 7, 8
(7)* Recurrent dislocation of a major joint	-	Has full functional motion, strength, and stability of the joint when examined after surgical repair	1, 4, 6, 7, 8
(8)* Ligament or meniscus knee disease	Has symptoms of locking, buckling, or giving-way	Has full functional motion, strength, and stability of the joint when examined after surgical repair	1, 4, 6, 7, 8
(9) Joint replacements or artificial joints	-	Meets the following provisions annually: a) Has normal range of motion, strength, and joint stability without history of dislocations post-replacement b) Has no pain or impairment with repetitive and prolonged pulling, bending, rotations, kneeling, crawling, and climbing c) Has no limiting pain d) Postsurgical replacement, has a signed statement and medical records from an orthopedic specialist, indicating that the individual can safely and effectively perform the essential job tasks	1, 4, 6, 7, 8
(10) Limitation of joint motion	Has significant limitation of motion or strength	-	1, 4, 6, 7, 8

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(11) Joint reconstruction	Has significant residual limitation of motion or strength	Meets the following provisions annually: a) Has normal range of motion, strength, and joint stability without history of dislocations post reconstruction b) Has no pain or impairment with repetitive and prolonged pulling, bending, rotations, kneeling, crawling, and climbing c) Has no limiting pain d) Postsurgical reconstruction, has a signed statement and medical records from an orthopedic specialist, indicating that the individual can safely and effectively perform the essential job tasks	1, 4, 6, 7, 8
(12) Fractures	Is unable to safely and effectively perform the essential job tasks due to the fracture location, fracture severity, or progress in healing or repair, as judged by the fire department physician	Has healed the fracture as assessed with a radiograph and physician's examination	1, 4, 6, 7, 8
(13)* Appliances (e.g., screws, pins, or metal plates)	Is unable to safely and effectively perform the essential job tasks due to the appliance location, as judged by the fire department physician	-	1, 4, 6, 7, 8
(14) Bone grafts	-	Has healed the graft as assessed with a radiograph and physician's examination	1, 4, 6, 7, 8
(15) Osteoarthritis or traumatic arthritis	Has frequent episodes of pain or reduced range of motion, strength, or endurance	-	1, 4, 6, 7, 8
(16) Inflammatory arthritis	Has frequent episodes of pain or reduced range of motion, strength, or endurance		1, 4, 6, 7, 8
(17) Complex regional pain syndrome	Has severe pain, requires narcotics or muscle relaxants, or has limited strength or flexibility	-	1, 4, 6, 7, 8
(18) Osteomyelitis or septic arthritis	Has active condition that is causing pain, local drainage, systemic infection, or increased risk for pathologic or traumatic fractures	-	1, 4, 6, 7, 8

*Additional information is provided in A.9.11.

A.9.11 Firefighters with active, ongoing, or recurrent orthopedic disorders can have difficulty due to reduced motor strength, sensation, and flexibility as well as problems with fatigue, coordination, gait, and equilibrium. These physical abilities are required to safely perform the essential job tasks. The protective uniform and SCBA can place the firefighter's involved extremity (upper or lower) at a biomechanical disadvantage due to added weight and altered center of gravity. Certain medications (e.g., narcotics and muscle relaxants) used to treat orthopedic conditions can produce or worsen somnolence, discoordination, and disequilibrium.

The following information pertains to the conditions marked with an asterisk in Table 9.11.

(6) Single dislocation of a major joint. Successful surgery for shoulder dislocation, if range of motion and strength were intact, would not interfere with the safe performance of essential job tasks.

(7) Recurrent dislocation of a major joint. Unrepaired, repeated joint dislocations indicate an unstable shoulder or hip, which can dislocate, leading to sudden incapacitation, placing the firefighter or the person depending on the firefighter at life-threatening risk. Postsurgical repair, the individual can perform essential job tasks if joint exam shows full functional motion, strength, and stability.

(8) Ligament or meniscus knee disease. Ligament or meniscus knee disease can lead to sudden incapacitation, placing the firefighter or the person depending on the firefighter at life-threatening risk. Symptoms of locking, buckling, or giving way or physical exams findings of joint instability, poor range of motion, significant swelling or tenderness might

compromise the individual's ability to safely and effectively perform the essential job tasks. Postsurgical repair, the individual can perform essential job tasks if joint exam shows full functional motion, strength, and stability.

(13) Appliances (e.g., screws, pins, or metal plates). If the appliance is superficial, it could lead to perforation of the skin under the normal abrasive conditions of firefighting.

If the underlying condition has healed, surgical consultation is advised to determine the risk-benefit analysis for removing the appliance, as not all appliances need to be removed. If the appliance is removed, evidence of bone healing should be assessed with a radiograph and physician's examination approximately 6 months postremoval before the individual is allowed to perform the essential job tasks.

9.12* Medical Conditions Involving Neurologic Functions. The physician shall report any applicable job restrictions associated with the conditions in Table 9.12, which could impair the individual's neurologic functions, including central regulation, cognitive abilities, strength, perception, reflexes, coordination, gait, and equilibrium.

Table 9.12 Medical Conditions Involving Neurologic Functions

Condition	**Special Criteria for Restriction**	**Special Provisions for No Restriction**	**Affected Essential Job Task(s)**
(1)* Epilepsy, including, but not limited to, simple, partial complex, generalized, psychomotor, or provoked seizure at high risk for recurrence	Two (2) or more unprovoked seizures more than 24 hours apart	Meets the following provisions annually: a) Had no seizures for the most recent consecutive 10 years b) Is currently on a stable regimen of antiepileptic drugs for the most recent 5 years with no side effects impacting the performance of the essential job tasks, or on no antiepileptic drugs for the most recent 5 years c) Has normal neurological examination results d) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 6, 8, 9, 10, 11, 13, 14
(2) Single unprovoked seizure, including, but not limited to, simple partial, complex partial, generalized, and psychomotor seizure disorders	-	Meets the following provisions annually: a) Had no seizures for the most recent consecutive 5 years b) Is currently on a stable regimen of antiepileptic drugs for the most recent 5 years with no side effects impacting the performance of the essential job tasks, or on no antiepileptic drugs for the most recent 5 years c) Has normal neurological examination results d) Has normal brain MRI results or meets the special provisions for epilepsy in (1) e) Has normal awake and asleep photic stimulation and hyperventilation EEG study results or meets the requirements for epilepsy in (1) f) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (e) and can safely and effectively perform the essential job tasks	1, 6, 8, 9, 10, 11, 13, 14

