Estimates of Healthcare-associated Infections in U.S. Hospitals

- 1.7 million infections in hospitals
  - 9.3 infections per 1,000 patient-days
  - 4.5 per 100 admissions (1 out of 20 patients acquire an infection in US)
  - Most frequent infections: bloodstream infections, urinary tract infections, surgical site infections, pneumonia
- 99,000 deaths associated with infections

Yearly *Clostridium difficile*-related mortality rates per million population, United States, 1999–2004.

Preventability of Healthcare-associated Infections

What proportion of healthcare infections are caused by errors... i.e. are preventable?

Healthcare-associated Infections

Medical Errors and Near-misses

Goal: Best quality of patient care and elimination of preventable hospital-associated infections
CDC’s Role in the Elimination of Healthcare-associated Infections

- Investigate outbreaks
- Conduct applied research
- Identify research needs
- Turn research into recommendations
- Produce evidence-based guidelines
- Disseminate information
- Track infections and progress toward prevention

**FIGURE.** Central line–associated bloodstream infection rate* in 66 intensive care units (ICUs), by ICU type and semiannual period — southwestern Pennsylvania, April 2001–March 2005

*Pooled mean rate per 1,000 central line days.
† Includes cardiothoracic, coronary, surgical, neurosurgical, trauma, medical, burn, and pediatric ICUs.
§ p<0.001.

MMWR 2005;54:1013-16

Prevent Infection

Bundles (sets of infection control recommendations) to prevent infection when inserting devices or performing procedures.
Hand hygiene
Isolation
Disinfection etc
CDC’s MRSA Prevention Initiatives

- **Unit**
  - ICU
    - VA Pittsburgh

- **Facility**
  - Hospital-wide
    - VA Pittsburgh

- **Regional**
  - VA Pilot
    - 17 hospitals, multiple states
  - Maryland Initiative
    - 19 hospitals
    - Southwest Pennsylvania Regional Collaborative
      - 19 hospitals
  - RWJ Initiative
    - 6 hospitals, 4 states

- **National VA Initiative**
  - 150 hospitals nationwide

> 60% Reduction in MRSA
Common Elements for Successful Infection Prevention

- Simple, check lists
- Patient-centered, integrated with care
- Evidence-based recommendations
- Part of a “package” for prevention
- Engaging and empowering clinicians
- Protocols and systems in place
- Cultural change, leadership support
- Standardized ways for recording information about infections (e.g., NHSN)
- Regular feed-back of information to providers
Patient Safety

Healthcare Personnel Safety

Research & Development

Biovigilance*

*NIn development
State Legislative Activity for Healthcare-associated Infections (as of March 17, 2009)

Month – Year = Date mandatory reporting using NHSN implemented

- Mandates public reporting using NHSN
- Mandates public reporting of infection rates
- Mandates reporting only to state government
- States with no legislation
- States with study laws
- Voluntary reporting

*Voluntary reporting using NHSN
Number of Healthcare Facilities using National Healthcare System Network (NHSN)

April 2007
- 491 facilities enrolled
  - 44% had 201-500 beds
- 8 States using or planning to use NHSN for mandatory reporting

March 2009
- 2230 facilities enrolled (50 States)
  - 66% have ≤ 200 beds
- 19 States using or planning to use NHSN for mandatory reporting
CDC successfully collaborates with States to prevent healthcare-associated infections

New York: CDC guidelines basis for prevention implementation initiatives
- Greater New York Hospital Association prevention initiative
- Collaborative partnership with 46 hospitals

- Focused on incrementally building infrastructure needed for BSI and other future prevention initiatives (e.g., C. difficile)
- Communications to share best practices
- Culture of accountability
  - CEO to support staff levels involved
  - Site visits, monthly reporting
- Adopted bundles of practices
Hospitals Participating in NHSN are Preventing MRSA Bloodstream Infections

Trends in Bloodstream Infections* by ICU Type, NHSN hospitals, 1997–2007

JAMA


Deron C. Burton; Jonathan R. Edwards; Teresa C. Horan; et al.

NHSN eSurveillance
Moving towards the future

NHSN

Component
Patient Safety

Component
Healthcare Personnel Safety

Component
Biovigilance

Modules
• Hemovigilance

Component
Research and Development

eSurveillance
• HL7 CDA
• HL7 Messages
Prevention research

Data Transmission Standards
- Structured documents for infection reports, denominators, and process of care measures
- Messages for laboratory results, admission/discharge/transfer, and pharmacy data

MDRO = Multidrug-resistant organism
CDAD = Clostridium difficile associated disease

HL7 = Health Level Seven
CDA = Clinical Document Architecture
Current Healthcare System

- Acute Care Facility
- Home Care
- Outpatient/Ambulatory Facility
- Long Term Care Facility
Nevada Epi-Aid investigation: hepatitis C outbreak

- Discovered reuse of syringes and single dose vials
- Resulted in massive patient notification: risks of bloodborne viral infections due to unsafe injection practices
Preventing Healthcare-associated Infections. . . the time is NOW

- Problem is critical and costly but preventable
- Interventions can have an immediate national impact
- Interventions can be cost savings
- Ongoing efforts are needed to address changes in healthcare
Keys for the Elimination of Healthcare-associated Infections

- Full adherence to recommendations
- Collect data and disseminate results
  - Communication with consumers
  - Evaluate how we’re doing
- Recognize excellence
- Identify and respond to emerging threats
- Improve science for prevention through research
Infection prevention is EVERYONE’s responsibility!

http://www.cdc.gov/ncidod/dhqp/