



## **Chemical/Biological Terrorism January 2004**

1: Alaska Med. 2000 Oct-Dec;42(4):101-13.

Preparedness for a bioterrorism event in Alaska. Part 1: Detection and identification of a biologic event.

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U.S. military and public health experts are increasingly concerned that the general public is at risk for terrorist attacks. Traditional weapons of mass destruction such as explosive and chemical devices remain the most likely forms of terrorism, however the threat of bioterrorism is also present and may be increasing. An intentional biologic event may be covert and if so, will not become apparent for days or even weeks when many ill people present with an unidentified illness. Health care providers will be the first responders during a biologic attack and will be called upon to diagnose diseases such as anthrax, tularemia or even smallpox. In the first of a two-part article, a hypothetical scenario is presented to illustrate how such an attack might first be discovered and the agent identified. As the scenario unfolds, evidence is collected that suggests the outbreak was intentional. Information about epidemiologic clues, disease syndromes and specific high-risk agents are discussed.

PMID: 14593880 [PubMed - indexed for MEDLINE]

2: Am J Bioeth. 2003 Winter;3(1):W-IF 1.

Smallpox revisited?

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This article reviews the history of smallpox and ethical issues that arise with its threat as a biological weapon. Smallpox killed more people than any infectious disease in history--and perhaps three times more people in the 20th Century than were killed by all the wars of that period. Following a WHO-sponsored global vaccination campaign, smallpox was officially declared eradicated in 1980. It has since been revealed that the Soviet Union, until its fall in the early 1990s, manufactured tens of tons of smallpox for military purposes. A worry is that some of this may have fallen into the hands of "rogue" nations or terrorists. Current U.S. debate questions whether smallpox vaccine should therefore be made available to the American public, which--like the rest of the world--now lacks immunity. Because the vaccine is considerably dangerous, public dialogue cannot resolve this matter if evidence material to the

likelihood of attack is classified (i.e. secret). I conclude by recommending numerous future areas for ethics research related to the weaponization of smallpox.

PMID: 14560713 [PubMed - indexed for MEDLINE]

3: Am J Pathol. 2003 Nov;163(5):1901-10.

The critical role of pathology in the investigation of bioterrorism-related cutaneous anthrax.

Shieh WJ, Guarner J, Paddock C, Greer P, Tatti K, Fischer M, Layton M, Philips M, Bresnitz E, Quinn CP, Popovic T, Perkins BA, Zaki SR; Anthrax Bioterrorism Investigation Team.

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Cutaneous anthrax is a rare zoonotic disease in the United States. The clinical diagnosis traditionally has been established by conventional microbiological methods, such as culture and gram staining. However, these methods often yield negative results when patients have received antibiotics. During the bioterrorism event of 2001, we applied two novel immunohistochemical assays that can detect *Bacillus anthracis* antigens in skin biopsy samples even after prolonged antibiotic treatment. These assays provided a highly sensitive and specific method for the diagnosis of cutaneous anthrax, and were critical in the early and rapid diagnosis of 8 of 11 cases of cutaneous anthrax during the outbreak investigation. Skin biopsies were obtained from 10 of these 11 cases, and histopathological findings included various degrees of ulceration, hemorrhage, edema, coagulative necrosis, perivascular inflammation, and vasculitis. Serology was also an important investigation tool, but the results required several weeks because of the need to test paired serum specimens. Other tests, including culture, special stains, and polymerase chain reaction assay, were less valuable in the diagnosis and epidemiological investigation of these cutaneous anthrax cases. This report underscores the critical role of pathology in investigating potential bioterrorism events and in guiding epidemiological studies, a role that was clearly demonstrated in 2001 when *B. anthracis* spores were intentionally released through the United States postal system.

PMID: 14578189 [PubMed - indexed for MEDLINE]

4: Am J Public Health. 2003 Oct;93(10):1640-2.

A global network for early warning and response to infectious diseases and bioterrorism: applied epidemiology and training programs, 2001.

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In many ministries of health, applied epidemiology and training programs (AETPs) are responsible for detecting and responding to acute health events, including bioterrorism. In November 2001, we assessed the bioterrorism response capacity of 29 AETPs; 17 (59%) responded. Fifteen countries (88%) had bioterrorism response plans; in 6 (40%), AETPs took the lead in preparation and in 6 (40%) they assisted. Between September 11 and November 29, 2001, 12 AETPs (71%) responded to a total of 3024 bioterrorism-related phone calls. Six programs

(35%) responded to suspected bioterrorism events. AETPs play an important role in bioterrorism surveillance and response. Support for this global network by various health agencies is beneficial for all developed and developing countries.

PMID: 14534215 [PubMed - indexed for MEDLINE]

5: Ann Emerg Med. 2004 Jan;43(1):6-14.

An emergency department response to severe acute respiratory syndrome: A prototype response to bioterrorism.

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Study objective: On March 13, 2003, Singapore physicians were alerted about an outbreak of atypical pneumonia that became known as severe acute respiratory syndrome (SARS). I describe the application of an emergency department (ED) disaster response plan to manage the SARS outbreak. METHODS: The ED implemented protection for staff, patients, and facility; infection control measures; and disaster-response workflow changes. The Ministry of Health, Singapore, centralized SARS cases in the hospital, and the ED became the national screening center. A screening questionnaire and a set of admission criteria were applied after assessment of clinical features and chest radiograph findings. RESULTS: For the duration of the outbreak that ended on May 31, 2003, the ED screened 11,461 persons for SARS, of whom 1,386 (12.9%) were admitted to rule out SARS and 235 (17%) were confirmed to have SARS. Among 10,075 persons discharged from the ED, there were 28 reattending patients who were admitted and diagnosed with SARS, giving an undertriage rate of 0.3% (95% confidence interval [CI] 0.1% to 0.4%). The sensitivity of an ED admission for SARS was 89.4% (95% CI 85.6% to 93.1%), and specificity was 89.7% (95% CI 89.2% to 90.3%). The positive predictive value was 17% (95% CI 15.7% to 18.4%), and the negative predictive value was 99.7% (95% CI 99.6% to 99.8%). No patient contracted SARS as a result of an ED visit. After full implementation of protective measures, 1 ED nurse with undiagnosed diabetes mellitus was treated for suspected SARS. CONCLUSION: Although the SARS outbreak was not a bioterrorism event, the ED disaster response was applicable in the outbreak's management. The use of a screening questionnaire and admission criteria enabled the ED to screen, treat, and safely discharge the majority of the patients.

PMID: 14707933 [PubMed - in process]

6: Arch Dermatol. 2003 Dec;139(12):1545-52.

Increased detection of rickettsialpox in a New York City hospital following the anthrax outbreak of 2001: use of immunohistochemistry for the rapid confirmation of cases in an era of bioterrorism.

