Shanksville


New York City


Pentagon

Health Risks Associated with 9/11 and the WTC Disaster: Lessons Learned

Over a decade later, are you familiar with the 9/11 health risks?

Pentagon photo courtesy of FEMA. Shanksville photo by vlashton, courtesy of Flickr

Training Objectives

Upon completion of this activity, participants will be able to:

- Identify patients who are eligible for care under the WTC Health Program
- Identify exposure-related health risks associated with environmental exposures from the WTC site
- Describe the lessons learned from the 9/11 disaster response

The Clinical Practice Assessment

- Addresses the core competencies of medical knowledge, patient care, and practice-based learning
- Provides a baseline “snapshot” of knowledge, skills, attitudes, or competence
- Identifies barriers faced in evaluating, diagnosing, and treating patients
- Is a first step to acquiring and retaining knowledge that will affect clinical practice and patient outcomes

Learning Goals for This Clinical Practice Assessment

Upon completion of this activity, participants will be able to:

- Identify immediate, short-term, and long-term health risks posed by exposure to disaster and/or terrorist attacks to responders and survivors
- Identify comorbidities most common in survivors and responders to the 9/11 World Trade Center (WTC), Pentagon, and Shanksville, Pennsylvania sites

Target Audience

- This activity is intended for clinicians who have or may encounter patients who were exposed to environmental hazards on 9/11.

The terrorist attacks on 9/11 at the World Trade Center (WTC), the Pentagon, and Shanksville, Pennsylvania, occurred more than 13 years ago, yet many of those affected by the disaster are still suffering from health effects today.

Clinicians, not only in these geographic locations but elsewhere in the country, may see patients who were exposed to toxins on that day or in the months that followed. Clinicians should be aware of the common health conditions that have been associated with hazardous 9/11 exposures and the benefits that may be available to their patients under the WTC Health Program.

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Monitoring and Treatment 9.11 WTC Health Program

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Monitoring and Treatment 9.11 WTC Health Program

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Monitoring and Treatment 9.11 WTC Health Program

Question 1

The term *aerodigestive* illness is used to describe acute and chronic health effects suffered by people exposed to hazards stemming from the 9/11/01 World Trade Center (WTC) terror attacks. The term *aerodigestive* includes all of the following conditions *except*:

- ❑ Obstructive airway disease, such as asthma and chronic bronchitis
- ❑ Gastroesophageal reflux disease (GERD)
- ❑ Inflammatory bowel disease
- ❑ Reactive upper airways dysfunction syndrome (RUDS)

Answer 1

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Answer 1 Explanation

An estimated 400,000 first responders, residents, workers, and others were exposed to the caustic dust (pH of 11) and toxic pollutants in the dust and debris cloud from the collapse of the WTC buildings on September 11, 2001.[1-3] Many people exposed to this "WTC cloud" -- through respiration, ingestion, or skin absorption -- manifested symptoms of acute injury to their airways and gastroesophageal junction , hence the term "*aerodigestive*". Occupational studies of caustic substances inhaled have demonstrated injuries to upper and lower airways, cough, heartburn and reflux consistent with GERD.[4] The aerodigestive injuries led to enduring diagnoses of asthma, chronic cough syndrome (WTC cough), chronic laryngitis, chronic nasopharyngitis, reactive airways dysfunction syndrome (RADS), RUDS, GERD, and sometimes to fibrosis, granulomas, or other nodules within the lung parenchyma[1,2,5,6]; however, inflammatory bowel disease has not been noted to be excessive in those exposed to 9/11.

Question 2

Which of the following exposure factors reported by area residents, disaster responders, and local workers has been shown to be highly correlated with the subsequent development of acute and chronic aerodigestive health effects?