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(3) Provoked seizures associated with one of the following factors that have a low risk of recurrence: (a) Medications (b) Toxin exposures (c) Metabolic abnormalities (d) Withdrawal (e.g., alcohol, benzodiazepines) (e) Drugs (e.g., cocaine, amphetamines, PCP)	-	Meets the following provisions annually: a) The underlying cause of the seizure is no longer present and the risk of encountering the precipitating factor again is minimal b) Has normal neurological examination results c) Has normal brain MRI results or meets the special provisions for epilepsy in (1) d) Has normal awake and asleep photic stimulation and hyperventilation EEG study results or meets the special provisions for epilepsy in (1) e) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (d) and can safely and effectively perform the essential job tasks	1, 6, 8, 9, 10, 11, 13, 14
(4) Provoked seizures associated with one of the following factors that have a high risk of recurrence: (a) Head trauma that occurred more than 7 days before the seizure (b) Intracerebral or intracranial hemorrhage (c) Brain infection— encephalitis, bacterial meningitis, abscess, cysticercosis (d) Stroke— ischemic or hemorrhagic (e) Brain surgery (f) Structural brain lesion, such as brain tumor (g) Active phase of an autoimmune disease	-	Meets the following provisions annually: a) Had no seizures for the most recent consecutive 10 years b) Is currently on a stable regimen of antiepileptic drugs for the most recent 5 years with no side effects impacting the performance of the essential job tasks, or on no antiepileptic drugs for the most recent 5 years c) Has normal neurological examination results d) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 6, 8, 9, 10, 11, 13, 14
Other Neurologic or Neurovascular Conditions			

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(5) Any of the following neuromuscular, demyelinating, or other progressive neurologic diseases: a) Amyotrophic lateral sclerosis (ALS), Huntington's chorea, and bulbar palsy b) Ataxias of heredo-degenerative type c) Cerebral aneurysm d) Dementia or other cognition impairments (e.g., Alzheimer's and other neurodegenerative diseases) with symptomatic loss of function or cognitive impairment (e.g., less than or equal to 28 on Mini-Mental Status Exam) e) Hemiparalysis or paralysis of a limb f) Migraines g) Multiple sclerosis h) Muscular dystrophy or atrophy i) * Myasthenia gravis j) Myopathy or myositis k) Myoneuropathies (e.g., Guillain-Barré, post-botulism, post-polio syndrome) l) Narcolepsy m) Neuropathies n) Parkinson's disease and other movement disorders resulting in uncontrolled movements, bradykinesia, or cognitive impairment (e.g., less than or equal to 28 on Mini-Mental Status Exam)	-	Meets the following provisions annually: a) Is not prescribed medication that can impair job function b) Has normal neurological and cognitive examination results c) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 4, 6, 8, 9, 10, 13, 14, 15
(6) Other neurologic or neurovascular condition that affects any of the following: a) Neurologic function b) Gait, balance, or movement c) Cognitive function d) Stamina or energy level/fatigue e) Neurological sensitivity to medications, treatments, or operational environment, including heat, hazards, stress, and exertion)	-	Meets the following provisions annually: a) Is not prescribed medication that can impair job function *(see Section 9.13)* b) Has normal neurological and cognitive examination results c) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions in (a) and (b) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(7)* Cerebrovascular disease	Has documented episodes of focal, reversible, or neurological impairment	Meets the following provisions annually: a) Has not experienced a transient ischemic attack in the last 12 months, has controlled risk factors, and is treated with an antiplatelet agent, other than aspirin b) Has not experience an ischemic stroke in the last 12 months or for a time suitable to the estimated risk of seizure c) Has no decreased sensation or weakness that interferes with essential job tasks d) Has no physical limitations that interfere with essential job tasks e) Has no cognitive limitations that interfere with essential job tasks f) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions in (a) through (c) and can safely and effectively perform the essential job tasks	1, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15
(8)* Cerebrovascular bleed	-	Meets the following provisions annually: a) Has had the cause of bleeding surgically corrected, if indicated b) Has normal physical examination results, including blood pressure c) Has no history of seizure or meets the requirements for epilepsy or seizures in (1), (2), (3), or (4), as applicable d) Has not experienced a hemorrhagic stroke or subarachnoid hemorrhage in the last 12 months or for a time suitable to the estimated risk of seizure e) Has no decreased sensation or weakness that interferes with essential job tasks f) Has no physical limitations that interfere with essential job tasks g) Has no cognitive limitations that interfere with essential job tasks h) Has a signed statement from a neurologic specialist, indicating that the individual meets the provisions in (a) through (d) and can safely and effectively perform the essential job tasks	1, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15
(9) Head trauma, including concussion, brain contusion, subarachnoid hemorrhage, or subdural or epidural hematoma	-	Meets the following provisions annually: a) Has no decreased sensation or weakness that interferes with essential job tasks b) Has no physical limitations that interfere with essential job tasks c) Has no cognitive limitations that interfere with essential job tasks d) If required by the fire department physician, has a signed statement from a neurologic specialist, indicating that the individual meets the provisions specified in (a) through (c) and can safely and effectively perform the essential job tasks	1, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15

*Additional information is provided in A.9.12.

A.9.12 Firefighters with active, ongoing, or recurrent neurologic disorders can have difficulty following orders, communicating information, and working in a coordinated manner with workers, victims, and the public (essential job tasks 11, 12, and 13). Firefighters with neurologic disturbances can also have difficulty with fatigue, somnolence, cognitive function, motor strength, sensation, coordination, gait, and equilibrium, all required to safely perform essential job tasks. The firefighter often is exposed to considerable stress (e.g., temperature, physical exertion, and psychological) during emergency operations. Stress conditions can exacerbate or highlight neurologic deficiencies when the firefighter is performing essential job tasks rapidly during an emergency operation where there is little room for error and where such errors can have life-threatening consequences for the firefighter, colleagues, or victims. Removing oneself from the scene, even temporarily, can significantly impact on the success of the operation. Medications used to treat neurologic conditions can frequently produce or worsen somnolence, discoordination, or disequilibrium.

The following information pertains to the conditions marked with an asterisk in Table 9.12.

(1) Epilepsy. Epilepsy is defined as the presence of "unprovoked, recurrent seizures — paroxysmal disorders of the central nervous system characterized by an abnormal cerebral neuronal discharge with or without loss of consciousness." Generalized, complex, partial, simple epilepsy, or recurrent seizures, even those that do not impair consciousness, prevent safe performance of the essential job tasks because of the uncertainty regarding how much of the brain could be involved and the risk of propagation to other regions of the brain, particularly in the highly epileptogenic environment of the fireground.

Treatment of patients with epilepsy is only variably successful, with roughly 40 percent of patients attaining remission on anticonvulsant therapy. Remission is defined as 5 years without recurrence of seizure activity. Further complicating the fitness-for-duty issue is the fact that only 50 percent of patients who achieve remission do so without toxic side effects of the anticonvulsant drug.

As much as 10 percent of the population will experience at least one seizure in a lifetime, whereas less than 1 percent of the population qualifies for a diagnosis of epilepsy.

Many conditions producing seizures in the pediatric age group are known to remit prior to adulthood, and many adults sustain a reactive seizure that can be attributed to a reversible, underlying precipitant. These circumstances do not necessarily represent an ongoing risk of sudden, unpredictable incapacitation of an individual.

(5)(i) Myasthenia gravis. Myasthenia gravis could compromise an individual's ability to safely perform the essential job tasks. In considering performance of essential job tasks, the impact of the operational environment (e.g., heat, stress, activity, duration, variable night shifts, and so forth) on exacerbations should be considered and specifically addressed by a knowledgeable neurological specialist and the fire department physician. The neurologist must indicate that the individual's cognitive function and neurological exam are normal and the individual is off all drug treatment. The individual cannot safely perform essential job tasks if there is evidence of respiratory muscle weakness or prior episode of respiratory muscle weakness in the last 3 years. The individual cannot safely perform essential job tasks if on drug treatment for myasthenia including corticosteroids, cytotoxic drugs (e.g., azathioprine), or plasmapheresis; these treatments indicate that disease is still active and likelihood for exacerbation and life-threatening sudden incapacitation exists during emergency operations.

