

Controlling Infection and Improving Patient Safety in Hospital Settings

By Hannah Cassidy

A major issue in hospitals across the United States is the threat of infection outbreaks. The Center for Disease Control and Prevention estimates that two million hospital-acquired infections (HAIs) occur each year. It is also estimated that these infections contribute to 99,000 deaths annually [1]. Disease can be quickly and uncontrollably transmitted through a hospital if proper protocols are not taken. Many practices have been adopted to battle this problem. A major initiative over the last few years is promoting the importance of hand hygiene in hospitals, as it is extremely vital in preventing the transmission of disease. Other examples of typical hospital protocols include specific procedures, describing the proper disposal of waste and the steps to sterilize an operating room. Some medical studies have attempted to examine more drastic protocols, such as contact isolation for all infected patients. Some of these procedures have proven successful, others have not. Most shortcomings with infection control come from lack of doctor and nurse compliance. Even if hospital administration implements completely foolproof solutions, they cannot be successful without 100% doctor and nurse participation. To confront this issue of hospital-acquired infections, a check-system should be put in place to reinforce patient safety protocols.

Breakdown of Hospital-Acquired Infections and their Impact on Healthcare

Several types of infections are problematic in hospital settings, especially those involving antibiotic-resistant bacteria. In a study on infection control, J. Burke analyzed the categorization and basic breakdown of hospital-acquired infections (HAIs) [2]. In the study, he states that 80% of all hospital infections are one of four types: urinary tract infections (UTIs), surgical-site infections, bloodstream infections, and pneumonia. Most frequently, are UTIs, usually catheter-associated. However, they present the lowest costs and mortality rates. Surgical-site infections, infections occurring after surgery in the part of the body where surgery took place, are the most frequent after UTIs. Bloodstream infections, typically related to the use of intravascular devices, such as IVs, are less frequent, but are quickly increasing in frequency. Bloodstream infections and pneumonia, another less common type of infection, both have higher costs and mortality rates. Burke claims almost 70% of all hospital-acquired infections are due to pathogens, bacteria that cause a disease and are resistant to antibiotics. Thus, there is no way to stop them with ordinary medications [2]. Specifically, MRSA – a bacterium responsible for several different hospital-related infections – is a strain of the staph bacteria that has become resistant to antibiotics used to treat typical staph infections, making it very dangerous in hospitals. In cases of antibiotic-resistant infections, initial prevention is more effective than treatment. In another study, R. Muder, *et al.*, says that MRSA causes over 50% of all infections in intensive care units in the United States [3]. This data shows the different forms that HAIs can take. HAIs can be the consequence of many different procedures and can be found in many different contexts within a hospital. Antibiotic-resistant bacteria are extremely dangerous and prevalent in United States hospitals. Unique solutions are needed to combat each individual type and cause of HAIs to make sure that all potential sources of these infections are stopped.

HAIs have shown to statistically increase the length of a patient's hospital visit, as well as to negatively affect a patient's long-term health, in some cases leading to death. For example, in 2009, a report on HAIs in Pennsylvania hospitals showed that patients who contracted an HAI had higher mortality rates, as well as longer visit lengths and higher rates of readmission [4]. The report was based on nearly two million inpatients, of whom just over 1% contracted at least one HAI. Of the patients who had contracted an HAI during their stay, about 9% of them died. This contrasts with the 2% of deaths of the patients who did not contract an HAI. Further, about 30% of the patients with HAI had to be readmitted within just thirty days. On the other hand, 6% of patients with no HAI were readmitted [4]. The mortality and readmission rates for patients who contracted an HAI are more than four times that of patients who did not contract an HAI. These values are extremely high and clearly need to be improved. A final comparison between infected and non-infected patients is that the average length of stay for infected patients is about three weeks and the average length of stay for non-infected patients is about five days [4]. All of these figures show that HAIs have statistical significance on a patient's health and safety and that practices need to be followed by doctors and nurses to stop these avoidable infections.

