



Behavioral Health Support for Patients, Families, and Healthcare Workers

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Introduction

During the 2014–2016 Ebola outbreak in West Africa, over 850 healthcare workers contracted Ebola, and over 500 died [1]. These tragic numbers underscore the need for strict adherence to infection control precautions when caring for patients with Ebola and other diseases that are both highly infectious and potentially fatal. In addition to the use of personal protection equipment (PPE), such measures include source isolation of infected patients. In the process of confining infectious pathogens, however, it is essential that health systems do not overlook the psychological needs of patients nor that of the medical staff who care for them. This chapter is divided into two sections. The first explores the experiences of patients cared for in source isolation, highlighting the possible iatrogenic psychological consequences of treatment on a biocontainment unit. Strategies for mitigating the potentially harmful psychological effects of isolation are reviewed, including considerations for children. The second section considers the experiences of healthcare workers. The discussion outlines the psychological impact of treating infectious diseases, risk factors for emotional distress, and strategies to promote psychological well-being and resilience.

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Source Isolation of Patients

Psychological Consequences

Patients treated in specialized hospital infection control units are subject to the full range of stressors attendant to hospitalization on any medical-surgical floor, such as incomplete understanding of the illness and treatment, anxiety about the outcome, painful conditions or procedures, and being away from home [2]. Beyond these sources of stress, however, patients treated in dedicated isolation rooms face a variety of unique challenges, including confinement in a small space, reduced opportunities for interaction with others, and potential stigmatization. Indeed, while source isolation is an essential strategy for minimizing risk to healthcare workers as well as the broader community, research conducted over the past two decades suggests that infection control precautions involving isolation may have negative psychological consequences for patients. Compared to hospitalized patients who are not isolated, for example, patients treated in isolation for multidrug-resistant organisms (MDROs) and *Clostridium difficile* are at increased risk for symptoms of depression and anxiety [3–7]. The data suggest that symptoms are likely to emerge after 2–3 days of isolation and may intensify with increased length of treatment [3, 4, 6–10]. Of course, beyond the effects of isolation, patients with life-threatening infectious diseases such as Ebola are at risk for significant emotional distress due to the traumatic nature of the symptoms themselves, the prospect of dying, and having witnessed or cared for others who died from the disease [11].

The literature on the psychological effects of isolation includes numerous qualitative-phenomenological studies, typically using semi-structured interviews to elicit patients' perceptions and recommendations. In addition to studying patients in source isolation for MDROs and *C. difficile*, this body of work includes patients in protective isolation for immunocompromised states, such as bone marrow transplant recipients. Despite differences in the circumstances associated with source and protective isolation, the evidence points to similarities in patients' reactions, including reports of loneliness [12–16], boredom [13, 16, 17], and fear [12, 18, 19].

Patients in isolation have also described feeling neglected and abandoned [13, 15, 17, 18, 20], with some characterizing the experience as prisonlike [12, 14, 16, 17, 20–22]. In a study of 24 US and French *C. difficile* patients interviewed within 14 months of hospitalization, several described feeling like outcasts and prisoners, with one patient comparing the experience to a horror film in which a victim is kept in a pit [12]. In addition, patients in isolation may regress to lower levels of functioning [23], such as requesting help with tasks they can perform themselves, seeking attention [13], or behaving in an abusive manner toward staff [20].

Beyond the loneliness, boredom, fear, abandonment, and regression described by patients in both source and protective isolation, those isolated for infectious conditions have described feelings of stigmatization [13, 17, 18, 21, 24]. Such patients have also reported fear and guilt regarding the prospect of spreading the infection to others [21].

Despite these reports, not all patients react negatively to isolation [25, 26]. In fact, some patients report liking the privacy and quiet [12, 13, 15, 17]. It should also be recognized that treatment in an isolation unit for a highly infectious condition is an unusual experience that generally occurs with little time for preparation. Consequently, an increase in anxiety or depression does not necessarily indicate preadmission or post-discharge psychiatric illness.

