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# Healthcare-Associated Infections Across the Spectrum of Care

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**Public Health**  
Learning Modules

Using **Healthy People 2020**  
to Improve Population Health



ASSOCIATION FOR PREVENTION TEACHING AND RESEARCH



College of Health Professions  
and Social Work  
TEMPLE UNIVERSITY\*

# Healthy People 2020 Objective:

“Prevent, reduce, and ultimately eliminate healthcare-associated infections (HAIs).”

# Objectives

1. Understand the burden and nature of healthcare-associated infections across the spectrum of care.
  - Discuss prevention strategies that are effective across the spectrum of care
2. Review the epidemiology associated with the most common hospital-associated infections.
3. Examine the causes of healthcare-associated infections in long-term care facilities.
4. Identify the risk for healthcare-associated infections in ambulatory care settings.



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# Part 1: Background and Definition of Healthcare-Associated Infections



# Objectives

1. Understand the burden and nature of healthcare-associated infections across the spectrum of care.
2. Review the epidemiology associated with the most common hospital-associated infections.
3. Examine how to prevent common causes of healthcare-associated infections in long-term care facilities.
4. Identify the risk for healthcare-associated infections in ambulatory care settings.

# What is a Healthcare-Associated Infection (HAI)?

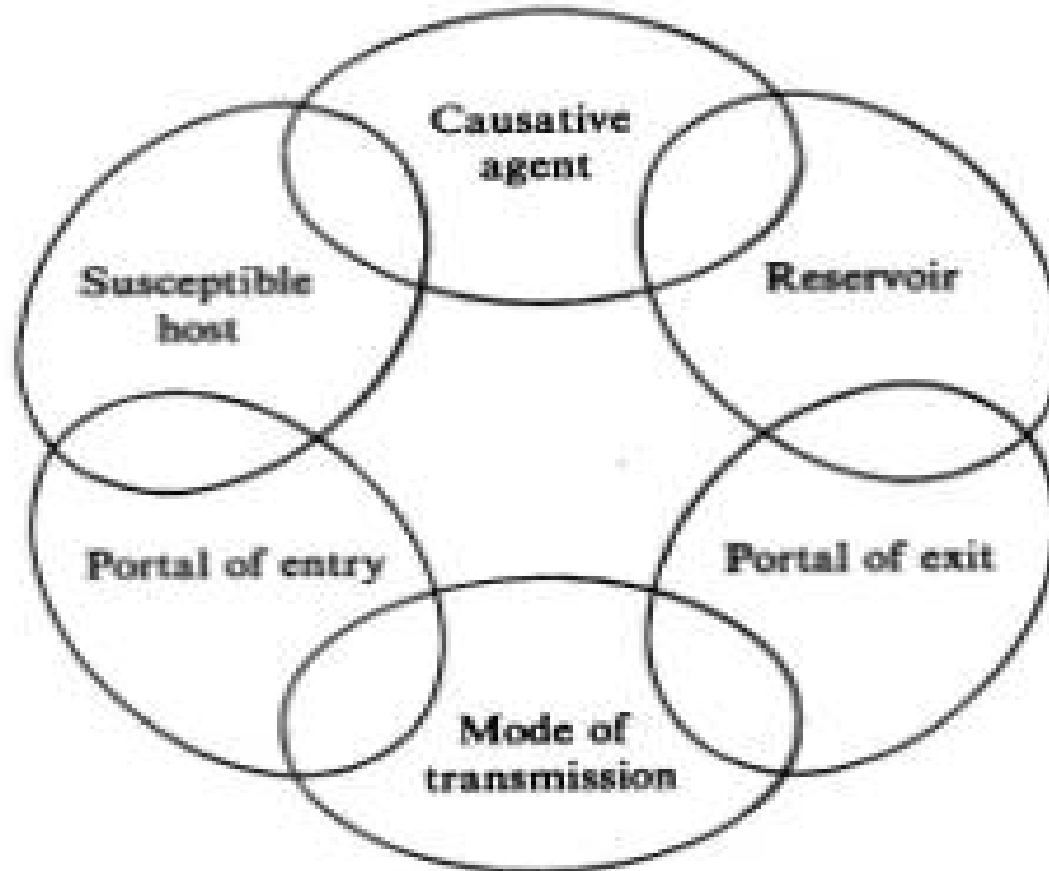
*“An infection that is neither present nor incubating at the time of admission”*

- Most commonly associated with medical devices or procedures
- Under-appreciated cause of significant morbidity in patients who receive care in settings other than acute care hospitals

