



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Assessing hospital emergency management plans: A guide for infection preventionists

Terri Rebmann, PhD, RN, CIC  
Saint Louis, Missouri

**Background:** Hospital emergency management plans are essential and must include input from an infection preventionist (IP). Multiple hospital planning documents exist, but many do not address infection prevention issues, combine them with noninfection prevention issues, or are disease/event specific. An all-encompassing emergency management planning guide for IPs is needed.

**Methods:** A literature review and Internet search were conducted in December 2008. Data from relevant sources were extracted. A spreadsheet was created that delineated hospital emergency management plan components of interest to IPs.

**Results:** Of the sources screened, 49 were deemed relevant. Eleven domains were identified: (1) having a plan; (2) assessing hospital readiness; (3) having infection prevention policies and procedures; (4) having occupational health policies and procedures; (5) conducting surveillance and triage; (6) reporting incidents, having a communication plan, and managing information; (7) having laboratory support; (8) addressing surge capacity issues; (9) having anti-infective therapy and/or vaccines; (10) providing infection prevention education; and (11) managing physical plant issues.

**Conclusion:** Infection preventionists should use this article as an assessment tool for evaluating their hospital emergency management plan and for developing policies and procedures that will decrease the risk of infection transmission during a mass casualty event.

**Key Words:** Emergency management; hospital preparedness; surge capacity; infection prevention; infection control.

Copyright © 2009 by the Association for Professionals in Infection Control and Epidemiology, Inc.  
(*Am J Infect Control* 2009;37:708-14.)

Hospital emergency management plans (hereafter termed the "Plan") are an essential component of hospital preparedness for mass casualty events (MCE) and need to address all hazards, including biologic threats such as bioterrorism, emerging infectious disease outbreaks, and pandemics. Plan development and assessment is a multidisciplinary and multidepartmental endeavor that must include the input from an infection preventionist (IP).<sup>1</sup> For most hospitals, the Plan consists of multiple components: the main body of the plan that addresses emergency management tasks/needs that are applicable to all MCEs and a series of appendices or annexes that address specific incidents such as chemical, nuclear, or biologic events. Examples of all-hazards components of the Plan include addressing

liability issues for health care personnel, providing mental health support for disaster victims and hospital staff, and establishing funding to cover uncompensated costs during an MCE. Although these issues are very important to emergency management and may have an indirect impact on infection transmission during an MCE, ensuring these topics are addressed in a Plan will not fall within the scope of an IP's responsibility at most hospitals. Most IPs will act as a consultant to the hospital emergency management planning committee and will be responsible for assessing the Plan in regards to preventing infection transmission during MCEs.<sup>1</sup> IP involvement will be most important in developing and assessing the Plan's biologic annex.

Many MCE planning guides are available from national organizations, governmental agencies, and academic institutions. However, these documents either address noninfection prevention MCE planning issues or they provide specific recommendations based on a singular disease, such as smallpox,<sup>2</sup> severe acute respiratory syndrome (SARS),<sup>3</sup> or pandemic influenza.<sup>4</sup> In 2002, the Association for Professionals in Infection Control and Epidemiology (APIC) Bioterrorism Working Group created guidelines for IPs to prepare for a biologic event, but that document only addresses bioterrorism and does not include more recent recommendations relevant to SARS or pandemic influenza that must be included in hospital emergency management plans.<sup>5</sup> An all-encompassing planning guide is needed for IPs

From the Institute of Biosecurity, Saint Louis University, School of Public Health, St. Louis, MO.

Address correspondence to Terri Rebmann, PhD, RN, CIC, Associate Director for Curricular Affairs, Institute of Biosecurity, Assistant Professor, Division of Environmental and Occupational Health, Saint Louis University, School of Public Health, 3545 Lafayette Ave, Room 361, Saint Louis, MO 63104. E-mail: [rebmannt@slu.edu](mailto:rebmannt@slu.edu).

Conflicts of interest: None to report.

0196-6553/\$36.00

Copyright © 2009 by the Association for Professionals in Infection Control and Epidemiology, Inc.

doi:10.1016/j.ajic.2009.04.286

that addresses all types of biologic incidents, including bioterrorism, emerging infectious disease outbreaks, and pandemics.<sup>1</sup> The purpose of this article is to compile infection prevention recommendations from various planning agencies and researchers into a single planning guide. This should ease IP's process of assessing hospital emergency management plans for infection prevention issues.

This article addresses only hospital emergency management plan development topics that have infection transmission implications. Plans need to have an appendix or annex that addresses biologic threats. In addition, there are infection prevention issues that must be addressed by the main component of the Plan, such as having infection prevention policies and procedures in place during any type of MCE. This article addresses all components of the Plan of interest to IPs: the biologic annex as well as the infection prevention issues that would be included in the main component of the Plan. IPs should use this article as a resource to assist in developing or assessing a hospital emergency management plan for infection prevention issues. There is no perfect Plan; the best plans are constantly under review and revision. Therefore, this article cannot provide information on best practices related to all aspects of infection prevention during emergency management. In addition, procedures that work in one hospital or region may not be applicable to all facilities. IPs should use this article to identify gaps in their hospital emergency management plan. Guidance on how to implement specific interventions, such as developing a policy on work quarantine or how to allocate limited amounts of respiratory protection, are provided in other documents.<sup>6,7</sup>

## METHODS

A literature review was conducted in December 2008 using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Healthstar, Psych Info, and Medline databases for years 1966 through 2008. The following terms were utilized as key word searches: infection control, infection prevention, hospital, readiness, disaster plan, mass casualties, bioterrorism, pandemic, and emergency management. Only English language articles in peer-reviewed journals were utilized. An Internet search was also conducted in December 2008 using the same search terms as above to identify existing book chapters, reports from response agencies, published standards and guidelines, and other relevant materials related to the development of hospital emergency management plans to address biologic MCEs that were outside the peer-reviewed literature. Inclusion criteria included articles, planning documents, and published reports that addressed

infection prevention issues that need to be included in a Plan. Articles that address community, public health, or personal preparedness were excluded. Also excluded were articles that only addressed noninfection prevention emergency management issues, such as developing policies and procedures for incorporating National Incident Management System (NIMS) terminology into the hospital emergency management plan. US- and non-US-based articles and documents/reports were included in the analysis.

Seven hundred sixty-four journal articles were identified and reviewed for relevance; many were eliminated based on the title or journal (non-peer reviewed or did not meet inclusion criteria) alone. Two hundred seventy-two references were screened by reading the abstract. Data from the relevant sources identified through the literature review and Internet search were extracted. A spreadsheet was created that delineated Plan components of interest to IPs identified by each source. The primary author conducted the article review, data extraction, data analysis, and determination of domains.