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BACKGROUND: Rickettsialpox is a self-limited febrile illness with skin lesions that may be mistaken for signs of potentially more serious diseases, such as cutaneous anthrax or chickenpox. The cluster of cutaneous anthrax cases from bioterrorism in

October 2001 likely heightened awareness of and concern for cutaneous eschars. OBJECTIVES: To apply an immunohistochemical technique on paraffin-embedded skin biopsy specimens for diagnosing rickettsialpox, and to compare the reported incidence of rickettsialpox before, during, and after the cluster of cutaneous anthrax cases. DESIGN: Case series. SETTING: Dermatology department in a large tertiary care hospital in New York City. PATIENTS: Eighteen consecutive patients with the clinical diagnosis of rickettsialpox from February 23, 2001, through October 31, 2002. MAIN OUTCOME MEASURES: Results of immunohistochemical testing of skin biopsy specimens and of serological testing. RESULTS: Immunohistochemical testing revealed spotted fever group rickettsiae in all 16 eschars and in 5 of the 9 papulovesicles tested. A 4-fold or greater increase in IgG antibody titers reactive with *Rickettsia akari* was observed in all 9 patients for whom acute and convalescent phase samples were available; 6 patients had single titers indicative of rickettsialpox infection ( $>$  or  $=1:64$ ). Of the 18 patients, 9 (50%) presented in the 5 months following the bioterrorism attacks. CONCLUSIONS: Rickettsialpox remains endemic in New York City, and the bioterrorism attacks of October 2001 may have led to increased awareness and detection of this disease. Because rickettsialpox may be confused with more serious diseases, such as cutaneous anthrax or chickenpox, clinicians should be familiar with its clinical presentation and diagnostic features. Immunohistochemical staining of skin biopsy specimens, particularly from eschars, is a sensitive technique for confirming the clinical diagnosis. PMID: 14676069 [PubMed - in process]

7: Arch Dermatol. 2003 Dec;139(12):1657-8.  
Bioterrorism preparedness in the dermatology community.  
Carroll C, Balkrishnan R, Khanna V, Feldman S.  
Publication Types: Letter  
PMID: 14676093 [PubMed - in process]

8: BMC Med Inform Decis Mak. 2003 Jan 23;3(1):2.  
Time series modeling for syndromic surveillance.  
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BACKGROUND: Emergency department (ED) based syndromic surveillance systems identify abnormally high visit rates that may be an early signal of a bioterrorist attack. For example, an anthrax outbreak might first be detectable as an unusual increase in the number of patients reporting to the ED with respiratory symptoms. Reliably identifying these abnormal visit patterns requires a good understanding of the normal patterns of healthcare usage. Unfortunately, systematic methods for determining the expected number of (ED) visits on a particular day have not yet been well established. We present here a generalized methodology for developing models of expected ED visit rates.  
METHODS: Using time-series methods, we developed robust models of ED utilization for the purpose of defining expected visit rates. The models were based on nearly a decade of historical data at a major metropolitan academic, tertiary care pediatric emergency department. The historical data were fit using trimmed-mean seasonal models, and additional models were fit with autoregressive integrated moving average (ARIMA) residuals to account for recent trends in the data. The detection

capabilities of the model were tested with simulated outbreaks. RESULTS: Models were built both for overall visits and for respiratory-related visits, classified according to the chief complaint recorded at the beginning of each visit. The mean absolute percentage error of the ARIMA models was 9.37% for overall visits and 27.54% for respiratory visits. A simple detection system based on the ARIMA model of overall visits was able to detect 7-day-long simulated outbreaks of 30 visits per day with 100% sensitivity and 97% specificity. Sensitivity decreased with outbreak size, dropping to 94% for outbreaks of 20 visits per day, and 57% for 10 visits per day, all while maintaining a 97% benchmark specificity. CONCLUSIONS: Time series methods applied to historical ED utilization data are an important tool for syndromic surveillance. Accurate forecasting of emergency department total utilization as well as the rates of particular syndromes is possible. The multiple models in the system account for both long-term and recent trends, and an integrated alarms strategy combining these two perspectives may provide a more complete picture to public health authorities. The systematic methodology described here can be generalized to other healthcare settings to develop automated surveillance systems capable of detecting anomalies in disease patterns and healthcare utilization.

Publication Types: Validation Studies  
PMID: 12542838 [PubMed - indexed for MEDLINE]

9: Clin Leadersh Manag Rev. 2003 Sep-Oct;17(5):281-2.  
Detection of the sentinel anthrax case in the United States.

Beall A, Cooke W, Trout J, Robb JA.

First-hand knowledge of the detection of the first bioweapon in modern United States history is described in this article. The method by which the presumptive diagnosis of anthrax meningitis was made within 13 hours of the patient presenting to the emergency department is described using pre-analytic, analytic, and post-analytic phases. The lessons learned from this process are briefly presented so that other laboratories may learn from our experience: how to prepare; how to quickly analyze a potential bioweapon; how to communicate with staff and local, regional, and national authorities; and how to deal with disruptive media attention.

PMID: 14531222 [PubMed - indexed for MEDLINE]

10 Comp Immunol Microbiol Infect Dis. 2003 Oct;26(5-6):431-43.  
Bioterrorism and infectious animal diseases.

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After a brief historical introduction, the authors describe a list of pathogens likely to be used by bioterrorists to adversely affect animal health and production, and eventually human health in case of zoonotic agents. The selection criteria for these numerous pathogens as well as the means available for their procurement, manipulation and dispersal are discussed. The potential consequences of this bioterrorism are evaluated mainly in economic terms. The authors conclude that the threat of bioterrorism is serious and suggest appropriate measures to prevent it or to limit its consequences.

Publication Types: Review Review, Tutorial  
PMID: 12818627 [PubMed - indexed for MEDLINE]

11: Comp Immunol Microbiol Infect Dis. 2003 Oct;26(5-6):423-30.

Smallpox vaccination and bioterrorism with pox viruses.

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Bioterrorist attacks occupy a special place amongst the innumerable potential types of terrorist attack, with the intentional release of pox viruses being especially feared in this connection. Apart from the variola virus, the agent responsible for smallpox in humans, the monkeypox virus and numerous other animal pox viruses pose potential risks for humans and animals. This risk scenario also includes recombinations between the various pox viruses, changes in hosts and genetically engineered manipulations of pox viruses. For over 200 years, the method of choice for combatting smallpox was via vaccination with a reproductive, original vaccinia virus. Worldwide eradication of smallpox at the end of the 1970s and the discontinuation of routine smallpox vaccination in 1980 can be credited to such vaccination.

Unfortunately, these vaccinations were associated with a large number of postvaccinal impairments, sometimes resulting in death (e.g. postvaccinal encephalitis). The only way to restrict such postvaccinal complications was to carry out initial vaccination within the first 2 postnatal years. Initial vaccination at a later age led to such a sharp increase in the number of vaccines with complications that vaccination had to be discouraged. The dilemma of the smallpox vaccine stocks stems from the fact that a large portion of these stocks are produced with the same vaccinia strains as before. This is irresponsible, especially as the percentage of immune-suppressed persons in the population, for whom vaccination-related complications pose an especial threat, is increasing. One solution to the dilemma of the smallpox vaccine stocks is the MVA strain. It is harmless, protects humans and animals equally well against smallpox and can be applied parenterally.

Publication Types: Review Review, Tutorial

PMID: 12818626 [PubMed - indexed for MEDLINE]

12: Comp Immunol Microbiol Infect Dis. 2003 Oct;26(5-6):401-21.

Medical management of biological warfare and bioterrorism: place of the immunoprevention and the immunotherapy.