- ❑ Performing rescue and recovery work at the Staten Island landfill
- ❑ Report of being engulfed by the WTC dust cloud
- ❑ Smoking at the disaster site
- ❑ Having a residence close to the disaster site

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Answer 2 Explanation

Acute and chronic health effects of WTC exposure were seen in many people exposed to 9/11, including traditional and nontraditional responders, disaster recovery workers, local workers, area residents, students, and those caught in the 9/11 dust cloud.[7] Evaluation of WTC dust found particles containing pulverized cement, glass fibers, asbestos, and a multitude of chemicals with a pH of 9 to 11. Airborne particulate levels were highest immediately after the attacks and moved over and past the disaster area.[8] Activities in and around the disaster area disturbed settled dust and debris with potential to impact the health of those who were exposed.[1] Although early arrival and being caught in the 9/11 dust cloud were associated with greater health consequences, persons exposed to lower levels of contaminants over time -- such as through exposure to contaminants trapped inside ventilation systems -- also developed health sequelae (eg, asthma).[4,9]

Question 3

People living, going to school, and/or working in the area of the WTC disaster were at risk for psychological trauma or distress from many sources. This group was *least* likely to report….

- ❑ Eating disorders
- ❑ Severe headaches
- ❑ New or worsening respiratory symptoms
- ❑ New or worsening gastrointestinal symptoms

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Answer 3 Explanation

Disaster exposure includes psychological hazards, such as the sudden and unexpected loss or serious harm of loved ones; serious injury or life threat; loss of one's home, possessions, workplace, school, or community; forced evacuation and relocation; and change in employment. Nearly two-thirds (62.4%) of those evacuating the WTC buildings were caught in the WTC cloud,[7] which was described as a threat to one's life. Data from the WTC Health Registry, involving 71,437 enrollees, found that survivors caught in the WTC cloud were more likely to report any injuries, [respiratory symptoms (56.6%), heartburn/reflux (23.9%), severe headaches (21.0%), and/or serious psychological distress (10.7%)] than those not directly exposed to the WTC cloud.[7] Exposure to 9/11 has a high degree of comorbidity with respiratory, gastrointestinal, and mental health conditions. The WTC Clinical Centers of Excellence that offer integrated services (psychiatric and medical) report enhanced therapeutic engagement and treatment compliance.[10]

Question 4

Many studies were performed on members of the Fire Department, City of New York (FDNY) concerning the health effects of WTC exposure. What is the scientific advantage of using the FDNY cohort when exploring linkage between 9/11 exposures and health outcomes?

- ❑ Firefighters tend to smoke less than other occupational groups
- ❑ Access to fitness training in most fire stations
- ❑ Easy access for retirees to obtain health care
- ❑ Availability of predisaster medical information (such as spirometry and standardized health assessments)

Answer 4

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Answer 4 Explanation

Epidemiological studies exploring causation require accurate and consistent characterization of exposures and health outcomes of concern. Health outcomes are most useful when there is a known change from baseline or predisaster status. As such, FDNY had collected standardized annual medical information from their active force since 1987 and was therefore well-positioned to establish exposure-disease linkages in the aftermath of 9/11. Investigators were able to assess pulmonary function in 12,079 New York firefighters between January 1, 1997 and September 11, 2001, including nearly 32,000 spirometry tests.[11] Firefighters exposed to 9/11 had a substantial reduction in pulmonary function that followed a dose-response pattern and was independent of prior smoking or airflow obstruction,[12] even though this workforce had low prevalence of smoking, were more physically fit, and had access to occupational health services compared with the general population.

Question 5

Congress provided funding to treat specific health conditions thought to be linked with 9/11 exposure. What kind of information was required to advocate for such a linkage?