## RESULTS

Of the articles and planning documents/reports screened, 49 references were deemed relevant: 35 were journals articles, and 14 were published reports, regulatory standards, and/or planning documents. There was a lot of overlap between sources when summarizing the infection prevention issues that should be addressed by a hospital emergency management plan. Common infection prevention issues mentioned included having policies and procedures related to infection prevention, conducting syndromic surveillance, having infection prevention coverage, and preparing for a surge in potentially contagious patients. Differences identified by the sources tended to be agent-specific interventions, such as developing a SARS response team,<sup>8</sup> identifying hospitals/health care facilities (types C, X, or R) based on whether or not smallpox patients are housed at the facility,<sup>2</sup> or tracking nosocomial transmission of influenza as part of pandemic influenza preparedness.<sup>4</sup> No single document or article identified all of the infection prevention issues that should be addressed by a Plan.

A full list of the infection prevention issues that should be included in a Plan are divided into themes or domains and are outlined in Table 1 and provided online at [www.ajicjournal.org](http://www.ajicjournal.org). IPs can use this Table as an assessment tool for evaluating their Plans and developing policies and procedures that will decrease the risk of infection transmission during an MCE. It is important to note that information provided in this article consists of compiled published recommendations that

are not considered mandates or regulations except for the Joint Commission standards for accredited US hospitals.<sup>9</sup>

### **Domain 1: Hospital emergency management plan and biologic annex**

Hospital emergency management plans need to have an appendix or annex that addresses all biologic threats, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics. This plan must be updated regularly based on lessons learned from disaster exercises, actual events, or published evidence of best practices. The Plan needs to be coordinated with local, state, and federal plans, and contact names and information for key response agencies need to be included. The Plan biologic annex needs to define how biologic events are different from other types of MCEs, how interventions will be stratified by pandemic stage/phase or nature of the biologic attack, and the epidemiologic clues of a potential biologic event.

### **Domain 2: Assessing hospital readiness for mass casualty event**

Hospitals must assess their readiness for MCEs, including biologic events. The Plan should state how and when a facility assessment, such as a hazard vulnerability assessment, will be performed. The hazard vulnerability assessment should include aspects of hospital readiness that relate to infection prevention, such as the location and amounts of hand hygiene stations or products, isolation rooms/areas, and others. Disaster exercises that utilize a biologic scenario should be performed by the hospital to assess for biologic MCE readiness. Whenever possible, community-wide exercises should be performed to ensure regional coordination for MCEs.

### **Domain 3: Infection prevention policies and procedures**

The Plan needs to outline infection prevention policies and procedures to be implemented during an MCE. These policies and procedures should encompass all aspects of patient care, environmental decontamination, visitor restriction, occupational health practices, and physical plant issues that could contribute to infection spread. There are a number of infection prevention policies and procedures that are needed to prevent infection transmission during patient care. Examples include procedures for when and how to perform patient decontamination, internal and external patient transport, patient placement, isolation, linen management, patient discharge, and postmortem care. Hospitals also need to have around-the-clock infection prevention coverage during a biologic MCE. If the hospital oversees outpatient

services or alternate care sites, these facilities and staff will require infection prevention coverage as well. Procedures for conducting and coordinating an epidemiologic investigation with local health officials should be included in the Plan.

In addition to outlining routine infection prevention policies/procedures, the Plan also needs to address crisis standards of care. Crisis standards of care are needed for times when routine standards cannot be met because of limited or depleted resources. Crisis standards of care that are specific to infection prevention issues include prioritization plans for allocating insufficient or depleted supplies of personal protective equipment (PPE), hand hygiene products, anti-infective therapy or vaccine, and other equipment that may contribute to disease spread during an MCE. Whenever possible, hospital or community ethics committees should be involved in the development of crisis standards of care.

### **Domain 4: Occupational health policies and procedures**

The risk of occupational exposure to infectious diseases/agents increases during a biologic MCE. Therefore, it is essential that infection prevention occupational health issues be addressed in the Plan. Examples include having a respiratory protection program, having a nonpunitive sick leave policy that does not encourage staff to work while ill during a biologic event, having procedures for monitoring and managing personnel who experience occupational exposures, and defining protocols for times when PPE or other resources are limited. Hospital emergency management plans should also outline the hospital immunization policy, including how staff compliance will be monitored for annual influenza vaccination. Staff at high risk from infection (ie, pregnant or immunocompromised individuals) or those who are involved in high-risk procedures (such as aerosolizing procedures during a biologic MCE) should be identified. Protocols should be developed that outline how high-risk staff will be managed during a biologic MCE, such as reassignment or furlough.

### **Domain 5: Surveillance and triage**

Surveillance will be a critical component of emergency management, especially for biologic MCEs. The Plan should outline the hospital's protocols for implementing, coordinating, and evaluating a syndromic surveillance program to identify or detect a bioterrorism attack, outbreaks of emerging infectious diseases, and pandemics. Protocols should be included for implementing a surveillance program that identifies staff, volunteers, visitors, and patients with potentially contagious

diseases; different indicators and/or frequency of reporting may be needed for pre- and postevent time periods. The Plan should also outline procedures for tracking admission and discharge of known or suspected contagious patients; monitoring staff absenteeism related to potentially communicable diseases/conditions; calculating the rate of seasonal influenza-like illness among staff, volunteers, and patients; and monitoring health care-associated infection transmission.

### **Domain 6: Reporting, communication plan, and information management**

The hospital emergency management plan biologic annex needs to outline procedures for reporting known or suspected biologic MCEs to internal and external departments, facilities, and response agencies. The names and contact information of the persons responsible for internal and external communication during a biologic MCE also need to be identified. This includes internal communication with hospital staff and volunteers regarding activation of the Plan and external communication with public health authorities, community health care facilities, and response agencies. Protocols for monitoring state and federal public health advisories; health alert network communications; and sharing estimates of hospital patient care equipment and PPE with local, regional, state, and tribal planning groups need to be outlined. It is also critical that IPs identify or create pre-event messages about the most likely biologic agents to be involved in an MCE; these materials can be provided or communicated to staff, visitors, patients, and the general public during a biologic MCE.<sup>7</sup> When developing pre- and postevent messages and educational materials, it is important that hospitals use language that is appropriate for individuals with visual, learning, or other disabilities and those who are non-English language speakers.

### **Domain 7: Laboratory infection prevention issues**

Hospital emergency management plans need to address laboratory infection prevention issues. Examples include having processes to obtain laboratory services around the clock and on weekends; having protocols for collecting, labeling, packaging, processing, and internal and external transport of laboratory specimens believed to be potential bioterrorism agents or emerging infectious diseases; having the ability to track and stratify all patient specimens and results; and having collection and management procedures for potential evidence during a bioterrorism attack. Laboratory services should be coordinated within the framework of the Laboratory Response Network using local, state, and federal government laboratory protocols.

