Role of CDC in Monitoring and Preventing Healthcare-associated Infections

Denise M Cardo, M.D.

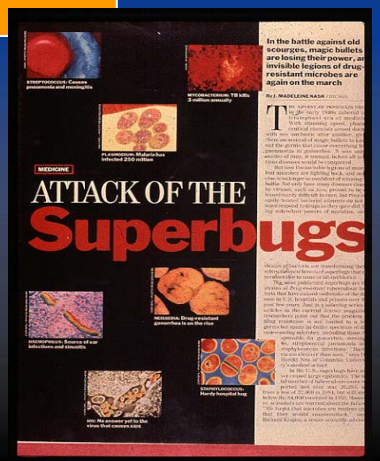
Director

Division of Healthcare Quality Promotion

CDC is working to improve patient safety

Patient Safety

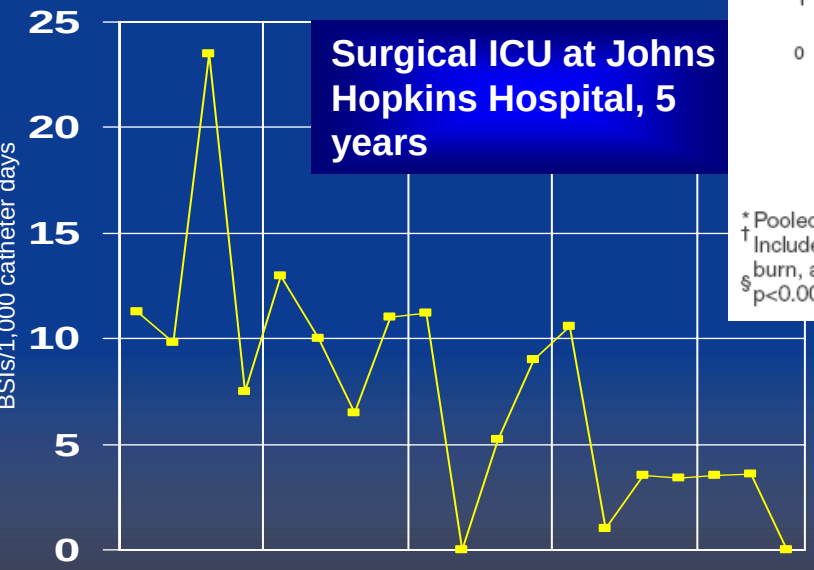
- Healthcare-associated Infections
  - Device/Procedure-related
  - Settings/Practices-related
    - MRSA
    - *C. Difficile*
    - *Acinetobacter*
- Adverse Drug Events
- Transfusion/Transplant Safety
- Antimicrobial Resistance



- Outbreak Investigations
- Surveillance
- Prevention Recommendations
- Intervention Implementation
- Extramural Research
- Laboratory Research and Support

www.SHEA-online.org

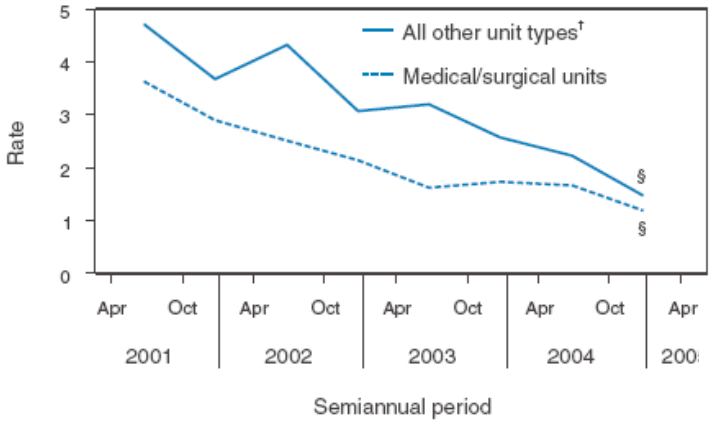
Following CDC Guidelines Reduces Healthcare-associated Infections



Surgical ICU at Johns Hopkins Hospital, 5 years

Berenholtz SM et al. Crit Care Med 2004;32:2014-20.

