Section 1 Getting Started

Chapter 1

Ethical Aspects of Infection Prevention

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Hospital epidemiologists and infection preventionists make countless decisions every day. In general, we do not make life-or-death decisions, such as whether to withdraw life support or whether to withhold possibly life-sustaining therapies. Few of our decisions require court injunctions or provide the fodder for eager journalists. We simply decide whether to isolate patients, whether to let healthcare workers continue to work, or whether to investigate clusters of infections – all very routine decisions in the life of anyone who practices infection control. These decisions are so ordinary that they could not possibly have any ethical implications. Or could they?

In fact, many of the decisions we make every day, even those we consider quite straightforward, are also ethical decisions – which is to say, they compel us to choose between competing moral values. Such choices are rarely easy, and their intrinsic difficulty is not eased by the fact that few of us have received more than cursory training in ethics. Moreover, if we attempt to train ourselves, we find that very little has been written about the ethics of our specialty, infection prevention and control.

Common Infection Prevention Decisions with Ethical Implications

We may easily overlook the ethical component of our everyday decisions; thus, we may misconstrue the decision confronting us, thinking that it is without ethical consequences when, in fact, ethical principles are at stake. Take, for example, the practice of isolating a patient colonized with a drug-resistant organism. Isolating a patient constrains the patient's freedom of movement but protects the rights of other patients to be treated in an environment without unnecessary risk. Similarly the practice of removing healthcare workers with contagious diseases from patient care follows from epidemiologic data but also from the ethical concepts of beneficence, nonmaleficence, and utility – with an overall goal of maximizing good outcomes and minimizing harm. In such cases, we restrict the freedom of healthcare workers to obtain the greater benefit of protecting patients and fellow workers. Or, when stocking the hospital formulary, we consider the efficacy and cost of drugs, but we also balance the benefit of lower cost (to the patient and the hospital) and the risk of selecting resistant microorganisms against physicians' freedom to prescribe any available drug.

Infection prevention personnel confront additional ethical dilemmas in many of their daily activities. For example, when managing an outbreak, infection prevention personnel must identify the offending pathogen's source and mode of transmission, and then intervene appropriately. This is simple enough if the reservoir is a contaminated drain that is easy to replace or a nursing assistant with no political clout in the hospital. But what if the reservoir is a powerful physician with a large practice and tremendous influence with the administration? Or what if the administration thinks your recommendations are too expensive and excessive? Would you bow to the pressures and recommend interventions that you think are less than optimal, or would you risk the wrath of the physician or the administration and state your best advice regardless of the consequences?

Infection prevention personnel frequently inform patients or healthcare workers that they have been exposed to an infectious disease. When the pathogen is varicella zoster virus, the problem is relatively simple. Yet infection prevention personnel must still consider ethical issues. Do you permit some susceptible employees to continue working, if they wear masks, but restrict others? Or do you restrict all susceptible healthcare workers regardless of their position or their economic status? If you are very busy at work or have plans for the evening, do you delay your response or ignore the exposure altogether? Other exposures, such as those to the hepatitis B virus, the human immunodeficiency virus (HIV), or the prion agent that causes Creutzfeldt-Jakob disease, provoke emotional responses and raise challenging ethical questions. For example, what do you tell employees in the pathology laboratory who were not informed that the patient might have Creutzfeldt-Jakob disease and, therefore, did not use the recommended precautions when they processed the brain tissue? Do you recall and resterilize instruments used for the implicated brain biopsy? Do you notify patients who subsequently had surgical procedures and might have been exposed to instruments that were not sterilized in the manner recommended to kill the infectious agent?

We hope these examples enable you to see that ethical considerations abound within the practice of infection prevention. Clearly, ethics is not the esoteric discipline some misunderstand it to be. Ethics is part of our daily practice. We should not delegate ethical deliberations to others, though we will need to include professional ethicists, hospital managers, accountants, and lawyers in our discussions. We all must recognize that maintaining our ethical integrity is an essential professional responsibility. This chapter is a brief introduction to the intricate intersection of ethics and infection prevention.

Taxonomy

In the introductory paragraphs, we described some routine infection prevention activities that have ethical implications. These descriptions are, in essence, a "narrative taxonomy" of

Table 1.1 A taxonomy of ethical problems in infection prevention

Control of the patient to limit spread of pathogenic organisms
Isolate patients who are colonized or infected with drug-resistant organisms
Isolate patients who are infected with highly infectious and/or dangerous organisms
Control of healthcare workers to limit spread of pathogenic organisms
Restrict the activities of healthcare workers who have been exposed to infectious diseases
Restrict the activities of healthcare workers who have infectious diseases
Restrict the activities of healthcare workers who refuse vaccinations (e.g., influenza vaccine)
Control of medications to limit selection and spread of antimicrobial resistance
Limit the antimicrobial agents included on the hospital formulary
Develop guidelines regarding the use of antimicrobial agents
Provide computer decision support for clinicians' antimicrobial choices
Mandating or recommending best practice and interventions to reduce the risk of infection
Mandate or recommend treatment to eradicate carriage of resistant pathogens
Mandate implementation of isolation precautions
Mandate pre-employment vaccination and/or immunity to certain pathogens
Organize and promote yearly influenza vaccination campaigns
Develop policies and procedures
Mandate postexposure testing of patients and healthcare workers
Recommend postexposure prophylactic treatment of patients and healthcare workers
Resource allocation
Establish a threshold for investigating clusters of infections
Evaluate products to assess their cost relative to their safety and efficacy
Determine whether single-use items may be reused
Guide choices regarding materials, design, number of sinks, etc., for construction projects (cost vs. safety)
Limit hospital formularies to reduce costs and control antimicrobial resistance
Information disclosure
Report exposures to staff and patients
Report outbreaks and cases of reportable diseases to the public health department
Report data on healthcare-associated infections to the Centers for Disease Control and Prevention's National Health Safety Network
Identify patients colonized with resistant organisms before intra- or inter-institutional transfers
Protect the confidentiality of patients' medical records and laboratory results
Protect the identity of index patients in outbreaks
Protect confidentiality of patients who test positive for human immunodeficiency virus
Conflicting and competing interests
Managing outbreaks
Staff, especially institutional leaders, may refuse to comply
Administrators may balk at the cost of investigating outbreaks
Hospital epidemiologists who chose unpopular interventions may lose referrals or their jobs
Managing exposures
Staff, especially institutional leaders, may refuse to comply
Selecting the hospital formulary
Relationships between the staff on the formulary committee and the pharmaceutical industry may compromise decisions
Staff physicians may prefer specific antimicrobial agents not on the formulary
Individual professionalism
Act altruistically (prompt intervention vs. personal convenience)
Mediate in-house disputes between administrators, clinicians, unions, and the hospital
Act courageously when necessary, despite inadequate or conflicting data
Keep up with new developments in the field
Personal
Protect yourself from acquiring infectious diseases
Protect your family from acquiring secondary infections