### **Domain 8: Surge capacity issues**

The hospital emergency management plan biologic annex must include protocols for handling an influx of potentially contagious patients. One aspect of surge capacity is assessing on-hand resources and calculating how much might be needed during an MCE. For biologic MCEs, this could include the need for equipment and supplies that would last up to 8 weeks (the estimated wave of a pandemic). These estimates should also take into account that other health care facilities will be placing strains on the supply system during this period and may not be able to meet normal supply needs. Examples of resources that need to be assessed include intravenous pumps, ventilators, anti-infective therapy, vaccination, diagnostic testing materials, linens, respiratory protection, gowns, gloves, eye protection, hand hygiene products, laboratory supplies, isolation rooms/areas, and morgue beds. The need for extra hospital personnel will likely be greater during a biologic MCE compared with other disasters because staff may be less willing or able to work during a biologic event.<sup>10,11</sup> Some factors that may influence health care workers' willingness and ability to work during a biologic MCE include personal illness or quarantine, family obligations, and fear of exposure or illness.<sup>10,11</sup> In addition, worker fatigue may be greater during a biologic MCE because of wearing PPE for extended periods of time or because of psychological stress. The Plan should include protocols for stockpiling or obtaining additional staff, medical and laboratory equipment/supplies, isolation rooms/areas, and morgue beds.

### **Domain 9: Anti-infective therapy, chemoprophylaxis, and vaccination**

Medications will be needed for all types of MCEs, but biologic events will require a disproportionate need for anti-infective therapy and vaccines. The Plan should outline on-hand resources and calculations regarding how much will be needed during a biologic event. Protocols should address the establishment and/or maintenance of a medication and vaccine stockpile that is coordinated with regional health care facilities and/or response agencies. The Plan should also define a prioritization plan for staff and their family members regarding who would be the first priority for anti-infective therapy, chemoprophylaxis, and vaccine during times of limited resources. A procedure is needed for identifying the most current recommendations and guidance on the use of anti-infective therapy and chemoprophylaxis needed for a biologic event because these guidelines become outdated quickly.<sup>4</sup> The hospital emergency management Plan biologic annex should outline procedures for administering

**Table 2.** Topics for staff education related to infection prevention during emergency management

## Education topics

- Self-screening for illness
- Screening/triaging of patients for communicable diseases/conditions
- Internal and external reporting and communication procedures
- Surveillance during mass casualty events
- Plan policies and procedures related to infection prevention
- Disease transmission methods/routes
- Isolation procedures
- Respiratory hygiene
- PPE use and reuse, including use of respiratory protection
- Hand hygiene protocols
- Social distancing
- Handling contaminated linens
- Obtaining and handling patient specimens safely
- Environmental cleaning/disinfection
- Disinfection and sterilization of medical equipment
- Waste management procedures
- Patient decontamination procedures
- Medical management of biologic event victims, including identification and diagnosis of disease, and clinical care procedures (treatment, isolation, and others)
- Postmortem care
- Influenza vaccine
- Impact of influenza

PPE, personal protective equipment.

anti-infective therapy; chemoprophylaxis; or vaccine to staff, patients, visitors, and/or the general public and protocols for follow-up monitoring as needed.

### Domain 10: Infection prevention education

The Plan should designate a person whose responsibility it is to create, coordinate, and track staff training on emergency management and biologic threats. In addition, the Plan should outline the types of infection prevention training/information that will be provided to patients, visitors, and the general public. Lists of groups requiring infection prevention education related to emergency management have been outlined in the literature.<sup>1,12</sup> Suggested topics for staff education related to infection prevention during MCEs are outlined in Table 2. Staff education should be based on identified competencies whenever possible and should be in language and formats that are appropriate for clinical and nonclinical personnel.<sup>15</sup>

### Domain 11: Physical plant infection prevention issues

Most physical plant issues will be planned for and managed by the hospital facilities engineering department. However, some aspects of the physical plant can contribute to infection spread during an MCE and need to have IP input. The Plan should include protocols for safe food and water handling practices, such as monitoring holding temperatures and times to prevent foodborne

illness during events when standard utilities may not be available and having sufficient water for drinking, sanitation, and hand hygiene needs. Other needed protocols include procedures for assessing for water, dust, or other contaminate infiltration; ensuring sewer/sanitation system functioning; obtaining sufficient functional or chemical toilets; and handling/managing an increase in regular and regulated medical waste during MCEs, including times when regular waste management pick-up is not possible because of the event.

### DISCUSSION

IPs need to be involved in developing and assessing hospital emergency management plans as they relate to infection transmission during mass casualty events. This article provides IPs guidance on aspects of hospital emergency management plans that have implications for infection spread in hospitals. IPs should use this tool to assess their Plan and develop policies and procedures for emergency management that will decrease the risk of infection transmission. This assessment tool is designed to be used with hospital all-hazards emergency management plans, with a special focus on the infection prevention issues that might occur during mass casualty events. Most notably, this article combines information from a variety of national organizations and published articles into 1 tool that can be used to address all types of mass casualty events, including bioterrorism, emerging infectious disease outbreaks, and pandemics.

The assessment tool outlined in this article provides a starting point for IPs to get involved in hospital emergency management. A full detailing of emergency management best practices, such as describing occupational health respiratory programs, is out of the scope of this article. In addition, many research questions related to infection prevention during emergency management remain unanswered. For example, most national organizations recommend stockpiling of anti-infective therapy, vaccines, and personal protective equipment, but guidelines for how much of a stockpile are needed have not been developed. Researchers agree that surge capacity is needed for all types of mass casualty events, but the exact amount/number of surge beds that need to be available for any given facility has not been outlined.<sup>11,16,18</sup> The number of airborne infection isolation rooms or negative-pressure surge capacity needed by a hospital and the most effective indicators for syndromic surveillance have also not yet been determined. Most researchers state that biologic scenarios should be used in hospital disaster exercises to evaluate hospital preparedness, and the Joint Commission requires hosting disaster exercises at least twice a year,<sup>9</sup> but the

frequency with which biologic scenarios must be used in these drills has not been established. Indicators for hospital emergency management preparedness vary by the researcher<sup>8,10,14,15</sup> and by the organization.<sup>3,5,11,16,17</sup> Until some of these research questions are answered, IPs and their hospital emergency management planning committees are left on their own to determine what is best for their facility given their resources and limitations. IPs should continue to monitor information from national organizations and regulatory agencies regarding recommended practices related to emergency management.

The author thanks Michael Olesen for providing feedback and review during the writing/development of this article.

