




Brief Report

# Streamlining Preparedness: A Practical Pathway to Special Pathogens Management

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**Abstract:** Managing special pathogens cases, also known as high consequence infectious diseases, presents unique challenges for healthcare systems. It requires thorough planning and comprehensive operational protocols, as well as an appreciation of how human and organizational factors influence readiness. Based on the outcomes from a full-scale Ebola Virus Disease exercise at New York City Health and Hospitals (NYC Health + Hospitals), this paper presents a checklist of considerations to promote healthcare facility preparedness for special pathogens and to minimize gaps between protocol design and real-world implementation. This approach not only strengthens compliance with the new Joint Commission requirements but also provides a replicable framework for enhancing special pathogens preparedness within other healthcare systems.

**Keywords:** preparedness; high consequence infectious disease; exercise; protocol; emergency management; emergency preparedness; special pathogens



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## 1. Introduction

Patients infected with special pathogens (SPs)—highly infectious agents that can cause severe illness—may appear in healthcare systems at any time and through any entry point [1]. Recent outbreaks, including Lassa fever in Nigeria [2], Marburg in Tanzania [3], and H5N1 in countries around the world [4], along with imported cases of Ebola and Lassa fever in the UK and US [5,6], underscore the critical need for robust hospital preparedness. The fatality rates of these diseases can be as high as 88%, demonstrating the danger of unconstrained spread [7]. In 2024, infection prevention and control measures for special pathogens became a requirement for hospitals by the Joint Commission (TJC), a major accreditation body for healthcare organizations across the United States [8,9].

Managing patients suspected to have a special pathogen infection poses unique challenges for healthcare systems, and the granular steps required to build and maintain readiness are often unclear [9–11]. Significant gaps in preparedness can arise from a disconnect between public health guidance and frontline healthcare expectations or operations (screening, isolation, patient care capabilities, waste management, and patient transport). For example, protocol seldom anticipates the human and organizational complexities that muddle preparedness in real life scenarios [12]. Fear, information overload, communication challenges, and unfamiliar workflows can make it challenging to put protocol to practice [13,14].

To evaluate the effectiveness of written preparedness and response plans in clinical settings, the New York City Health and Hospitals System-wide Special Pathogens Program conducted a full-scale exercise (FSE) focused on the Identify, Isolate, and Inform (III) approach, waste management, and infection control measures. FSEs include multiple agencies and disciplines, and simulate real events as closely as possible. The exercise revealed gaps in preparedness, prompting the development of a comprehensive Special Pathogens Readiness Checklist—a tool that acknowledges real-world complexities and integrates them into practical planning considerations. The tool is included in this article for customization and implementation by other healthcare facilities.

## 2. Methods

### *Exercise Design*

In 2021, the System-wide Special Pathogens team conducted a full-scale exercise (FSE) focused on Ebola virus disease to assess the healthcare system's capacity to manage a case with one of the highest levels of transmissibility and stringent waste precautions. The exercise was especially timely, following the Ebola virus disease outbreak in the Democratic Republic of the Congo in 2020 [15] and an outbreak in Guinea in early 2021 [16]. The NYC Health + Hospitals Ebola virus disease FSE involved all actors who would be engaged in the event of a true suspected SP patient, including multiple frontline acute care hospitals, the local health department, the fire department, a public health lab, and a waste management vendor. Frontline hospitals handle screening, identification, and clinical care. Suspected SP cases are reported to the local health department, initiating bidirectional communication. The guidance at the time dictated that the fire department assist in transferring suspected SP patients from frontline hospitals to the Regional Emerging Special Pathogen Treatment Center, a facility specifically prepared to handle highly infectious diseases. The public health lab analyzes patient specimens to identify the disease in question. Lastly, the waste management vendor ensures the safe handling of Category A waste—infectious waste that holds the potential to cause serious illness or death. The exercise included all relevant actors in order to best determine gaps between protocol and lived experience.

This FSE assessed hospitals' abilities pertaining to the following objectives:

- Safely follow infectious diseases screening and identification protocols.
- Promptly isolate the patient.
- Don and doff personal protective equipment.
- Notify the local health department, internal response teams and department leadership.
- Follow intra-facility patient transfer plans.
- Follow waste management plans.