(7) Cerebrovascular disease. Cerebral vascular insufficiency includes the spectrum of syndromes from transient ischemic attack (TIA) to stroke, and its cause should be investigated. If due to arteriovenous malformation, cerebral aneurysm, or bleeding, then see specific recommendations. If due to hypertension, then this is evidence of end-organ disease. Stroke does not permit safe performance of the essential job tasks since the physiological stress associated with strenuous physical exertion can increase the likelihood for new strokes leading to life-threatening sudden incapacitation. Cerebral vascular insufficiency can affect control of respiration, cognitive abilities, communication, motor strength, sensation, coordination, and equilibrium. If stroke is due to embolic disease, then risk factors (e.g., hypercoagulable state, collagen vascular disease, carotid vascular disease, patent foramen ovale, cardiac disease) need to be evaluated. Ability to safely and effectively perform essential job tasks is based on an evaluation of current neurologic status, treatment, and any contributory underlying conditions. (For example, Warfarin and other anticoagulant treatment regimens do not allow the safe performance of essential job task 8.)

(8) Cerebrovascular bleed. The cause of cerebral bleed needs to be determined. If due to hypertensive bleed, then this is evidence for target organ disease. Hypertension with target organ disease does not permit safe performance of the essential job tasks, as the hypertension and stress associated with strenuous physical exertion can increase the likelihood for new bleeds and strokes leading to life-threatening sudden incapacitation due to central nervous system instability affecting control of respiration, cognitive abilities, communication, motor skills, sensory abilities, coordination, and equilibrium.

Arteriovenous malformation or cerebral aneurysm does not allow for the safe performance of the essential job tasks since hypertension and stress associated with strenuous physical exertion can increase the likelihood for acute rupture and stroke leading to life-threatening sudden incapacitation.

9.13* Medications and Their Side Effects. The physician shall report any applicable job restrictions associated with the effects of any medication taken by the individual, whether prescribed or over-the-counter, including, but not limited to, the medications identified in Table 9.13. *(Refer to the applicable section for the underlying condition being treated by the medication.)*

Table 9.13 Medications with Noteworthy Side Effects That Can Interfere with the Performance of Essential Job Tasks

Medication Type	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1)* Anticoagulation medications (full- or low-dose) or any drugs that prolong prothrombin time, partial thromboplastin time, or international normalized ratio (INR)	Is unable to safely and effectively perform the essential job tasks due to the risk of internal bleeding from trauma with potential for rapid incapacitation from shock or central nervous system hemorrhage	-	8
(2) Opioids	Is unable to safely and effectively perform the essential job tasks due to alterations in mental status, including vigilance, judgment, and other neurologic functions	-	1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(3) Muscle relaxants	Is unable to safely and effectively perform the essential job tasks due to alterations in mental status and other neurologic functions	-	1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(4) Sedatives or hypnotics, including benzodiazepines, dronabinol, and marijuana (medical or recreational)	Is unable to safely and effectively perform the essential job tasks due to alterations in mental status, including vigilance, judgment, and other neurologic functions	-	1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(5) Neuroleptics *(See Section 9.21 for the psychiatric condition or psychological disorder being treated.)*	Is unable to safely and effectively perform the essential job tasks due to increased risk of heat stress, movement disorders, and somnolence	-	5, 8, 11, 13, 14, 15
(6)*† Certain anti-hypertensive agents (e.g., beta-blockers, high-dose diuretics, and central agents such as clonidine) *(See Section 9.7 for the hypertensive condition being treated.)*	(a) Is unable to safely and effectively perform the essential job tasks due to a high risk for dehydration, electrolyte disorders, lethargy, disequilibrium, cardiovascular dysfunction, or alterations in mental status, including vigilance, judgment, and other neurologic functions (b) See 9.13.2	-	5, 8
(7)* Inhaled bronchodilators (beta-agonists, anticholinergics; short or long lasting) *(See Section 9.6 for the asthmatic condition being treated.)*	Is unable to safely and effectively perform the essential job tasks without use of the inhaled bronchodilator	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15
(8) High-dose corticosteroids for chronic disease	Is unable to safely and effectively perform the essential job tasks due to the risk for dehydration, electrolyte disorders, myopathy, altered sensorium, lethargy, or infection	-	3, 5, 8
(9) Systemic corticosteroids, at any dose	Is unable to safely and effectively perform the essential job tasks due to the risk for dehydration, electrolyte disorders, myopathy, altered sensorium, lethargy, or infection	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Medication Type	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(10)*† Anti-inflammatory or anti-rejection medications (e.g., cyclosporin), methotrexate, CellCept® (mycophenolate mofetil), Cytoxan® (cyclophosphamide), or TNF-alpha blockers (commonly referred to as biologics) used for chronic inflammatory disease management	Is unable to safely and effectively perform the essential job tasks due to the risk for dehydration, electrolyte disorders, myopathy, altered sensorium, lethargy, or infection	-	3, 8, 15
(11) Anabolic steroid	Is unable to safely and effectively perform the essential job tasks due to alterations in mental status, including vigilance, judgment, and other neurologic functions	-	1, 5, 9, 10, 11, 12, 13, 15

* Additional information is provided in A.9.13.

† Trademarks used herein are trademarks of their respective owners.

A.9.13 The following information pertains to the medications marked with an asterisk in Table 9.13. Trademarks used herein are trademarks of their respective owners.

(1) Anticoagulation medications (full- or low-dose) or any drugs that prolong prothrombin time, partial thromboplastin time, or international normalized ratio (INR). Examples of anticoagulation medications include antithrombin (ATryn®), apixaban (Eliquis®), argatroban, bivalirudin (Angiomax®), dabigatran etexilate (Pradaxa®), dalteparin (Fragmin®), enoxaparin (Lovenox®), fondaparinux sodium (Arixtra®), rivaroxaban (Xarelto®), and warfarin sodium (Coumadin®).

Antiplatelet agents are not anticoagulation medications and do not lead to restrictions (unless the underlying medical condition does). Examples of antiplatelet agents include aspirin, combination aspirin–extended-release dipyridamole (Aggrenox®), clopidogrel bisulfate (Plavix®), prasugrel (Effient®), ticagrelor (Brilinta®), and ticlopidine hydrogen chloride (Ticlid®).

Although risk of bleeding from the newer oral anticoagulants is generally less than with warfarin sodium, and antidotes for several are now available, published data to date do not indicate that risk of major bleeding from these medications is less than 1 percent per year, which is the risk level used by NFPA. Table 1 in Lowenstern, et al., provides a comprehensive summary of published data to date.

Research in trauma patients on anticoagulants is limited but notable in the following:

(1) Kobayashi et al., "Novel oral anticoagulants and trauma: The results of a prospective American Association for the Surgery of Trauma Multi-Institutional Trial." J Trauma Acute Care Surg., 82:827–835, 2017.
(2) Myers SP., et al., "Management of anticoagulation with rivaroxaban in trauma and acute care surgery: Complications and reversal strategies as compared to warfarin therapy." J Trauma Acute Care Surg., 82: 542–549, 2017.