## SUPPLEMENTARY DATA

Note: To access Table 1, visit the online version of the American Journal of Infection Control at [www.ajicjournal.org](http://www.ajicjournal.org).

## References

1. Rebmann T. APIC State-of-the-Art report: The role of the infection-preventionist in emergency management. *Am J Infect Control* 2009;37:271-281.
2. Centers for Disease Control and Prevention. Smallpox response plan and guidelines version 3.0. 2003. Available from: <http://www.bt.cdc.gov/agent/smallpox/response-plan/index.asp>. Accessed January 30, 2004.
3. Centers for Disease Control and Prevention. Severe acute respiratory syndrome. Supplement C: preparedness and response in healthcare facilities. Appendix C2: checklist for SARS preparedness in healthcare facilities 2005. Available from: <http://www.cdc.gov/ncidod/sars/guidance/C/pdf/app2.pdf>. Accessed November 12, 2005.
4. Centers for Disease Control and Prevention. Hospital pandemic influenza planning checklist. 2007. Available from: <http://www.pandemicflu.gov/plan/healthcare/hospitalchecklist.pdf>. Accessed July 2, 2007.
5. Association for Professionals in Infection Control and Epidemiology (APIC). April 2002 Interim bioterrorism readiness planning suggestions. 2002. Available from: [http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Bioterrorism/APIC\\_BTWG\\_BT\\_RSugg.pdf](http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Bioterrorism/APIC_BTWG_BT_RSugg.pdf). Accessed April 7, 2002.
6. Bartley J, Stricof R, Alexander S, Cain T, Citarella B, Cloughessy M, et al. Reuse of respiratory protection in prevention and control of epidemic and pandemic-prone acute respiratory diseases (ARD) in healthcare. *Association for Professionals in Infection Control and Epidemiology* 2008. Available from: <http://www.apic.org/>. Accessed July 1, 2008.
7. Rebmann T. Emergency management. In: Carrico R, editor. *APIC text of infection control and epidemiology*. 3rd ed., Chapter 119. Washington, DC: Association for Professionals in Infection Control and Epidemiology, Inc.; 2009.
8. Loutfy MR, Wallington T, Rutledge T, Mederski B, Rose K, Kwolek S, et al. Hospital preparedness and SARS. *Emerg Infect Dis* 2004;10:771-6.
9. Joint Commission. Hospital accreditation program. 2009 chapter: Infection prevention and control 2008. Available from: [http://www.jointcommission.org/NR/rdonlyres/38BEED6D-59D7-4314-9E2B-3C4571F92159/0/HAP\\_IC.pdf](http://www.jointcommission.org/NR/rdonlyres/38BEED6D-59D7-4314-9E2B-3C4571F92159/0/HAP_IC.pdf). Accessed June 21, 2008.
10. Amaratunga CA, O'Sullivan TL, Phillips KP, Lemyre L, O'Connor E, Dow D, et al. Ready, aye ready? Support mechanisms for healthcare workers in emergency planning: a critical gap analysis of three hospital emergency plans. *J Emerg Manage* 2007;5:23-38.
11. American Hospital Association. Hospital preparedness for mass casualties. 2000. Available from: <http://www.ncha.org/public/docs/bioterrorism/AHA.pdf>. Accessed March 2, 2004.
12. Shadel BN, Clements B, Arndt B, Rebmann T, Evans RG. What we need to know about bioterrorism preparedness: results from focus groups conducted at APIC 2000. *Am J Infect Control* 2001;29:347-51.
13. Carrico RM, Rebmann T, English JF, Mackey J, Cronin SN. Infection prevention competencies for hospital-based healthcare personnel. *Am J Infect Control* 2008;36:691-701.
14. Rebmann T, Carrico R, English J. Hospital infectious disease emergency preparedness: a survey of infection control professionals. *Am J Infect Control* 2007;35:25-32.
15. Rebmann T, Wilson R, LaPointe S, Russell B, Moroz D. Hospital infectious disease emergency preparedness: a 2007 survey of infection control professionals. *Am J Infect Control* 2009;37:1-8.
16. Agency for Healthcare Research and Quality. Bioterrorism emergency planning and preparedness questionnaire for healthcare facilities. Rockville, MD: Agency for Healthcare Research and Quality; 2002.
17. Trust for America's Health. Ready or not. Protecting the public's health from diseases, disasters, and bioterrorism. 2007. Available from: <http://healthyamericans.org/reports/bioterror07/BioTerrorReport2007.pdf>. Accessed May 14, 2008.
18. Hick JL, Hanfling D, Burstein JL, DeAtley C, Barbisch D, Bogdan GM, et al. Health care facility and community strategies for patient care surge capacity. *Ann Emerg Med* 2004;44:253-61.
19. Braun BI, Darcy L, Divi C, Robertson J, Fishbeck J. Hospital bioterrorism preparedness linkages with the community: improvements over time. *Am J Infect Control* 2004;32:317-25.
20. Case GG, West BM, McHugh CJ. Hospital preparedness for biologic and chemical terrorism in central New Jersey. *New Jersey Med* 2001;98:23-33.
21. Hui Z, Jian-Shi H, Xiong H, Peng L, Da-Ling Q. An analysis of the current status of hospital emergency preparedness for infectious disease outbreaks in Beijing, China. *Am J Infect Control* 2007;35:62-7.
22. Karwa M, Currie B, Kvetan V. Bioterrorism: preparing for the impossible or the improbable. *Crit Care Med* 2005;33(Suppl 1):S75-95.
23. Lynn M, Gurr D, Memon A, Kaliff J. Management of conventional mass casualty incidents: ten commandments for hospital planning. *J Burn Care Res* 2006;27:649-58.
24. Occupational Safety and Health Administration. Pandemic influenza preparedness and response guidance for healthcare workers and healthcare employers. 2007. Available from: [http://www.osha.gov/Publications/OSHA\\_pandemic\\_health.pdf](http://www.osha.gov/Publications/OSHA_pandemic_health.pdf). Accessed March 14, 2008.
25. Rebmann T. Management of patients infected with airborne-spread diseases: an algorithm for infection control professionals. *Am J Infect Control* 2005;33:571-9.
26. Rebmann T. Infectious disease disasters: bioterrorism, emerging infections, and pandemics. In: Carrico R, editor. *APIC text of infection control and epidemiology*. 3rd ed., Chapter 120. Washington, DC: Association for Professionals in Infection Control and Epidemiology, Inc.; 2009.
27. Schultz CH, Mothershead JL, Field M. Bioterrorism preparedness. I: The emergency department and hospital. *Emerg Med Clinics N Am* 2002;20:437-55.
28. Srinivasan A, McDonald LC, Jernigan D, Helfand R, Ginsheimer K, Jernigan J, et al. Foundations of the severe acute respiratory syndrome preparedness and response plan for healthcare facilities. *Infect Control Hosp Epidemiol* 2004;25:1020-5.
29. Thorne CD, Levitin H, Oliver M, Losch-Skidmore S, Neiley BA, Socher MM, et al. A pilot assessment of hospital preparedness for bioterrorism events. *Prehospital Dis Med* 2006;21:414-22.
30. Treat KN, Williams JM, Furbee PM, Manley WG, Russell FK, Stamper CD. Hospital preparedness for weapons of mass destruction incidents: an initial assessment. *Ann Emerg Med* 2001;38:562-5.
31. Wetter DC, Daniell WE, Treser CD. Hospital preparedness for victims of chemical or biological terrorism. *Am J Public Health* 2001;91:710-6.