Unfortunately, the national rates of many types of HAIs, including those listed previously, have shown very little improvement over a decade. By 2009, the rate of UTIs went up by 3.6%, the rate of surgical-site infections (specifically bloodstream infections following surgery) went up by 8%, and the rate of bloodstream infections related to IVs saw no change at all [5]. The one improvement, however, was the rate of pneumonia following surgery, which went down by 12% [5]. HAIs have become an increasingly dangerous threat. Over time, many of these infections have become worse and currently show no signs of improving. This proves hospital practices related to infection control and patient safety are not satisfactory. Significant changes and improvements are needed to ensure patient health and safety in healthcare facilities.

Beyond the mere presence of infections in hospitals, HAIs also have a huge impact on hospital operations. The high cost of these infections is a major concern for healthcare professionals. According to Burke's article from 2003, "[Hospital-acquired infections] affect approximately two million patients each year in the United States, result in some 90,000 deaths, and add an estimated \$4.5 to \$5.7 billion per year to the costs of patient care" [2]. The price of HAIs, in terms of lives and money, is outrageous. Further, because HAIs have such a high cost, treating them is at the expense of other hospital efforts. In a more recent article from 2012, it was estimated that HAIs cost the entire nation about \$28 billion to \$34 billion each year [6]. HAI outbreaks are completely out of control; hospitals cannot afford the price of HAIs. Not only are hospital-acquired infections becoming more prevalent in facilities across the United States, but they are also increasingly interrupting the quality and amount of all care in a hospital. By having to redirect money and resources to combat HAIs, other patient care is being negatively and unfairly affected. HAIs are very preventable and deny attention to more pressing matters.

Hospitals' Response to Hospital-Acquired Infections

Because HAI rates have become worse over the years, hospitals across the United States are attempting to improve patient safety and reduce outbreaks. Every hospital has a set of best

practices and protocols to limit the chance of transmission. For example, hand hygiene is widely accepted as being essential to infection control. The simple act of doctors and nurses washing their hands is one of the most important and basic practices to stop the spread of germs from patient to patient. Like many hospitals in the United States, the Littleton Adventist Hospital in Colorado has implemented waterless hand sanitizer dispensers around their wards [1]. This promotes hand hygiene and also makes it easier and more convenient for people to sanitize their hands when a sink is not readily available. Other typical practices found in hospitals include protocols for waste disposal and specific procedures for ensuring sterilization in operating rooms [1]. An example of a more drastic patient safety protocol is contact isolation. In a study by J. Jernigan, *et al.*, the effect of contact isolation on the transmission and spread of MRSA was examined [7]. Contact isolation is when no other patient or HCW comes into direct physical contact with an infected patient. The study was conducted in a neonatal intensive care unit at the University of Virginia Hospital during a MRSA outbreak. Jernigan, *et al.*, concluded that contact isolation was successful and effective in controlling the spread of MRSA in this particular unit of this particular hospital [7]. However, there are many potential issues associated with contact isolation that were not addressed in this study, such as how it creates a barrier and limits the amount of care a physician can provide. All of the previously mentioned patient safety practices, in addition to similar ones found at other hospitals, assist in keeping HAI rates down. However, at some point, hospitals fall short in patient safety, as national rates have shown no signs of improving. If sound procedures are being implemented in hospitals, the issues must logically occur somewhere in the implementation phase.

Some of the major problems relating to patient safety in hospitals have to do with compliance and avoidable medical errors made by doctors and nurses. In an ideal world, most protocols set forth by hospitals would be sufficient to significantly reduce the rates of HAIs. However, it is not an ideal world, and human error is unavoidable. When healthcare workers do not follow in-place procedures closely enough, they can threaten patient safety. The Joint Commission Center on Transforming Healthcare stated that there are as many as forty “wrong site, wrong side, and wrong patient procedures” occurring each week in the United States [8]. These “wrong” instances include doctors operating on the incorrect patient, performing the wrong procedure, or performing a procedure on the wrong part of the body. The Joint Commission Center says that these events should “never” happen, yet they do, and at alarming rates. Many of these errors lead to life-threatening HAIs and these “preventable medical errors” account for 98,000 deaths per year and a national cost of \$29 billion. If these errors were included in the list of leading causes of death in the United States, they would rank sixth [8]. Human error is inevitable and everyone makes mistakes. However, most of the medical errors that contribute to death can be avoided. If doctors and nurses would more carefully and thoughtfully follow procedures and protocols, many of these deaths could be avoided.