In general, published trauma research includes older patients with more comorbidities and less severe trauma compared to firefighters who are healthier overall but at risk for more severe trauma.

(6) Certain antihypertensive agents (e.g., beta-blockers, high-dose diuretics, and central agents such as clonidine). Beta-blockers, high-dose diuretics, and central agents, such as clonidine, have an unacceptably high risk for dehydration, electrolyte disorders, lethargy, disequilibrium, cardiovascular dysfunction, and alterations in mental status, including vigilance, judgment, and other neurologic functions. Other antihypertensive agents have minimal risk for side effects that could interfere with essential job tasks.

(7) Inhaled bronchodilators (beta-agonists, anticholinergics; short or long lasting).
Inhaled bronchodilators have not been tested for efficacy in a fire environment nor can they be safely administered while wearing respiratory protections such as SCBA.

Leukotriene receptor antagonists should not cause a candidate to be unqualified if used to treat conditions not affecting the lower respiratory system.

(10) Anti-inflammatory or anti-rejection medications (e.g., cyclosporin), methotrexate, CellCept® (mycophenolate mofetil), Cytoxan® (cyclophosphamide), or TNF-alpha blockers (commonly referred to as biologics) used for chronic inflammatory disease management. Antirejection drugs increase the likelihood for infection.

9.13.1 Annual Follow-Up. The physician shall ensure specialized annual follow-up of members taking medications referenced in Table 9.13.

9.13.2 Special Considerations for Anti-Hypertensive Agents.

9.13.2.1 An individual on beta-blockers, high-dose diuretics, or central agents, such as clonidine, shall not be considered able to safely and effectively perform the essential job tasks.

9.13.2.2 An individual on calcium channel blockers or angiotensin converting enzyme inhibitors or enzyme blockers used as anti-hypertensive medication and not for cardiac treatment shall be considered able to safely and effectively perform the essential job tasks. *(If used for cardiac treatment, refer to Section 9.7.)*

9.13.2.3 An individual that has a change in anti-hypertensive medication shall be re-evaluated for duty once stable.

9.14 Pregnancy and Reproductive Health.

9.14.1 Educational Materials. The fire department shall make educational materials outlining the risks from firefighting to reproductive health available to all male and female firefighters.

9.14.2* Hazards and Restrictions.

A.9.14.2 It is recommended that members who become pregnant report the pregnancy immediately to the fire department physician.

The following information is intended to help female firefighters make informed decisions regarding their job activities if they are pregnant or considering pregnancy. The majority of pregnant firefighters will be able to continue to work throughout pregnancy, with some reasonable accommodations. They should discuss with their treating physician any individual conditions that might require limitation of activities during pregnancy. *(See Annex C.)*

The following occupational hazards can have adverse effects during pregnancy:

(1) Products of combustion, especially carbon monoxide
(2) Excessive heat (The risk to the fetus created by heat is highest during the first two months of pregnancy.)
(3) Other toxic chemicals, including prolonged exposure to vehicular exhaust
(4) Trauma (even simple falls)
(5) Beginning in the second trimester: Alternating shift work, prolonged standing, and heavy lifting
(6) Beginning in the second trimester: Noise exposure

Activities that involve or require aerobic fitness, speed, agility, and balance can be adversely affected by body changes during pregnancy, especially in the third trimester.

Personal protective equipment. PPE is not designed to protect the fetus. The PPE fitted pre-pregnancy might not offer the same level of protection during pregnancy and might need to be refitted.

Post-delivery. Return-to-work decisions should be based on an individualized evaluation of the member's status, the requirements of her work assignment, and the type of delivery and its complications.

Lactation. Exposure to toxic substances might result in the substances being present in breast milk.

9.14.2.1 Once informed of the individual's pregnancy or lactation, the fire department physician shall do all the following:

(1) Inform the individual of the numerous hazards to the pregnancy and the fetus during routine firefighting tasks or obtain a signed statement from the individual's obstetrician, indicating that the individual has been counseled on these hazards.
(2) Inform the individual of the hazards to breast milk from toxic substances encountered during routine firefighting tasks or obtain a signed statement from the individual's obstetrician or child's pediatrician, indicating that the individual has been counseled on these hazards.
(3) Evaluate the individual for the ability to safely and effectively perform essential job tasks 1, 2, 3, 4, 5, 6, 7, 8, and 9, due to anticipated issues with diminished aerobic capacity, dyspnea, balance, speed, and agility during later

stages of pregnancy or obtain a signed statement from the individual's obstetrician, indicating that the individual can safely and effectively perform the essential job tasks.

(4) Inform the AHJ of any applicable job restrictions that will remain in effect until after delivery and recovery from pregnancy.

9.14.2.2 If the individual requests an alternative-duty assignment in an environment deemed safe for the pregnancy, the fetus, or breast milk, the physician shall recommend restrictions for essential job tasks 1, 3, 5, 6, 7, and 8 so that the AHJ can determine if a reasonable accommodation can be found.

9.15* Chronic Systemic Diseases and Miscellaneous Conditions. The physician shall report any applicable job restrictions associated with the conditions in Table 9.15.

Table 9.15 Medical Conditions Involving Chronic Systemic Diseases and Miscellaneous Conditions

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Rheumatologic, connective tissue diseases, such as dermatomyositis, systemic lupus erythematosus, scleroderma, and rheumatoid arthritis	Is unable to safely and effectively perform the essential job functions due to impairment from the disease or medication, as judged by the fire department physician	-	1, 2, 3, 4, 5, 6, 7, 8, 9
(2)* A history of thermal, chemical, or electrical burn injury or other injury with residual functional deficit	Is unable to safely and effectively perform the essential job functions due to impairment from the disease or medication, as judged by the fire department physician	-	1, 2, 3, 4, 5, 6, 7, 8, 9

*Additional information is provided in A.9.15.

A.9.15 The following information pertains to the conditions marked with an asterisk in Table 9.15.

(2) A history of thermal, chemical, or electrical burn injury or other injury with residual functional deficit. Previous burn injury per se does not interfere with the essential job tasks of firefighting. Extensive burn injury with or without the need for skin grafting can result in skin surfaces that are easily damaged, sensitive to chemical or solvent exposure, or lacking in sweat or sebaceous glands. The individual should be evaluated for heat or cold intolerance, range of motion and motor strength, and ability to wear personal protective clothing and equipment.

9.16* Infectious Diseases.