32. Maldin B, Lam C, Franco C, Press D, Waldhorn R, Toner E, et al. Regional approaches to hospital preparedness: biosecurity bioterrorism 2007;5:43-53.
33. Toner E, Waldhorn R, Maldin B, Borio L, Nuzzo JB, Lam C, et al. Hospital preparedness for pandemic influenza: biosecurity bioterrorism 2006;4:207-17.
34. DiConsiglio J. Mapping a disaster plan. *Materials Manage Health Care* 2001;10:14-7.
35. Ippolito G, Puro V, Heptonstall J. Hospital preparedness to bioterrorism and other infectious disease emergencies. *Cell Mole Life Sci* 2006;63:2213-22.
36. Kaji AH, Koening KL, Lewis RJ. Current hospital disaster preparedness. *J Am Med Assoc* 2007;298:2188-90.
37. Bennett RL. Chemical or biological terrorist attacks: an analysis of the preparedness of hospitals for managing victims affected by chemical or biological weapons of mass destruction. *Int Environ Res Public Health* 2006;3:67-75.
38. Grow RV, Rubinson L. The challenge of hospital infection control during a response to bioterrorist attacks: biosecurity bioterrorism. *Bio-defense Strat Pract Sci* 2003;1:215-20.
39. Ippolito G, Nicastrì E, Capobianchi M, Di Caro A, Petrosillo N, Puro V. Hospital preparedness and management of patients affected by viral haemorrhagic fever or smallpox at the Lazzaro Spallanzani Institute, Italy. *Eur Commun Dis Bull* 2005;10:36-9.
40. Levin PJ, Gebbie EN, Qureshi K. Can the health care system meet the challenge of pandemic flu? Planning, ethical, and workforce considerations. *Public Health Rep* 2007;122:573-8.
41. Lewis CP, Aghababian RV. Disaster planning, part I. Overview of hospital and emergency department planning for internal and external disasters. *Emerg Med Clin N Am* 1996;14:439-52.
42. Petrosillo N, Puro V, Di Caro A, Ippolito G. The initial hospital response to an epidemic. *Arch Med Res* 2005;36:706-12.
43. Higgins W, Wainright C III, Lu N, Carrico R. Assessing hospital preparedness using an instrument based on the mass casualty disaster plan checklist: results from a statewide survey. *Am J Infect Control* 2004;32:327-32.
44. Bradley RN. Health care facility preparation for weapons of mass destruction. *Prehospital Emerg Care* 2000;4:261-9.
45. Chan JT, Yeung RS, Tang SY. Hospital preparedness for chemical and biological incidents in Hong Kong. *Hong Kong Med J* 2002;8:440-6.
46. DeJohn P. Hospital supply chain vital part of disaster plan. *Hosp Materials Manage* 2002;27:14-5.
47. Shadel BN, Rebmann T, Clements B, Chen JJ, Evans RG. Infection control practitioners' perceptions and educational needs regarding bioterrorism: results from a national needs assessment survey. *Am J Infect Control* 2003;31:129-34.
48. Xiong W, Hollingsworth E, Muckstadt J, Van Lieu Vorenkamp J, Lazar EJ, Cagliuso NV, et al. Hospital "self-prophylaxis": strategies for efficient protection of the workforce in the face of infectious disease threats. *Infect Control Hosp Epidemiol* 2007;28:618-21.
49. Department of Health and Human Services. Proposed guidance on antiviral drug use during an influenza pandemic. 2008. Available from: <http://aspe.hhs.gov/panflu/antiviral-n-masks.shtml>. Accessed June 1, 2008.
50. Ransom MM, Goodman RA, Moulton AD. Addressing gaps in health care sector legal preparedness for public health emergencies. *Dis Med Public Health Preparedness* 2008;2:50-6.
51. Bentley JD. Hospital preparedness for bioterrorism. *Public Health Rep* 2001;116:36-9.
52. Department of Health and Human Services. Proposed considerations for antiviral drug stockpiling by employers in preparation for an influenza pandemic. 2008. Available from: <http://aspe.hhs.gov/panflu/antiviral-n-masks.shtml/>. Accessed June 1, 2008.
53. Columbia School of Nursing. Clinician competencies: during initial assessment and management of emergency events. New York, NY: Columbia School of Nursing; 2003. Available from: <http://cpmcnet.columbia.edu/dept/nursing/chphsr/pdf/clinician-comps.pdf>. Accessed December 14, 2003.



**Table I.** Infection prevention components of a hospital emergency management plan

---

Hospital emergency management plan and biological annex

- Addresses all biologic events, including bioterrorism, emerging infectious diseases, and pandemic influenza<sup>2-7,9,10,12,14,16,19-31</sup>
- Identifies contact names and numbers for local and state health department, state health association, and tribal health association<sup>4</sup>
- Is coordinated with local, state, and federal emergency management plans<sup>4,5,7,9,16,23,26-29,32,33</sup>
- Identifies the person(s) authorized to implement/activate the biologic annex plan and the organizational structure that will be used, including the delegation of authority to carry out the plan 24/7<sup>4,16</sup>
- Describes the responsibilities of key personnel and departments (and back-ups for key personnel) within the facility related to executing the biologic annex component of the Plan<sup>4,27</sup>
- Defines how biologic events are different from other types of MCEs<sup>11,26,27</sup>
- Has planning committee focusing on biologic events that includes an infection preventionist and/or hospital epidemiologist<sup>3-5,7,8,14-16,24,26-29</sup>
- Stratifies implementation of specific actions on the basis of the WHO pandemic phases, US government pandemic stages, and the pandemic severity index level worldwide, in the United States, and at the local level<sup>4,24</sup>
- Stratifies implementation of specific actions for a bioterrorism attack on the basis of whether the attack is overt or covert and on the basis of high-risk syndromes or suspected routes of disease transmission<sup>5,26,27</sup>
- Describes the epidemiologic signs of a potential bioterrorism attack<sup>5,26</sup>
- States how often the annex will be updated and by whom, including contact names/information, incorporating lessons learned from exercises/drills, and changes in recommendations related to managing biologic events<sup>3-5,7,10,16,21,27</sup>