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Biological weapons are considered as mass destruction and terror weapons. Terrorism including bioterrorism is the major threat in the future conflicts for our nations. The aim of bioterrorism is more related to the potential disorganisation of the society than to the lethal effects of the agents used. The dramatic consequences cannot be discarded, especially if contagious agents such viral are used. The preparation of specific defence measures is a major challenge for our countries. The knowledge acquired from the struggle against natural infectious diseases and recent events are essential to improve behaviours to face the biological weapon threats. The defence attitude is based on the anticipation of the threat, the management of the victims, and the restoration of the operational capabilities. This global defence attitude implies six important functions: (i) alert, (ii) detection and diagnosis, (iii)

availability of pharmaceutical countermeasures such as vaccine, sera and anti-infectious medicine and products, (iv) medical management of victims, (v) training and information, (vi) research and development. Passive and active immunoprevention and immunotherapy belong to the approaches discussed in the context of bioterrorism countermeasures. Further researches might be focused on these topics.

Publication Types: Review Review, Tutorial  
PMID: 12818625 [PubMed - indexed for MEDLINE]

13: Crit Care Nurse. 2003 Oct;23(5):15-20; quiz 21-2.

Chemical warfare. Toxicity of nerve agents.

Martin T, Lobert S.

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Publication Types: Review Review, Tutorial  
PMID: 14606123 [PubMed - indexed for MEDLINE]

14: Crit Rev Microbiol. 2003;29(3):223-57.

Distinguishing offensive from defensive biological weapons research.

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Publication Types: Review Review, Tutorial  
PMID: 14582619 [PubMed - indexed for MEDLINE]

15: Dent Clin North Am. 2003 Oct;47(4):733-44.

Dentistry and bioterrorism.

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Dentistry's role in responding to bioterrorism and other catastrophic events is evolving and may involve a wide range of activities. Organized dentistry. Local dental societies. and interested individuals should make local emergency response planners aware of the services the dental profession can provide and should work to integrate dental resources to strengthen the disaster response capacity of community health care systems. With effective planning, education, and training, dentists can play a significant role in responding to acts of bioterrorism or other unforeseen events.

PMID: 14664462 [PubMed - in process]

16: Diagn Mol Pathol. 2003 Jun;12(2):103-7.

Rapid diagnosis of smallpox infection and differentiation from its mimics.

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The potential for a bioterrorism-induced smallpox outbreak has been much discussed of late. The literature of the late 1960s stressed that the distinction between

smallpox and the other viral-induced vesicle-forming diseases, namely varicella zoster and disseminated herpes simplex, was difficult to make. Given that the cutaneous manifestations of smallpox would be among the initial symptoms, we reviewed 2 cases of smallpox diagnosed in South America in the 1970s in conjunction with 9 cases of multiple skin vesicles diagnosed as either disseminated herpes simplex or varicella-zoster. These were examined by routine hematoxylin and eosin stain (H&E) as well as by in situ hybridization. A blind review of the cases demonstrated that each showed striking intraepithelial vesicles containing multinucleated squamous cells exhibiting a ground glass appearance of the nuclear chromatin. Thus, as expected, routine H&E examination could not differentiate the 2 smallpox cases from the other 9 samples. In situ hybridization easily distinguished the 2 cases of smallpox from the other 9 samples, 5 of which contained varicella-zoster (two had been misdiagnosed as herpes) and the other 4 were disseminated herpes simplex. The in situ test, readily accomplished in any histology-based molecular laboratory in 4 hours, allows for the rapid and specific identification of smallpox infection and, importantly, its distinction from its mimics. Formalin fixation, which is optimal for in situ hybridization, guarantees the inactivation of the smallpox virus.  
PMID: 12766615 [PubMed - indexed for MEDLINE]

17: Disaster Manag Response. 2003 Oct-Dec;1(4):125.  
Recognition and management of bioterrorism infections.  
[No authors listed]  
PMID: 14666104 [PubMed - as supplied by publisher]

18: Disaster Manag Response. 2003 Oct-Dec;1(4):124-125.  
Innovative surveillance methods for rapid detection of disease outbreaks and bioterrorism: Results of an interagency workshop on health indicator surveillance.  
[No authors listed]  
PMID: 14666102 [PubMed - as supplied by publisher]

19: Disaster Manag Response. 2003 Oct-Dec;1(4):114-8.  
Lessons learned: the "pale horse" bioterrorism response exercise.  
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The city of San Antonio, Texas, and the Fort Sam Houston Army Post conducted a bioterrorism response exercise to test the command infrastructure in a large tabletop exercise. A number of local, state, and federal agencies participated in the exercise. The scenario, program format, and multiple lessons learned from this experience are described. Needs for additional services, planning, and legal issues are identified.  
PMID: 14666097 [PubMed - in process]

20: Emerg Infect Dis. 2003 Oct;9(10):1330-2.  
The European Commission's Task Force on Bioterrorism.  
Tegnell A, Bossi P, Baka A, Van Loock F, Hendriks J, Wallyn S, Gouvras G.  
Task Force on Biological and Chemical Agent Threats, Public Health Directorate,

European Commission, L-2920 Luxembourg, Belgium. anders.tegnell@cec.eu.int  
PMID: 14609475 [PubMed - indexed for MEDLINE]

21: Emerg Infect Dis. 2003 Oct;9(10):1281-6.  
Multijurisdictional approach to biosurveillance, Kansas City.  
Hoffman MA, Wilkinson TH, Bush A, Myers W, Griffin RG, Hoff GL, Archer R.  
Cerner Corporation, 2800 Rockcreek Parkway, Kansas City, MO 64117-2551, USA.  
mhoffman1@cerner.com  
PMID: 14609464 [PubMed - indexed for MEDLINE]

22: Emerg Infect Dis. 2003 Oct;9(10):1197-204.  
Syndromic surveillance and bioterrorism-related epidemics.  
Buehler JW, Berkelman RL, Hartley DM, Peters CJ.  
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Publication Types: Review Review, Tutorial  
PMID: 14609452 [PubMed - indexed for MEDLINE]

23: Epidemiol Infect. 2003 Oct;131(2):849-57.  
Forecasting the geographical spread of smallpox cases by air travel.  
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Instituting air travel restrictions to slow the geographical spread of smallpox cases  
would have significant consequences and present serious logistical concerns. Public  
health decision makers must weigh the potential benefits of such restrictions against  
their negative impact. The goal of this research is to provide a basic analytical  
framework to explore some of the issues surrounding the use of air travel restrictions  
as a part of an overall containment strategy. We report preliminary results of a  
compartmental model for the inter-city spread of smallpox cases resulting from US  
domestic air travel. Although air traffic can be halted within hours as was shown  
following the terrorist attacks of 11  
September 2001, these results suggest that the consequences of halting domestic air  
travel may not be outweighed by public health benefits.  
PMID: 14596525 [PubMed - indexed for MEDLINE]

24: Expert Opin Biol Ther. 2003 Dec;3(8):1279-89.  
Defensive applications of gene transfer technology in the face of bioterrorism: DNA-  
based vaccines and immune targeting.  
Ackley CJ, Greene MR, Lowrey CH.  
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Gene transfer involves the introduction of an engineered gene into a person's cells  
with the expectation that the protein expressed from the gene will produce a  
therapeutic benefit. Strategies based on this principle have led to the approval of >  
600 clinical trials and enrolment of approximately 3500 subjects worldwide in  
attempts to treat diseases ranging from cancer to AIDS to cystic fibrosis. While gene  
therapy has met with limited success and still has many hurdles to overcome before

it sees wide application, it may be useful as a defensive strategy against bioterrorism agents including infectious microbes and toxins. Although many defensive strategies are possible, immunological strategies are currently the most developed and are being actively applied to the development of strategies against several of the most virulent potential bioweapons. While most of these strategies are not yet ready for human application, DNA-based vaccines appear to be among the most promising in the fight against bioterrorism. PMID: 14640954 [PubMed - in process]

25: Expert Opin Biol Ther. 2003 Dec;3(8):1201-1207.