The physician shall report any applicable job restrictions associated with systemic, local, acute, and chronic infections, as well as postinfectious processes, including the diseases identified in Table 9.16, with consideration for the following:

(1) Ability to control of body temperature, hydration, and nutritional status
(2) Presence of severe pain, muscle weakness, or compromised mobility or ability to perform heavy physical exertion
(3) Ability to interact with other firefighters and individuals of the public without posing a public health risk due to contagious disease
(4) *Presence of acute or self-limited infectious processes that require temporary work restriction until resolution

Table 9.16 Infectious Diseases That Can Interfere with the Performance of Essential Job Tasks

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Skin conditions, infections, ulcers, or cysts	Is unable to wear PPE	-	1, 2, 5
	Presents a high risk for exposure to infectious agents and toxins	-	3, 15
(2) Upper or lower respiratory infections	Is unable to safely and effectively perform the essential job tasks due to impairment from the infection, its frequent recurrence, or its treatment, as judged by the fire department physician	-	1, 2, 3, 4, 5, 7, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(3) Ear infections	Is unable to safely and effectively perform the essential job tasks due to interference with balance or hearing, as judged by the fire department physician	-	8, 12
(4) Gastrointestinal infections, including parasites	Is unable to safely and effectively perform the essential job tasks due to dehydration or frequent use of toilet facilities (at least temporarily)	-	1, 2, 5, 9
(5) Kidney or urinary infections	Is unable to safely and effectively perform the essential job tasks due to dehydration or frequent use of toilet facilities (at least temporarily)	-	1, 5, 9
(6)* Other Infection	Is unable to safely and effectively perform the essential job tasks due to dizziness, significant weakness, significant weight loss, or pain-limiting functional capacity	-	1, 2, 5, 8, 9
(7)* Highly contagious infections (e.g., active pulmonary tuberculosis, mumps, measles, chicken pox, rubella, MRSA skin infections, SARS, COVID-19)	Poses a public health risk to other individuals and the community	Is no longer contagious	2, 3, 13, 15
(8)* Hepatitis and treatment thereof, specifically infectious diseases of the liver caused by viruses including, but not limited to, A, B, C, D, and E	Has either of the following conditions: a) Is unable to safely and effectively perform the essential job tasks due to impairment from the infection or its treatment b) Poses a public health risk to other individuals and the community (e.g., acute Hepatitis A)	Meets current CDC guidelines, including recommendations for restriction from various types of duty	1, 2, 9, 13, 15
(9)* Human immunodeficiency virus (HIV) infection	Has any of the following conditions resulting from HIV infection such that the ability to safely and effectively perform the essential job tasks is impaired: (a) Organ damage or dysfunction (b) Anemia, cardiopulmonary dysfunction, or neurologic dysfunction (c) Peripheral neuropathy (d) Dementia	-	1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13

*Additional information is provided in A.9.16.

A.9.16 The following information pertains to the conditions marked with an asterisk in Table 9.16.
(6) Other infection. After acute infection has resolved, the firefighter can return to work if weight, muscle strength, cardiac function, and function of other involved organs have returned to levels required for safe and effective performance of essential job tasks. Concepts used within this document for each of these organ systems should be applied here.

(7) Highly contagious infections (e.g. active pulmonary tuberculosis, mumps, measles, chicken pox, rubella, MRSA skin infections, SARS, COVID-19). After active infection has resolved (e.g., sputum AFB or sputum culture negative for 3 successive days) and the firefighter is no longer contagious (usually within 2 weeks of successful treatment), the firefighter can return to work but perform only essential job tasks 1, 2, 3, 4, 5, 7, and 9 if weight, muscle strength, pulmonary function, and function of other involved organs have returned to acceptable levels for safe performance. Concepts used within this standard for each of these organ systems should be applied here. A positive tuberculin (PPD) skin test or a positive tuberculin blood test without symptoms and with a normal chest radiograph indicates exposure, and latent infection without evidence for active infection does not prevent a firefighter from performing essential job tasks. Alternatively, a positive TB skin test (PPD) can be a false-positive from exposure to atypical mycobacterium or from prior BCG vaccination. The TB blood test does not produce these false positives, but experience with false negatives is limited [*MMWR, No. RR-15,* December 16, 2005]. If conversion from negative to positive tuberculin test (PPD or blood test) occurred within the last 2 years, there is increased risk for the development of active contagious tuberculosis, which requires either treatment or frequent monitoring for symptoms and chest radiograph changes (annually for at least 2 years

or during evaluation of current symptoms). Individuals on prophylactic treatment can perform all essential job tasks without restrictions. Treatment is a personal decision, but in its absence, monitoring with chest radiographs at prescribed intervals is mandatory because development of active disease is a public health hazard.

(8) Hepatitis and treatment thereof, specifically infectious diseases of the liver caused by viruses including, but not limited to, A, B, C, D, and E. Hepatitis, when not acute or when chronic but without symptoms and without significant liver dysfunction or other organ system dysfunction, does not prevent the safe and effective performance of essential job tasks during firefighting or EMS work. Hepatitis A, when not acute, is no longer a public health risk. Hepatitis B, C, and so forth, are bloodborne pathogens and are not a public health risk, as standard precautions to prevent the spread of bloodborne infections are a mandatory part of all emergency operations. Treatment to prevent Hepatitis C from progressing to liver insufficiency or failure (i.e., cirrhosis) is now available and FDA approved. Members receiving this treatment need to be regularly evaluated to determine their ability to safely perform their essential job tasks. This combination drug therapy protocol can produce dehydration, fatigue, depression, anemia, thrombocytopenia (i.e., bleeding disorder), and so forth.

(9) Human immunodeficiency virus (HIV) infection. HIV without AIDS does not prevent the safe and effective performance of essential job tasks during firefighting or EMS work. HIV is a bloodborne pathogen and is not a public health risk, as standard precautions to prevent the spread of bloodborne infections are a mandatory part of all emergency operations. The firefighter with AIDS but without significant organ dysfunction is able to safely perform essential job tasks after careful evaluation. Treatment to prevent AIDS from occurring when HIV infection occurs or to control the progression of AIDS is available and FDA approved. Members receiving this treatment need to be regularly evaluated to determine their ability to safely perform the essential job tasks on the fire ground, during emergency operations, and when wearing protective clothing. This combination drug therapy protocol can produce dehydration, fatigue, depression, anemia, thrombocytopenia (i.e., bleeding disorder), and so forth.

A.9.16(4) Examples of acute or self-limited infectious processes that require temporary work restriction include influenza or upper respiratory tract infection, which can interfere with safe performance of essential job tasks 2 and 3, or acute dermatitis, which would interfere with safe performance of essential job task 3.

9.17 Chronic Skin Conditions.
The physician shall report any applicable job restrictions associated with the conditions in Table 9.17.

Table 9.17 Chronic Skin Conditions

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Chronic skin condition that results in loss of skin integrity, inflammation, or irritation of the skin surface	Has increased risk of burns, infection, dehydration, or inability to wear PPE, including thermal protective gear or respirators, while firefighting	-	1, 2, 3, 5, 9, 15

9.18 Hematologic Disorders and Their Treatment. The physician shall report any applicable job restrictions associated with the conditions in Table 9.18.