Possible Causes of Negative Psychological Effects

One factor that may contribute to the negative psychological impact of isolation is the loss of control associated with confinement in a small space for an indeterminate length of time [4, 13, 19, 23, 27, 28]. Beyond restriction to their rooms, patients in isolation typically have little say regarding who enters the room, when they can be alone, what food is available, and which clothes they can wear. In addition, curtailment in meaningful activities, including opportunities for socialization with friends, family, and other patients, may play a role in the harmful psychological consequences of isolation [13, 16–18, 22]. More generally, diminished sensory stimuli, including a limited view of the rest of the hospital unit [29, 30] and reduced visual contact with others [13], might also contribute to the adverse effects of treatment in an isolation room. Furthermore, when infection control precautions include masks, even face-to-face interactions with staff provide less sensory input [17]. Indeed, Ebola patients at both Nebraska Medicine and Emory University described frustration with the lack of full face-to-face visual contact as well as minimal tactile connection with others. Patients in source isolation for infections have also reported that isolation hampered their recovery and physical rehabilitation [17, 21, 29]. Finally, for patients isolated due to infectious diseases, the rapid implementation of infection control precautions, often with inadequate explanation [25], may be an additional source of psychological distress [13, 24].

Mitigating the Potentially Harmful Effects of Isolation

Investigators have recommended a variety of strategies to reduce the potentially harmful effects of isolation [31]. However, there appear to be no controlled studies examining whether such interventions are effective. With this caveat in mind, the following sections present considerations for hospitals to reduce the risk of negative psychological consequences associated with isolation (Table 16.1). While some suggestions apply to virtually all biocontainment units, others depend on the physical structure of the unit as well as on hospital and unit policies and procedures. The recommendations are based on the available literature, in connection with the clinical experience of the Nebraska Medicine and Emory University infection control teams.

Table 16.1 Summary of strategies to reduce the adverse psychological effects of isolation

	Communication	Control	Physical environment	Staff-patient interaction
Considerations for all patients	Make empathic statement when first meeting patient	Encourage patient to plan daily routines	Clock and calendar	Encourage patient to express concerns
	Explain infection control precautions and rationale	Schedule times without interruption	Window to outdoors	Listen actively
	Provide opportunities for patient to ask questions	Identify and honor preferences regarding visitors	Window looking onto unit, with convex mirror for wider view	Ask clarifying questions
	Repeat information	Inform patients about activities and supplies	Calming pictures on wall	Share something about life outside of hospital
	Use verbal, written, and video-based formats	Problem solve around desired activities not readily available	Shelving for personal belongings	Write staff names on gowns
	Employ professional interpreters	Provide opportunities to practice religion	Pictures from home	Provide photographs and brief bios of caregivers
		Allow ordinary clothes	Telephone, television, and computer	Train staff on adverse effects of isolation and strategies to minimize them
		Permit visitors and staff to bring in home-cooked or restaurant food	Games and snacks readily available in room	Facilitate contact with family and friends
		Exercise equipment		

(continued)

Table 16.1 (continued)

	Communication	Control	Physical environment	Staff-patient interaction
Additional considerations for children	Adapt information to child's maturity level	Provide initial orientation to unit	Age-appropriate toys and crafts	Hands-on activities for expression of feelings
	Ask what child "knows" about the hospitalization	Maximize family contact; should be predictable	Child friendly decor	Time for play
	Limit and discuss media exposure	Communicate changes to visit schedule in advance	Family pictures	Opportunities for decision-making and participation in care
	Clarify misconceptions	Consider time for schoolwork in daily routine	Comfort toys from home	
	Coach parents to model confidence in care team and outcome	Ensure consistency and honesty regarding discharge date		

Consistent, Clear Communication

Numerous authors have highlighted the role of communication in the isolation experience, either inadequate communication leading to increased distress or thorough communication making the experience more bearable [24, 30, 32–35]. At the same time, a number of studies suggest that many patients hospitalized with contact precautions do not understand the reasons for the infection control measures [15, 21, 24, 25, 32], even when provided with verbal and/or written information [15, 21]. Thus, a foundational strategy for reducing the potentially harmful psychological effects of isolation is ensuring that patients understand what precautions will be followed and the reasons for their implementation [6, 7, 30, 32, 34, 35]. One obstacle to achieving this objective is the difficulty patients may have processing information when under emotional and physical stress [15].

To reduce the impact of stress on comprehension, B. Reynolds of the Centers for Disease Control and Prevention recommended making an empathic statement within 30 s of meeting the patient in order to calm strong emotions [36]. A lower level of emotional arousal, in turn, can help the patient process the rest of the interaction. Providers should also give patients opportunities to ask questions and should be prepared to repeat information, perhaps multiple times. Along with providing information on infection control practices in both verbal and written forms [30, 32], hospitals can use video and internet-based formats, which some patients prefer [37]. Verbal, written, or video-based material can also include content on normal reactions to isolation and basic coping skills. Finally, if care team members do not speak

the patient's primary language, a professional interpreter is necessary and may require telephone or video conferencing to reduce the risk of exposure.