Bacterial biofilms of importance to medicine and bioterrorism: proteomic techniques to identify novel vaccine components and drug targets.

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Biofilms are highly ordered microbial communities enmeshed in a carefully sculpted matrix designed for survival of organisms either in multi- or mono-genus/species in a specific microniche. In human disease, biofilm infections are some of the most recalcitrant to treat. Even with rigorous antibiotic regimens, some biofilms, such as those within the thick airway mucus of cystic fibrosis (CF) patients, persist throughout the course of the disease process. In this editorial, discussion will cover the utility of using advanced proteomic techniques to help identify potential weaknesses in the already

impressive defensive armamentarium of biofilm bacteria. Two biofilm systems will be discussed herein, one of which is that of *Pseudomonas aeruginosa* biofilms within CF airway biofilms. The other is referred to as persistent 'bioterrorist agent biofilms' in which *Francisella tularensis* can grow on surfaces where environmental amoeba can phagocytose them, allowing for growth of *F. tularensis* within the amoebae.

Publication Types: EDITORIAL

PMID: 14640945 [PubMed - as supplied by publisher]

26: Expert Opin Biol Ther. 2002 Dec;2(8):883-93.

Vaccines for Category A bioterrorism diseases.

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Vaccination programmes are very successful as a preventive strategy against many infectious diseases which have had a major impact on human morbidity and mortality. One of these diseases, smallpox, has been eliminated as a natural infection. The recent concern about biological attacks has turned attention to the use of an immunisation programme to prevent infection with what are considered the most significant potentially harmful biowarfare pathogens. This review puts into perspective the available information on current immunization and newer vaccine options for anthrax, smallpox, tularaemia, plague and botulism.

Publication Types: Review Review, Tutorial

PMID: 12517267 [PubMed - indexed for MEDLINE]

27: Fam Pract. 2003 Aug;20(4):441-2.

Patient and family physician preferences for care and communication in the eventuality of anthrax terrorism.

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**BACKGROUND:** The threat of bioterrorism consequent to the September 11, 2001 attack in the USA generated suggestions for improved medical response mainly through hospital preparedness. **OBJECTIVES:** The aim of the present study was to investigate the impact of this period of tension on patients' first choice for care and for receiving relevant information, and on primary care doctors' feelings of responsibility in the eventuality of an anthrax attack. **METHODS:** During October 11-31, 2001, 500 patients from 30 clinics throughout Israel were asked to complete a questionnaire on their awareness of the anthrax threat, measures taken to prepare for it, and preferred sources of care and information. Their 30 physicians, and an additional 20, completed a questionnaire on knowledge about anthrax and anthrax-related patient behaviours and clinic visits. **RESULTS:** The outstanding finding was the low rate (30%) of patients who chose the hospital emergency department as their first choice for care or information if they were worried about an anthrax attack or the media communicated that an attack was in progress. The other two-thirds preferred their family doctor or the health authorities. Most of the physicians (89%) felt it was their responsibility to treat anthrax-infected patients and that they should therefore be supplied with appropriate guidelines. **CONCLUSION:** This study suggests that in Israel, a country with a high degree of awareness of civil defence aspects, both patients and primary care doctors believe that family physicians should have a major role in the case of bioterrorist attacks. This must be seriously considered during formulation of relevant health services programmes.

PMID: 12876118 [PubMed - indexed for MEDLINE]

28: Hastings Cent Rep. 2003 Sep-Oct;33(5):26-33.

The smallpox vaccination of health care workers: professional obligations and defense against bioterrorism.

May T, Aulisio MP, Silverman RD.

Center for the Study of Bioethics, Medical College of Wisconsin, USA.

PMID: 14696277 [PubMed - in process]

29: Health Matrix Clevel. 2003 Winter;13(1):159-80.

Regulation of biological research in the terrorism era.

Kellman B.

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PMID: 14569661 [PubMed - indexed for MEDLINE]

30: Health Matrix Clevel. 2003 Winter;13(1):117-58.

Biodefense: who's in charge?

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PMID: 14569660 [PubMed - indexed for MEDLINE]

31: Health Matrix Clevel. 2003 Winter;13(1):85-115.  
Quarantine redux: bioterrorism, AIDS and the curtailment of individual liberty in the name of public health.  
Parmet WE.  
Northeastern University School of Law, USA.  
PMID: 14569659 [PubMed - indexed for MEDLINE]

32: Health Matrix Clevel. 2003 Winter;13(1):71-83.  
Policy choices and model acts: preparing for the next public health emergency.  
Wing K.  
PMID: 14569658 [PubMed - indexed for MEDLINE]  
33: Health Matrix Clevel. 2003 Winter;13(1):33-70.  
Blinded by bioterrorism: public health and liberty in the 21st century.  
Annas GJ.  
Health Law Department, Boston University School of Public Health, USA.  
PMID: 14569657 [PubMed - indexed for MEDLINE]

34: Health Matrix Clevel. 2003 Winter;13(1):3-32.  
The Model State Emergency Health Powers Act: public health and civil liberties in a time of terrorism.  
Gostin LO.  
Georgetown University, USA.  
PMID: 14569656 [PubMed - indexed for MEDLINE]

35: Int J Antimicrob Agents. 2003 Feb;21(2):200-6.  
Bioterrorism--a new challenge for public health.  
Venkatesh S, Memish ZA.  
Department of Medical Affairs, King Abdulaziz Medical City--Riyadh, King Fahad National Guard Hospital, Riyadh, Saudi Arabia.  
The opening years of the new millennium have presented a new and worrisome possibility to the public, including travellers: the threat of deadly infectious diseases from biological agents being deliberately released. The possibility of bioterrorism had always seemed remote but the recent anthrax attacks by mail have made this threat of immediate relevance. The deliberate use of Bacillus anthracis with the intent to harm civilian populations has raised public health concerns about potential exposure to intentionally released Variola virus and other biological agents. There is an urgent need for countries to examine their preparedness to respond to biological weapons attacks. Given the emotional shock of even an alleged threat of a biological release, it will be wise for governments to consider how to address such dangers as an integral part of the national response to other threats to public health and well being. Physicians and other health professionals, including those providing guidance to international and domestic travellers, need to have a clear understanding of the possible agents and the appropriate therapy or prophylaxis. This paper attempts to give a perspective on the threat of bioterrorism, the consequences of its use, the likely biological agents

that may be used, and the clinical presentation and management of diseases caused by some agents most likely to be used.

Publication Types: Historical Article Review Review, Tutorial

PMID: 12615387 [PubMed - indexed for MEDLINE]

36: Int J Epidemiol. 2003 Aug;32(4):660-1.

Biological warfare and the people of Iraq.