Patient actors with symptoms, travel history, and epidemiological risk factors for Ebola virus infection presented to four emergency departments and, as the exercise progressed, documented the outcomes. A total of seven hospitals and agencies across four New York City boroughs participated in the FSE. Following the exercise, facility-specific and system-wide debriefs were conducted. Successes, challenges, and areas for improvement were documented and analyzed.

## 3. Results

Common challenges emerged across the frontline hospitals, including delays in travel and symptom screening, inability to promptly isolate the patient, overlooked engineering controls, and unexpected situations that tested administrative measures, which proved that there was room for systematic improvement to more comprehensively account for human and organizational factors which could improve a state of readiness. Task tracking and sim-

plifying workflows, especially for rare scenarios such as Ebola, emerged as considerations for improvement, which are consistent with the literature [17,18].

Table 1 highlights exercise themes and identifies key considerations for improvement.

**Table 1.** Exercise Findings and Improvement Points.

Categories of Readiness	Exercise Outcomes/Themes	Considerations for Process Improvement
Identification and Routine Screening	Delayed or incomplete travel and symptom screening.	Add redundant screening protocol reminders within the electronic medical record as well as signage in registration and triage areas.
Engineering Controls	Communication barriers between healthcare workers inside of the isolation room and support staff outside of the isolation.	Utilize alternative methods for communication, such as intercom, telephone or video services.
Administrative Controls	Difficulties with patient transfer (e.g., clearing the hallway when patient is being moved while preventing disruptions to normal operations).	Develop a protocol and conduct training for efficient communication to hospital security and a simple workflow to best support management of hallways if patient transfer is warranted while simultaneously preventing disruption of the emergency department.
Isolation	Challenges with removal of medical equipment/unnecessary supply from the isolation room and prompt placement of required supply.	Develop a simple list of critical tasks to be performed prior to isolating the patient, such as removing any medical equipment from the room and ensuring PPE and supplies are available.

#### 4. Discussion

The following 10 domains are included in the checklist:

1. Identification and Routine Screening
2. Engineering Controls
3. Administrative Controls
4. Isolation
5. Staff Safety/PPE
6. Patient Assessment and Management
7. Laboratory Testing
8. Notification and Activation of HICS
9. Cleaning, Disinfection, and Spills and Waste Management
10. Inter-facility Transfer

Myriad observations during FSE debriefs, along with guidance from the CDC and NYS DOH, informed the development of a Special Pathogens Readiness Checklist, which is composed of an array of planning considerations [19–25]. The tool combines FSE-derived knowledge of real-world complexities, feedback from healthcare providers across clinical departments, and the latest literature on how to effectively prepare for infectious disease threats [8,18–21]. The tool aligns with guidance from the CDC on Viral hemorrhagic fevers (VHFs), a category to which EVD belongs, including the CDC’s Infection Control Guidance, Guidance for Personal Protective Equipment, Clinical Testing and Screening, Evaluating an

Ill Person for VHF, Handling VHF-Associated Waste, Interim Guidance for Environmental Infection Control in Hospitals, and Infection Presentation and Control Recommendations for Patients in U.S. Hospitals who are Suspected or Confirmed to have Selected Viral Hemorrhagic Fevers [26]. This is not to suggest that the checklist encompasses all of the specific details in each guidance document but rather that it serves as a cohesive and organized framework to guide readers through the key action items.

To supplement key public health guidelines, the SP Readiness Checklist includes the four categories of readiness identified through the FSE and their respective considerations for process improvement, as described in the results. These items serve as examples of how the team utilized full-scale exercises to identify gaps between protocol and practice, and then built upon these learnings to improve larger processes. The redundant screening protocol reminders within the Identification and Routine Screening category of readiness were included in Section 1, boxes 1, 3, and 4 of the appendix (Appendix A). The alternative modes of communication within the Engineering Controls category of readiness were included in Section 2, box 4, and Section 6, box 3 of the appendix (Appendix A). The workflow to manage the hallways and the clarification of the role of hospital security within the Administrative Controls readiness category were included in Section 3, box 2, and Section 4, boxes 1 and 3 of the appendix (Appendix A). The list of critical tasks that must be completed prior to isolating the patients within the Isolation category of readiness were included in the SP Readiness Checklist Section 4, boxes 4, 5, and 6 of the appendix (Appendix A). In this manner, key observations and lessons learned from dozens of exercises were incorporated into the checklist in order to better align guidance with lived scenarios.

