



Nurse Call Integration

Highly Infectious Pathogens in the Hospital Setting

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Recent events have brought to light the challenge of highly infectious and emerging infectious diseases. Communication is a core strategy in treating patients with these illnesses while protecting caregivers and the public in unclear and evolving situations. New methods of communication and information gathering are necessary for optimal patient care and accurate data collection.

Introduction

The Ebola outbreak in West Africa and the prospect of infected travellers bringing Ebola virus disease (EVD) to other parts of the world has gotten much attention in the last year. The care provided to one patient in Dallas, TX highlights the challenges of communication among healthcare workers and outside agencies in identifying and treating patients appropriately.

Even when potentially infected patients are managed properly, healthcare teams still have the challenge of mobilizing appropriate resources and providing care to a critically ill patient under difficult circumstances.

Common infections, such as extended-spectrum beta lactamase-producing bacteria (ESBL), *Clostridium difficile* (C diff) and methicillin-resistant *Staph. aureus* (MRSA) also pose problems for healthcare workers and patients. Identifying and properly isolating patients is a high priority for preventing

Utilizing Rauland's Responder 5 system, staff can rapidly call for transport and housekeeping to help move the patient into appropriate isolation.

nosocomial infections and the complications that result for patients, but isolation carries risks of its own.

Research shows that patients in isolation for more routine pathogens experience poorer quality of care.¹ One barrier to care is the difficulty faced by healthcare workers who need to "gown up" before going into a patient room for even minor tasks.

On a business level, Medicare pay for performance and the public reporting of various infection rates have put hospital-acquired conditions (HACs) at the top of the agenda for hospital leadership nationwide. Early identification and isolation of potentially infectious patients, teamwork among healthcare workers, and the mobilization of necessary isolation and cleaning supplies are all key strategies in infection control. Communication lies at the heart of all these activities.

As was demonstrated in the case of a man hospitalized in Indiana with Middle Eastern Respiratory Syndrome (MERS), communications solutions such as the Rauland Responder 5 system have the potential to improve patient care and protect public health. Rauland

¹ Kirkland KB, Weinstein JM. Adverse effects of contact isolation. *Lancet* 1999; 354:1177-1178.