Roberts I.

Publication Types: Letter

PMID: 12913049 [PubMed - indexed for MEDLINE]

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Missed sentinel case of naturally occurring pneumonic tularemia outbreak: lessons for detection of bioterrorism.

Dembek ZF, Buckman RL, Fowler SK, Hadler JL.

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BACKGROUND: Family physicians are likely to care for patients that have been exposed to diseases associated with bioterrorism. Persons with seemingly nondescript initial disease symptoms could be harbingers of a larger outbreak, whether naturally occurring or purposefully created. METHODS: We report a missed sentinel case of pneumonic tularemia associated with a naturally occurring outbreak. The patient's initial clinical symptoms and signs were nondescript, and the diagnosis was recognized by subsequent blood tests. The medical literature was searched using the key words "tularemia," "bioterrorism," "index of suspicion," and "sentinel case." RESULTS AND CONCLUSIONS: Being alert to possible unexpected causes of a pneumonic summer illness in a patient with associated weight loss might have led to an earlier diagnosis of this sentinel case tularemia and its association with the subsequent outbreak. Individual patients are likely to visit a physician's office after a purposeful bioterrorism event. Greater efforts must be made to increase awareness in all primary care physicians who might see patients exposed to a bioterrorism illness.

Publication Types: Case Reports

PMID: 12949036 [PubMed - indexed for MEDLINE]

38: J Am Med Inform Assoc. 2003 Nov-Dec;10(6):547-54. Epub 2003 Aug 04.

Automated syndromic surveillance for the 2002 Winter Olympics.

Gesteland PH, Gardner RM, Tsui FC, Espino JU, Rolfs RT, James BC, Chapman WW, Moore AW, Wagner MM.

University of Utah, Salt Lake City, USA.

The 2002 Olympic Winter Games were held in Utah from February 8 to March 16, 2002. Following the terrorist attacks on September 11, 2001, and the anthrax release in October 2001, the need for bioterrorism surveillance during the Games was paramount. A team of informaticists and public health specialists from Utah and Pittsburgh implemented the Real-time Outbreak and Disease Surveillance (RODS) system in Utah for the Games in just seven weeks. The strategies and challenges of implementing such a system in such a short time are discussed. The motivation and cooperation inspired by the 2002 Olympic Winter Games were a powerful driver in overcoming the organizational issues. Over 114,000 acute care encounters were monitored between February 8 and March 31, 2002. No outbreaks of public health

significance were detected. The system was implemented successfully and operational for the 2002 Olympic Winter Games and remains operational today.  
PMID: 12925547 [PubMed - indexed for MEDLINE]

39: J Am Vet Med Assoc. 2003 Sep 15;223(6):761-2.

'We're looking for zebras now'.

Nolen RS.

Publication Types: News

PMID: 14507083 [PubMed - indexed for MEDLINE]

40: J Appl Toxicol. 2003 May-Jun;23(3):139-70.

Therapy and prophylaxis of inhaled biological toxins.

Paddle BM.

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This review highlights the current lack of therapeutic and prophylactic treatments for use against inhaled biological toxins, especially those considered as potential biological warfare (BW) or terrorist threats. Although vaccine development remains a priority, the use of rapidly deployable adjunctive therapeutic or prophylactic drugs could be life-saving in severe cases of intoxication or where vaccination has not been possible or immunity not established. The current lack of such drugs is due to many factors. Thus,

methods involving molecular modelling are limited by the extent to which the cellular receptor sites and mode of action and structure of a toxin need to be known. There is also our general lack of knowledge of what effect individual toxins will have when inhaled into the lungs - whether and to what extent the action will be cell specific and cytotoxic or rather an acute inflammatory response requiring the use of immunomodulators. Possible sources of specific high-affinity toxin antagonists being investigated include monoclonal

antibodies, selected oligonucleotides (aptamers) and derivatized dendritic polymers (dendrimers). The initial selection of suitable agents of these kinds can be made using cytotoxicity assays involving cultured normal human lung cells and a range of suitable indicators. The possibility that a mixture of selected antibody, aptamer or dendrimer-based materials for one or more toxins could be delivered simultaneously as injections or as inhaled aerosol sprays should be investigated. Copyright Crown Copyright 2003. Reproduced with the permission of Her Majesty's Stationery Office. Published by John Wiley & Sons, Ltd.

Publication Types: Review Review, Academic

PMID: 12794937 [PubMed - indexed for MEDLINE]

41: J Appl Toxicol. 2003 May-Jun;23(3):177-86.

Putative role of proteolysis and inflammatory response in the toxicity of nerve and blister chemical warfare agents: implications for multi-threat medical countermeasures.

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Despite the contrasts in chemistry and toxicity, for blister and nerve chemical warfare agents there may be some analogous proteolytic and inflammatory

mediators and pathological pathways that can be pharmacological targets for a single-drug multi-threat medical countermeasure. The dermal-epidermal separation caused by proteases and bullous diseases compared with that observed following exposure to the blister agent sulfur mustard (2,2'-dichlorodiethyl sulfide) has fostered the hypothesis that sulfur mustard vesication involves proteolysis and inflammation. In conjunction with the paramount toxicological event of cholinergic crisis that causes acute toxicity and precipitates neuronal degeneration, both anaphylactoid reactions and pathological proteolytic activity have been reported in nerve-agent-intoxicated animals. Two classes of drugs already have demonstrated multi-threat activity for both nerve and blister agents. Serine protease inhibitors can prolong the survival of animals intoxicated with the nerve agent soman and can also protect against vesication caused by the blister agent sulfur mustard. Poly (ADP-ribose) polymerase (PARP) inhibitors can reduce both soman-induced neuronal degeneration and sulfur-mustard-induced epidermal necrosis. Protease and PARP inhibitors, like many of the other countermeasures for blister and nerve agents, have potent primary or secondary anti-inflammatory pharmacology. Accordingly, we hypothesize that drugs with anti-inflammatory actions against either nerve or blister agent might also display multi-threat efficacy for the inflammatory pathogenesis of both classes of chemical warfare agent.

Publication Types: Review Review, Tutorial  
PMID: 12794939 [PubMed - indexed for MEDLINE]

42: J Clin Microbiol. 2003 Dec;41(12):5372-6.

Surge capacity for response to bioterrorism in hospital clinical microbiology laboratories.

Shapiro DS.