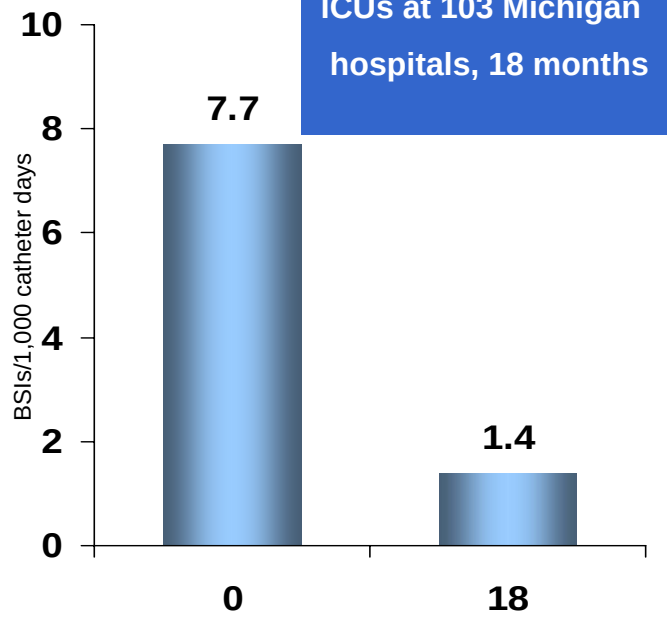
FIGURE. Central line–associated bloodstream infection rate* in 66 intensive care units (ICUs), by ICU type and semiannual period — southwestern Pennsylvania, April 2001–March 2005



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

MMWR 2005;54:1013-16

ICUs at 103 Michigan hospitals, 18 months

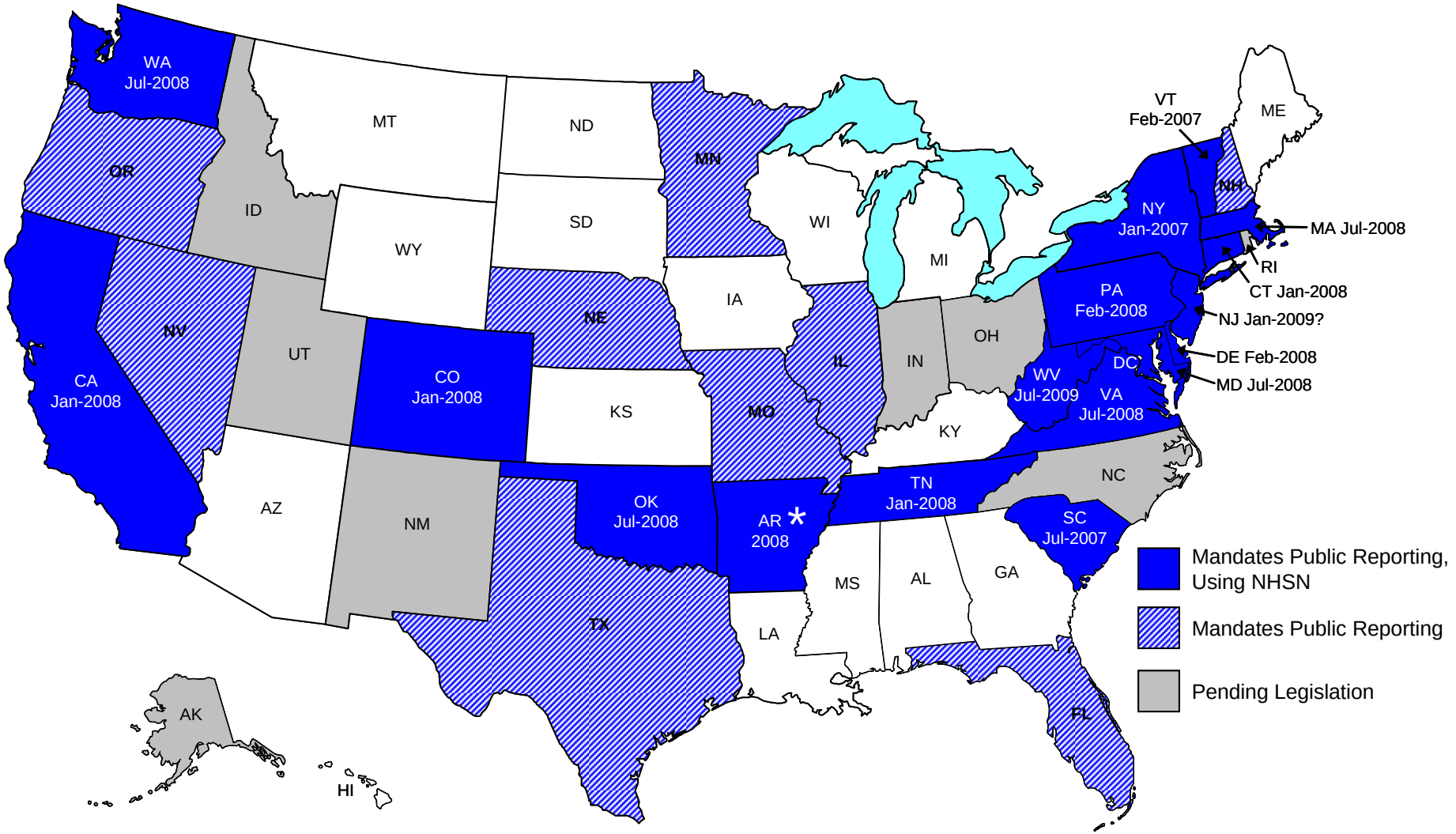


Pronovost P. New Engl J Med 2006;355:2725-32.