Table 9.18 Hematologic Disorders and Their Treatment

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Hematologic disorder, such as anemia, leukopenia, polycythemia vera, splenomegaly, bleeding disorders, and hypercoagulable conditions	-	Is not prevented from safely and effectively performing the essential job tasks due to any of the following: a) Fatigue b) Oxygen deprivation c) Risk of infection d) Bleeding	1, 2, 3, 5, 9, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(2) Treatment of a hematologic disorder with drugs that prolong prothrombin time, partial thromboplastin time, or international normalized ratio (INR)	Has increased risk of internal bleeding from trauma with potential for rapid incapacitation from shock or central nervous system hemorrhage	-	8

9.19 Heat Stress and Heat-related Illness. The physician shall report any applicable job restrictions associated with the conditions in Table 9.19 with consideration for the following:

(1) Documented evidence of a predisposition to, history of, or recurrence of heat illness, rhabdomyolysis, metabolic acidosis, or exertion-related incapacitation, which can increase the risk for potentially life-threatening recurrence during training or on the fire ground
(2) Presence of a neurologic (e.g., myasthenia gravis, multiple sclerosis) or other condition that is exacerbated by heat stress
(3) Requirement for medications (e.g., MAOIs, phenothiazines, anticholinergics, tricyclic antidepressants) that increase an individual's risk of heat stress
(4) Heat exposure restrictions imposed during pregnancy
(5) Signed statement from a physician knowledgeable in heat stress, heat-related conditions, and rhabdomyolysis, indicating that the individual's risk for recurrence is minimal and that the individual can safely and effectively perform the essential job tasks

Table 9.19 Heat and Stress Illness

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) A history of heat stress and heat-related illness including rhabdomyolysis	-	Meets both of the following provisions: a) Has no history of severe or recurrent heat stress or heat-related illness b) Has no history or risk of heat stress or heat-related illness due to an underlying, persistent condition or its treatment	1, 5, 9

9.20* Tumors — Malignant or Benign. The physician shall report any applicable job restrictions associated with the conditions in Table 9.20.

Table 9.20 Tumors — Malignant or Benign

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1)* Benign tumor	Has reduced energy levels or reduced functions of the involved organ system due to the space-occupying lesion or its treatment	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
(2) Acute illness related to malignancy or its treatment	Has low energy levels, anemia, weight loss, or debilitation due to the specific aspects of that organ's dysfunction	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 13
(3)* Central nervous system tumor *(If applicable, see Section 9.12 for seizures.)*	Has low energy levels, anemia, undernutrition, weight loss, inability to wear PPE or SCBA, or specific organ dysfunction (e.g., seizures, loss of balance, inability to communicate, inability to process complicated commands in an emergency situation, weakness)	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment and is able to safely and effectively perform the essential job tasks	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(4)* Head or neck malignancy	Has low energy levels, anemia, undernutrition, weight loss, inability to clear oral secretions, or other specific organ dysfunction that interferes with respiration, communication, hydration, or eating	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment and is able to safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
(5)* Lung cancer	Has low energy levels, anemia, dyspnea, undernutrition, weight loss, weakness, paraneoplastic syndromes, or specific organ dysfunction (e.g., abnormal secretions, dyspnea, or pulmonary dysfunction interfering with or prohibiting use of SCBA or strenuous physical activities)	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment, has pulmonary function consistent with Section 9.6, and is able to safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 7, 8, 9, 13
(6)* Gastrointestinal malignancy	Has low energy levels, anemia, undernutrition, weight loss, weakness, paraneoplastic syndromes, or specific organ dysfunction (e.g., abnormal secretions or bowel function interfering with or prohibiting prolonged use of personal protective clothing or prohibiting strenuous physical activities)	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment, has normal gastrointestinal function, and is able to safely and effectively perform the essential job tasks	1, 3, 4, 5, 7, 8, 9
(7) Genitourinary malignancy	Has altered urinary function that prevents prolonged activity without use of toilet facilities, low energy levels, anemia, undernutrition, weight loss, or specific organ dysfunction	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment and is able to safely and effectively perform the essential job tasks	1, 3, 4, 5, 7, 8, 9
(8)* Hematologic or lymphatic malignancy (e.g., leukemias, lymphomas)	Has anemia, lymphopenia, thrombocytopenia, or adverse effects of treatment	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment and is able to safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 7, 8, 9
(9) Skin cancer that requires significant resection, chemotherapy, or other systemic anti-neoplastic therapy, or that results in the loss of skin integrity	Has low energy levels, anemia, undernutrition, weight loss, or increased risk of burns, infection, dehydration, or heat rash while firefighting and wearing PPE	Has a signed statement from a specialist, indicating that the individual has undergone successful treatment and is able to safely and effectively perform the essential job tasks	1, 3, 4, 5, 7, 8, 9

*Additional information is provided in A.9.20.

A.9.20 Malignant conditions of any organ system can produce specific organ dysfunction or generalized debilitation. Malignancy or its treatment can result in anemia, malnutrition, pain, and generalized weakness, temporarily or permanently compromising the individual's ability to safely and effectively perform the essential job tasks.

In all cases where an additional opinion from the treating physician is requested, the fire department physician determines whether restrictions are appropriate.

The following information pertains to the conditions marked with an asterisk in Table 9.20.

(1) Benign tumor. The individual should be evaluated for space-occupying lesion, treatment, or sequelae affecting ability to safely and effectively perform essential job tasks.

(3) Central nervous system tumor. The individual should be evaluated for history or risk of seizure; residual effects on balance, coordination, strength, speech, judgment; and medication requirements.

(4) Head or neck malignancy. The individual should be evaluated for ability to wear SCBA and maintain nutrition and oral hydration.

(5) Lung cancer. The individual should be evaluated for residual pulmonary function and medication requirements.

(6) Gastrointestinal malignancy. The individual should be evaluated for abnormal bowel or urinary function that would interfere with emergency operations where toilet facilities are unavailable, the ability to maintain nutrition and hydration, and medication requirements.

(8) Hematologic or lymphatic malignancy (e.g., leukemias, lymphomas). The individual should be evaluated for anemia, leukopenia, or thrombocytopenia, or residual cardiac, pulmonary, GI, dermatological, or neurological effects of surgery, radiation, or chemotherapy.

9.21* Psychiatric Conditions and Psychological Disorders. The physician shall report any applicable job restrictions associated with the conditions in Table 9.21 in consultation with a mental health professional if clinically indicated.

Table 9.21 Psychiatric Conditions and Psychological Disorders

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(1) Anxiety disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(2) Bipolar disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no suicide attempts within the previous 12 months e) Had no manic episodes within the previous 12 months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(3) Depressive disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no suicide attempts within the previous 12 months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(4) Posttraumatic stress disorder (PTSD)	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use, dissociative disorders, or sleep disorders d) Had no suicide attempts within the previous 12 months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Condition	**Special Criteria for Restriction**	**Special Provisions for No Restriction**	**Affected Essential Job Task(s)**
(5) Delusional disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no psychotic symptoms within the previous 12 months e) Had no suicide attempts within the previous 12 months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(6) Brief psychotic disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no psychotic symptoms within the previous 12 months e) Had no suicide attempts within the previous 12 months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(7) Schizophreniform disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no psychotic symptoms within the previous 12 months e) Had no suicide attempts within the previous 12 months f) If required by the fire department physician, has a signed statement from a mental health professional indicating that the individual meets the provisions in (a) through (e) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Condition	Special Criteria for Restriction	Special Provisions for No Restriction	Affected Essential Job Task(s)
(8) Schizophrenia	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no psychotic symptoms within the previous 12 months e) Had no suicide attempts within the previous 12 months f) If required by the fire department physician, has a signed statement from a mental health professional indicating that the individual meets the provisions in (a) through (e) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(9) Schizoaffective disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no psychotic symptoms within the previous 12 months e) Had no manic episodes within the previous 12 months f) Had no suicide attempts within the previous 12 months g) If required by the fire department physician, has a signed statement from a mental health professional indicating that the individual meets the provisions in (a) through (f) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
(10)* Substance-use disorder	-	Is able to safely and effectively perform the essential job tasks and meets the following provisions annually: a) Complies with treatment, if indicated b) Has no disqualifying side effects from treatment c) Is being treated for any comorbidities, including substance use or sleep disorders d) Had no substance use within the previous 3 months e) Complies with random testing in accordance with department guidelines f) If required by the fire department physician, has a signed statement from a mental health professional indicating that the individual meets the provisions in (a) through (e) and can safely and effectively perform the essential job tasks	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

*Additional information is provided in A.9.21.