- ❑ Standardized medical, psychiatric, and exposure histories, examinations, and medical testing
- ❑ Media reports and photos about the terror attacks that did not include environmental measurement
- ❑ Evaluation of individual treatment records from community practitioners or local medical facilities
- ❑ Stakeholder advocacy that did not include systematic medical evidence

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Answer 5 Explanation

The WTC Worker and Volunteer Medical Screening Program, a network of occupational health clinics, set up standardized medical screenings for workers responding to 9/11, using philanthropic and federal funding (2002). Congress funded an ongoing medical monitoring program for disaster responders in 2004 and funded treatment services in 2006, which became known as the WTC Medical Monitoring and Treatment Program *(*MMTP*)* for responders, with federal funding administered by the National Institute for Occupational Safety and Health (NIOSH). A protocol involving standardized health and 9/11 exposure questionnaires, physical exam, chest imaging, blood/urine/lung function testing, and mental health evaluation was implemented in 5 New York academic medical centers.[13] In 2008, Congress funded treatment services of community members impacted by 9/11 for the same conditions identified in the worker cohorts ("survivor program"). Both cohorts were enrolled in the WTC Health Program (2011), a federal entitlement health program with Clinical Centers of Excellence and a Nationwide Provider Network and administered through NIOSH.

Question 6

Studies of FDNY rescue workers indicated longitudinal deficits in which pulmonary function testing parameter even in patients with normal lung function?

- ❑ Forced expiratory volume 1 (FEV1)
- ❑ FEV1/forced vital capacity (FVC)
- ❑ Total lung capacity
- ❑ Diffusing capacity

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Answer 6 Explanation

Longitudinal analysis of pulmonary function in more than 12,000 FDNY rescue workers compared nearly 32,000 spirometry examinations between January 1, 1997 and September 11, 2002.[11] FDNY rescue workers with various levels of exposure from the WTC collapse had a significant reduction in adjusted average FEV1 in the first year following the collapse: equal to 12 years of aging-related FEV1 decline. Exposure intensity assessed by initial arrival time at the WTC site had a direct linear correlation with FEV1 reduction.

Question 7

Which of the following spirometric abnormalities was seen most often in the population of responders and survivors who were not members of the FDNY?

- ❑ FEV1
- ❑ FEV1/FVC
- ❑ FVC
- ❑ Diffusing capacity

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- ❑ FEV1/FVC
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Answer 7 Explanation

The WTC Worker and Volunteer Medical Monitoring Program has assessed and provided treatment to 9/11 workers and volunteers, known as "general responders." At 3 years, approximately 1 in 4 general responders (24.1%) had abnormal spirometry findings; reduced FVC without obstruction was most commonly observed (16.1%).[14] Although most responders had a normal decline in lung function, a subset of responders who reported chronic persistent cough, wheezing, or dyspnea at the first medical examination after 9/11 were more likely to have lower lung function and bronchodilator responsiveness.[15] In addition, a lack of bronchodilator response at that first exam and weight gain were significantly associated with greater decline in lung function .[14]

Question 8

Long-standing chronic rhinosinusitis has been hypothesized to increase nasal airway inflammation and increase snoring. As a consequence of these changes, there is a reported excess in the development of which of the following conditions?

- ❑ Central sleep apnea
- ❑ Tracheitis
- ❑ Bronchiolitis
- ❑ Obstructive sleep apnea (OSA)

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Answer 8 Explanation

Ten years after the 9/11 WTC attacks, responders and survivors continued to demonstrate the long-lasting effects. A significant number of rescue workers and residents and workers near the site reported upper and lower respiratory conditions, including rhinosinusitis and asthma, as well as GERD, OSA, and musculoskeletal injuries.[1,16] A cross-sectional comparative study compared 50 WTC MMTP responders who had aerodigestive disorders and worsening snoring with 50 nonresponder habitual snorers.[18] Among the nonresponders, body mass index, weight, and apnea-hypopnea index were all strongly correlated; however, in the responders, there was no correlation between either body mass index or weight and apnea-hypopnea index. The investigators concluded that different mechanisms, not obesity, were important in the development of OSA in WTC responders with aerodigestive disorders.[17]

Question 9

John is a 50-year-old, currently employed construction worker with asthma. He was at the WTC site from September 12, 2001 to July 2002. He currently works in demolition and building remodeling. He is being treated by his pulmonary physician with inhaled steroids and long-acting bronchodilators. He needs to use his rescue inhalant at least twice daily during the workday but rarely uses it on weekends. Which intervention would be most effective in improving John's long-term respiratory health?