Giving Patients Control

As mentioned above, the loss of control experienced by patients in isolation is one likely reason for the negative psychological effects [4, 28]. Consequently, giving patients as much control as possible over the daily routine, visitors, physical layout of the room, available activities, and, when feasible, the treatment itself may help improve psychological well-being [13, 19, 28, 34]. The long stretches of downtime during hospitalization, for example, provide an opportunity for patients to take some control over the schedule. Toward that end, staff can encourage patients to plan daily routines, including times for reading, eating, bathing, watching television, exercising, making phone calls, and engaging in any hobbies that may be accessible during hospitalization [20, 38, 39]. When possible, such plans should include specific times without interruption [28], which can be empowering for patients who otherwise have little control over healthcare workers' entering and exiting the room. In a similar vein, identifying and honoring patient preferences regarding visitation from family and friends (in person or via audiovisual media) can also promote patient autonomy [30].

In addition, care team members should discuss with patients available activities and supplies [6, 14, 30, 32, 35] such as books, newspapers, and crafts and problem solve around activities of interest that are not available. For example, staff in the Nebraska Medicine Biocontainment Unit (NBU) arranged for one patient to have access to drawing supplies, a variety of books, and a harmonica with instructions for beginners, based on the patient's stated interests. A small budget to make such activities accessible can go a long way toward ameliorating the potential boredom, loneliness, loss of control, and regression experienced by many patients in isolation. It is also important to inquire about religious preferences and to provide opportunities for patients to practice their religions [28], which may include video or telephone contact with hospital chaplains or community clergy.

Other ways to increase patients' sense of control as well as normalcy include allowing them to wear ordinary clothes (e.g., sweatpants) rather than hospital gowns [35] and permitting friends and family to bring in food, which can also strengthen patients' connections to life outside of the hospital [36]. At both Emory and Nebraska Medicine, for example, patients appreciated staff members' efforts to deliver favorite foods from local restaurants. Finally, empowering patients to make even trivial decisions, such as where to place the tray table or whether to keep the lights on or off, can make a difference in their sense of control over an otherwise highly restrictive situation [39].

The Physical Environment

Characteristics of the physical environment may also play a role in patients' well-being during isolation. Ensuring that rooms have a clock and a calendar can help patients stay oriented to the time and the day. A window to the outdoors may also help orient patients to time and lessen the sense of claustrophobia [13, 18, 28, 30,

35, 39]. Furthermore, a window looking onto the unit can provide additional sensory input and decrease feelings of isolation [13, 17, 29–31, 39]. In this regard, hospitals might consider installing convex mirrors outside of isolation room windows in order to provide a more complete view of the unit.

Although hospital rooms are often small and crowded with equipment, finding a portion of the wall for a poster, such as a nature scene, can help make a sterile environment more visually interesting [28, 31]. Furthermore, adequate shelving to allow patients to store some of their belongings can help patients to personalize their surroundings [20, 35]. Such shelving might also be used to display pictures from home, which can reinforce in patients a sense of connection to their lives outside of the hospital [16, 39].

Also essential in keeping patients connected to the outside world are a telephone, television, tablet, and computer [18, 32, 33], which have the additional benefit of helping patients stay busy [35]. In addition, having games available can serve as a source of both distraction and socialization [16]. Moreover, keeping snacks in patient rooms, rather than requiring patients to depend on unit staff to deliver food, can increase patients' feelings of control and independence [20].

Another consideration is providing exercise equipment for patients in isolation. Nebraska Medicine's NBU, for example, has a compact exercise bicycle that can be stationed in patient rooms. In addition, patients at both Emory and Nebraska Medicine enjoyed using a foam ball and basketball net. The opportunity to exercise can encourage patients to structure their days and can facilitate physical rehabilitation and overall well-being.