ethical problems in infection prevention and hospital epidemiology. A taxonomy is an orderly listing or categorization of things. Infection prevention personnel are probably familiar with taxonomy as it refers to microorganisms, but not with respect to our profession. On the basis of our experience in infection prevention (LAH) and ethics (LCK), we developed a taxonomy that we think will be helpful to infection prevention personnel as they think about their own work (Table 1.1).

Table 1.2 Differences in emphasis between epidemiologic ethics and medical ethics

Variable	Epidemiologic ethics	Medical ethics
Scope of concern	Populations	Individuals
Goal	Prevent infection	Treat and prevent infection
Typical principles	Nonmaleficence	Beneficence and nonmaleficence
	Justice (fairness)	Respect for patient autonomy
	Utility	
Purpose of disclosure	Investigation	Diagnosis
Information handling	Confidential reporting	Confidential documentation

Table 1.3 Differences in approach between infection prevention and medical care in the care of a patient with a transmissible infection

Variable	Epidemiologic approach	Medical approach
Microbial colonization	Possible treatment	Observation
Confidentiality	Qualified (e.g., posting signs on patients' doors)	Maintained
Freedom of movement	May limit with isolation precautions	Maintained
Freedom of contact	May limit with isolation precautions	Maintained

The taxonomy not only describes the most important ethical problems in infection prevention but also helps us define the individuals, groups, and organizations to which infection prevention personnel have specific obligations. In particular, infection prevention personnel have obligations to inpatients and outpatients as groups, to individual patients, to visitors as a group, to individual visitors, to healthcare workers as a group, to individual healthcare workers, to the healthcare facility for which they work, to public health entities both local and federal, to facilities to which their facility refers or transfers patients, to referring or transferring facilities, and to the public in general. Different groups often have different interests that are in competition. We can use the taxonomy to help us identify the type of ethical problem we are facing and the competing obligations that may surround that problem.

An Approach to Ethical Problems in Infection Prevention

Most discussions of medical ethics ignore the epidemiologist-population relationship and concentrate instead on the clinician-patient relationship.[1,2] Infection prevention personnel are frequently clinicians; however, we must differentiate our clinical and epidemiologic roles because the fiduciary duties associated with these different roles do not always coincide. Medical ethics are "person-oriented," while epidemiologic ethics are "population-oriented" (Table 1.2).[3–5] Even so, the standard principles of medical ethics also apply to hospital epidemiology. These principles are as follows:[6,7]

- Autonomy (respecting the decisions of a competent patient)
- Beneficence (doing good)
- Nonmaleficence (doing no harm)
- Justice (being fair and allocating resources equitably)
- Utility (maximizing benefits and reducing harms to all concerned)

However, the principles are applied according to the public health model,[5,7] which requires commitment to improving the health of populations, not only individual patients.[8] Although both medical ethics and epidemiologic ethics stress nonmaleficence and confidentiality, medical ethics emphasizes privacy at times when epidemiologic ethics emphasizes investigation and reporting to protect the population. Furthermore, medical ethics stresses patient autonomy, whereas epidemiologic ethics places special priority on justice. Put more practically, medical ethics demands that the clinician treat an infected patient while maintaining the patient's confidentiality, privacy, dignity, freedom, and contact with other human beings (Table 1.3). In contrast, epidemiologic ethics might stress treating both infected and colonized patients to protect patients and healthcare workers. In particular cases, epidemiologic ethics might require healthcare workers to post isolation signs on the doors to patients' rooms; or insist that patients stay in their rooms except when going to essential tests, in which case they must wear surgical masks; or require healthcare workers to wear gowns, gloves, and masks to avoid direct contact with patients.

By now it should be clear that ethically challenging situations are common in the practice of infection prevention and hospital epidemiology. To respond effectively to these challenges, infection prevention staff must address each problem systematically. Kaldjian et al.[9] developed an approach to ethics that is clinically oriented and helps the user state the problem clearly, collect data comprehensively, formulate an impression, and, finally, articulate a justified plan. In outline form, we present a modified version of this approach tailored to the particular demands of infection prevention (Table 1.4), and we employ this approach (in abbreviated form) as we discuss three core topics.

