

# Infection Surveillance, Prevention and Control Program (ISPC): Brief History

## Understanding the history of Infection Prevention and Control.

The value of the Infection Prevention and Control (IPC) program to the organization and the populations it serves cannot be underestimated. The recent Patient Safety movement has highlighted importance of surveillance and prevention activities, as much as process improvement. But Infection Prevention and Control is not new. Most of our basic concepts have been around a long time. In the next few paragraphs you will have a chance to learn about some of the pioneers of the industry.

### **Florence Nightingale**

Healthcare had its first infection prevention and control champion in Florence Nightingale. While she had no scientific understanding of asepsis, her research into hospital sanitary problems made her a firm believer in pure air, pure water, efficient drainage, cleanliness, and light. Some of her writings described the putrid condition she found in hospitals during her travels. She once stated, "It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm." Nightingale's firm belief in preventive medicine led to an established standard of formalized cleanliness and sanitation in hospitals and the military. She observed that open windows interfered with the ventilation of hospital wards and allowed air from the wards to pass into the corridors. Nightingale believed that respiratory secretions were potentially dangerous, especially among the sick and that the sick should be isolated.

### **Ignaz Semmelweis and Oliver Wendell Holmes**

Around the same time period, an obstetrician in Vienna, Dr. Ignaz Semmelweis, demonstrated more formally that routine handwashing could prevent the spread of puerperal fever. He noted that maternity patients were dying at such an alarming rate that they begged to be sent home from the hospital to deliver with a midwife. The death rate was five times higher for mothers who delivered in the hospital than for mothers who delivered at home. Semmelweis' analysis of the outbreaks of puerperal fever in his hospital revealed that medical students, who were responsible for deliveries in Division I, often performed autopsies before assisting in deliveries, while midwives, who worked in Division II, did not. He theorized that disinfecting hands could prevent transmission of infection from a diseased cadaver to a pregnant



patient. Therefore, on May 15, 1847, he required all medical students to wash their hands with chlorinated lime before assisting in deliveries, which resulted in a dramatic outcome - deaths on the maternity ward fell fivefold. Oliver Wendell Homes made this same discovery but sadly, both Holmes and Semmelweis were ridiculed by their peers at the time of their writings.

### **Joseph Lister**

Joseph Lister, a professor of surgery at Glasgow, Scotland, was troubled by high mortality rates from post-surgical sepsis. He was the first to see the connection between Pasteur's discoveries of the fermentation process and the suppuration of wounds. In April 1867 he published his ground-breaking paper on antisepsis, stating that "all the local inflammatory mischief and general febrile disturbance which follow severe injuries are due to the irritating and poisoning influence of decomposing blood or sloughs."

Lister is credited with the beginnings of sterilization in the Operating Room. Before surgery, he sprayed the operating rooms with carbolic acid, because he thought that the infections were caused by dust particles in the air. Later, he began applying carbolic acid to compound fracture wounds. The wounds healed, amputation was averted, and the mortality rate from amputation plummeted from 45% to 15%.

## **The Birth of Infection Prevention and Control Programs**

The Centers for Disease Control and Prevention

- 1960s - hospital surveillance
- 1970s - training courses
- Hospital Infections Program  
(Now the DHQP- Division of Healthcare Quality and Promotion)
- 1970s NNIS
- 1974 SENIC Study
- 1991 HICPAC
- 2005 NHSN

Hospital surveillance was born in the 60s as a result of the Staphylococcus aureus pandemic of the 1950s.

Training courses were first offered in the 70s by CDC

The Hospital Infections Program (which is now the Division of Healthcare Quality and Promotion) is a federal advisory committee created to provide guidance to the CDC



- 14 external IC experts
- Primary function: issue recommendations on IC practices

The National Nosocomial Infection Surveillance System (NNIS) was created in the 70s

- Collect, analyze and disseminate data on nosocomial infections in hospitals
- Standardized definitions for nosocomial infections and provided comparison data for hospitals to use
- Limited participation due to requirements but any hospital could use the comparison data for data submission

The SENIC project, Study on the Efficacy of Nosocomial Infection Control, published in 1974, found that one third of nosocomial infections could be prevented by effective IC programs, including surveillance and practice activities. In addition, prevention of approximately 6% of HAIs offset the cost of an Infection Control program in a 250-bed hospital. The Healthcare Infection Control Practices Advisory Committee (HICPAC) was formed in 1991 by the CDC. Many guidelines have been produced by this group. In 2005 hospitals began contributing data to NHSN (National Healthcare Safety Network).