Staff Interaction with Patients

For many patients, the physical isolation associated with contact precautions leads to social isolation at a time when increased social support proves particularly critical [14, 18, 22]. Hospital staff can play a role not only in facilitating contact with friends and family (see below) but also in establishing a supportive and validating interpersonal connection [6, 14, 28, 30]. Cohen et al. [16] refer to this latter responsibility as "physical caregiving with a positive presence." Key elements of such compassionate staff-patient interaction include encouraging patients to express their concerns, using active listening skills, asking clarifying questions, and conveying understanding. In addition, patients often appreciate hearing some details about staff members' lives outside of the hospital [28].

Because staff ID badges are not worn or covered by gowns pursuant to infection control procedures, biocontainment unit teams should consider alternative means by which patients can identify caregivers. At both Nebraska Medicine and Emory, for example, staff members write their names across their gowns. Chronicling his experience in isolation for multidrug-resistant tuberculosis, Mayho [20] suggests that patients receive photographs of team members since caregiver faces are obscured by masks. Including a brief biographical sketch along with staff pictures might increase patients' level of comfort with their healthcare providers. For some members of the team, such information may be available via the hospital's web-based provider profiles. Patients in the NBU expressed appreciation and a sense of

relief on seeing provider faces unobstructed by PPE when directed to online profiles.

More generally, unit administrators should ensure that all staff members receive education on the potentially harmful psychological effects of isolation and ways to minimize them [7, 24, 31]. Such in-service training should include discussion of possible regressive and disruptive patient conduct in order to inoculate team members against the natural tendency to take such behavior personally and help them develop constructive responses.

Family Contact

Contact with family members is for many isolated patients a crucial source of social and emotional support, as well as an invaluable connection to the outside world [14, 28]. Family contact may also play an important role in alleviating the feelings of boredom, loneliness, and neglect often described by patients in isolation [18, 30, 31, 35]. Such contact may be arranged through a secure audiovisual connection. At both Nebraska Medicine and Emory University, a separate room for family members provides a private and comfortable space for family to gather and to communicate via video with their loved one.

Children in Isolation

Psychological Consequences for Children

Although a detailed discussion of the psychological impact of isolation precautions on children is beyond the scope of this chapter, it should be noted that the potentially harmful effects on adults described above may also apply to children. In their qualitative study of children hospitalized with suspected or probable severe acute respiratory syndrome (SARS), Koller et al. [40] found that isolation precautions significantly disrupted family-centered care, leading to distress among children, their parents, and the healthcare workers who attended to them. The young patients in this sample experienced sadness, loneliness, and worry. More generally, hospitalized children may show anxiety, depression, homesickness, fear, withdrawal, and sleep disruption [41–44], depending in part on their age and personality characteristics. Hospitalized children have also been reported to display regression, anger, aggression, and demanding behavior [41, 43].

Interventions for Children

The strategies described above for mitigating the potentially harmful effects on adults also apply to children, though they must be tailored to the child's development level (see Table 16.1). For example, while frequent information sharing by the care team is important for pediatric patients [40–43], healthcare workers and parents should present information at a level consistent with the patient's intellect and maturity so as not to overwhelm the child [41]. In this regard, asking children what they "know" about their hospitalization and isolation is an effective strategy to uncover misapprehensions, such as a belief that they did something wrong or that

they are being punished. Likewise, children's exposure to media coverage of the infection should be limited and discussed to process what the child heard and to clarify misconceptions [40]. Finally, coaching parents to model confidence in the care team and optimism about the outcome of treatment is particularly important for children, who may look to their parents for cues regarding the competence of their providers and the seriousness of their conditions [42].

As with adults, active listening to encourage expression of feelings is essential. However, some children may be more apt to express themselves through writing, playing, or drawing. For such children, hands-on activities, such as making a book about their experiences, might prove helpful. More generally, hospitalized children need opportunities to play, whether formal sessions with designated "child life" staff, informal play with care providers or family members, or by themselves. Beyond providing a distraction, play can help children communicate, process, and master distressing emotions and experiences related to their isolation [41]. Thus, access to a range of age-appropriate toys and crafts, along with television, video, and other media, is essential. Similarly, room décor should be child-oriented [41].

As discussed with regard to adults, establishing structured routines, including time for schoolwork if the child is healthy enough [45], may be especially important for children's emotional well-being. When feasible, an initial orientation to the unit, including an introduction to daily routines along with viewing staff photographs, can increase children's sense of predictability and control. Furthermore, consistency and honesty regarding possible discharge dates are important in order to maintain trust [42]. In addition, pediatric patients' participation in their own care and decision-making, even concerning seemingly trivial matters, can help with adjustment to hospitalization [43].