Core Ethical Topics in Infection Prevention

Staff Vaccination Programs

Vaccines were one of the public health movement's major triumphs during the twentieth century, and in that very

Table 1.4 An approach to ethical problems in infection prevention

1.	State the problem plainly
2.	Gather and organize data a. Medical facts b. Goals and procedures of infection prevention and control c. Interests of patients, healthcare workers, hospital, community, and public health agencies d. Context
3.	Ask: Is the problem ethical?
4.	Ask: Is more information or discussion needed?
5.	Determine the best course of action and support it with reference to one or more sources of ethical value a. Ethical principles: beneficence, nonmaleficence, respect for autonomy, justice, utility b. Rights: protections that are independent of professional obligations c. Consequences: estimating the goodness or desirability of likely outcomes d. Comparable cases: reasoning by analogy from prior "clear" cases e. Professional guidelines: for example, APIC/CHICA-Canada professional practice standards[48] f. Conscientious practice: preserving epidemiologists' moral integrity
6.	Confirm the adequacy and coherence of the conclusion

NOTE: APIC, Association for Professionals in Infection Control and Epidemiology; CHICA-Canada, Community and Hospital Infection Control Association–Canada.

triumph are the seeds of a substantial controversy and an ethical problem. Because use of vaccines effectively decreased the incidence of many infectious diseases, the public no longer knows how dreadful these infections can be and how many complications and deaths they have caused. The public is now more aware of vaccine complications than they are of the infections the vaccines were developed to prevent. In addition, parents of "vaccine-damaged children," the natural health movement, television, radio talk shows, and the Internet have all become important participants in this "debate."[10,11]

The controversy about the pertussis vaccine is illustrative. In the 1940s, pertussis was the leading cause of death among children under 14 years of age. Pertussis, in fact, killed more children than measles, scarlet fever, diphtheria, polio, and meningitis combined.[12] The incidence of pertussis was already decreasing before the killed whole-cell vaccine was introduced, which was probably related to changes in social conditions, hygiene, and nutrition. However, the incidence declined significantly after the vaccine was introduced.[13]

Because the whole cell pertussis vaccine is composed of dead Gram-negative bacteria, it includes many toxic components and is, thus, quite reactogenic. Recipients often have significant pain, swelling, and erythema at the vaccination site, and they may develop fever, anorexia, irritability, and vomiting.[14] In addition, some children may develop inconsolable crying, excessive somnolence, seizures, or hypotonic-hyporesponsive episodes.[14] Encephalopathy, which is very rare, is the most severe complication of pertussis vaccination.[14] Opponents of the vaccine allege that the vaccine not infrequently causes serious permanent neurological damage. In some countries, such as Sweden, Japan, and the United Kingdom, the antivaccine movements gained such prominence that the countries either stopped vaccinating children or the rate of vaccination decreased significantly. All three of these countries had outbreaks of pertussis that affected thousands of children and caused numerous deaths.[14]

The controversy over the pertussis vaccine suggests that the ethical debate over vaccines in both the public health arena and in the hospital revolves around providing the greatest good for the greatest number of people (i.e., protecting them against harmful infections) and protecting the individual from harm that could be caused by a vaccination. The ethical dilemma occurs because, in general, the population benefits (i.e., an immunized population that is less susceptible to infection), but individual persons bear the risk of vaccine complications.[15–19] In highly vaccinated populations, a single person can refuse a vaccine and may avoid both the potential complications of the vaccination and the infection itself because he or she is protected by the vaccinated population. However, one may ask whether this is fair to persons who are willing to bear the burdens of being vaccinated (potential complications).[15] Furthermore, if this scenario is repeated often enough, the vaccination rate in the population will drop, and nonimmune people will be at risk.

The ethical dilemma just described also occurs in healthcare facilities that require healthcare workers to be immune to certain infections. For example, most healthcare facilities require that healthcare workers be immune to rubella, which means that employees must present proof that they have had the infection or that they have had at least two rubella vaccinations. The reasons healthcare facilities have this requirement are that rubella is easily transmitted within healthcare facilities and that this virus can cause severe congenital defects if a pregnant woman becomes infected.[20,21] Thus, healthcare facilities caring for pregnant women seek to protect these patients by requiring staff to be immune to this infection. Pregnant employees also benefit from this requirement. However, the individual healthcare provider may not benefit from receiving this vaccine, because rubella causes very mild disease in adults, and an adult vaccine recipient might develop complications. Thus, the hospital puts limits on the autonomy of its staff members to avoid harming pregnant patients and employees.

The approach many facilities take to influenza vaccine illustrates another extreme. The influenza virus is quite contagious and can cause serious complications, hospitalization, and death, particularly among elderly people and people with significant underlying diseases. Healthcare facilities, particularly hospitals, care for many people who are at risk for complications of influenza. Moreover, outbreaks of influenza have occurred in healthcare facilities. These outbreaks are difficult to recognize and, therefore, are underreported.[22] Thus, many hospitals offer the vaccine free of charge to employees each fall. But employees, even those who work with high-risk patients, usually are not required to be vaccinated.[23] In this case, hospitals have elected not to mandate vaccination with a safe and effective vaccine that could prevent at least as many severe complications as does the rubella vaccine. Instead, they have elected to preserve their healthcare workers' autonomy rather than allowing the interests of vulnerable patients to take precedence over that autonomy.[23]

Why do hospitals manage rubella one way and influenza another? To our knowledge, no one has studied this issue. However, we might speculate that society considers the birth of even one child with congenital rubella to be a tragedy. By contrast, we might speculate that society is not as alarmed by the fact that thousands of elderly people die each year from complications of influenza. Moreover, a damaged child represents many impaired life-years, whereas a frail elderly person who dies represents very few life-years lost. Furthermore, because influenza outbreaks in healthcare facilities are rarely recognized, most hospital administrators probably feel that the risk to the patients is very low and, thus, do not require all staff to be vaccinated. In contrast, the hospital would face a huge lawsuit if a woman could document that she acquired rubella while receiving prenatal care in that facility. Though these different approaches to rubella vaccine and influenza vaccine present major ethical issues, healthcare providers seem relatively unaware of these issues even though they often discuss their right to autonomy regarding vaccinations.

