



State of Colorado
Department of Public Health and Environment

Patient Safety Initiatives
Health Facility Acquired Infections Background Information
January 2008

Overview

Below is a brief overview of health facility acquired infections and healthcare epidemiology. When possible the overview will point to specific examples from Colorado's Health Facility Acquired Infections Initiative as it relates to the covered topics. For more information about the Colorado Health Facility Acquired Infections Initiative see the 2008 annual report.

Health facility acquired infections are infections that occur during or after treatment for a separate medical condition in a health facility. This is sometime referred to as hospital-acquired infections, healthcare-acquired infections or nosocomial infections. In Colorado hospitals, hospital units, ambulatory surgery centers and dialysis treatment centers are targeted to report infections acquired at their facilities. Because reporting is not limited to infections acquired in a hospital, yet not broad enough to include all healthcare settings, Colorado has decided to use the term health facility acquired infections in reference to the initiative and in the overview below.

A Historical Perspective

Health facility acquired infections are not a new phenomenon. Some of the earliest medical writings mention strange illnesses, which in the end led to the death of seemingly healthy patients. Although these illnesses have been well documented through the ages, just over the last 200 years significant advancements in the delivery of care have led to identifying and reducing the number of health facility acquired infections. More recently, healthcare organizations have developed procedures to lessen the impact and spread of infections on patients and their families.

The most profound and seemingly simple change in the delivery of healthcare came in 1847 when Ignác Semmelweis used observation techniques to establish a link between healthcare workers and the spread of infections. Over the years since Semmelweis' discovery, the goal of slowing and eventually stopping the spread of infectious disease throughout society, by using strict, scientific observation and identification and application of best health practices, has evolved into the profession of epidemiology.

What is Epidemiology?

Infection control and healthcare epidemiology is a profession primarily concerned with preventing the spread of disease in society as a whole and within healthcare systems. Infection control concerns itself both with prevention (hygiene, hand washing, cleaning, disinfection, sterilization, vaccination, surveillance) and with investigation and management of demonstrated or suspected spread of infection within a particular setting (e.g. outbreak investigation). Epidemiology is an essential part of both public health and facility based healthcare.

Public Health Epidemiology

Public health officials use the principles and practices of epidemiology to develop appropriate interventions to prevent and control public health problems. The Centers for Disease Control and Prevention (CDC) defines public health as: the science and art of preventing disease, prolonging life and promoting health through organized community efforts. These efforts include sanitation, control of contagious infections, hygiene education, early diagnosis and preventive treatment and adequate living standards. It requires understanding not only of epidemiology, nutrition, and antiseptic practices but also of social science.

Everyday choices are influenced by public health epidemiology. For instance, campaigns that encourage the public to eat more fruits and vegetables, enjoy a more active lifestyle or quit smoking are all public health applications of epidemiological studies.

In the United States, public health is studied and coordinated on a national level by the CDC and locally by state and county or local health departments. Internationally, the World Health Organization coordinates public health interventions.

Public Health in Colorado

The Colorado Department of Public Health and Environment (the department) plays an active role in monitoring diseases and environmental, occupational or chronic conditions throughout the state. Colorado state law requires the department monitor, investigate and control the causes of epidemic and communicable diseases affecting public health in Colorado. Currently, the department maintains a state-of-the-art web-based disease reporting system where health providers report cases of vaccine-preventable diseases, foodborne and enteric diseases, sexually transmitted diseases, zoonotic diseases and many other serious conditions¹. All medical records are held in confidence and policies are in place to safeguard the privacy of Coloradans.

The department's work in tracking, controlling and preventing the spread of communicable diseases throughout the state is done by maintaining a disease-monitoring network of Colorado health providers. This network helps to ensure prompt reporting of diseases, to identify the causes and modes of transmission of diseases and to ultimately stop epidemics. The department provides technical assistance statewide in the control, treatment and prevention of certain infectious diseases. Disease prevention is accomplished by using public information, education, and training to facilitate behavior change.

The new health facility acquired infections disclosure initiative is just one of the many ways the department is working to protect and preserve the health and environment of the people of Colorado.

Healthcare Epidemiology

Infection control and hospital epidemiology are akin to public health epidemiology within a particular healthcare delivery system rather than directed at society as a whole.

Training in Healthcare Epidemiology

Specialized training in infection control and healthcare epidemiology is required for medical epidemiologists. Practitioners can come from several different educational streams. Many begin as nurses, some as medical technologists (particularly in clinical microbiology), and some as physicians (typically infectious disease specialists).

Colorado's mandatory health facility acquired infections disclosure bill requires individuals who collect the surveillance data have a Certification in Infection Control and Epidemiology² or become certified within six month of becoming eligible to take the certification test. Certification requirements do not apply to individuals collecting the data in hospitals with 50 beds or less.

Health Facility Infection Control Programs

Modern healthcare employs many types of invasive devices to help patients recover. Such devices can bypass patients' natural defenses against invading micro-organisms. Therefore, use of these devices has been linked to infections of the lung, bloodstream and urinary tract. Similarly, surgical treatment may place a patient at risk of acquiring an infection at the surgical site. Anyone who seeks invasive medical treatment, surgery or becomes hospitalized raises their risk of acquiring an infection. Other risk factors can be attributed to personal characteristics and health status or health facility processes.

¹ A complete list of reportable conditions can be found on the Internet at www.cdphe.state.co.us.

² The Certification Board of Infection Control and Epidemiology is an organization that certifies infection control practitioners based on their educational background and professional experience, in conjunction with testing their knowledge base through a standardized exam.

Prevention of health facility acquired infections requires a systematic, multidisciplinary approach. This is usually achieved under the leadership of an institutional infection control program. The principle activities of such a program include surveillance, outbreak management, policy development, expert advice and education. Infection control practitioners also perform surveillance, research and outbreak investigations.

In larger hospitals, program leadership is often provided by an infection control professional, such as a physician with training in epidemiology and infection control. Smaller facilities may obtain such expertise by contractual arrangement with outside experts. Oversight of the infection control program is usually provided by a multidisciplinary infection control committee.

Colorado's mandatory health facility acquired infection bill requires extensive surveillance at the facility level. Surveillance is the act of infection investigation using predefined definitions to identify infections. Identifying an infection requires that an infection control practitioner review a patient's chart to confirm the patient began experiencing the signs and symptom of an infection after admission to the health facility.

According to the CDC's Healthcare-Associated Infections Web page, health facility acquired infections are one of the top ten leading causes of death in the United States. As the CDC has estimated approximately one third of health facility acquired infections are preventable, so surveillance and preventive activities continue to be an increasing priority for healthcare workers. In fact, a study on the Efficacy of Nosocomial Infection Control Project performed by the CDC in the 1970's found that hospitals reduced their health facility acquired infection rates by approximately 32 percent by focusing on surveillance and prevention.

Improving Patient Safety

Since the Study on the Efficacy of Nosocomial Infection Control Project (SENIC) was released in the 1970's there has been an industry wide focus on infection control and prevention in healthcare settings. This cultural change has slowly but consistently led to improved patient safety.

Many national and local organizations have demanded more accountability in the healthcare industry, which has paved the way for government intervention. Since 2004, Colorado is just one of over 20 states that have passed laws requiring public reporting of health facility acquired infections.

References

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