Maximizing contact with family members is perhaps the most critical factor in reducing the potentially harmful effects of isolation on pediatric patients, particularly younger children [40–43]. Contact with family members should be predictable and any changes to the visit schedule communicated in advance [42]. The decision whether or not to allow parents at the bedside must be made on a case-by-case basis with careful consideration of the risks and benefits [46]. When parents cannot physically be in the room, regular and predictable contact using technology, such as a cell phone or web-based media, is essential [40, 42, 47, 48]. In addition, pictures of family, comfort toys from home, and activities that foster connection with family, such as writing letters, can help [42, 43]. Healthcare workers may also become temporary "substitute family" for children in isolation [40, p. 55].

Family Members

Family members of critically ill patients may experience a range of stressors related to uncertainty about the outcome of the illness, economic hardship, and role disruption (e.g., as a parent, employee, or spouse) [47, 49]. Also common are feelings of helplessness, loneliness, anxiety, and sadness, as well as anger at or resentment toward the care team or even the patient [40, 48]. Furthermore, family members

might experience guilt about feeling angry. They may also feel guilty about their inability to help and being healthy while their loved one is ill [48]. Family members of patients with infectious diseases may face additional hardships, including worry about other relatives' contracting the virus, feeling deprived of contact with their loved ones due to the isolation precautions, and stigma and social isolation within their communities [40, 47, 50]. Additionally, when a child is the patient, parents may experience "overwhelming fear" regarding their child's isolation and separation [47, p. 402].

The family's ability to cope with the above stressors can impact the patient's well-being and recovery. Consequently, hospitals should consider strategies to minimize the stress experienced by family members and to maintain their emotional, physical, and spiritual health. Bulling et al. [36] cogently summarize approaches that care teams can adopt to support families of patients in isolation. Perhaps the most important is regularly providing information, including specifics regarding the patient's condition, the treatment, and any risks to the family [18, 36, 40, 48–51]. Furthermore, making arrangements to keep family members informed when they are away from the hospital can help reduce anxiety and encourage needed breaks [36, 40, 47]. Additionally, providing information about normal family reactions, including fear of contracting the illness themselves, might help allay concerns among loved ones that their feelings are abnormal and can assuage any guilt about such reactions. When concerned family members include young children, suggesting concrete activities that promote children's connections to their loved ones in isolation can help. For example, children can draw pictures to decorate the hospital room or help prepare care packages.

Care team members can also encourage families to use existing support networks. At the same time, staff can empower family members to limit interaction with others when necessary, including turning off cell phones and disconnecting from social media, particularly in cases garnering media attention [36, 49]. In this regard, hospital staff can encourage family members to remain vigilant regarding how they share information within their support network, as personal social media posts can quickly become news when unit activations are covered by the press.

When treating patients with Ebola, Nebraska Medicine's NBU provided families with a concierge nurse who arranged for transportation, lodging, meals, regular meetings with the medical team, and video conferencing with patients. This proved to be an essential resource for decreasing the stress experienced by family members, all of whom were from out of town. Along with their physical and psychological needs, evaluating families' religious and spiritual needs, and facilitating access to clergy or hospital chaplains when indicated, may be critical for some families [36, 49]. Finally, when family members display significant emotional distress or difficulty coping that interferes with their ability to care for themselves or their loved ones, referral to a behavioral health provider should be considered [36].

Role of the Behavioral Health Specialist

In her review of strategies for minimizing the negative effects of isolation on patients with MRSA, Jones [31] recommended psychological screening of all patients. This approach may prove useful for biocontainment units as well. Behavioral health providers can introduce themselves as members of the biocontainment unit team, assess for mental health problems, and offer information on common psychological reactions. Additionally, behavioral health specialists can use psychological first aid principles and techniques to help patients connect with social supports, reinforce use of existing coping resources, and assist with problem-solving [52]. If necessary, behavioral health providers can suggest ways for patients to structure their time as well as teach specific coping skills, such as deep breathing, progressive muscle relaxation, mindfulness, and healthy thinking.

For some patients, ongoing supportive therapy may be indicated. Behavioral health providers should also be prepared to treat patients with adjustment disorders or acute stress disorder, particularly those with potentially fatal infections such as Ebola. Such patients may be severely stressed or traumatized by the symptoms of the illness itself as well as having witnessed or cared for others who were critically ill and who may have died [11, 53]. Providers can also make referrals for psychopharmacological intervention when necessary. In addition, some hospital facilities may consider the use of a palliative care team to address behavioral health concerns depending, in part, on the patient's health status.