- ❑ Improving workplace conditions and avoid/decrease exposure to dust
- ❑ Adding systemic steroid therapy
- ❑ Adding a leukotriene antagonist
- ❑ Changing from gas heating to oil heating at home

Answer 9

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Answer 9 Explanation

John is likely to have occupational asthma, which, along with work-aggravated asthma, has become a prevalent occupational lung disease.[18-20] The best health outcome is likely to be achieved by removing exposure to the causative agent(s) or at least reducing exposure.[18,19] The American Thoracic Society recommends early diagnosis and removal from further exposures for optimal results, noting that a subset of persons may be able to continue working safely with reduced exposure.[20,21] Adding additional medications is not appropriate; changes are needed in the workplace, not in the home environment.

Question 10

Susanna resided in lower Manhattan at the time of the WTC attacks. She has had a chronic, nonproductive cough for 5 years. She has been treated for rhinitis, sinusitis, and cough-variant asthma without success. What other treatment has been shown to benefit patients with WTC cough?

- ❑ Antibiotics for bronchitis
- ❑ Systemic steroids for asthma
- ❑ Bronchoalveolar lavage for pulmonary fibrosis
- ❑ Proton pump inhibitor for GERD

Answer 10

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- ❑ Proton pump inhibitor for GERD

Answer 10 Explanation

A predominant consequence of the collapse of the WTC has been "WTC cough syndrome," which is characterized by chronic rhinosinusitis, asthma, and/or bronchitis and frequently complicated by GERD.[23] Consequently, proton pump inhibitors have shown benefit in treating patients with WTC cough syndrome.[22]

Question 11

Which of the following cancers has the shortest latency period and is most frequently cited in the literature as associated with exposure to both radiation and chemicals?

- ❑ Gastrointestinal malignancies
- ❑ Hematopoietic malignancies
- ❑ Lung malignancies
- ❑ Skin cancer

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Answer 11 Explanation

The WTC Health Program Administrator determined minimum latencies for the following 5 types or categories of cancer eligible for coverage in the WTC Health Program, in order of shortest to longest: (1) lymphoproliferative and hematopoietic cancers (including all types of leukemia and lymphoma): 0.4 years (~146 days); (2) childhood cancers (excluding lymphoproliferative and hematopoietic cancers): 1 year; (3) thyroid cancer: 2.5 years; (4) all solid cancers (excluding mesothelioma, lymphoproliferative, thyroid, and childhood cancers): 4 years; and (5) mesothelioma: 11 years.[23,24]

Question 12

WTC exposure has resulted in an excess of all types of cancers compared with state registry data from 2002 to 2008. Which of the following is *not* one of the 15 most commonly reported cancers reported in patients exposed to the WTC disaster?

- ❑ Multiple myeloma
- ❑ Lymphoma
- ❑ Pancreatic cancer
- ❑ Thyroid cancer

Answer 12

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- ❑ Pancreatic cancer
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Answer 12 Explanation

Most occupational cancers first manifest at least a decade after carcinogenic exposure.[24] In the first 7 years after 9/11, the incidence of several types of cancer was greater than expected -- including cancer at all sites combined as well as thyroid, prostate, and combined hematopoietic and lymphoid cancers.[24] These findings are similar to those of other studies on populations affected by WTC exposure, including one on firefighters[25] and another on "general responders."[26] There was a modest excess of cancer cases among exposed vs nonexposed firefighters.[25] Standardized incidence ratios had significantly increased by 2007/2008 among rescue and recovery workers for 3 cancer sites: prostate cancer, thyroid cancer, and multiple myeloma[26]; however, there is no evidence to date regarding an increased incidence of pancreatic cancer among persons exposed to the WTC disaster.

Question 13

There is potential for bias due to vigilance concerning health after an exposure, and therefore more screening may be performed on susceptible populations. Which of the following cancer diagnoses is *not* susceptible to screening bias?