Assessing hospital readiness for MCE

- States how and when a facility assessment will be performed that addresses infection prevention issues, such as location and amounts of hand hygiene products, isolation rooms/areas, and others<sup>5,7,8,26,27</sup>
- Incorporates biologic scenarios, such as pandemic influenza or bioterrorism, into a disaster exercise; whenever possible, this exercise should be community wide<sup>3-5,7,10,11,14-16,19-22,24,26-31,34-36</sup>

Infection prevention policies and procedures

- Has a protocol for providing 24/7 infection prevention and control coverage, including coverage for outpatient facilities or alternate care sites owned/operated by the hospital<sup>2-5,7-9,11,14-16,28</sup>
- Has a protocol for authorizing the hospital epidemiologist or Infection Control Committee or its designee to rapidly implement prevention and control measures in response to a biologic event<sup>5</sup>
- Has a protocol for personal protective equipment (PPE) use and hand hygiene<sup>2-10,14,15,19,21,22,24,26-29,31,33-35,37-42</sup>
- Has a policy for physically isolating and managing contaminated vehicles<sup>43</sup>
- Has a procedure related to more frequent checking of patients' oxygenation and early transfer to an intensive care unit to reduce the risk of infection transmission by allowing for elective, early intubation to be done in a controlled environment by minimal staff<sup>8</sup>
- Includes policies for modifying admission criteria on the basis of current bed capacity and disease status, including procedures for closing the facility to potentially infectious patients or noninfectious patients<sup>2-4,11,24</sup>
- Has a protocol for limiting or restricting visitors to the facility during a biologic event, including coordination with security or local law enforcement to ensure compliance<sup>4,24,27,28</sup>
- Has a protocol for monitoring staff compliance with infection prevention procedures, including PPE use, hand hygiene, isolation, and others<sup>3,4,8-10,24,28</sup>
- Has protocols for environmental decontamination during an MCE, including cleaning patient rooms, managing "white powder" or other environmental contamination incidents, cleaning/disinfection/sterilization of patient care items, reprocessing of equipment when resources are limited, cleaning/decontaminating patients' valuables and belongings when necessary, and cleaning and inspecting environment before reopening a previously closed area of the hospital<sup>2,5,7,9,14,24-27,38</sup>
- Defines a procedure for conducting and coordinating the epidemiologic outbreak investigation of a biologic event with the local health department and identifies a person (and back-up person) at the hospital who will be the leader/coordinator of the investigation at the hospital<sup>3,4,7,9,14,25,28</sup>
- Has a protocol for implementing an on-site quarantine that is coordinated with local public health officials, including plans for ensuring compliance and providing necessary supplies to maintain the quarantine<sup>4,7,9,10,19,24,26</sup>
- Has a protocol for coordinating with security or local law enforcement entities to enforce isolation and quarantine orders on-site<sup>2,7,27</sup>
- Has a protocol for managing animals or pets in the hospital, including care/management of staffs' pets if employees are confined to work for extended periods of time during an MCE<sup>7,11</sup>
- Has prioritization plans/algorithms for allocating limited PPE, hand hygiene products, ventilators, anti-infective therapy or vaccination, and other supplies/products that affect infection transmission during a biologic event<sup>3-7,9,11,14-16,24,25,28,33</sup>
- Describes how the hospital Ethics Committee is involved in the development of crisis standards of care for the facility<sup>4,15,24,33</sup>

Infection prevention policies and procedures related to patient management

- Has a protocol for identifying when and how to perform patient decontamination related to a biologic event (ie, an overt bioterrorism attack)<sup>5,7,20,22,26,27,29-31,36,37,41,43,44-46</sup>
- Has a protocol for internal and external patient transport of potentially contagious patients, including coordination with local emergency medical services and 9-1-1 services for interfacility transfer<sup>2-5,7,9,24,26,27,29,35,39,41,42</sup>
- Has a protocol for determining patient placement of potentially contagious patients, including plans for cohorting of patients with known or suspected communicable diseases during a biologic event<sup>2-5,7,14,24-29,35,42,47</sup>
- Has a protocol for designating staff limited to work with potentially infected patients (ie, staff cohorting)<sup>2-4,6,7,15,24,26,28</sup>
- Has a protocol for instituting Standard and Transmission-Based Precautions for all biologic events (bioterrorism, outbreaks of emerging infectious diseases, and pandemics), including procedures for implementing respiratory hygiene practices<sup>2-5,7,9,14,19,24-28,35,37,38,39,42-43,49</sup>
- Has a procedure for identifying and managing vulnerable individuals/groups who may be at an increased risk of infection during a biologic event<sup>4,7,26,37</sup>
- Has an inventory or list of all available isolation rooms/areas, including AIIRs and negative-pressure rooms/areas<sup>5</sup>
- Has a protocol for assessing the functionality of all AIIRs before patient admittance for isolation<sup>5,24</sup>