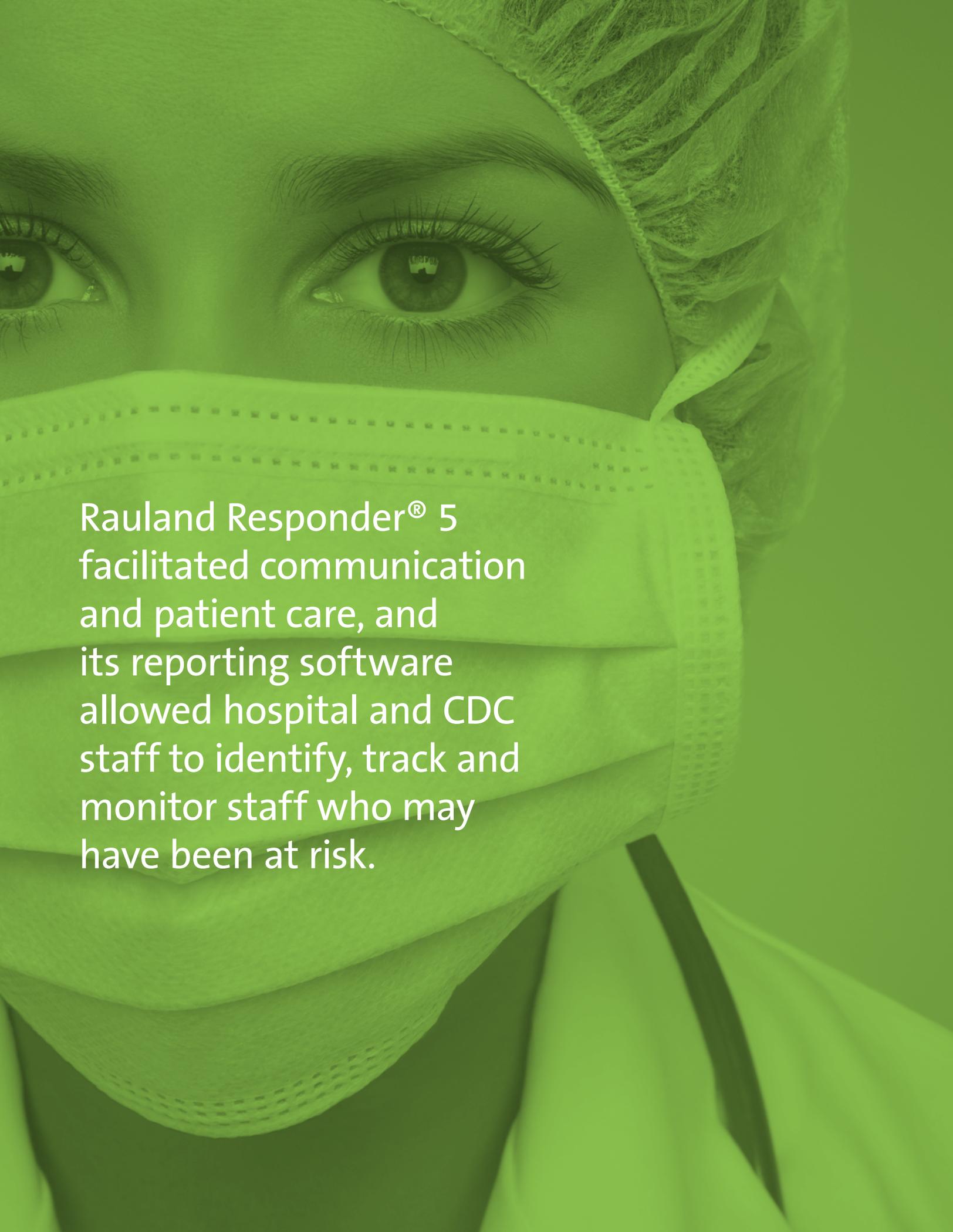
Responder 5 facilitated communication and patient care with a patient in isolation, and its reporting software allowed hospital and CDC staff to identify, track and monitor staff who may have been at risk for illness from contact with this patient.

Review of Pathogens, Outbreaks and Risks:²

As dramatic as EVD is, and as common as *C. diff* is, there are a number of other infectious agents to keep in mind when planning an institutional response. Robust response plans should take into account both emerging infectious diseases such as EVD (SEE FIGURE) as well as more common infections.

Recent measles outbreaks in the US present an example of a "re-emerging" infectious disease. In the second half of the twentieth century, measles became almost unheard of in the US and other developed countries. In many areas, immunization rates have dropped below the threshold needed for herd immunity. Measles can persist in airborne particles for hours, meaning that a single infected patient in a hospital or physician office waiting area has the potential to cause serious illness in susceptible individuals such as young children who are not yet immunized,

² All information on outbreaks and infectious agents are from the www.CDC.gov.



Rauland Responder[®] 5 facilitated communication and patient care, and its reporting software allowed hospital and CDC staff to identify, track and monitor staff who may have been at risk.

and immunocompromised individuals of any age.

Other common infections also have the potential to cause significant morbidity and mortality in hospital settings. A patient with meningococcal infection may present at first without the classic rash but with only vague and indolent symptoms. The final diagnosis may take days to obtain, while in the meantime numerous healthcare workers and other patients may become exposed.

Even a routine infection such as Influenza can be a challenge. When a novel flu strain emerges suddenly, immunization may not be possible. Influenza, especially in pandemic years (e.g. H1N1), can spread rapidly and up to 20% or more of hospital and emergency department patients may be infected.