Behavioral health providers may meet with patients via an audiovisual connection to minimize the risk of exposure to infectious diseases. Video consultation has the additional benefit of allowing patients to see the provider's face, which would otherwise be obscured by PPE. Another important role for the behavioral health specialist is providing support to the biocontainment unit team, which is the focus of the following section.

Behavioral Health Considerations for Healthcare Workers

In recent years, global and local health systems mobilized to develop comprehensive response protocols for patients with emerging infectious diseases, including severe acute respiratory syndrome (SARS), Middle East respiratory syndrome coronavirus (MERS-CoV), Ebola virus, and Lassa fever. To meet the growing demand for skilled healthcare workers required by these outbreaks, healthcare systems developed multifaceted responses including specialized assignments within hospitals, military and humanitarian deployments, and volunteer efforts (locally and globally). In response, healthcare workers (HCWs) answered the call to service.

Many studies have examined the effects of responding to these infectious disease crises on HCWs assigned to specialized hospital units or deployed internationally. In this regard, investigators have stressed the importance of active planning to promote and support the well-being of HCWs as systems prepare organizationally to manage and contain emerging infectious diseases. This section outlines the

Table 16.2 Challenges faced by HCWs in biocontainment units [55–58]

Personal challenges	Work-related challenges
Fear of contracting illness	Difficulties with proper use of personal protective equipment (PPE) and infection control protocols
Concerns for safety of family and friends	Lack of organization and role clarity
Isolation from family	Lack of resources
Communication and pressure from family members, lack of support	Altered standards of care and ethical conflicts
Continued pressure to justify work commitment	Safety and security
Sense of loss of control	Community response
Stigmatization, lack of appreciation	Isolation from regular unit colleagues
Directed negative community response toward individual and family members	Sense of being underappreciated
Fatigue and limited rest time	Team pressure to save patients
Feeling misunderstood	Witnessing the death of patients
Personal pressure to succeed in care of patients	Challenging team dynamics; managing stress and emotions effectively
Self-doubt, PTSS	Lack of sustained organizational support
Reentry stress at home	Loss of executive sponsorship
	Stress with reentry to regular unit
	Team engagement from frontline to ancillary staff

^aAt the Emory SCU and Nebraska Medicine NBU, HCWs experienced some of these challenges while caring for Ebola and Lassa fever patients

psychological impact of treating infectious diseases on HCWs, risk factors for emotional distress, and organizational strategies to promote psychological well-being and resilience.

Challenges and Psychological Consequences for HCWs

There is notable consistency in the literature on the challenges faced by HCWs in voluntary, assigned, and deployed positions on biocontainment units [54–56]. Table 16.2 presents the most frequent personal (self, family, community) and work-related (job tasks, team, work location) challenges reported by HCWs treating a mixture of infectious diseases [55–57]. For some HCWs in hospital settings facing the epidemics of SARS and MERS-CoV, there were additional challenges due to caring for colleagues as patients within their facilities and being forcibly quarantined when workers developed symptoms [57, 59, 60].

Healthcare workers practicing in highly stressful, life-threatening environments are likely to experience psychological distress and are at risk of developing post-traumatic stress symptomatology (PTSS) and a variety of psychiatric morbidities [54, 55, 57, 61–66]. These outcomes, along with staff absenteeism while working in such settings [64, 66, 67], are more likely to occur in connection with the challenges outlined in Table 16.2 [54–56, 64, 65]. Symptoms may appear shortly after the

outbreak is under control rather than during its height [54]. Emotional distress and psychiatric morbidity generally decrease over time, though relapse may occur, especially for those with preexisting mental health conditions and re-exposure to additional infectious disease outbreaks. For some HCWs, chronic posttraumatic stress disorder, depression, and anxiety were clinically diagnosed 2 years after exposure [54].