On a similar note to medical errors, healthcare workers failing to follow infection control procedures can also put patients at unnecessary risk. While a great deal is being done in hospitals to eradicate HAIs, many hospitals still have issues with doctor and nurse adherence to these protocols. In all United States hospitals, compliance rates for hand washing are around 40% [9]. This means that less than half of the time, doctors and nurses are washing their hands when they should. According to the Joint Commission Center, some doctors noted that they do not always wash their hands when entering a patient’s room because their hands are too full, too

much soap dries out their hands, or the placement of sinks and dispensers is inconvenient. However, it was seen in a study in a North Carolina Hospital that if hand hygiene is patient centered, rather than doctor or nurse centered, compliance rates increase. For example, a sign that reads “Hand Hygiene Prevents Patients from Catching Disease” is more effective than a sign that reads “Hand Hygiene Prevents You from Catching Disease” [9]. Low compliance problems create a need for ways of getting healthcare workers to follow all necessary procedures and guidelines. It has been concluded that hand hygiene, in particular, is very important to hospital infection control, as it stops an infection from entering a patient’s room. However, hospitals need to make sure that hand washing and sanitizing is always followed through. Compliance can increase by constantly reiterating infection control protocols and the importance of those protocols to healthcare workers.

Improving Doctor and Nurse Compliance

To address this issue of doctor and nurse compliance, a system should be put in place to reinforce the protocols that doctors and nurses must follow. This “check-system” could be in the form of a monthly “assessment.” Each month, doctors and nurses would be required to take this assessment to test their knowledge on proper patient safety protocols. The point of this test would be less to stump the healthcare workers and more to reiterate and remind them of appropriate protocols when they first enter a patient’s room. For example, one issue that is seen in many hospital rooms is that a nurse or doctor will enter, wash their hands, and then immediately touch a curtain, which is washed about twice a year, before touching the patient. By giving doctors and nurses this monthly test, the protocols will naturally be imprinted into their minds. A question on this assessment could be phrased as follows: “After washing your hands in between patients, is it acceptable to touch the curtain in the room immediately before providing care?” Doctors and nurses will likely know the answer to this question, as it is common sense and the curtains can harbor many bacteria. However, this issue may never have crossed their minds before. This “assessment” would make these subtleties second nature to them.

Further, this monthly “assessment” should be implemented in hospitals merely because there is no legitimate reason why hospitals should not implement it. It is easy to both design and manage. Because the assessment would have questions on existing protocols, coming up with the questions would require simple copying and pasting. Moreover, there would be low costs and maintenance associated with this endeavor. This survey would be completely online, requiring no printing or distribution expenses. It would also not take up too much of a doctor or nurse’s time, and, if anything, it would simply help increase their understanding of the patient safety protocols and better the way they give care. Because there would be nothing to lose in implementing this solution, it is an extremely viable option to increase doctor and nurse compliance.

Conclusion

Patient safety is a top priority in any hospital in the United States. However, hospital-acquired infections have become a serious threat for many healthcare facilities. Over the past decade, most of the national rates of common HAI types increased and became more prevalent in

hospitals [5]. HAIs negatively affect the health of patients and lead to longer hospital visits, higher chances of being readmitted, and an elevated risk of death [4]. Further, hospital costs relating to HAIs are extremely high; it was estimated that HAIs cost the nation about \$28 billion to \$34 billion each year [6]. While hospitals are doing a great deal to combat this issue, they are clearly still lacking. These shortcomings are mostly due to the fact that compliance rates for doctors and nurses are drastically low and medical errors are unnecessarily high. Specifically, compliance rates for hand washing are around 40% [9]. A solution must be implemented in hospitals to reinforce patient safety protocols and increase compliance. This solution could be in the form of a monthly “assessment” for doctors and nurses to complete. This easy-to-implement, low-cost, and risk-free solution would work to remind healthcare workers of patient safety protocols. If a system like this is put in place to help raise doctor and nurse compliance and, subsequently, all necessary procedures are followed at all times, hospitals could come very close to completely eliminating HAIs and saving many thousands of lives.

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