The Special Pathogens Readiness Checklist highlights considerations for ongoing preparedness and may be utilized in anticipation of patients presenting to a facility with a suspected or confirmed special pathogen infection. It uses plain language, allows staff to check off completed tasks and add relevant notes to the master document, and consolidates considerations into one document (Appendix A). It should be adapted based on the healthcare facility's risk assessment, local regulations, and capabilities of the health department. The complete checklist is included as in Appendix A.

While we believe that this tool will be useful for other healthcare systems, there are several limitations of the SP Readiness Checklist and of its associated research to date. First, the team only had access to qualitative observations. Quantitative assessments of the extent to which use of the checklist improves hospital readiness for special pathogens are important to assess its efficacy. Further, it is possible that FSEs diverge from true special pathogen cases in process considerations. However, the limited number of special pathogens outbreaks within the United States makes it challenging to assess hospital readiness in non-exercise scenarios. Lastly, the Special Pathogens Readiness Checklist was developed for the NYC public hospital system and further research could be helpful to better incorporate the particularities of disparate care settings.

## 5. Conclusions

Proactive planning is essential for the prompt identification and effective management of special pathogens cases. With an increasing frequency of special pathogens outbreaks and travel-associated cases, the need for preparedness is ubiquitous worldwide [27,28]. Protocols, encoded in neat and distilled documents, only act as scaffolding. Human, organizational, and infrastructure factors influence the state of preparedness for healthcare facilities, and must be incorporated into plans and processes. Bridging expectations and realistic operational capabilities through exercises and planning tools, such as the Special

Pathogens Readiness Checklist, is critical to provide the necessary structural integrity for a true state of preparedness.

The Special Pathogens Readiness Checklist presented in this paper serves as a tool to improve healthcare facility preparedness and may be used assist with compliance with TJC requirements. Using FSEs to move from the theoretical to the lived, the checklist manages and leverages key human and organizational factors, enables seemingly disparate factors to be considered in tandem, facilitates collective reflection to guide constructive action, and acknowledges that all stakeholders involved play a crucial role in safeguarding healthcare workers and public health. In order to remain attentive as a healthcare system, country, and world, we must embrace the intrinsic human nature that accompanies our work to sharpen our response to whichever pathogen may be around the corner.

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## Appendix A



# Special Pathogens Readiness Checklist Template

### Purpose:

Maintaining a state of readiness to manage suspected or confirmed special pathogens is essential to protect healthcare workers, prevent exposures, and safely care for patients in a coordinated and collaborative manner. In order to enhance collective preparedness and response efforts, this checklist highlights considerations for ongoing preparedness and may be utilized in anticipation of patients presenting to a facility with a suspected infectious disease from a special pathogen [27,28,29,30].

### Scope of Guidance:

This checklist provides practical considerations to ensure your facility is able to detect possible cases, protect your employees, and respond appropriately. The checklist is broken down into **10 sections**:

1. Identification and Routine Screening
2. Engineering Controls
3. Administrative Controls
4. Isolation
5. Staff Safety/PPE
6. Patient Assessment and Management
7. Laboratory Testing
8. Notification and Activation of Emergency Response
9. Cleaning, Disinfection, and Spills & Waste Management
10. Inter-facility Transfer