- ❑ Colon (diagnosed after colonoscopy)
- ❑ Lymphoma
- ❑ Prostate (diagnosed after prostate-specific antigen testing and digital rectal exam)
- ❑ Thyroid (diagnosed after physical exam)

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Answer 13 Explanation

Various types and categories of cancer have strong causal evidence linking them to exposure to specific carcinogens; however, some of those carcinogens (eg, iodine) were *not* present at/around Ground Zero.[24] Increased medical surveillance has been offered as a possible explanation for greater-than-expected numbers of specific cancer diagnoses among persons directly affected by the WTC collapse.[24] Specifically, prostate and endocrine cancers have been shown to be diagnosed more frequently among heavily screened populations. Responders with respiratory health problems underwent chest computed tomography, increasing the likelihood of detection of thyroid malignancies. Responders diagnosed with GERD may have undergone colonoscopy, increasing detection of colon cancer; however, there is as yet no reliable screening test for lymphoma.

Question 14

Which of the following cancers is associated with shiftwork and polychlorinated biphenyl (PCB) exposure?

- ❑ Breast cancer in females
- ❑ Testicular cancer
- ❑ Prostate cancer
- ❑ Ovarian cancer

Answer 14

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- ❑ Testicular cancer
- ❑ Prostate cancer
- ❑ Ovarian cancer

Answer 14 Explanation

In September 2012, breast cancer was added to the list of WTC-related health conditions among "responders or survivors who were exposed to either shiftwork/nighttime sleep disruption or PCBs as a result of the 9/11 attacks."[27] Substantial evidence links shiftwork/nighttime sleep disruption with increased risk of breast cancer.[28-31] The International Agency for Research on Cancer (IARC) classifies shiftwork involving circadian rhythm disruption as probably carcinogenic to humans; research estimates the potential impact of shiftwork may account for nearly 11,800 breast cancers in 2010.[32] Although a study by the IARC concluded that there is limited evidence that PCBs cause breast cancer, the administrator believed that the presence of PCBs at the site warranted inclusion of breast cancer as a WTC-related health condition, which facilitated potential coverage for responders (from PCBs and shiftwork), survivors, and those exposed to the dust.[33,34] Associations between shiftwork and PCBs and increased risk for other cancers have not yet been substantiated.[35,36]

Question 15

Tom is a 53-year-old retired City of New York Police Department (NYPD) officer living in Tallahassee, Florida. He worked at the Staten Island Landfill for 88 hours from September 20, 2001 through September 30, 2001 and was exposed to WTC dust. He has asthma, GERD, rhinitis, and posttraumatic stress disorder (PTSD). His conditions are consistent with WTC Health Program time intervals for new onset of aerodigestive disorders,[37] and his medical history would show that his PTSD is WTC-related. What (if any) are his benefits under the WTC Health Program?

- ❑ He would be eligible to be a member of the WTC Health Program; he would be eligible for annual screening, medical and mental health treatment for his conditions and any related conditions, and all pharmaceutical costs
- ❑ He would be eligible for the WTC Health Program and could receive annual screening, but he could not receive treatment because he lives outside the New York metropolitan area
- ❑ He would not be eligible for the WTC Health Program because he did not work at Ground Zero, which is the only location where responders received exposures
- ❑ He would not be eligible for the WTC Health Program because he lives outside of the New York City/New Jersey area

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Answer 15 Explanation

Tom's conditions are included in the WTC Health Program list.[39] In addition to FDNY firefighters, the WTC Health Program (www.cdc.gov/wtc) also covers "a member of the Police Department of New York City (active or retired) or a member of the Port Authority Police of the Port Authority of NY and NJ (active or retired) who participated onsite in rescue, recovery, debris cleanup, or related services in lower Manhattan (south of Canal St), including Ground Zero, the Staten Island Landfill, or the barge loading piers…The WTC Health Program NPN [Nationwide Provider Network] provides care for WTC responders and WTC survivor members who live outside of the NY metropolitan area." The NPN attempts to provide care within 70 miles of the person's residence if possible.[39] Tom may also have benefits available to him under the Victim Compensation Fund (VCF) created by the James Zadroga 9/11 Health and Compensation Act of 2010 and administered by the Department of Justice (www.vcf.gov).