This is the re-vamped NNIS system and the first comparison rates were published in 2007.

## Patient Safety/Quality Initiatives

Purpose

- Safe environment for patients/healthcare workers
- Reduce transmission of infections
  - Additional gains
- Cost savings/avoidance
- Recognition
- Reimbursement

Today's Patient Safety and Quality initiatives are largely based on a report from the Institute of Medicine, published in 1999. The IOM report entitled, "To Err is Human: Building a Safer Health System" actually presented no new data. Instead, it was a consolidation of old reports repackaged more dramatically. The report stemmed from the publication of 2 large studies examining adverse events in healthcare. These studies reported that:

- Over half of all adverse events resulted from medical errors
- They implied that more than 44,000 Americans die each year as a result of preventable medical errors, and



- The cost associated with these errors is estimated to be between 17 and 29 billion dollars

There were a number of recommendations that stemmed from the report, one of which was for hospitals to establish Patient Safety programs. Concerning IC programs, this means reducing transmission of infections and providing a safe environment for everyone in the facility.

Additional gains for healthcare organizations in implementing Patient Safety programs are cost savings (by reducing complications and mortality), recognition from national organizations, and higher levels of reimbursement from payors.

## What is Patient Safety?

The National Safety Foundation, which was founded by the American Medical Association has defined “Patient Safety” as - avoidance, prevention and improvement of adverse outcomes or injuries stemming from the processes of healthcare. Their basic mission is to improve the safety of patients.

## Current Quality Initiatives

- Joint Commission on Accreditation of Healthcare Organizations (Joint Commission)
- Institute of Medicine (IOM)
- National Quality Forum (NQF)
- Consumer’s Union
- And many more....

A number of national organizations are driving the Patient Safety movement. All of them have one goal in common – improving the quality of patient care. The Joint Commission has developed a set of National Patient Safety Goals which hospitals must comply with in order to be accredited.

The IOM was previously referenced.

The National Quality Forum is a not-for-profit membership organization created to develop and implement a national strategy for health care quality measurement and reporting. NQF has published 39 highly recommended practices for hospitals to attempt to achieve. Some examples are:

- increasing influenza immunization among healthcare workers
- using good hand hygiene practices
- developing methods to prevent catheter related bloodstream infections

The Consumer’s Union has been by far the most influential in the lives of IPs through their push for mandatory reporting of hospital-acquired infections.



## Current Quality Initiatives

- Agency for Healthcare Research and Quality (AHRQ)  
[www.guidelines.gov](http://www.guidelines.gov)  
[www.qualitymeasures.ahrq.gov](http://www.qualitymeasures.ahrq.gov)
- Center for Medicare and Medicaid Services (CMS)

The Agency for Healthcare Research and Quality (AHRQ) was established in 1989 as a part of the Department of Health and Human Services. 80% of their budget is awarded as grants and contracts to researchers.

Some of AHRQ's primary goals are to:

- Support improvements in health outcomes
- Strengthen quality measurement and improvement
- Identify strategies that improve access, foster appropriate use, and reduce unnecessary expenditures
- Improve the quality of healthcare
- Promote patient safety and reduce medical errors

A really great thing about AHRQ activities is their National Guideline Clearinghouse and Evidence-based Practice Centers. The web site is provided so that you will be able to access these guidelines once you get home.

CMS has Quality Initiatives for various HC settings incl. hospitals, LTC, home care and dialysis. HC organizations must participate in these initiatives in order to receive full Medicare reimbursement.

## Recent Quality Initiatives

- Institute for Healthcare Initiatives (IHI) (GIVE WEB ADDRESS)
- National Health Safety Network (NHSN) (GIVE WEB ADDRESS)

The Institute for Healthcare Improvement (IHI) is a not-for-profit organization committed to improving health by advancing the quality and value of health care. IHI is convinced that a remarkably few proven interventions, implemented on a wide enough scale, can avoid greater than 100,000 deaths annually. Facilities choose from a list of quality initiatives in which to benchmark against other hospitals. IHI brought us what we now refer to as “bundle” measures.

The National Healthcare Safety Network (NHSN) is a revised knowledge system developed by CDC to replace the current NNIS system. NHSN was developed for the purpose of accumulating, exchanging and integrating relevant information on infectious and noninfectious adverse events associated with healthcare delivery.



Their first report was published in the June 2007 issue of AJIC and contains a wealth of information as well as healthcare associated infection statistics to help with your surveillance program.