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Surge capacity is the ability to rapidly mobilize to meet an increased demand. While large amounts of federal funding have been allocated to public health laboratories, little federal funding has been allocated to hospital microbiology laboratories. There are concerns that hospital laboratories may have inadequate surge capacities to deal with a significant bioterrorism incident. A workflow analysis of a clinical microbiology laboratory that serves an urban medical center was performed to identify barriers to surge capacity in the setting of a bioterrorism event and to identify solutions to these problems. Barriers include a national shortage of trained medical technologists, the inability of clinical

laboratories to deal with a dramatic increase in the number of blood cultures, a delay while manufacturers increase production of critical products and then transport and deliver these products to clinical laboratories, and a shortage of class II biological safety cabinets. Federal funding could remedy staffing shortages by making the salaries of medical technologists comparable to those of similarly educated health care professionals and by providing financial incentives for students to enroll in clinical laboratory science programs. Blood culture bottles, and possibly continuous-monitoring blood culture instruments, should be added to the national antibiotic stockpile. Federal support must ensure that companies that manufacture essential laboratory supplies are capable of rapidly scaling up production. Hospitals must provide increased numbers of

biological safety cabinets and amounts of space dedicated to clinical microbiology laboratories. Laboratories should undertake limited cross-training of technologists, ensure that adequate packaging supplies are available, and be able to move to a 4-day blood culture protocol.  
PMID: 14662913 [PubMed - in process]

43: J Emerg Med Serv JEMS. 2003 Oct;28(10):60-71.  
Nerve agent attack: a dangerous threat to emergency responders & the public.  
Suprun SC Jr.  
Manassas Park Fire Department, Virginia, USA. csuprun@gwu.edu.  
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Drinking-water security.  
[No authors listed]  
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Public perceptions of information sources concerning bioterrorism before and after anthrax attacks: an analysis of national survey data.  
Pollard WE.  
Office of Communication, Centers for Disease Control and Prevention, Atlanta, Georgia 30333, USA. bdp4@cdc.gov  
This study examined data from six national surveys before and after the bioterrorist anthrax attacks in the fall of 2001. Public perceptions of information sources regarding bioterrorism were examined. The findings highlighted the importance of local television and radio and of cable and network news channels as information sources. The findings also showed the importance of national and local health officials as spokespersons in the event of bioterrorist incidents. Periodic surveys of public attitudes provide important, timely information for understanding audiences in communication planning.  
PMID: 14692574 [PubMed - in process]

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Electronic journal publishing in the age of bioterrorism: how fast is fast?  
Potter P.  
Emerging Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia 30333, USA. ppotter@cdc.gov  
PMID: 14692566 [PubMed - in process]

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Bioterrorism risk communication policy.  
Sandman PM.  
Risk Communication Consultant, Princeton, New Jersey, USA. peter@psandman.com  
PMID: 14692584 [PubMed - in process]

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Optimistic bias and perceptions of bioterrorism in Michigan corporate spokespersons, fall 2001.

Salmon CT, Park HS, Wrigley BJ.

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The notion that individuals believe that they are more likely than others to experience positive events and avoid negative ones is a well-documented phenomenon in the combined literatures of social psychology and health communication. The current study focuses on Michigan corporate spokespersons' perceptions of their company's risk and potential for optimistic bias. Beginning on September 10, 2001, and continuing through October 2001, telephone surveys were conducted by a professional survey research firm to assess spokespersons' awareness of and preparedness for a bioterrorism attack at their corporation, as well as to ascertain perceived self-risk relative to that of other, similar corporations. The results offer evidence of a robust optimistic bias, and provide an unusually timely snapshot of levels of corporate awareness of bioterrorism during a critical period of time in which the U.S. experienced its first anthrax attack.

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Unresolved issues stall approval of Project Bioshield.

[No authors listed]

Publication Types: News

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Smallpox and bioterrorism: public-health responses.

Hull HF, Danila R, Ehresmann K.

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There is great concern that smallpox could be used for bioterrorism. The disease has a high mortality rate and can be spread by aerosols, and immunity in the population is low. Although an initial release of smallpox could infect a large number of people, secondary spread would likely be slow because of the long incubation period and the close contact required for transmission. Hospital personnel and household contacts are at the greatest risk of becoming infected. An outbreak of smallpox will be controlled through surveillance, containment, vaccination, and isolation of cases—the strategy used to eradicate the disease globally in 1978. Pre-exposure vaccination is recommended for hospital personnel likely to be exposed to smallpox while caring for patients during an outbreak.

Publication Types: Review Review, Tutorial

PMID: 14625527 [PubMed - indexed for MEDLINE]

51: J Nurses Staff Dev. 2003 Sep-Oct;19(5):218-25; quiz 226-7.

Chemical and biological terrorism preparedness for staff development specialists. Veenema TG.

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Staff development specialists must adapt orientation and continuing/life-long learning educational programs to provide nursing staff with the knowledge and skills required to respond to a biological or chemical terrorist attack. The integration of accurate, reliable, and timely information into staff development programs will contribute to the advancement of a national nursing workforce adequately prepared to respond to a major public health event resulting from the intentional use of biological and chemical weapons.

Publication Types: Review Review, Tutorial

PMID: 14581829 [PubMed - indexed for MEDLINE]

52: J R Army Med Corps. 2003 Jun;149(2):138-41.

Some recollections of Porton in World War 1. Commentary.

Garner JP.

Chemical weapons now regularly feature in news reports and the threat from them has become widely recognised by the public at large. Terrorist actions such as the Tokyo subway incident in 1995, coupled with the persistent use of agents such as sulphur mustard and Sarin by the Iraqi regime over the last 20 years in the Iran/Iraq war and against the Kurds of Northern Iraq, make it easy to think that chemical weapons are a new phenomenon. This paper reminds us that many chemical agents were developed during WWI; indeed the first use of a chemical agent was the release of chlorine gas--a choking agent--by the Germans over the battlefields of Ypres in 1915. Porton Down remains at the very heart of chemicals and biological weapons research, albeit in a purely defensive capacity; few of the old buildings remain and the idyllic lifestyle in the

Officer's Mess at Idmiston Manor has long since disappeared. These recollections provide a fascinating insight into scientific research at the time of World War I.

Publication Types: Historical Article

PMID: 12929523 [PubMed - indexed for MEDLINE]

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Bioterrorism: preparing for the unthinkable.

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Terrorism is not a new concept but our need to prepare for the effects of bioterrorism has achieved a particular urgency. The use of biological agents provides a new set of challenges to professional caregivers, emergency personnel and Governments. These agents are generally not readily identified through the senses, have delayed effects and have the power to generate fear and panic. They are also intended to demonstrate that Governments and other organisations are not able to protect their citizens and members. What evidence there is suggests bioterrorist incidents have the potential to create higher levels of psychopathology than physical injury. Therefore, the authorities must identify and rehearse suitable methods of psychoprophylaxis and intervention.

Publication Types: Review Review, Tutorial

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Joseph DG.  
Yale University, New Haven, Conn, USA.  
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Incapacitating chemical weapons: a year after the Moscow theatre siege.  
Coupland RM.  
Legal Division, International Committee of the Red Cross, CH 1202, Geneva,  
Switzerland. rcoupland@icrc.org  
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Q fever: a biological weapon in your backyard.  
Madariaga MG, Rezai K, Trenholme GM, Weinstein RA.  
Division of Infectious Disease, Cook County Hospital, Chicago and the Section of  
Infectious Diseases, Rush-Presbyterian-St Luke's Medical Center, Chicago, IL  
60612, USA. migmad@worldnet.att.net  
Coxiella burnetii, which causes Q fever, is a highly infectious agent that is  
widespread among livestock around the world. Although the culture process for  
coxiella is laborious, large amounts of infectious material can be produced. If used as  
an aerosolised biological weapon, coxiella may not cause high mortality, but could  
provoke acute disabling disease. In its late course, Q fever can be complicated by  
fatal (eg, endocarditis) or debilitating (eg, chronic fatigue syndrome) disorders. The  
diagnosis of Q fever might be delayed because of non-specific and protean  
presentations. Effective antibiotic treatment is available for the acute form of disease  
but not for the chronic complications. Vaccination and chemoprophylaxis in selected  
individuals may be used in the event of bioterrorism.  
Publication Types: Review Review, Academic  
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[No authors listed]  
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Bioterrorism in the United States: a balanced assessment of risk and response.