Risk Factors for Psychological Distress

As indicated above, it is evident that HCWs experience some level of emotional distress, ranging from moderate levels of worry [67] to posttraumatic stress symptoms and mental illness [54, 60, 65, 67–69]. A recent comprehensive review and meta-analysis of peer-reviewed articles published between January 2000 and December 2014 reveals that HCWs who are deployed and/or perceive themselves at a heightened risk of infection are more likely to experience psychological distress, insomnia, alcohol/drug misuse, PTSS, depression, and anxiety [54]. Additional risk factors for psychological distress and mental illness include longer duration of high-risk exposure, younger age, being single, not living with family, fewer years of work experience, lower education, and lower household income [54]. Other important factors to consider are previous history of psychiatric illness, availability of emotional support, and employer-sponsored resilience training [68, 70–73]. These findings underscore the importance of prevention and intervention strategies to promote self and team care among HCWs.

Strategies for Individual and Family Resilience

Given the significant psychological risks of biocontainment work environments, it is imperative that healthcare systems integrate behavioral health support, resilience training, and continuing education into the development plan for biocontainment teams. Engaging in comprehensive preparedness that addresses psychosocial challenges, as well as technical biocontainment training, can increase the skills and confidence of HCWs, reduce the negative psychological impact, enhance communication and collaboration, and reinforce the organization's commitment to supporting staff [54, 63, 66]. In particular, the evidence supports the design of an intervention model that targets individual and family resilience, in addition to organizational leadership, to reduce the risk of psychological distress for HCWs caring for patients with infectious diseases [54, 57, 59, 63, 70, 74, 75].

Individual Resilience

Individual resilience is the ability to reduce the effect of a stressful life event, cope with adversity, or bounce back [74]. Below are strategies that care teams can adopt to promote resilience in HCWs who volunteer or are assigned to work on biocontainment unit teams:

- Schedule individual information sessions with prospective staff members to review the roles, expectations, responsibilities, challenges, and rewards prior to the formal interview process. In addition to providing an opportunity to address any required occupational health clearance considerations, the session should prompt individuals to think about past experiences working in challenging roles as well as any history of PTSS or PTSD [66].
- Discuss with prospective staff members the motivating factors that contribute to their pursuit of these high-risk assignments. Frequently cited motivations include the uniqueness of the opportunity, professional interest, excitement about contributing to the field, desire to do something different, recognition, enhancing the reputation of the facility, improving one's CV, and helping others [55, 56]. HCWs from Emory University and Nebraska Medicine shared similar motivations for work with their biocontainment units.
- During the initial exploration phase of working in a high-risk environment, discuss with HCWs their suitability and preparation for the work. Verify that staff members have a full understanding of what will be involved from clinical, technical, psychosocial, and community perspectives.
- Recruit a behavioral health consultant to assist unit leadership in addressing concerns and questions that may emerge during recruitment of prospective staff.
- Include a resilience measure in preassignment health assessments to identify those at risk for developing a mental health disorder during or after the assignment [54].
- During the initial orientation and training, incorporate a module on behavioral health considerations, including strategies for strengthening resilience. This is currently part of the training sponsored by the National Ebola Training and Education Center (NETEC). Educating teams about behavioral health risks related to working in biocontainment units reinforces the importance of self and team care while reducing the stigma associated with psychological distress.
- Consider peer support training, which is a frequently cited approach to enable active monitoring for PTSS [66]. The trauma risk management (TRiM) program, for example, is used by military forces, media companies, and diplomatic organizations. Another model is psychological first aid, which can be implemented to support staff with early signs of distress [66, 74].
- Provide ongoing education sessions related to symptom recognition, effective coping strategies, and stigma reduction.
- Integrate a behavioral health specialist (BHS) into the biocontainment team. The BHS can provide on-site support (individual and group) utilizing a psychological first aid approach. This strategy serves as a bridge for HCWs to access a mental health clinician, who can connect staff to other providers as needed. Both the Emory Special Communicable Diseases Unit (SCDU) and Nebraska Medicine NBU have incorporated psychological support services through the Faculty Staff Assistance Program (FSAP) and the Behavioral Health division, respectively. Ideally, the BHS should attend regular team training sessions so that staff is familiar and comfortable with the provider. When the unit is activated, the BHS should spend time in the staff break room to maintain visibility and access.

- Establish a mentorship or “buddy” system that pairs new staff with more experienced colleagues [59].
- Provide access to individual counseling and support groups to manage psychological distress, including secondary traumatization [58, 62, 69]. These services can be provided by internal resources such as occupational health, employee assistance programs (EAP), or hospital behavioral health departments.
- Arrange debriefing sessions when critical incidents occur. These services can be offered by the BHS or spiritual health providers to support HCWs with processing complex feelings about the biocontainment work, especially once patients are discharged or pass away.