A.9.21 Also see Annex E.

Firefighters perform individually and as a team. Firefighters with active, ongoing or recurrent, psychiatric or psychological conditions can have difficulty following orders, communicating information, and working in a coordinated manner with workers, victims, and the public. The firefighter with a personality disorder might not respond appropriately to command structure or adequately control his or her interpersonal behavior. Behavior that undermines command structure, group function, or group cohesion is not safe to the firefighter or others performing essential job tasks. Firefighters are exposed to gruesome tragedy during emergency operations, further exacerbating the stress of the job. Removing oneself from the scene, even temporarily, can significantly impact on the success of an emergency operation. Medications used to treat psychiatric or psychological conditions can produce or worsen somnolence, impair coordination, and predispose to heat stress.

The following information pertains to the conditions marked with an asterisk in Table 9.21.

(10) Substance-use disorder. Substance-use interferes with cognitive functions, energy, command structure, communication, strength, sensation, gait, coordination, and equilibrium, and therefore compromises the individual's ability to safely perform the essential job tasks. There is increased risk for auto accidents when driving vehicles or apparatus. Dehydration, arrhythmia, and disequilibrium can be life threatening in a toxic/traumatic/stressful environment. Firefighting requires individuals to perform independently and in coordination with others. Behavior that undermines command structure, group function, or group cohesion during emergency operations is not safe to the firefighter or others at the scene.

13. Revise Annex paragraphs B.1, B.1.1, B.1.1.1, B.1.2, B.2, B.3, and B.5 to read as follows:

B.1 Legal Considerations in Applying the Standard. The consideration of an application or continued employment of ~~a member~~ an individual based on medical or physical performance evaluations involves a determination that is not without legal implications. To this end, prior to making an adverse employment decision based on the current standard, the authority with jurisdiction might wish to consult with legal counsel.

B.1.1 Legal Protections for Individuals with ~~Handicaps or~~ Disabilities. The Rehabilitation Act of 1973, as amended, 29 U.S.C. § 791 et seq., and implementing regulations prohibit discrimination against those with ~~handicaps or~~ disabilities under any program receiving financial assistance from the federal government. The Americans with Disabilities Act (ADA) of 1990, 42 U.S.C. § 12101 et seq., also prohibits employment discrimination by certain private employers against individuals with disabilities. In addition, many states have enacted legislation prohibiting discrimination against those with ~~handicaps or~~ disabilities. Generally speaking, these laws prevent the exclusion, denial of benefits, refusal to hire or promote, or other discriminatory conduct against an individual based on a ~~handicap or~~ disability, where the individual involved can, with or without reasonable accommodation, perform the essential functions of the job without creating undue hardship on the employer or program involved.

~~Beginning in 1999, the United States Supreme Court has issued a series of decisions limiting the scope of the ADA. As a result, persons with certain kinds of impairments that are mitigated by corrective measures such as medication for high blood pressure or eyeglasses for myopia are not "disabled" under the ADA. See *Sutton v. United Airlines, Inc*., 527 U.S. 471 (1999); *Murphy v. United Parcel Service, Inc*., 118 S. Ct. 2133 (1999); and *Albertsons, Inc. v. Kirkingburg*, 527 U.S. 555 (1999). More recently the Supreme Court held that an impairment is not a disability covered by the ADA unless it severely restricts a person from doing activities that are of central importance to most people's daily lives. See *Toyota Motor Mfgr., Kentucky, Inc. v. Williams*, 534 U.S. 184 (2002). These cases significantly limit the persons who can claim the protections of the federal ADA, but do not, by any means, eliminate the ADA as an important consideration in fire service related employment decisions. Moreover, it should be borne in mind that separate disability protections exist under laws of many states, and some of these laws have been interpreted to afford greater protections than that afforded by the ADA. See, for example, *Dahill v. Boston Department of Police*, 434 Mass. 233 (2001), where the Supreme Judicial Court of Massachusetts ruled that a corrective device to alleviate a disability is not relevant in determining whether someone is disabled under the state's disability law.~~

Under the ADA, *disability* means, with respect to an individual, any of the following:

1. A physical or mental impairment that substantially limits a major life activity
2. A record of such an impairment
3. Being regarded as having such an impairment

The definition of *disability* should be interpreted broadly. The question of whether an individual's impairment is a disability under the ADA should not demand extensive analysis. For more information, see *Fact Sheet on the EEOC's Final Regulations Implementing the ADAAA*, published by the US Equal Employment Opportunity Commission (EEOC).

~~The disability~~Disability discrimination laws, therefore, continue to be an important part of the legal framework that governs employment-related decisions. Although this standard has been developed with this in mind, these laws can, depending on the jurisdiction and the circumstances, affect the degree to which the authority having jurisdiction can implement the standard in an individual case. Users of this standard should be aware that, while courts, in assessing disability discrimination claims, are likely to give considerable weight to the provisions of a nationally recognized standard such as NFPA 1582 [see, for example, *Miller v. Sioux Gateway Fire Department*, 497 N.W.2d 838 (1993)], reliance on the standard alone might not be sufficient to withstand a challenge to an adverse employment decision. See *Eldredge v. City of St. Paul*, 809 F. Supp. 2d 1011 (D. Minn. 2011).

B.1.1.1 Reasonable Accommodations for Individuals with Disabilities. Federal civil rights law in the United States requires an employer to provide reasonable accommodation, when requested or if a disability is obvious, to qualified individuals with disabilities who are employees or applicants for employment, except when such accommodation would cause an undue hardship.

Reasonable accommodation is, in general, any change or adjustment to a job or work environment that permits a qualified applicant or employee with a disability to participate in the job application process, to perform the essential functions of a job, or to enjoy benefits and privileges of employment equal to those enjoyed by employees without disabilities.

Determination of a reasonable accommodation must be conducted on a case-by-case basis because the nature and extent of a disabling condition and the requirements of the job will vary. The principal test in selecting a particular type of accommodation is that of effectiveness — whether the accommodation will enable the person with a disability to perform the essential functions of the job. It need not be the best accommodation or the accommodation the individual with a disability would prefer, although primary consideration should be given to the preference of the individual involved. However, an employer has discretion to choose between effective accommodations.

When an employee with a disability is unable to perform the employee's present job even with the provision of a reasonable accommodation, an employer must consider reassigning the employee to an existing position that the employee can perform with or without a reasonable accommodation. The requirement to consider reassignment applies only to employees and not to applicants.