Common Elements for Successful Infection Prevention

- Simple, the only option
- Patient-centered, integrated with care
- Evidence-based recommendations
- Part of a “package” for prevention
- Engaging and empowering clinicians
- Protocols and systems in place
- Standardized ways for recording information about infections
- Regular feed-back of information to providers

States with Legislation to Report HAIs



* Voluntary reporting using NHSN

3/26/2008

Number of hospitals using National Healthcare Safety Network (NHSN) has tripled in the last year

April 2007

- 491 facilities enrolled
  - 44% had 201-500 beds
  - 80% were general, acute care hospitals
  - 39% were non-major teaching hospitals
- 398 actively reporting data
- 8 States using or planning to use NHSN for mandatory reporting

May 2008

- 1470 facilities enrolled
  - 34% have 201-500 beds (56% have ≤ 200 beds)
  - 91% are general, acute-care hospitals
  - 61% are non-major teaching hospitals
- 1145 actively reporting data
- 17 States using or planning to use NHSN for mandatory reporting

17 states use NHSN for public reporting

CLABSI	CO, CT, DE, IL, MA, MD, NJ, NY, OK, PA, SC, TN, VA, VT, WA
CAUTI	PA
SSI	CO, DE, MA, NJ, NY, PA, SC, TN, VT
VAP	OK, PA, SC, WA
Dialysis events	PA
MDRO*	CA, MD, NJ, PA
Process measures	CA, DE, MD, NJ, PA, VT

*Preliminary Information

As of 5/12/2008

NHSN Components and Modules

NHSN

Component Patient Safety

Events Modules
- *Device Associated*
- *Procedure Assoc.*
- *Medication Assoc.*
- *MDRO and CDAD*
- *High Risk Inpatient Influenza Vaccination*