---

Continued

**Table I. Continued**


---

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Has a protocol for handling, transporting, and laundering soiled linens, including times when routine linen cleaning/washing cannot occur because of the MCE<sup>2,4,5,7,16,24,26</sup></li> <li>• Has a protocol for patient discharge (where they will be discharged to, decision matrix for deciding/prioritizing who is discharged, discharge instructions to reduce the risk of disease spread, and others) specific to biologic events<sup>2-5,24,26,27,29</sup></li> <li>• Has a protocol for postmortem care procedures that limit infection transmission during a biologic event<sup>2,4,5,7,14,16,24,26,39</sup></li> </ul>  | <p>Occupational health policies and procedures</p> <ul style="list-style-type: none"> <li>• Has a program that offers and monitors compliance with the annual influenza vaccine for hospital employees<sup>4,9,24,48</sup></li> <li>• Has a respiratory protection program that fit-tests staff for respirators or provides and trains staff on the use of PAPRs that do not require fit-testing<sup>8,24</sup></li> <li>• Has a liberal/nonpunitive sick leave policy that addresses the needs of ill and symptomatic personnel during a biologic event, including allowances and encouragement for sick employees to stay home until no longer contagious or furloughing exposed or infected staff<sup>3,4,7,10,28</sup></li> <li>• Has a protocol for managing personnel who become ill during a biologic event, including what to do when staff develop symptoms while at work and outlining how long staff must remain off-duty after becoming infected<sup>2-5,7-9,14,19,24,26,28,35,42,48</sup></li> <li>• Has a protocol for identifying and managing staff who are at an increased risk for infection during a biologic event (eg, pregnant women, immunocompromised workers, and employees of age 65 years or older), such as administrative leave, furlough, altering work assignment or location, and others<sup>4,7,24</sup></li> <li>• Has a protocol for tracking staff who have had contact with a potentially contagious patient or contaminated source (ie, an exposure) during a biologic event, including offering PEP when indicated<sup>2-5,7-9,14,19,24,26,28,35,39,42,43,48,49</sup></li> <li>• Has a protocol for tracking staff who have recovered from illness during a biologic event, including confirmed and probable cases<sup>24</sup></li> <li>• Has a protocol that addresses if, how, and when long-term prophylaxis for employees will be provided during a pandemic and to which staff this policy applies<sup>24,49</sup></li> <li>• Has a protocol for notifying staff's other employers if the staff are exposed or infected during a biologic event<sup>3</sup></li> <li>• Includes a policy for the prevention of occupational injury and exposure to bloodborne pathogens during an MCE, including times when PPE or other resources are limited<sup>5,24</sup></li> </ul> |
| <p>Surveillance and triage</p> <ul style="list-style-type: none"> <li>• Identifies a process for syndromic surveillance to identify or detect a biologic event, including bioterrorism, outbreaks of emerging infectious diseases, and pandemic influenza; collection indicators (chief complaint, hospital admissions, unusual clusters of pneumonia, rashes, flu-like illness, and others, are identified in plan)<sup>2-5,7,9,11,16,19,22,24,26-29,35,36,42,43,50</sup></li> <li>• Outlines the hospital's participation in a community-wide syndromic surveillance program to identify or detect a biologic event; collection indicators (chief complaint, hospital admissions, and others) are identified in plan<sup>2,3,7,11,19,26,28,29</sup></li> <li>• Defines the frequency with which syndromic surveillance reports/data will be sent to infection prevention/hospital epidemiology and local public health agency; frequency of data sharing reflects the pandemic security level<sup>4,9,16</sup></li> <li>• Identifies a process for surveillance to monitor for potentially contagious diseases during a MCE after it is identified, including screening of patients, visitors, and staff; frequency of surveillance (upon admittance to hospital, before each shift, and others) is identified<sup>2,3,7,8,19,26-28,47</sup></li> <li>• Has a protocol for surveillance based on the level of disease in the community (such as preevent passive surveillance using signage and midevent active surveillance using temperature/symptom screening for hospital visitors)<sup>2,4,9,24</sup></li> <li>• Identifies a process for testing and evaluating the syndromic surveillance program/system being used to detect pandemic influenza (the program/system is evaluated during the seasonal influenza period)<sup>4,7,9</sup></li> <li>• Includes a protocol for tracking admissions and discharges of patients with potentially communicable diseases during a MCE<sup>4,9</sup></li> <li>• Has a protocol for tracking all onsite individuals (patients, visitors, and staff) who have had contact with a potentially infectious patient during a MCE<sup>4,9,24,28</sup></li> <li>• Identifies a protocol for monitoring staff absenteeism for health reasons<sup>24</sup></li> <li>• Describes a written protocol for monitoring and reporting seasonal influenza-like illness among hospitalized patients, volunteers, and staff<sup>4,24</sup></li> <li>• Has a procedure for identifying, monitoring, and tracking health care-associated infection transmission among hospitalized patients, volunteers, and staff, including nosocomial transmission of SARS<sup>28</sup> and seasonal influenza<sup>4,24</sup></li> <li>• Identifies a process for monitoring individuals who are quarantined on-site for signs/symptoms of contagious diseases<sup>4,9</sup></li> <li>• Includes plans for a designated location that is physically separated from other triage/evaluation areas for triaging patients with possible communicable diseases during a biologic event<sup>4,5,7,26,27</sup></li> <li>• Has a protocol for creating or has triage signage that addresses language barriers, individuals with disabilities (visual, hearing, or others), and varying reading levels<sup>4,24,26</sup></li> </ul> | <p>Reporting, communication plan, and information management</p> <ul style="list-style-type: none"> <li>• Includes a protocol for 24/7 notification of infection prevention or hospital epidemiology of a known or suspected biologic event, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics<sup>2-5,7,9,19,25-28,43</sup></li> <li>• Includes a protocol for notifying local health officials and local law enforcement of a known or suspected biologic event, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics<sup>2-5,7,9,14,19,24-29,43,47</sup></li> <li>• Identifies the name, title, and contact information of a primary and back-up person assigned to communicate with hospital staff and volunteers regarding activation of the Plan and the status and impact of the biologic event during the incident<sup>4,9,16</sup></li> <li>• Identifies the name, title, and contact information of a primary and back-up person assigned to communicate with public health authorities during a biologic event<sup>4,11</sup></li> <li>• Identifies a person assigned to monitor state and federal public health advisories and update the pandemic response coordinator and members of the hospital emergency management committee when pandemic flu has been reported in the United States and is nearing the geographic area<sup>4,5,9,10,24,42</sup></li> <li>• Includes a list and contact information of other health care entities and key community response entities (fire safety, law enforcement, EMS, public health, and governmental agencies) within the region with which it will be necessary to maintain real-time communication during a biologic event<sup>4</sup></li> <li>• Describes the process with which health alert messages, information about contagious diseases, hospital rules for visitors, and need for and use of infection control measures (social distancing practices, isolation, PPE, and others) will be posted and/or communicated within the facility during an MCE (such as through an intranet, hotline, closed-circuit TV, and others)<sup>2-5,7,9,10,15,19,29</sup></li> </ul>   |