We believe that healthcare workers have a moral obligation to restrict their own freedom when it comes to complying with interventions such as influenza vaccine if in so doing they might help preserve their patients' health. Rea and Upshur[23] take this position in their commentary on the issue:

As Harris and Holm wrote of society in general: "There seems to be a strong prima facie obligation not to harm others by making them ill where this is avoidable." But there is a special duty of care for us as physicians not simply to avoid transmission once infected, but to avoid infection in the first place whenever reasonable. Our patients come to us specifically for help in staying or getting well. We have not just the general obligation of any member of our community, but a particular trust: *first* do no harm.[23]

The hepatitis B vaccine illustrates another approach to vaccines within the healthcare setting. The US Occupational Safety and Health Administration requires healthcare facilities to offer hepatitis B vaccine to all employees who will have contact with blood and body fluids to protect them from acquiring this virus through an occupational exposure.[24] In this case, the individual vaccinated gets the benefit and bears the risk associated with the vaccine. In addition, employees are not required to take the vaccine. If they do not want it, they simply sign a waiver stating that they decline the vaccine, in which case they bear the risk if they are exposed to hepatitis B. The institution, thereby, fulfills its ethical and legal obligation to the employee, and the employee maintains his or her freedom to choose whether to be vaccinated.

But a question remains regarding hepatitis B vaccine, and that is whether all healthcare workers should be required to be immune to this virus to protect patients from becoming infected. Given that the risk of transmitting hepatitis B virus is very low with most healthcare-associated activities, there does not seem to be a strong ethical argument for requiring vaccination. However, more than 400 patients have acquired hepatitis B from infected healthcare workers who performed invasive procedures.[25] It is, therefore, appropriate to ask whether all healthcare workers who perform invasive procedures that could expose the patient to the healthcare workers' blood should be vaccinated against hepatitis B. Though some healthcare workers might argue that mandatory hepatitis B vaccination infringes on their right to choose, we think that mandatory vaccination for this group of healthcare workers is ethically justifiable, given the known benefits of vaccinating healthcare workers, the minimal risks associated with the vaccine, and the possible benefits to patients. Because many medical schools now require medical students to be vaccinated and the Centers for Disease Control and Prevention recommend vaccinating all infants, in the near future this question may become moot.

Isolating Patients Who Carry or Are Infected with Resistant Organisms

The incidence of colonization or infection with drug-resistant microorganisms, particularly methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE), has increased substantially over time. One of the primary goals for infection prevention personnel is to protect patients from acquiring pathogenic organisms, including resistant organisms, from other patients, the environment, and healthcare workers. Infection prevention personnel have several means to accomplish this goal: educating staff; implementing isolation precautions, with or without active screening programs to identify carriers (see Chapter 7, on isolation precautions); implementing hand hygiene programs; controlling use of antimicrobial agents (see Chapter 19, on antimicrobial stewardship); and developing cleaning protocols for patients' rooms and equipment. Of these methods for controlling spread of resistant organisms, implementing isolation precautions, with or without active screening, and controlling use of antimicrobial agents have been quite controversial and are associated with significant ethical issues. We discuss the ethical implications of using contact precautions to control spread of MRSA and VRE.

There are numerous reasons to prevent spread of MRSA and VRE. Both organisms can cause serious infections.[26–29] Because MRSA and VRE are resistant to the first-line

antimicrobial agents used to treat serious infections caused by *S. aureus* and enterococci, these infections may be difficult and expensive to treat. Moreover, if MRSA becomes resistant to vancomycin (i.e., if the resistance gene is transferred from VRE to MRSA), infection with such strains might be virtually untreatable with currently available antimicrobial agents. Furthermore, MRSA infections do not replace infections caused by methicillin-susceptible *S. aureus*, rather they are added to them. Thus, in hospitals where the incidence of MRSA colonization and/or infection increases, the overall incidence of healthcare-acquired *S. aureus* infection often increases as well.[26] If MRSA and VRE are transmitted in a hospital, other organisms, such as *Clostridium difficile* and gram-negative organisms that are resistant to extended-spectrum β-lactam agents or to carbapenems may also be transmitted, indicating that the overall infection prevention practice in the hospital is lax.

Some infection prevention personnel argue that data from numerous institutions document the effectiveness of aggressive prevention and control measures.[27] Infection prevention personnel who take this position would also argue that, as healthcare professionals, we should first do no harm. Because MRSA and VRE harm many patients, we should do all we can to prevent both transmission of these organisms and infections caused by these organisms. Therefore, infection prevention programs are obliged to use reasonable means to prevent selection and spread of these organisms.[27]

Other infection prevention personnel argue, to the contrary, that there are numerous reasons not to invest substantial resources and time into MRSA and VRE control efforts.[29,30] They insist that the incidence of colonization or infection with these organisms is already so high that control measures are ineffective and waste precious resources. They would agree that aggressive measures have worked in some instances, primarily in outbreaks, but that the data on the overall incidence of MRSA and VRE colonization or infection indicate that infection control efforts have failed to stop transmission. They also argue that many colonized patients never become infected, colonization per se does not harm these patients, and MRSA and VRE are neither more virulent nor do they cause greater morbidity and mortality than methicillin-susceptible *S. aureus* and vancomycin-susceptible enterococci. Thus, these patients should not be subjected to decolonization or to isolation from which they will not benefit. These infection prevention personnel also state that efforts to control MRSA and VRE impair patient care and, therefore, may actually cause worse patient outcomes than would have occurred if the patients were not isolated.[31–33] Finally, they would argue that eradicating carriage with antimicrobial agents such as mupirocin may actually increase antimicrobial resistance.[34]