**Figure A1.** *Cont.*

1. Identification and Routine Screening	Completed	Notes
Ensure signage and respiratory hygiene station are placed in easily noticeable locations at points of entry to promote source control.	<input type="checkbox"/>	
Ensure respiratory hygiene stations are fully stocked with tissues, face masks, and hand sanitizer.	<input type="checkbox"/>	
Ensure screening criteria and signage are placed in an easily noticeable manner at ED triage stations, clinics, and other care locations.	<input type="checkbox"/>	
Ensure registration staff utilize the [electronic medical record system] travel screen during patient registration to capture relevant signs, symptoms, exposure, and travel history.	<input type="checkbox"/>	
Ensure staff are prepared to educate patients on safety measures and infection prevention (hand hygiene, how to wear a mask, etc.) if they present with signs and symptoms of an infection.	<input type="checkbox"/>	

2. Engineering Controls	Completed	Notes
Ensure zones demarcating appropriate places to don clean PPE and doff potentially contaminated PPE are established, ensuring there is a clear separation of clean and dirty areas.	<input type="checkbox"/>	
Ensure predetermined route is established for prompt isolation in designated room.	<input type="checkbox"/>	
Ensure staff are familiar with each zone and the activities that can be performed in each zone.	<input type="checkbox"/>	
Ensure methods of communication for visitors are established (e.g., telephone or video services).	<input type="checkbox"/>	
Ensure appropriate, designated isolation rooms are available (e.g., Airborne infection isolation room (AIIR) negative pressure isolation room or, if no AIIR room available, room removed from immediate patient care areas with closeable door and no recirculation of air to facility unless high-efficiency particulate air (HEPA) filtered).	<input type="checkbox"/>	
Ensure a bathroom or a bedside commode (with a plan on how to dispose of the waste) is within the isolation room.	<input type="checkbox"/>	

3. Administrative Controls	Completed	Notes
Ensure staffing model established based on patient duration of stay (ex: shift change every 4 hours).	<input type="checkbox"/>	
Ensure Hospital Police and/or facility security understand and are trained for their roles to secure and manage the area.	<input type="checkbox"/>	
Ensure protocols, plans, and job action sheets are up to date, maintained, and easily accessible by staff and leadership.	<input type="checkbox"/>	
Ensure relevant supplies are available in accordance with hospital (PPE in various sizes, single-use disposable equipment, spill clean-up supply, etc.).	<input type="checkbox"/>	

Figure A1. Cont.

4. Isolation	Completed	Notes
Ensure processes are in place for prompt isolation and limited wait time.	<input type="checkbox"/>	
Ensure an area away from others is designated to immediately place a patient.	<input type="checkbox"/>	
Ensure procedures are in place to clear and secure hallways on route to designated isolation room.	<input type="checkbox"/>	
Ensure reminders are in place to remove SP cart if in room and place cart outside near room prior to patient isolation.	<input type="checkbox"/>	
Ensure reminders are in place to remove other equipment from room (if necessary).	<input type="checkbox"/>	
Ensure appropriate single-use, disposable, medical supply is available.	<input type="checkbox"/>	
Ensure staff are aware of the appropriate places to don clean PPE and doff potentially contaminated PPE, ensuring there is a clear separation of clean and dirty areas.	<input type="checkbox"/>	
Ensure appropriate transmission-based isolation precautions are used and signage is posted on the patient room door.	<input type="checkbox"/>	

5. Staff Safety/PPE	Completed	Notes
Ensure staff have access to PPE donning and doffing protocols for appropriate PPE based on suspected pathogen before entering room.	<input type="checkbox"/>	
Ensure process is in place to have a trained observer present to assist staff in donning and doffing procedures.	<input type="checkbox"/>	
Ensure procedures are in place to limit staff from entering the room.	<input type="checkbox"/>	
Ensure a log of personnel who enter and leave patient's room is in place for use.	<input type="checkbox"/>	
Ensure trained observers and staff are educated and aware of how to manage PPE breaches and/or management of visible contamination.	<input type="checkbox"/>	
Ensure the facility occupational health department has a post-exposure plan with appropriate interventions as well as a monitoring/quarantine plan appropriate for the agent involved.	<input type="checkbox"/>	
Ensure mental health and wellness resources are available for staff.	<input type="checkbox"/>	