Question 16

Reggie is a 63-year-old retired firefighter who is a member of the WTC Health Program. He is currently living in Arizona for the benefits of its weather. Reggie was exposed to high levels of WTC dust working on the pile doing rescue and recovery work for more than 6 weeks. In 2004 Reggie was diagnosed with multiple myeloma that was determined to be WTC-related. Which of the following is *not* covered under his Zadroga benefits?

- ❑ VCF compensation
- ❑ Pharmaceuticals for multiple myeloma
- ❑ Medical coverage for hyperlipidemia
- ❑ Medical coverage for health conditions medically associated with his multiple myeloma

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Answer 16 Explanation

Reggie's Zadroga benefits cover medical care and pharmaceuticals associated with his multiple myeloma. He also is eligible to receive compensation from the VCF "for economic and non-economic loss as defined in the regulations."[40]; however, he is not covered for issues that are unrelated to his medical problems associated with 9/11, such as any acute medical conditions, problems such as hypertension or hyperlipidemia, or dental concerns.

Question 17

Which of the following is *less* likely to be a predictor of PTSD among WTC responders and survivors?

- ❑ Subjective perception of threat to their lives
- ❑ Being among responders who were first to arrive on the scene
- ❑ Being a police officer
- ❑ Witnessing trauma or sustaining an injury at the site

Answer 17

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Answer 17 Explanation

PTSD and PTSD symptoms are still present among many rescue/recovery workers as well as for persons living or working near the 9/11 sites. Factors associated with PTSD include early arrival at the WTC towers, performing tasks not common for one's occupation, not having prior disaster training or experience, witnessing traumatic events, or sustaining an injury.[41-44] Early arrival at the WTC towers was a primary factor associated with probable PTSD among 11,006 WTC-exposed firefighters.[44] Among individuals living near the WTC on 9/11, probable PTSD was associated with older age, female gender, Hispanic ethnicity, low education and income, and divorce.[41] Police have substantially lower rates of PTSD vs others with exposures.[2] Factors that increase risk of PTSD among police include comorbid depression, panic disorder, alcohol problems,[45] age 45 to 69, increased number of stressful events witnessed on 9/11 or experienced since 9/11, and unmet mental healthcare needs.[46]

Question 18

According to research findings, primary care providers should be alert for possible mental health concerns in patients who were responders to, or survivors of, the WTC attacks and have which of the following manifestations?

- ❑ Have abnormal lung function
- ❑ Demonstrate increasing substance misuse
- ❑ Are currently employed
- ❑ Have higher socioeconomic status

Answer 18

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- ❑ Demonstrate increasing substance misuse
- ❑ Are currently employed
- ❑ Have higher socioeconomic status

Answer 18 Explanation

Common risk factors for mental illness after traumatic exposure include prior trauma, prior mental health problems, younger age, and female gender, as well as lower socioeconomic status and minority ethnicity.[47] Studies have found an association between lower respiratory symptoms and probable PTSD, although no correlation has been found between PTSD and abnormal lung function.[47] A common triad observed in WTC survivors/responders includes mental health, respiratory disorders, and gastrointestinal disorders. In addition, research has demonstrated an increase in substance misuse among persons with later or delayed-onset PTSD.[47]

Question 19

Andrew is a 59-year-old recent retiree of the NYPD who was part of the recovery efforts after the WTC attacks. He retired this past August with a 25-year pension. His retirement brought out memories and feelings of grief regarding neighbors and colleagues who did not survive the actual attacks of 9/11 or who succumbed to its medical consequences. He has been having more frequent nightmares about 9/11, is irritable, and complains of fatigue and a short temper. His wife cannot understand why he is unwilling to fly to Florida for a vacation. He admits these issues are affecting his marriage and daily functioning. He was surprised that his primary care provider suggested these emotions might be related to his recovery work after the WTC attacks. All but which of the following are possible reasons Andrew has not sought counseling?