Infection prevention personnel who think contact precautions are an important component of a program to prevent spread of MRSA and VRE offer several arguments to support their position:[35] 1) contact precautions have been shown by numerous investigators to stop transmission of these organisms during outbreaks; 2) contact precautions have reduced transmission of MRSA and VRE in situations where they are endemic; 3) data from several studies suggest that proximity to a patient who carries MRSA or VRE is a risk factor for acquiring these organisms;[27] and (4) common sense suggests that housing infected or colonized patients in rooms separate from patients who do not carry these organisms should reduce spread of the resistant organisms.

Other infection prevention personnel present arguments against using isolation precautions to control the spread of MRSA and VRE:[29–33] 1) MRSA and VRE are spreading despite these precautions; 2) patients in contact precautions do not receive the same level of care as do patients with similar problems who are not in contact precautions; 3) contact precautions may actually prevent patients from getting appropriate treatments (e.g., aggressive physical rehabilitation) or from being transferred out of an acute-care facility to a facility better suited to the patients' needs; and 4) contact isolation creates social isolation that may impair patients' psychological well-being.

Other infection prevention experts would argue that the real question is not *whether* to invest resources in attempts to control MRSA and VRE, but *which means* should be used to control spread. The major issue in this discussion has been whether to use intensive active surveillance coupled with contact precautions to control the spread of these organisms [27,36] or to enhance compliance with standard precautions and hand hygiene.[30,32] The crux of this debate revolves around differing interpretations of the extant data. Those who support active surveillance and use of contact precautions believe that the data strongly support this approach,[27,36] while those who support enhancing general infection prevention precautions believe either that current data suggest these measures are not effective[30,32] or that more data are needed before hospitals spend large amounts of money and time performing active surveillance.[37]

As suggested in the preceding paragraphs, the major ethical dilemma with respect to using contact precautions to control the spread of resistant organisms is that the health interests of patients who are not colonized or infected with a resistant organism conflict with those of the patients who are colonized or infected with one or more of these organisms. That is, the patients who are not colonized or infected expect to be treated in the safest possible environment, one that is free of organisms that could complicate or prolong their hospitalizations or could add costs to their hospital bills. They desire to avoid untoward consequences or complications of hospitalization. On the other hand, patients who are colonized or infected with one of these organisms have the right to full treatment for their medical problems, which includes receiving adequate attention from staff and having access to all tests and therapies that are necessary for their care. These patients want to avoid complications of inadequate care, such as slower or impaired rehabilitation, and complications of social isolation, such as depression, anger, and nonadherence to recommendations. Each side in this debate refers to different ethical principles to support their case. Those in favor of contact precautions argue that this type of isolation protects unaffected patients from acquiring organisms that could eventually harm them

and thus supports the ethical principle of nonmaleficence. The opposition argues that use of contact precautions violates affected patients' autonomy and may violate the principles of beneficence and nonmaleficence, as well.

Some infection prevention leaders have begun to question whether contact precautions should be used as a primary component of a program to prevent spread of MRSA and VRE within healthcare facilities.[38–40] They argue that most studies addressing this issue are of low quality and were done before intensive efforts to improve hand hygiene were begun or before hospitals introduced bathing patients with antiseptics like chlorhexidine. Moreover, they argue that contact precautions do not prevent infections in colonized patients, that contact precautions may harm patients, that the incremental benefit of contact precautions is likely to be small, and that contact precautions increase costs and healthcare waste considerably.[38–40] Recent studies by Gandra et al.[41] and Edmond et al.[42] found that MRSA and VRE transmission rates and device-associated hospital-acquired infection rates, respectively, did not change significantly after they stopped using contact precautions for patients colonized or infected with these organisms. While the data are suggestive, neither study assessed whether the rate of MRSA and VRE transmission changed. Both studies had methodological weaknesses, and thus they do not provide a definitive answer to this question.

Those who still support using contact precautions cite the results of recent studies that did not find an increased risk of adverse events among patients treated with contact precautions compared with patients who were not.[43–47] In fact, the cluster randomized trial study conducted by Harris et al. found that universal gown and glove use by healthcare workers caring for patients in intensive care units significantly reduced the risk of MRSA acquisition as measured by routine surveillance cultures and did not increase the risk of adverse events.[45,47]

MRSA and VRE are the two most common resistant bacterial pathogens in most US hospitals. Nevertheless, as we have discussed in this section, experts in infection prevention still debate the merits and the ethics of placing patients in contact precautions simply because they are colonized or infected with one of these organisms. This discussion also illustrates that as medical information changes, one's ethical assessment of the merits of infection prevention interventions may change as well. Consequently, hospital epidemiologists and infection preventionists cannot take refuge in the old adage "we've always done it this way." Rather, we must constantly reassess the literature and then reassess our practices in light of new data and ethical principles.

Ethical Issues Associated with Caring for Patients Infected with Highly Transmissible and Virulent Organisms such as Ebola Virus

Highly transmissible and virulent organisms present special challenges for healthcare providers, including infection prevention staff. Outbreaks of Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and Ebola have demonstrated the ease with which such organisms can spread in healthcare facilities. In fact, spread of these organisms has been amplified in the healthcare setting; many patients and healthcare workers have acquired these infections in healthcare facilities, and many of these patients and healthcare workers have died. Thus, outbreaks of these infections have shown how important protecting patients, visitors, and staff – infection prevention programs' primary responsibility – truly is.