In any of these cases, rapid identification of infected individuals, marshalling supplies to prevent spread of infection, and tracking healthcare workers and other susceptible individuals requires good teamwork and communication.

Case Studies:

There are multiple variables to consider in assessing and triaging a patient with a potentially infectious pathogen. The following cases help illustrate how appropriate tools and processes can help turn a potentially difficult situation into a safe and controlled one.

Case 1:

A 35-year-old woman comes to labor and delivery (L and D) at 38 weeks' gestation. She is concerned she is in labor and has been having some strange itchy spots on her chest and abdomen. She waits in the L and D waiting area for 30 minutes until she is placed in a bed in a triage area.

The hospital can quickly and confidentially identify those staff members that had been exposed to the patient and infection control is able to assess staff for who may be at risk for infection.

She tells her nurse that she has been feeling sick with a fever, fatigue and loss of appetite for the past 3 days. She noticed a rash on her chest and abdomen the day prior to presentation. The nurse evaluates her rash and is immediately concerned about chicken pox (varicella zoster virus, VZV). The woman does not think she ever had chicken pox and has not received the vaccination. The nurse quickly understands that this may not only be a risk for the woman and her fetus but for other patients and staff on the unit. The nurse immediately calls the obstetrician on call. Utilizing Rauland's Responder 5 system, staff can rapidly call for transport and housekeeping to help move the patient into appropriate isolation. Treatment for VZV is started. The patient's information and isolation precautions are logged, triggering materials management to bring a cart with isolation supplies to the patient's assigned room.

With Responder All Touch integration, the isolation information logged to EMR is automatically reflected outside the patient room for all staff to see.

Noticing the urgency with which the patient has been whisked out of the triage area, the other women there and their partners become somewhat alarmed. One woman has no record of prior VZV immunity, and the partner of a second is on immunosuppressive therapy for Crohn's Disease.

Mitigating Risk

Hospital infection control and an infectious disease physician are consulted. With the patient receiving appropriate care, their attention focuses on mitigating the risk of exposure to the other patients and staff on L and D. Since the patient initially presented to the emergency department before being directed to Labor and Delivery (L and D), an additional group of possibly exposed individuals have to be identified. Using Rauland's Responder reporting, the hospital is able to access the Patient Activity Report, and identify each and every time a staff member entered and exited the patient room, as well as how long each staff member spent in the room in the ED and L and D.

With access to this detailed information, the hospital can quickly and confidentially identify those staff members that had been exposed to the patient and infection control is able to assess staff for who may be at risk for infection. The system also identifies which patients were in triage at the same time as the woman with VZV. At risk staff and patients are offered post exposure prophylaxis.

Case 2:

A 32 year old man presents to triage in the Emergency Department (ED) with complaints of fever, myalgias, nausea and vomiting. Thinking that this was "just another flu case," the triage nurse sends him to the waiting room. When he is called back to the ED an hour later, his nurse realizes that a travel

history was not obtained at triage. She discovers that he has recently worked as a video producer on a news team covering the Ebola outbreak in Liberia. He says he had some contact with healthcare workers in an area where “there were lots of sick people.”

Explaining her concern for EVD, the nurse quickly puts on some basic personal protective equipment (PPE), gives the patient a mask to put on and transports him to the dedicated isolation room in the ED.

Mitigating Risk

With one phone call, the ED charge nurse activates the hospital’s response plan, involving rapid notification of ED clinical leadership, security, infection control, and the hospital’s incident command system. At the same time, a rapid response team is alerted through the use of the Responder 5 system. Infection control quickly arrives to supervise use of the higher-level PPE that were brought up from central supply as soon as the Responder alert went out. Hospital engineering sets up a “warm zone” outside the patient’s room where PPE donning and doffing can take place. A physician and nurse put on the full suit of proper PPE recommended when caring for a patient with EVD and examine him. They start an IV, draw labs, and have the samples sent out for definitive testing for EVD. Since the patient is at “some risk for EVD” but is stable, it is decided to keep him in isolation in the ED while

A rapid response team is alerted through the use of the Responder 5 system. Infection control quickly arrives.

awaiting definitive test results over the next 24 hours.³ Strict protocols are put in place for tracking healthcare workers and other staff who have any contact with the patient. Entry to the room is kept to a minimum, if for no other reason than the time and effort required by providers to don and doff PPE. Rauland’s Reports manager log facilitates tracking staff movements in and around the patient’s room.