Component Healthcare Personnel Safety

Modules
- *Blood/Body Fluid Exposure*
- *Vaccination*

Component Biovigilance

Modules
- *Hemovigilance*

Component Research and Development

eSurveillance
- *HL7 Messages*
- *HL7 CDA*

Prevention research

Data Transmission Standards

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

MDRO = Multidrug-resistant organism

CDAD = *Clostridium difficile* associated disease

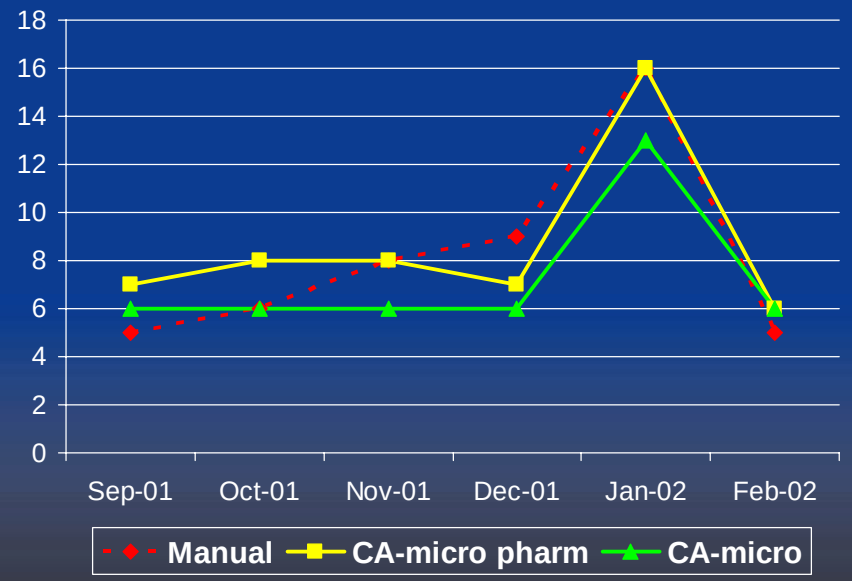
HL7 = Health Level Seven

CDA = Clinical Document Architecture

Current CDC Activities to Enhance Use of Electronic Data Sources

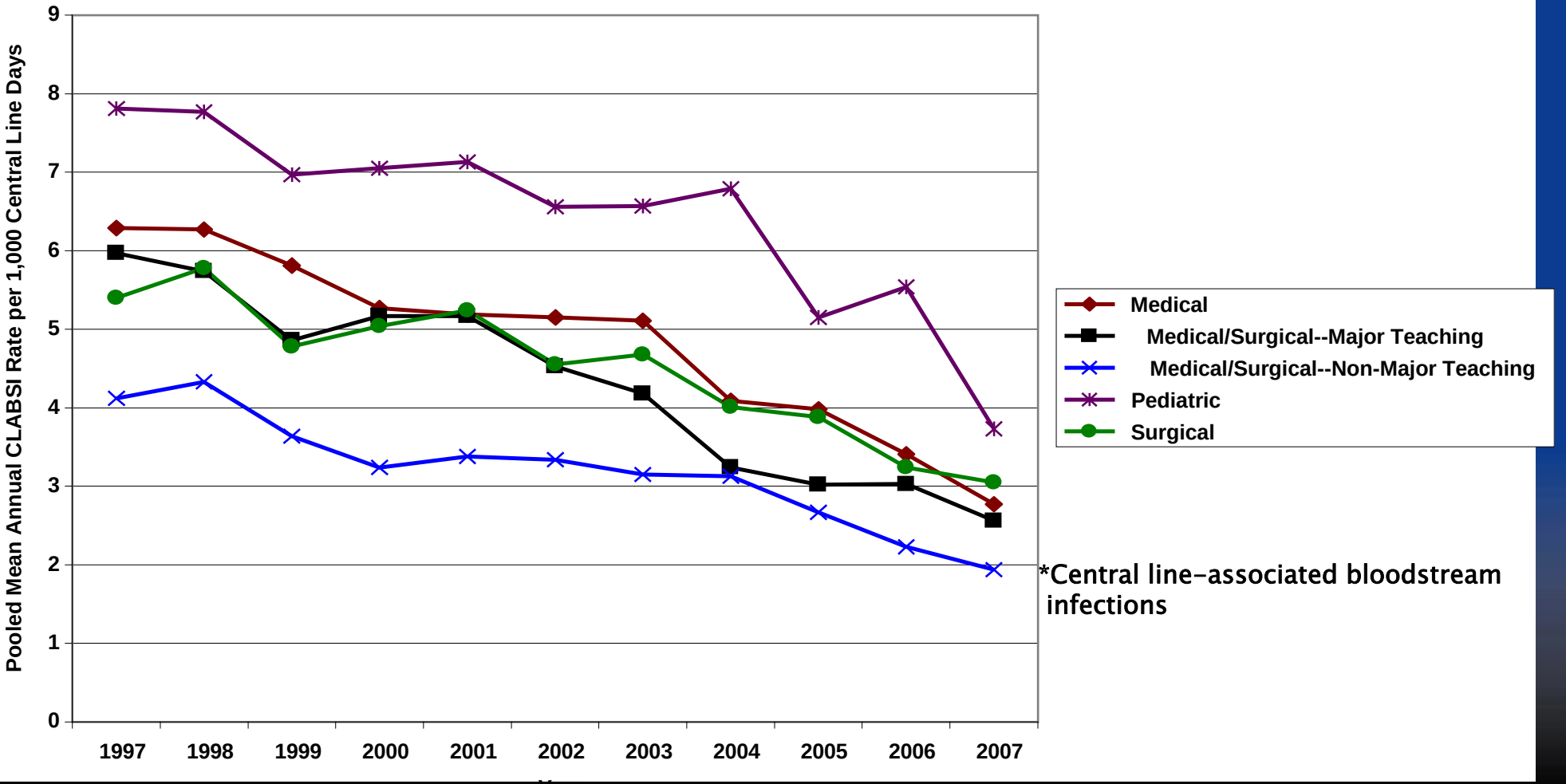
- E-surveillance
  - Clinical Document Architecture
  - Health Level 7 messaging
  - HAI detection

BSI detection, Chicago Antimicrobial Resistant Project



Hospitals Participating in NHSN are Preventing Bloodstream Infections

Trends in Bloodstream Infections* by ICU Type, United States, 1997–2007



*Central line–associated bloodstream infections

Example of potential impact of reducing one type of healthcare-associated infection: Bloodstream infections