In this section, we will use the example of Ebola virus infection to illustrate how the ethical principles of autonomy, beneficence, nonmaleficence, justice, and utility apply when healthcare workers care for patients infected with a highly transmissible and virulent organism. We will also discuss the following additional ethical values that are relevant when addressing such challenging situations: altruism, solidarity, and conscientious practice.

Infection prevention personnel direct much of their work toward preventing harm to patients, visitors, and healthcare workers. Thus, many routine infection prevention practices are designed to maximize beneficence and nonmaleficence. In contrast, some routine practices, such as implementing isolation precautions or restricting ill healthcare workers, place explicit limits on autonomy for patients or for healthcare workers. In addition, infection prevention personnel generally focus most of their attention on providing benefit and preventing harm to patients while at the same time ensuring that visitors and healthcare workers are also safe. When healthcare workers care for patients with infections caused by highly transmissible and virulent organisms, infection prevention staff members must increase their efforts to ensure that other patients, visitors, and healthcare workers are safe (nonmaleficence) and must place more limits on patients' autonomy. During outbreaks of these infections or during other crises, infection prevention staff may also apply the principle of utility more frequently to ensure that benefits within a healthcare population are maximized, harms are minimized, and scare resources are preserved.

Autonomy: The principle of respect for patient autonomy indicates that patients have the right to request and receive available treatment even for infections caused by highly transmissible and virulent organisms. Healthcare workers must always respect the patient's right to self-determination while balancing this right against the important interests of other patients and of healthcare workers themselves. Because Ebola virus is transmitted easily in healthcare facilities and infections are often severe, infection prevention programs implement more stringent infection prevention practices that necessarily limit the infected patient's autonomy to protect the interests of other patients, visitors, and healthcare workers. Thus, to protect other patients and healthcare workers, healthcare facilities place a patient with Ebola virus infection in rigorously enforced isolation precautions and limit the diagnostic tests and treatments offered.

Beneficence: The principle of beneficence indicates that healthcare workers must promote patients' best interests. In most situations, this means that infection prevention measures address primarily the patient's welfare and that

healthcare professionals work primarily to ensure the patient's welfare when deciding which diagnostic tests and treatments are appropriate. When a patient is infected with a highly transmissible virulent organism such as Ebola virus, infection prevention personnel and clinicians must increase their attention to the welfare of other patients, visitors, and healthcare workers, thereby expanding the extent to which the principle of beneficence is applied also to these groups. When trying to maximize the principle of beneficence, we should try to balance the best interests of all concerned parties (maximizing beneficence in this way can be seen as being related to promoting utility). On the basis of the principles of autonomy and beneficence, healthcare workers should strive to meet the patient's needs and should never abandon the patient.

Nonmaleficence: The principle of nonmaleficence indicates that healthcare workers must avoid harming patients. This principle can be applied to healthcare workers, even during routine patient care. For example, the Centers for Disease Control and Prevention introduced standard precautions to protect healthcare workers from the harm of acquiring pathogenic organisms while caring for infected patients, including those infected with common organisms such as MRSA, hepatitis B, hepatitis C, and HIV.

When a patient is infected with a highly transmissible and highly virulent organism, such as Ebola virus, the principle of nonmaleficence can be seen as indicating that, in addition to protecting the patient from harm, we must also protect other patients, visitors, and healthcare workers from harm. As noted previously, healthcare workers still must accept some risk because they cannot abandon patients. Healthcare facilities and infection prevention programs must do all they reasonably can to minimize the risks for each front-line staff member by providing safeguards such as optimal personal protective equipment, education and practical training, an optimal work environment, and other staff members who monitor and coach the staff members caring for the patients.[48,49]

Justice: In general, the principle of justice indicates that persons should have equal access to healthcare resources, that persons in similar situations should be treated similarly, and that available benefits or necessary burdens should be distributed fairly among the group of individuals under consideration. When healthcare workers must care for patients infected with highly transmissible and virulent organisms, the principle of justice indicates that risks and burdens of caring for these patients should be distributed fairly and consistently among staff. This principle also indicates that healthcare workers who do not accept this risk have likely transferred the risk to someone else. Thus, a healthcare worker who will not care for a patient with Ebola or who does not report to work during an influenza pandemic has shifted to other healthcare workers both the risk intrinsic to caring for the patient and the responsibility for not abandoning the patient.[50]

Utility: The principle of utility indicates that infection prevention programs and healthcare workers should work to maximize benefits and minimize risks to all persons concerned, including the affected patients, other patients, healthcare workers, and members of the community. Under usual circumstances, infection prevention programs' and healthcare workers' primary focus is on maximizing the benefits and minimizing the harms for individual patients while maintaining a safe environment for other patients, visitors, and healthcare workers. However, when caring for a patient infected with Ebola virus or with another highly transmissible virulent organism, infection prevention programs must increase their efforts to ensure that other patients, visitors, and healthcare workers benefit and are not harmed. In these situations, infection prevention personnel and clinicians must consider both the likelihood that the patient will benefit from a diagnostic test or a procedure and the likelihood that healthcare workers or other people will be harmed in the process.[49] For example, clinicians may choose to intubate the patient and insert a central venous catheter before the patient's condition deteriorates (i.e., preemptively) to decrease the likelihood of harm to healthcare workers associated with performing procedures under emergent conditions. Or clinicians may deem the likelihood that a moribund patient will benefit from a procedure, such as dialysis, to be very low and the likelihood that a healthcare worker could be harmed to be high and, therefore, decide not to offer the patient this intervention.[49,51] During widespread outbreaks, such as the Ebola outbreak in West Africa, healthcare administrators, clinicians, infection prevention personnel, and public health officials may justifiably apply the principle of utility (alongside other principles and values) to protect healthcare workers because healthcare workers are a limited resource that is essential to the community's well-being.[49] To protect healthcare workers, it may be necessary to preferentially provide them prophylaxis or treatment, and it may be necessary to triage patients[48] to limit healthcare workers' exposure to patients who are least likely to respond to treatment.