- ❑ He does not connect these affective symptoms to 9/11 because so much time has elapsed since the attacks
- ❑ He denies the need for mental health counseling, noting that he is not "legitimately crazy“
- ❑ He likely attributes his symptoms to aging
- ❑ His WTC-related benefits will not cover mental health counseling unless he demonstrates severe depression

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Answer 19 Explanation

Despite the occurrence of physical and/or mental health symptoms, many persons directly affected by the events of 9/11 fail to associate current symptoms with the attacks.[48] Research has found that individuals are more likely to attribute their current (mental) health concerns to aging, and others believe that too much time has elapsed since 9/11 to explain their current symptoms. The stigma of mental health concerns and the misperception that only persons who are "legitimately crazy" require mental health care are also common barriers to obtaining appropriate psychological or psychiatric care.[48]

Question 20

Frank is a 42-year-old retired member of the NYPD. He has a history of childhood asthma and was intermittently taking bronchodilators in the year before 9/11; his asthma is triggered by cold. He worked at various WTC-related sites from September 12, 2001 until November 2002, including on the "pit" doing search and rescue, at the Staten Island landfill, and in the temporary morgues. While working at these sites, he developed a hacking cough that was not part of his usual asthma symptoms, along with increasing shortness of breath that was particularly bad at the Staten Island landfill. He was started on inhaled steroids by his pulmonologist in December 2001, but he continued to have worsening asthma symptoms. In 2006, a computed tomography scan obtained through the WTC Health Program showed mediastinal lymphadenopathy and parenchymal nodules. He underwent an open lung biopsy that showed noncaseating granulomas with tissue culture negative for acid-fast bacilli and fungus. Which of the following is the most likely diagnosis?

- ❑ Metastatic disease
- ❑ Lymphoma
- ❑ Sarcoidosis
- ❑ Tuberculosis

Answer 20

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Answer 20 Explanation

Sarcoidosis is a multisystemic granulomatous disorder that is characterized by the presence of noncaseating granulomas on tissue biopsy. Patients often present with bilateral hilar adenopathy, pulmonary reticular opacities, and skin joint and eye lesions. The presentation of sarcoidosis varies from asymptomatic with incidental findings of radiologic abnormalities to fevers, cough, dyspnea, fatigue, and weight loss.[49,50] In patients presenting with sarcoidosis malignancy, infection is often on the differential and must be ruled out. In this patient, who has an absence of systemic symptoms, this is less likely. As granulomas can be seen in patients with mycobacterial and fungal infections, all biopsy specimens should be examined for the presence of mycobacterial or fungal infection.

Question 21

The WTC Health Program provides a unique environment to follow participants exposed to an unusual dust composition in the setting of rare disaster. Of the pulmonary diseases listed below, which is currently *not* expected to increase in long-term surveillance?

- ❑ Bronchiolitis
- ❑ Interstitial lung disease
- ❑ Lung cancer
- ❑ RADS

Answer 21

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- ❑ Bronchiolitis
- ❑ Interstitial lung disease
- ❑ Lung cancer
- ❑ RADS

Answer 21 Explanation

Studies are ongoing to further understand the long-term health consequences of the WTC disaster. Physicians should be aware that diseases such as interstitial lung disease and cancer may still be related to 911 exposure even though they can present years later.[1,5,6,24,25,51,52] Although several types of obstructive airways disease may develop over time, RADS is typically felt to occur early after exposure.

Additional Resources

WTC Health Program

WTC Health Program: Frequently Asked Questions

Which Cancers Are Eligible for Coverage?

Eligibility Information and How to Apply to the WTC Health Program

WTC-Affiliated Clinics and the National Provider Network

NIOSH: Personal Protective Equipment

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