6. Patient Assessment and Management	Completed	Notes
Ensure staff are aware of case definitions and travel advisories for guidance regarding criteria for a person suspected to have an infectious disease.	<input type="checkbox"/>	
Create a questionnaire focused symptoms, travel, and other epidemiological linkages that can be used as an enhanced screening tool for triage/clinical staff.	<input type="checkbox"/>	
Ensure alternative communication methods can be used, where possible, to communicate with patient (e.g., intercom, telephone, video)	<input type="checkbox"/>	
Ensure procedures are in place to limit all testing and procedures to what can be done in the room safely if immediate care is required and that aerosol-generating procedures are avoided.	<input type="checkbox"/>	

Figure A1. Cont.



7. Laboratory Testing	Completed	Notes
Ensure facility is capable of performing minimum laboratory testing necessary based on appropriate clinical care, as warranted by public health partners.	<input type="checkbox"/>	
Ensure laboratory testing capability can be maintained for a minimum of 24 hours.	<input type="checkbox"/>	
Ensure staff are aware of specimen acquisition procedures (who collects samples and how are samples managed).	<input type="checkbox"/>	
Ensure requirements for diagnostic testing are known: what tests should be performed? Does the local department of health need to be consulted first? Where will lab analysis occur (internal lab; sent out; point of care)?	<input type="checkbox"/>	
Ensure compliance with protocols and procedures for sending specimens for confirmatory testing, internal and external specimen packaging, transport, storage prior to transport, tracking from collection to transport/destruction.	<input type="checkbox"/>	
Ensure laboratory analysis can be performed safely in accordance with hospital and local health regulations. Preferably laboratory analysis should be performed in a separate room near the patient isolation room and, minimally, should have a Class 2 biosafety cabinet, dead air hood or splash protection shield.	<input type="checkbox"/>	
Ensure guidance is provided by the local department of health on how to collect, prepare, and package specimens for transport to a designated laboratory if needed.	<input type="checkbox"/>	
Ensure there is appropriate space and supplies available to package and ship any specimens for pathogen-specific testing	<input type="checkbox"/>	

8. Notification and Activation of Emergency Response	Completed	Notes
Ensure a facility Incident Response Guide or protocol for special pathogens is up-to-date and available.	<input type="checkbox"/>	
Ensure that all triage staff, nursing leadership, and clinical leaders are familiar with the notification and communication processes for facility leadership (infection prevention and control, infectious disease, administration, laboratory, others as applicable), and state and local public health authorities regarding a person suspected to be infected with a special pathogen.	<input type="checkbox"/>	
Ensure points of contact within your facility are designated and responsible for communicating with hospital emergency management, state and local public health officials.	<input type="checkbox"/>	
Ensure triggers are established and roles are defined to activate an emergency operations/command center.	<input type="checkbox"/>	

9. Cleaning, Disinfection, Spills & Waste Management	Completed	Notes
Ensure staff are aware of infectious substances that are considered Category A and Category B.	<input type="checkbox"/>	
Ensure staff are aware of cleaning and disinfecting protocols per the final diagnosis (e.g., all used equipment remains in the room until it can be disinfected appropriately).	<input type="checkbox"/>	
Ensure safe management of Category A waste.	<input type="checkbox"/>	

Figure A1. Cont.



Ensure there is a designated area for the packaging and storage of contaminated waste documented plan to handle the waste, consistent with the existing plans with external vendors if needed.	<input type="checkbox"/>	
Ensure a designated route is established for transport of category A waste to storage space and to vendor pickup area.	<input type="checkbox"/>	
Ensure supply is available and easily accessible to handle spills and staff are trained on relevant protocol.	<input type="checkbox"/>	

10. Inter-facility Transfer	Competed	Notes
Ensure the area for patient transport is prepared, e.g., clearing the hallways and patient, staff, visitor movement.	<input type="checkbox"/>	
Ensure a plan is in place for staff to be able to care for patient during the transfer process (e.g., one clinical provider remains in PPE and stays within the appropriate safety zone until patient has been transferred out of the facility.)	<input type="checkbox"/>	

Figure A1. Special Pathogens Readiness Checklist Template [27–30].

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