Family Resilience

Family resilience involves the potential for recovery, repair, and growth in families facing serious life challenges [76]. For HCWs treating infectious diseases, family resilience is essential, as family members are often affected by the work choices and experiences of their loved ones. Moreover, HCWs need to feel confident that their families are coping effectively while they are engaged in special assignments. Accordingly, health systems should develop strategies to foster resilience in family members before, during, and after special assignments [57, 76]. A variety of approaches are summarized below.

- Schedule a pre-deployment general information session about unit activation procedures, staff member roles, equipment, responsibilities, and stressors. Address fears, risks, and coping strategies as part of the session [55, 64]. One study found that this approach assisted HCWs with the transition back to their usual jobs after completion of their assignments [70].
- Encourage families to develop a “family plan” to address how roles and responsibilities, such as carpooling, grocery shopping, and meal preparation, might be altered should the HCW face quarantine or increased work hours.
- Provide additional sessions to update families on the unique aspects of particular unit activations. This may be offered online, in person, or via conference call.
- Arrange periodic group support sessions for HCWs’ families. In addition, an annual family outing or picnic provides family members an opportunity to develop relationships that can reduce the isolation they may feel during an activation.
- Alert family members to the possibility of media interest in unit activations, and discuss potential consequences of sharing information with friends, employers, colleagues, and community contacts.
- Upon unit deactivation, schedule family debriefing sessions to enhance knowledge, respond to inquiries, and promote family resilience.

Organizational Leadership

Organizational leaders have a significant impact on the psychological well-being of HCWs navigating high-risk, trauma-exposed work environments. In particular, leaders who provide supportive engagement, a clear vision, and feedback and

recognition to HCWs increase the probability of a successful biocontainment unit activation [70]. Lack of leadership support and effective communication, on the other hand, can leave workers feeling unappreciated, isolated, and devalued [70].

- Develop a strategy team including representatives from key functional areas to oversee resilience and well-being initiatives for staff working with emerging infectious diseases [63].
- Recruit senior leaders to meet with HCWs to communicate the organizational commitment to the biocontainment unit team. These sessions can reinforce to staff that hospital leaders appreciate and value the specialized work in which they are engaged.
- Offer leadership training to supervisors to ensure that they have the skills needed to build and maintain a healthy work culture. Key topics include effective communication, conflict management, team building, and stress management.

Future Directions

Research Needs

Although dozens of investigators have studied the psychological effects of source isolation as a component of contact precautions for infectious diseases, significant gaps in our understanding remain. Future research should examine the individual, family, illness, treatment, and environmental factors that predict who will be most impacted by source isolation. In addition, prospective research with baseline and multiple follow-up periods could help clarify the relationship between duration of isolation and patient distress. Such research should also evaluate patients after discharge to explore possible long-term psychological sequelae of various infectious diseases and their treatment. Preliminary evidence shows that, for example, 4–7 months after discharge, patients treated for Ebola continue to have psychological or cognitive symptoms, including sleep disturbance, short-term memory loss, and depression or anxiety [54]. Furthermore, randomized trials of interventions proposed to mitigate the impact of isolation are necessary, along with efforts to determine which interventions are best suited for which patients. Moreover, as most of the studies on source isolation involve patients with MDROs, more work is needed to examine the psychological impact of isolation in the context of treatment for potentially deadly infections, such as Ebola.

Research aimed at identifying the individual characteristics and skills that predict effective stress management and resilience during and after deployment is needed to help institutions identify and recruit prospective staff members for specialized infection control assignments. Furthermore, additional research on interventions designed to promote resilience before, during, and after deployment is necessary. Such studies can guide healthcare systems in providing the most effective support possible to protect the workforce from psychological distress and mental illness. While there is a tendency for investigators to focus primarily on nurses

and physicians because of their frontline patient care responsibilities, ancillary team members are also vulnerable to the psychological distress inherent in the work with emerging infectious diseases. These positions may include patient transport staff, lab workers, pharmacists, facility management professionals (especially those handling biohazardous waste), and administrative assistants. From recruitment and training to activation and debriefing, it is essential to provide our workforce evidence-based, comprehensive behavioral health services to prevent, treat, and manage the negative psychological effects of high-stress and high-risk biocontainment unit activations.

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