Example. If an incumbent has a disability that prevents the incumbent from wearing respiratory protection, and assuming there is no reasonable accommodation that would allow the incumbent to perform safely and effectively the essential functions of the job that require wearing respiratory protection, the department must consider reassigning the employee to an existing position that the employee can perform with or without a reasonable accommodation. The reassignment to a different position that the employee can perform with or without the accommodation is the reasonable accommodation provided to the incumbent. For a similarly situated candidate, if there is no reasonable accommodation that would allow the candidate to perform safely and effectively the essential functions of the job that require wearing respiratory protection, the candidate would not be qualified for hire and the department is not required to offer reassignment to the candidate.

Undue hardship means significant difficulty or expense and focuses on the resources and circumstances of the employer in relation to the cost or difficulty of providing a specific accommodation. Undue hardship refers not only to financial difficulty, but to reasonable accommodations that are unduly extensive, substantial, or disruptive or that would fundamentally alter the nature or operation of the business. An employer is also not required to eliminate an essential function when considering a reasonable accommodation. An employer must assess on an individualized basis whether a particular reasonable accommodation would cause undue hardship. Where a requested accommodation would result in undue hardship, the employer must offer an alternative accommodation if one is available absent undue hardship.

Finally, the ADA allows for qualification standards that screen out, tend to screen out, or otherwise deny a job or benefit to an individual with a disability, if the qualification standards have been shown to be job-related and consistent with business necessity and such performance cannot be accomplished by reasonable accommodation. Qualification standards can include a requirement that an individual shall not pose a direct threat to the health or safety of other individuals in the workplace.

Direct threat means a significant risk of substantial harm to the health or safety of the individual or others that cannot be eliminated or reduced by reasonable accommodation. The determination that an individual poses a direct threat must be based on an individualized assessment of the individual's present ability to safely perform the essential functions of the job. This assessment must be based on a reasonable medical judgment that relies on the most current medical knowledge and the best available objective evidence. In determining whether an individual would pose a direct threat, the factors to be considered include the following:

(1) The duration of the risk
(2) The nature and severity of the potential harm
(3) The likelihood that the potential harm will occur
(4) The imminence of the potential harm

For more information, see the following resources from the EEOC:

(1) *The ADA: Your Responsibilities as an Employer*, https://www.eeoc.gov/publications/ada-your-responsibilities-employer.
(2) *Enforcement Guidance on Reasonable Accommodation and Undue Hardship under the ADA*, https://www.eeoc.gov/laws/guidance/enforcement-guidance-reasonable-accommodation-and-undue-hardship-under-ada.

B.1.2 Legal Protections for Individuals Who Are Members of Protected Classes (Race, Sex, Color, Religion, or National Origin). Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000e, and implementing regulations by the ~~Equal Employment Opportunity Commission (~~EEOC~~)~~ prohibit discrimination in employment on the basis of race, sex, color, religion, or national origin (i.e., protected classes). Under Title VII, an "employer" is defined, generally, to mean a person with "15 or more employees for each working day in each of 20 or more calendar weeks in the current or preceding calendar year" (42 U.S.C. § 2000e). Several federal jurisdictions have held that unpaid volunteers are not considered to be "employees" under Title VII.

Additionally, many states, cities, and localities have adopted similar legislation. Generally, physical performance or other requirements that result in "adverse impact" on members of a protected class (e.g., on the basis of gender) are required to be validated through a study in accordance with EEOC guidelines, if such requirements are to be relied on in making employment decisions. Under EEOC guidelines, a study validating employment standards in one jurisdiction can be transportable to another jurisdiction (and therefore used in lieu of conducting a separate study). However, specific preconditions must be met in this regard, and the authority having jurisdiction should seek the advice of counsel before relying on a transported validation study.

B.2 Determining Essential Job Tasks. The medical requirements in this edition of the standard were revised based on the essential job tasks contained in Chapter 5~~ and Chapter 9~~. It is recognized that some firefighting functions and tasks can vary from location to location due to differences in department size, functional and organizational differences, geography, level of urbanization, equipment utilized, and other factors. Therefore, it is the responsibility of each individual fire department to document, through job analysis, the essential job functions that are performed in the local jurisdiction.

There are a wide variety of job analytic techniques available to document the essential functions of the job of~~ a member~~ a firefighter. However, at a minimum, any method utilized should be current, in writing, and meet the provisions of the ~~Department of Labor~~EEOC regulations [29 CFR 1630.2(n)(3)]. Job descriptions should focus on critical and important work behaviors and specific tasks and functions. The frequency and/or duration of task performance and the consequences of failure to safely perform the task should be specified. The working conditions and environmental hazards in which the work is performed should be described.

The job description should be made available to the fire department physician for use during the pre-placement medical examination for the individual determination of the medical suitability of~~ applicants for membership~~ individuals.

B.3 *(1st para only).*
Several factors should be considered in choosing a fire department physician. There are relatively few physicians with formal residency training and certification in occupational medicine. The fire department physician should be qualified to provide professional expertise in the areas of occupational safety and health as these areas relate to emergency services. For the purpose of conducting medical evaluations, the fire department physician should understand the physiological and psychological demands placed on~~ members~~ firefighters as well as the environmental conditions under which~~ members~~ firefighters have to perform.

B.5 *(1st para only).*
Confidentiality of all medical data is critical to the success of the program.~~ Members~~ Individuals need to feel assured that the information provided to the physician will not be inappropriately shared. No fire department supervisor or manager should have access to medical records without the express written consent of the~~ member~~ individual. There are occasions, however, when specific medical information is needed to make a decision about placement, return to work, and so forth, and a fire department manager should have more medical information for decision making. In that situation, written medical consent should be obtained from the~~ member~~ individual to release the specific information necessary for that decision.

14. Revise Annex paragraph E.1 to read as follows:

E.1 Psychiatric Conditions and Psychological Disorders. This annex material defines specific psychiatric conditions as referenced in ~~Chapter 6 and~~ Chapter 9.

15. Revise Annex paragraph F.1.2.4 to read as follows:

F.1.2.4 US Government Publications. US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

National Diabetes Information Clearinghouse, National Institute of Diabetes and Digestive and Kidney Diseases, National Institute of Health (NIH), Sickle Cell Trait and Other Hemoglobinopathies and Diabetes. Important Information for Physicians, http://diabetes.niddk.nih.gov/dm/pubs/hemovari-A1C/.

Title 29, Code of Federal Regulations, Part 1630.2(n)(3), "Regulations to Implement the equal employment provisions of the Americans with Disabilities Act," 2003.

Title 29, Code of Federal Regulations, Part 1910.95, "Occupational noise exposure," 1996.

US Dept. of Health & Human Services, National Heart, Lung and Blood Institute, *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 7), 2014.

US Equal Employment Opportunity Commission (EEOC), *Enforcement Guidance on Reasonable Accommodation and Undue Hardship under the ADA*, https://www.eeoc.gov/laws/guidance/enforcement-guidance-reasonable-accommodation-and-undue-hardship-under-ada.

US Equal Employment Opportunity Commission (EEOC), *Fact Sheet on the EEOC's Final Regulations Implementing the ADAAA*, https://www.eeoc.gov/laws/guidance/fact-sheet-eeocs-final-regulations-implementing-adaaa.

US Equal Employment Opportunity Commission (EEOC), *The ADA: Your Responsibilities as an Employer*, https://www.eeoc.gov/publications/ada-your-responsibilities-employer.

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(Note: For further information on NFPA Codes and Standards, please see www.nfpa.org/docinfo)