Altruism: The principle of altruism indicates that healthcare workers have a duty to care for infected patients regardless of the causative organism's transmissibility or virulence. Because they have promised to care for the sick and to make patients' needs their primary professional concern, healthcare workers are committed to responding to their patients' needs, even when responding entails some degree of risk to their own welfare. The basis for healthcare workers' duty to care results from:

- A professional's promise to respond to the needs of the sick;
- The actual need of one or more patients;
- The ability of an actual professional to meet that need.

Various professionals, organizations, agencies, employers, and governments have assessed the extent of a professional's duty to care for patients during disasters or outbreaks that pose serious risks to the healthcare workers' lives. However, they have come to very different conclusions.[48–50,52,53] Some have stated that the duty to serve is an absolute duty regardless of the healthcare worker's risk; others have stated that the individual healthcare worker can decide how much risk he or she is

Table 1.5 Range of possible responsibilities based on the assessment of the duty to care in a crisis situation

Expectation	Rationale
Work is mandatory	Duty entails accepting the associated risks
Exceptions exist	Competing duties exist that may mitigate a particular healthcare worker's duty to care
Healthcare workers may volunteer; if a sufficient number of healthcare workers do not volunteer, a lottery system can be used to select additional personnel	Healthcare workers may opt out of caring for patients in risky situations; if some workers must be required to work, a lottery system distributes burdens fairly
Healthcare workers may volunteer, and those who do will receive hazard pay; if a sufficient number of healthcare workers do not volunteer, a lottery system can be used to select additional personnel	Healthcare workers may opt out of caring for patients in risky situations, and those who volunteer should be compensated for accepting the risk; if some workers must be required to work, a lottery system distributes burdens and compensation acknowledges the significance of the risk

willing to assume; and yet others have come down somewhere between these two alternatives.

The American Medical Association's (AMA) Code of Medical Ethics upholds the duty to care, stating: "Because of their commitment to care for the sick and injured, individual physicians have an obligation to provide urgent medical care during disasters. This ethical obligation holds even in the face of greater than usual risks to their own safety, health or life."[54] But the AMA Code includes a note of caution that effectively appeals to the principle of utility: "The physician workforce, however, is not an unlimited resource; therefore, when participating in disaster responses, physicians should balance immediate benefits to individual patients with ability to care for patients in the future."

Unlike most professional societies, some governments have defined healthcare workers' duty to work and treat patients during emergencies as being absolute. In fact, some US states "regard the obligation to treat during an emergency as a legal duty punishable by criminal sanctions for failure to act or for abandonment of patients."[48] Some employers have developed strict policies addressing the duty to work during crises, such as a pandemic. For example, the University of Iowa developed a policy that focuses on utility and also stipulates that the duty to care is extensive, given that the hospital is an essential community resource. The policy states: "The University will be considered a 'community asset' and a 'state asset' in responding to a pandemic. University of Iowa Hospitals and Clinics and Student Health Services will experience increased demand for medical treatment and advice from faculty, staff, students, and the community. For this reason, employees of these facilities are considered essential and required to report to work as scheduled, or may be called to report to work if not scheduled."[55]

Table 1.5 describes a range of possible expectations and rationales relevant to the duty to care in situations that pose infectious or other risks to healthcare professionals.

Solidarity: The principle of solidarity indicates that healthcare facilities and the community should support healthcare workers who serve at risk to their own and their loved ones' welfare. As discussed previously, healthcare facilities have a duty to protect their staff (see nonmaleficence), but attention to this duty is particularly important during times of crisis or high anxiety associated with highly transmissible and virulent organisms. The principle of solidarity indicates that healthcare facilities should: 1) clearly articulate and actively promote the applicable professional standards of duty and the institutional and societal expectations regarding the duty to care so that the healthcare workers understand the situation; and 2) provide venues in which staff members can learn about the infectious agent, the risks posed by caring for a patient infected with this agent, and precautions the facility is implementing to protect and help staff who care for these patients. Opportunities for open dialogue between leadership and frontline staff members will allow the concerned parties to calibrate and communicate their expectations and also acknowledge the boundary between consensus and controversy.

The principle of solidarity also indicates that healthcare facilities have additional responsibilities when their staff members care for patients infected with highly transmissible and virulent organisms, such as Ebola virus.[48,49,52] For example, healthcare facilities must protect the staff who care for the patient from discrimination, stigmatization, and harassment from inside and outside the institution and must help provide for the caregivers' physical needs (e.g., food, water, adequate breaks from work, a place to stay if necessary) and emotional needs (e.g., help making difficult decisions, counseling) given the difficulty of caring for critically ill patients while wearing extensive personal protective equipment and maintaining constant vigilance to avoid exposing themselves to the infecting pathogen. Moreover, because healthcare workers who acquire Ebola while caring for a patient could become seriously ill and could subsequently be disabled or die, healthcare facilities should consider developing compensation provisions for harms suffered by healthcare workers who knowingly accept serious risks when caring for such patients (e.g., death benefits for surviving family members).