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There are many definitions of terrorism and numerous examples of the use of explosives and small arms, especially against civilians and with the objective of instilling fear. Although chemical and biological agents have only rarely been used by terrorists, there has recently been much concern about the threat of bioterrorism and the role of future health personnel in counteracting it. Rational setting of priorities requires the balance of risks against benefits in prevention and preparedness. Adverse effects of preparedness include inappropriate warnings, diversion of resources from other public health measures, both in the United States and overseas and constraints on civil rights. It is argued that the US should counteract the threat of bioterrorism by dealing with its root causes and by strengthening civil rights, international arms control and international law rather than by a self-defeating 'war on terrorism'.

PMID: 14703129 [PubMed - in process]

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Bioterrorism: how should doctors respond to the threat of biological weapons?

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Planning for the threat of a biological weapons attack includes preparations to recognize and identify an attack and its scale. Training is the key element of any response, but it is not possible for any health service to maintain sufficient extra capacity to deal with a massive bioterrorist threat. Training must include both first- and second-line responders. Subject to issues of confidentiality, information about plans should be as widely available as possible. Planning for prevention is also important. This should include stopping the production and dispersal of weapons under international humanitarian law and establishing the ethical basis on which doctors and scientists would not become involved in the production of biological and other weapons.

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Perspectives. Bioterror fears, medical-data deluge drive e-records push.

[No authors listed]

Publication Types: News

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Biodefense research: new tricks to fight old enemies.

Mariani SM; American Association of Immunologists.

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Publication Types: Congresses

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Is Armageddon a reality? The question gets answered at scientific meeting.  
Murray K.

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Chemical warfare and the Gulf War.

Korenyi-Both AL.

Publication Types: Comment Letter

PMID: 14620635 [PubMed - indexed for MEDLINE]

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Comment in:

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Chemical warfare and the Gulf War: a review of the impact on Gulf veterans' health.  
Riddle JR, Brown M, Smith T, Ritchie EC, Brix KA, Romano J.

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Washington, DC, USA. james.riddle@otsg.amedd.army.mil

It is unlikely that Gulf War veterans are suffering chronic effects from illnesses caused by chemical warfare nerve agent exposure. Extensive investigation and review by several expert panels have determined that no evidence exists that chemical warfare nerve agents were used during the Gulf War. At no time before, during, or after the war was there confirmation of symptoms among anyone, military or civilian, caused by chemical warfare nerve agent exposure. However, studies of Gulf War veterans have found belief that chemical weapons were used, significantly associated with both severe and mild-moderate illnesses. The psychological impact of a chemical warfare attack, either actual or perceived, can result in immediate and long-term health consequences. The deployment or war-related health impact from life-threatening experiences of the Gulf War, including the perceived exposure to chemical warfare agents, should be considered as an important cause of morbidity among Gulf War veterans.

Publication Types: Review Review Literature

PMID: 12943034 [PubMed - indexed for MEDLINE]

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Evaluations over the medical emergency responding to chemical terrorist attack.

Karayilanoglu T, Kenar L, Gulec M.

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The use of chemical warfare agents intentionally has become a great concern in the arena of the cold war. On the other hand, there has always been a threat on civilian population due to their mass destruction effects, including psychological damage and a great deal of discussion how to respond to it in terms of medical management. It is very important to provide the best lifesaving medical care and triage in a chemical-contaminated area. Mass casualties exposed

to chemical agents require immediate medical intervention to save their lives and should be classified in accordance to medical care priorities and available medical sources, including antidotes and sophisticated health facilities. Establishing the decontamination area for chemical casualties where it is located at the suitable place with respect to the wind direction is necessary. To overcome the mass destruction effects of chemical warfare agents following the terrorist attack, we must have the emergency medical response plan involving experienced triage officers and medical care providers to be able to perform medical management in the chemical-contaminated area and health facilities.  
Publication Types: Evaluation Studies  
PMID: 12943031 [PubMed - indexed for MEDLINE]

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The role of an advanced practice public health nurse in bioterrorism preparedness.  
Mondy C, Cardenas D, Avila M.  
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cmondy@dhs.co.la.ca.us  
The 2001 anthrax events have vividly illustrated that terrorism involving the release of a biological agent is a major public health emergency requiring an immediate and well-coordinated response. If healthcare professionals and emergency responders are to be prepared to manage such attacks, unprecedented cooperative efforts at the national, state, and local levels are necessary. To aid such efforts, advanced practice public health nurses (PHNs) must exercise their ability to collaborate with a variety of disciplines and communities. Using the Los Angeles County Public Health Nursing Practice Model, advanced practice PHNs can be trained to deal effectively with acts of bioterrorism. This model defines the practice of public health nursing as working on a population-based level to create conditions under which healthy people can live within healthy communities. This article will discuss the threat of bioterrorism and describe how the Public Health Nursing Practice Model can be applied to assist advanced practice PHNs in the development of a public health plan for

preparedness and response to bioterrorism. Six specific interventions that enable advanced practice PHNs to affect populations at the community and systems level will be discussed along with the implications of bioterrorism for advanced practice public health nursing.

Publication Types: Review Review, Tutorial  
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Simulation modeling of anthrax spore dispersion in a bioterrorism incident.  
Reshetin VP, Regens JL.

Joint Institute for Power and Nuclear Research, national Academy of Sciences of Belarus, Sosny-Minsk, 220109, Belarus.

Recent events have increased awareness of the risk posed by terrorist attacks. *Bacillus anthracis* has resurfaced in the 21st century as a deadly agent of bioterrorism because of its potential for causing massive civilian casualties. This analysis presents the results of a computer simulation of the dispersion of anthrax spores in a typical 50-story, high-rise building after an intentional release during a bioterrorist incident. The model simulates aerosol dispersion in the case of intensive, small-scale convection, which equalizes the concentration of anthrax spores over the building volume. The model can be used to predict the time interval required for spore dispersion throughout a building after a terrorist attack in a high-rise building. The analysis reveals that an aerosol release of even a relatively small volume of anthrax spores during a terrorist incident has the potential to quickly distribute concentrations that are infectious throughout the building.

PMID: 14641889 [PubMed - in process]

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Enserink M, Malakoff D.

Publication Types: Biography Historical Article News

Personal Name as Subject: Butler T

PMID: 14684799 [PubMed - indexed for MEDLINE]

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Bioterrorism. Anthrax powder: state of the art?  
Matsumoto G.

Publication Types: News

PMID: 14645823 [PubMed - indexed for MEDLINE]

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Technology challenges in responding to biological or chemical attacks in the civilian sector.

Fitch JP, Raber E, Imbro DR.

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Increasingly sophisticated technologies are needed for counterterrorism responses to biological and chemical warfare agents. Recently developed detection and identification systems are characterized by increased sensitivity, greater automation, and fewer false alarms. Attempts are also under way to reduce the cost and complexity of field-deployable systems. A broad range of

decontamination reagents for equipment and personnel is emerging, but decontamination of large buildings, inaccessible spaces, and sensitive equipment remains problematic.