Extra healthcare costs for a bloodstream infection	**$ 36,441** **$ 9 billion nationally**
Reductions of bloodstream infections in NHSN hospitals	Up to 70%
Potential savings if reductions in NHSN hospitals expanded nationally	Up to $ 6 billion
Estimate of impact on Medicare costs	Up to $ 2 billion

NHSN Vision

- Extensible to other healthcare settings
- Outcome measures of healthcare-associated infections
- Process of care measures
- Standards-based reporting tool
- Knowledge system

Changing World of Patient Safety

MRSA

Multi-drug resistant gram negative

C. difficile

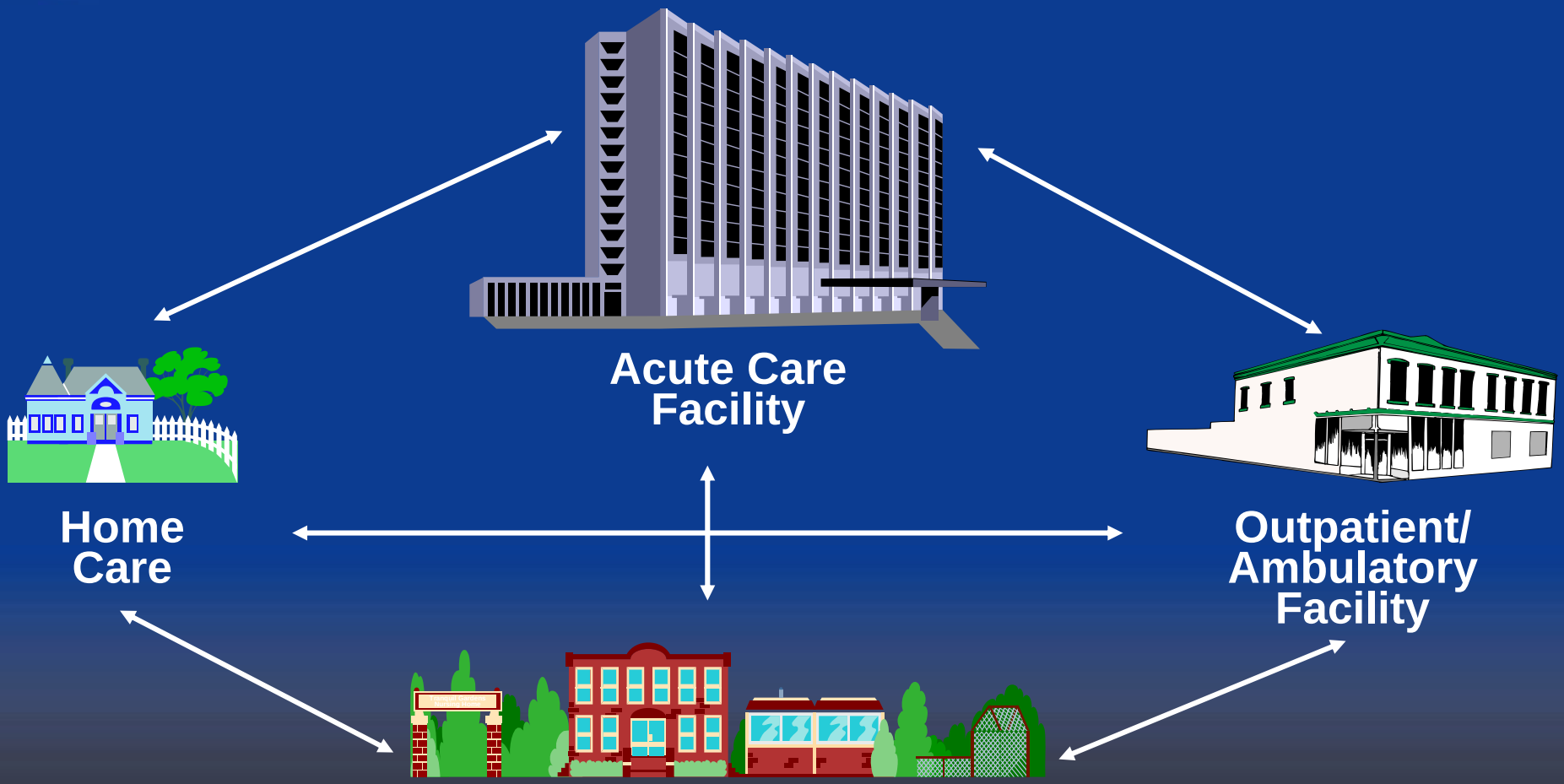
Acinetobacter

Increased use of ambulatory care settings

Antimicrobial resistance

Public reporting

Current Healthcare System



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**