While in isolation, the patient is able to communicate with his caregivers using a bed call/communication system the hospital recently installed. Calls to his nurse are answered on the wireless phones synced with the Responder system. Video telephony is set up with a screen in his room and another at the nursing station, allowing him to communicate with his caregivers as close to face-to-face as his isolation permits.

Patients who were in the waiting room at the same time as this man are identified from patient logs and security camera video recordings. A few patients contact hospital administration threatening lawsuits for being exposed to Ebola, but security tapes show that these people were not in the same area at the same time as this patient.

A number of staff ask how long they will have to be off work on home quarantine and paid leave. The Responder reports log easily allows hospital administration is able to tell

³ Details in this case are based on recommended protocols from the CDC. The inspiration for this scenario came from a blog post by an NPR reporter, <http://www.npr.org/blogs/goatsand-soda/2015/01/09/376152441/back-in-d-c-from-the-ebola-hot-zone-i-broke-out-in-a-fever>

Rauland’s Reports Manager log facilitates tracking staff movements in and around the patient’s room.

who on staff need to be furloughed and who do not by looking at the sensor logs of who entered the patient’s room at various points.

Conclusion:

Infection control is one of many areas in which risk assessment, teamwork and communication come together in healthcare. Helping individual patients heal, preventing spread of disease to other patients and caregivers, and maintaining public health are all priorities. Communication strategies and solutions such as Responder 5 can help in multiple ways. Patients can communicate with caregivers and others more easily, even when in isolation. Because of Responder’s ability to interface with many other systems-- Wi-Fi phones, smartphones, pocket pagers, real-time locating systems, electronic staff assignments-- nursing units are quieter without the need for overhead paging, helping patients rest better and heal faster. Staff can get the supplies and information needed from other departments and caregivers more easily. Hospitals and public health officials can use Responder reports to trace potential exposure to infection rapidly and accurately.

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This white paper was prepared for Rauland-Borg.

Emerging Infectious Diseases

Definition: An EID is one where...

- Incidence in humans has increased over the past 2 decades, or threatens to increase in the near future.
- May include:
 - o New infections resulting from changes or evolution of existing organisms (e.g. H1N1 Influenza);
 - o Infections spreading to new geographic areas or populations;
 - o Infections reemerging due to a breakdown in public health measures.⁴

Examples:

- Hantavirus in the US
 - o Identified in the early 1990s.
 - o Over 600 cases of Hantavirus pulmonary syndrome (HPS) in the US since identification
 - o Case fatality rate of 35%
- Hantavirus, worldwide
 - o Hemorrhagic fever with renal syndrome
 - o Mortality between 1% and 15%

- Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV)
 - o Worldwide outbreak between 2002 and 2004
 - o SARS caused illness in 29 countries and regions
 - o 8,096 persons with probable SARS, 774 deaths.
- Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV)
 - o Cases are mostly confined to the Arabian Peninsula
 - o One case managed in the US in a returning traveler
 - o Case fatality rate of 30%
 - o 2015 outbreak in South Korea, dozens of people infected in healthcare settings after exposure to one returning traveler.
- Avian Influenza
 - o Sporadic outbreaks worldwide
 - o Rare cases in North America
 - o Influenza tends to mutate and jump from fowl to swine and humans.
 - o Worldwide pandemic may be more than merely a theoretical possibility.

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⁴ <http://wwwnc.cdc.gov/eid/page/background-goals>



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