Publication Types: Review Review, Tutorial  
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Pneumonic plague.  
Krishna G, Chitkara RK.  
Veterans Administration Palo Alto Health Care System, CA, USA.  
Pneumonic plague, a disease caused by the bacterium *Yersinia pestis*, is a rare disease in the United States and carries a high mortality. Health care professionals in the United States are not familiar with the clinical presentation and diagnosis of plague pneumonia. The wide prevalence of the bacterium in different parts of the world, its high virulence, and its ability to spread by aerosolization makes it a potential agent of biological warfare in the hands of terrorists. This review focuses on the prevalence, pathogenesis immunity, clinical manifestations, diagnosis, treatment, and prevention of plague pneumonia, with particular emphasis on the plague bacillus as an agent of biological warfare. Based on available information, we discuss measures that need to be undertaken by health care personnel, public health personnel, and epidemiologists in the event of such an attack.  
Publication Types: Review Review, Tutorial  
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When bioterrorism strikes: diagnosis and management of inhalational anthrax.  
Shafazand S.  
Department of Medicine, Washington Hospital Center, Washington, DC 20010-2975, USA. shirin.shafazand@medcenter.org  
In October and November, 2001, reports of patients with inhalational anthrax reacquainted the public with this ancient disease and introduced the harsh reality of a bioterrorist act. *Bacillus anthracis*, a rod-shaped, spore-forming bacterium, primarily infects herbivores. Humans traditionally have acquired the disease from occupational or agricultural exposure to infected animals and

animal products. Recent events saw the intentional release of anthrax spores, using the U.S. postal system as an unlikely and unwilling agent. Cutaneous disease, pulmonary disease, and gastrointestinal anthrax are the known clinical manifestations of anthrax. Inhalational anthrax has the highest mortality and is the main focus of this report.

Publication Types: Review Review, Tutorial  
PMID: 14505276 [PubMed - indexed for MEDLINE]

79: Semin Respir Infect. 2003 Sep;18(3):206-15.  
Ebola hemorrhagic fever in the era of bioterrorism.  
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Viral hemorrhagic fevers are among a small group of infectious diseases considered potential candidates for use as agents of bioterrorism. Ebola hemorrhagic fever, the focus of this article, has the highest mortality rate of the viral hemorrhagic fevers and has no effective treatment. It is transmitted easily to family members and health care professionals not following universal precautions. The history of this infection, its clinical presentation, and epidemiology are discussed. Attention is paid to the immunopathogenesis of the disease with a focus on pulmonary involvement. Recommendations for infection control and Ebola virus' potential as a bioterrorism agent are addressed.  
Publication Types: Review Review, Tutorial  
PMID: 14505282 [PubMed - indexed for MEDLINE]

80: Surg Infect (Larchmt). 2003 Fall;4(3):281-7.  
Bacterial agents used for bioterrorism.  
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BACKGROUND: Bacterial pathogens and their products are potential agents of biological terrorism and biological warfare. These agents can be deployed through simple aerosol delivery systems and thereby cause widespread disease and death. METHODS: This report is a review of bacterial species that have been employed for development of biological terrorism, relying on a system for classification of their threat developed by the Centers for Disease Control. RESULTS: Physicians must understand how to recognize early signs and symptoms caused by bacterial agents. Clinical findings often seen on presentation are emphasized along with a summary of therapeutic approaches. CONCLUSIONS: Initiation of immediate therapy and supportive care provides the best chance for survival from these potentially lethal and devastating infections. A high index of suspicion must be maintained, especially in the setting of a sudden influx of cases with what are often relatively nonspecific symptoms.  
Publication Types: Review Review, Tutorial  
PMID: 14588163 [PubMed - indexed for MEDLINE]

81: Toxicol Appl Pharmacol. 2003 Dec 1;193(2):228-36.  
Sulfur mustard induces the formation of keratin aggregates in human epidermal keratinocytes.

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The vesicant sulfur mustard is an alkylating agent that has the capacity to cross-link biological molecules. We are interested in identifying specific proteins that are altered upon sulfur mustard exposure. Keratins are particularly important for the structural integrity of skin, and several genetically inherited blistering diseases have been linked to mutations in keratin 5 and keratin 14. We examined whether sulfur mustard exposure alters keratin biochemistry in cultured human epidermal keratinocytes. Western blotting with specific monoclonal antibodies revealed the formation of stable high-molecular-weight "aggregates" containing keratin 14 and/or keratin 5. These aggregates begin to form within 15 min after sulfur mustard exposure. These aggregates display a complex gel electrophoresis pattern between approximately 100 and approximately 200 kDa. Purification and analysis of these aggregates by one- and two-dimensional gel electrophoresis and mass spectrometry confirmed the presence of keratin 14 and keratin 5 and indicate that at least some of the aggregates are composed of keratin 14-keratin 14, keratin 14-keratin 5, or keratin 5-keratin 5 dimers. These studies demonstrate that sulfur mustard induces keratin aggregation in keratinocytes and support further investigation into the role of keratin aggregation in sulfur mustard-induced vesication.

PMID: 14644625 [PubMed - indexed for MEDLINE]

82: Toxicol Appl Pharmacol. 2003 Nov 15;193(1):73-83.

Hypothermia reduces sulphur mustard toxicity.

Mi L, Gong W, Nelson P, Martin L, Sawyer TW.

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The effect of temperature on the development of sulphur mustard (HD)-induced toxicity was investigated in first passage cultures of human skin keratinocytes and on hairless guinea pig skin. When cells exposed to HD were incubated at 37 degrees C, a concentration-dependent decline in viability was observed that was maximal by 2 days. In contrast, no significant HD-induced toxicity was evident up to 4 days posttreatment when the cells were incubated at 25 degrees C. However, these protective effects were lost by 24 h when the cells were switched back to 37 degrees C. The protective effects of hypothermia were also demonstrated when apoptotic endpoints were examined. The HD concentration-dependent induction of fragmented DNA (as quantitated using soluble DNA and the TUNEL reaction), morphology, and p53 expression were all significantly depressed when cell cultures were incubated at 25 degrees C compared to 37 degrees C. When animals were exposed to HD vapour for 2, 4, and 6 min and left at room temperature, lesions were produced whose severity was dependent on exposure time and that were maximal by 72 h posttreatment.

Moderate

cooling (5-10 degrees C) of HD exposure sites posttreatment (4-6 h) significantly reduced the severity of the resultant lesions. However, in contrast to the in vitro results, these effects were permanent. It appears that the early and noninvasive act of cooling HD-exposed skin may provide a facile means of reducing the severity of HD-induced cutaneous lesions.

PMID: 14613718 [PubMed - indexed for MEDLINE]

83: US News World Rep. 2003 Oct 20;135(13):55.  
Bioterror. Giving science a safety check.  
Nell B.  
Publication Types: News  
PMID: 14584464 [PubMed - indexed for MEDLINE]

84: Vaccine. 2003 Jan 30;21(7-8):582-5.  
Bioterrorism and the biotechnologist.  
Spier RE.  
Publication Types: Editorial  
PMID: 12531321 [PubMed - indexed for MEDLINE]

85: Vet Rec. 2003 Oct 18;153(16):482-3.  
Dealing with the threat of bioterrorism and exotic disease.  
[No authors listed]  
Publication Types: News  
PMID: 14601793 [PubMed - indexed for MEDLINE]