Conscientious practice by staff: Conscientious practice refers to the profound role that conscience, or integrity, plays in our moral lives. It indicates that healthcare workers should have the freedom to determine the degree of risk that is acceptable given their life situations and other important responsibilities (such as obligations to dependents). In other words, healthcare workers must balance their duty to care for patients in a particular situation against their duties or obligations to family, friends, society, and, we might say, even themselves.[49,52]

Respecting conscientious practice protects the individual healthcare provider's ability to maintain his or her integrity, and doing so acknowledges that healthcare workers vary in their assessments of how much risk is acceptable based on their personal obligations and their philosophical, religious, or professional beliefs.

Moving from Theory to Practice

As should be apparent, ethical principles and values provide guidance but not absolute or detailed answers to specific ethical issues. Moreover, different principles can suggest different and possibly competing responsibilities and may lead administrators, clinicians, and infection prevention personnel at different healthcare facilities to different conclusions based on their patient populations, their healthcare worker population, their resources, and the guidelines and laws governing their practices. When developing policies and procedures to address either routine or more challenging infection prevention issues, infection prevention personnel, clinicians, and administrators must consider the implications of each principle and determine which principles are most important for specific indications or situations. As new information arises, infection prevention personnel and others must evaluate whether specific policies and procedures still meet the standards implicit in the ethical principles.[9,52] For example, they may need to evaluate whether contact precautions for patients with MRSA or VRE infection or colonization remain an ethical practice given intensive use of alcohol-based products for hand hygiene and antiseptic solutions for bathing patients. If effective treatments are introduced for Ebola or infections caused by other highly transmissible and virulent organisms, infection prevention personnel may need to reevaluate imitations on care offered to patients infected with these organisms.[52]

Ethical codes emphasize a profession's core values and may help guide decisions and behavior. To our knowledge, neither the Society for Healthcare Epidemiology of America nor the Association for Professionals in Infection Control and Epidemiology (APIC), the two societies concerned with infection prevention, have developed codes of ethics. However, APIC and the Community and Hospital Infection Control Association–Canada (CHICA-Canada) have published a document describing "professional and practice standards" for persons practicing infection prevention and control.[56]

A well-developed and clearly stated ethical code is an essential guide, yet it is also insufficient. A code of ethics cannot identify all of the ethical dilemmas that individual hospital epidemiologists and infection preventionists will face in the course of their practice. Nor, despite the fond hopes of professional school administrators, does reciting such a code at graduation guarantee ethical conduct. Alone, an ethical code cannot ensure ethical behavior. It must be taught, learned, affirmed, and lived, if it is to affect our practice. As William Diehl writes: "Formal codes of ethics are hot items these days. [But one] thing is certain: any organization that requires all its employees to review and sign its ethics code each year, and then does nothing else to encourage high moral behavior, is wasting its time on the code."[57]

Any institution that does not act as it preaches wastes time and also, at least implicitly, encourages unethical behavior. Institutions reward the conduct they prize. It should be a warning to us that, at present, we are probably more likely to hear of inconsiderate behavior excused on the grounds of a colleague's academic or technical brilliance than to hear an individual praised for making a difficult but ethically sound decision. Perhaps as a community we need to consider the significance of Ralph Waldo Emerson's startling and humbling remark that "character is higher than intellect."

As our financial and staff resources are stressed without limit and as the pressures under which we work intensify, temptation amplifies. Barbara Ley Toffler of Resources for Responsible Management states:

> For many employees, being ethical is getting to be too risky – something they can't afford any more. . .. The problem grows out of what I call the "move it" syndrome. . .. That's when the boss tells a subordinate to "move it" – just get it done, meet the deadline, don't ask for more money, time, or people, just do it – and so it goes on down the line.[58]

For American companies, this peril from within is as serious as outside threats from competitors. As more employers are forced to "move it," companies are increasingly vulnerable – legally, financially, and morally – to the unethical actions of decent people trying to [move it just to keep their jobs].[58]

To "move it," we may find ourselves declining to issue appropriate sanctions in an outbreak because we are loath to alienate an important doctor or lose referrals from a powerful practice group. Or, fearing management anger over bad publicity and loss of revenue, we may decide against closing a ward affected by an outbreak. Under pressure to reduce budgets, we may approve questionable practices or eliminate effective infection prevention programs. We may be tempted to treat influential administrators or practice groups preferentially because they control our budgets or could curtail our programs. We may be tempted to recommend a particular product because we have received grants from the company that makes the product or whose stock we own. We may feel pressure to withhold information regarding resistant organisms so that we can transfer patients to other institutions and shorten their length of stay in our hospital. Or perhaps we may be tempted to condone altering hospital records to avoid losing accreditation.

What can you as an individual hospital epidemiologist or infection preventionist do? We would recommend that you think about your job and identify the most common questions you answer and decisions you make. Once you have identified these questions and decisions, you can try to identify the ethical choices they represent. You can then develop an approach for dealing with these issues before you face them again, since it is easier to think more clearly and dispassionately when not in the middle of a crisis. When designing such approaches, you should obtain help, if necessary or prudent, from experts in medicine, law, ethics, or other appropriate disciplines.

We have described but a few of the manifold ethical challenges that confront us. Against our ambitions and our fears,

we must rely on our enduring values, commitments, and continual self-examination as we strive to meet the challenges posed by our work. We must ask ourselves difficult questions. Are we serving ourselves or patients and healthcare workers? Are we seeking to keep our jobs, or are we seeking to implement the right interventions? As hospital epidemiologists and infection preventionists, we must keep our attention focused firmly on the needs of our patients and communities.

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