---

Continued

**Table I. Continued**

- Describes the process with which the hospital has arranged mechanisms and content for interfacility communication with other hospitals and health care agencies in the region for safe patient placement during a biologic event, including during admission and discharge procedures (includes information on PPE, isolation, and other infection prevention interventions)<sup>2-5,9,19,21,24,26,27,32,45</sup>
  - Describes the process with which the hospital has shared estimates regarding the quantities of essential patient care materials/equipment and PPE with local, regional, state, and tribal planning groups to better plan stockpiling agreements<sup>4,16</sup>
  - Describes procedures for obtaining and communicating infection prevention information when phone lines are not available<sup>7</sup>
  - Includes preevent messages and materials about the most likely biologic agents to be involved in an MCE that can be communicated to staff, visitors, patients, and the general public during an MCE<sup>2,7</sup>
- Laboratory infection prevention issues
- Has a process for obtaining laboratory services<sup>24/7</sup><sup>16</sup>
  - Has a procedure for collecting, labeling, packaging, processing, and transporting laboratory specimens believed to be potential bioterrorism agents or emerging infectious diseases, including protocols for internal and external transport<sup>2,4,5,7,16,19-22,24,27,35-37,39,42</sup>
  - Has a procedure for coordinating the processing of laboratory specimens with regional laboratories, including the LRN<sup>2,4,5,16,19,22,24,27,35,37,39,42,43</sup>
  - Has a process for evaluating and tracking 100% of all microbiology results and stratifying the report according to organism<sup>5,43</sup>
  - Has a procedure for collecting and managing evidence during a known or suspected bioterrorism event, including coordination with local law enforcement and chain of custody documentation<sup>5,27</sup>
- Surge capacity issues
- Has a plan for surge capacity to handle an influx of potentially contagious patients<sup>2-9,11,14-19,24-30,35,43,49,51-53</sup>
  - Estimates the quantities of essential patient care materials/equipment and PPE that would be needed for an 8-week period (ie, the estimated wave of a pandemic). Examples of patient care materials/equipment and PPE: intravenous pumps, ventilators, anti-infective therapy, vaccination, diagnostic testing materials, linens, respiratory protection, gowns, gloves, eye protection, hand hygiene products, and others<sup>4-7,10,16,21,22,26,27,34,37</sup>
  - Estimates the current staff shortages and staffing levels during an MCE<sup>7,16,27,33</sup>
  - Has a protocol for assessing and finding/supplying essential patient care materials/equipment and PPE stocks during an MCE<sup>3,6-8,10,14,15,19,21,22,24,26-29,31,33-35,37,38,42</sup>
  - Includes protocols for health care worker surge capacity that acknowledges that staff may be less willing or able to work during a biologic event (because of health care worker illness or quarantine, family obligations, or fear leading to reluctance or refusal to work) and that more staff will be needed because of worker fatigue from wearing PPE for extended periods of time and has contingency plans for these types of situations<sup>3,4,7,8,10,11,24,26,28,29,33,37,40,50,51</sup>
  - Includes a protocol for interim and/or long-term negative-pressure surge capacity (ie, AIIRs, negative-pressure rooms/areas, or other protective environments)<sup>3,5,7,8,10,15,19,20,22,24-26,28,29,33,35,36,38,39,42</sup>
  - Estimates the current quantities of linens for patient care and has a plan to obtain additional linen during an MCE<sup>2,4,5,7,16,24,26</sup>
  - Estimates the current hospital laboratory capacity and surge capacity potential, including an inventory of laboratory supplies<sup>7,16,22,27</sup>
  - Identifies current morgue capacity and has protocol for obtaining morgue surge capacity to limit infection transmission during a biologic event<sup>7,27,36,41</sup>
  - Includes a protocol for maximizing staff's ability and willingness to work during an MCE, such as offering worker incentives and encouraging staff to have a personal disaster plan<sup>10,15,26</sup>
- Anti-infective therapy, chemoprophylaxis, and vaccination
- Estimates the current quantities of anti-infective therapy, chemoprophylaxis, and vaccines on-hand<sup>7,16,27,31</sup>
  - Includes a protocol for establishing and/or maintaining a medication and vaccine stockpile and/or coordination plans with regional health care facilities or vendors to obtain additional anti-infective therapy supplies during an MCE<sup>2,5,10,15,16,19-22,24,26,29,36,46,52</sup>
  - Includes a prioritization plan for staff and their family members regarding who would be the first priority for anti-infective therapy, chemoprophylaxis, and vaccine during times of limited resources<sup>4,5,7,10,14,15,19,24,26,36,43,48,49,52</sup>
  - Has a protocol for identifying the most current recommendations and guidance on the use of anti-infective therapy and chemoprophylaxis needed for a biologic event<sup>4,24,26,31</sup>
  - Has a protocol for expediting administration of anti-infective therapy, chemoprophylaxis, or vaccine to patients, staff, and/or staff's family as recommended by public health officials<sup>4,7,26,29,48,49</sup>
  - Defines the role, if any, of the facility in a large scale program to distribute anti-infective therapy, chemoprophylaxis, or vaccine to the general population, including hospital visitors and the general public<sup>4,7,16,24,26,29,49</sup>
  - Includes a protocol for performing follow-up monitoring and treatment of staff, patients, and/or visitors who received anti-infective therapy, chemoprophylaxis, or vaccine<sup>4,7,24,49</sup>
  - Includes security procedures as needed for control and administration of anti-infective therapy, chemoprophylaxis, or vaccine during MCEs<sup>2,5,24,49</sup>
- Infection prevention education
- Has a designated person who creates, coordinates, and tracks standardized staff training on biologic threats and emergency management<sup>4,6,11,16,24,53</sup>
  - Has a protocol that outlines the types of information that will be provided to staff related to biologic threats and emergency management, the frequency this training will take place, and how competence will be assessed<sup>2-14,16,19-24,27,29,35-37,39,40</sup>
  - Has a protocol that outlines the types of information that will be provided to patients, visitors, and the general public; who will provide this training; and when and how this education will be provided<sup>2,4,5,12,24</sup>
  - Includes agent-specific information (such as background on the agent/disease, epidemiology of the agent/disease, clinical features, incubation period, case definition, staff educational materials, quick reference materials for staff, and educational materials for patients and visitors) for the most likely agents to be used in a bioterrorism attack or those that might occur during an outbreak of an emerging infectious disease or pandemic (SARS, avian influenza, or others)<sup>4,5,26,28</sup>
  - Includes disease-specific patient management information (such as criteria for detecting a possible case, screening form for the disease, diagnostic workup to be performed when ruling out the disease, medical treatment, vaccination, postexposure follow-up or treatment, patient placement, route of transmission, isolation precautions and PPE needed, environmental decontamination procedures, and home care or discharge instructions)<sup>4,5,26,28</sup>

**Table I. Continued**

---

**Physical plant infection prevention issues**

- Has a protocol for food safety practices, including holding temperatures and times to prevent foodborne illness during MCEs when standard utilities may not be available<sup>7,14</sup>
  - Has a procedure for handling/managing increases in regular and regulated medical waste during MCEs, including times when regular waste management pick-up is not possible because of the event<sup>2,5,7,9,14,24,41</sup>
  - Has protocol for assessing for functioning sewer after an MCE<sup>7</sup>
  - Has protocol for assessing for water, dust, or other contaminate infiltration after an MCE<sup>7</sup>
  - Has procedure for obtaining additional functional or chemical toilets after an MCE<sup>7,41</sup>
  - Has procedure for obtaining additional water during an MCE for sanitation and hand hygiene needs<sup>2,7,14,41</sup>
- 

*AIIR*, airborne infection isolation room; *EMS*, emergency medical services; *LRN*, laboratory response network; *MCE*, mass casualty event; *PAPR*, powered air purifying respirator; *PEP*, postexposure prophylaxis; *PPE*, personal protective equipment.