# Burden of HAI

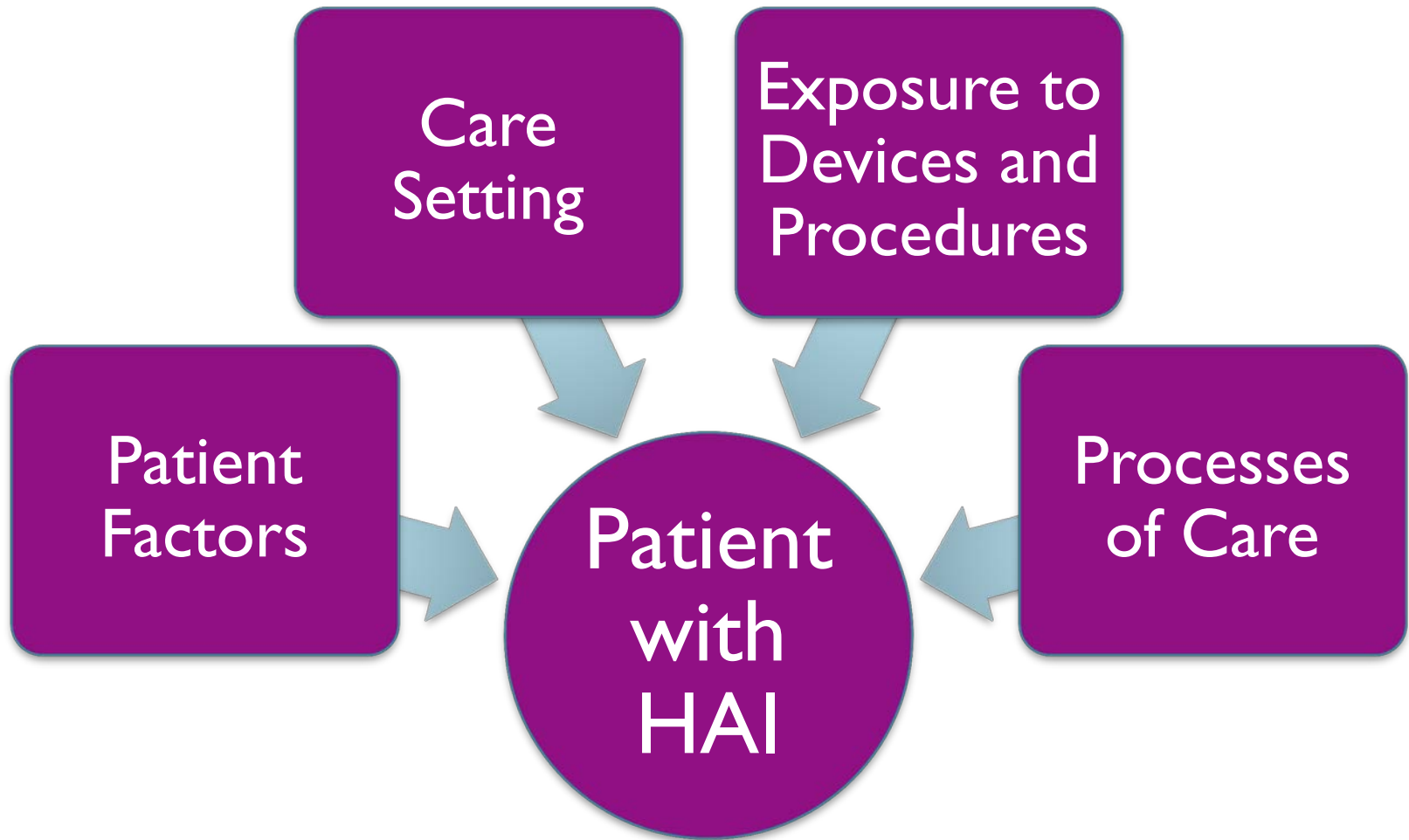
- In 2002, annual burden in U.S.
  - 1.7 million HAI
  - 99,000 attributable deaths
  - 1 out of 20 hospitalized patients in U.S. develop an HAI
- Major driver of healthcare costs (2009 data)
  - Mean attributable cost ~\$26,000 of an HAI
  - Total annual direct costs ~\$35.7 - \$45.0 BILLION dollars
- Worldwide burden of HAI even greater
  - 1 out of 5-10 hospitalized patients in resource-poor settings will get an HAI

# Chain of Infection

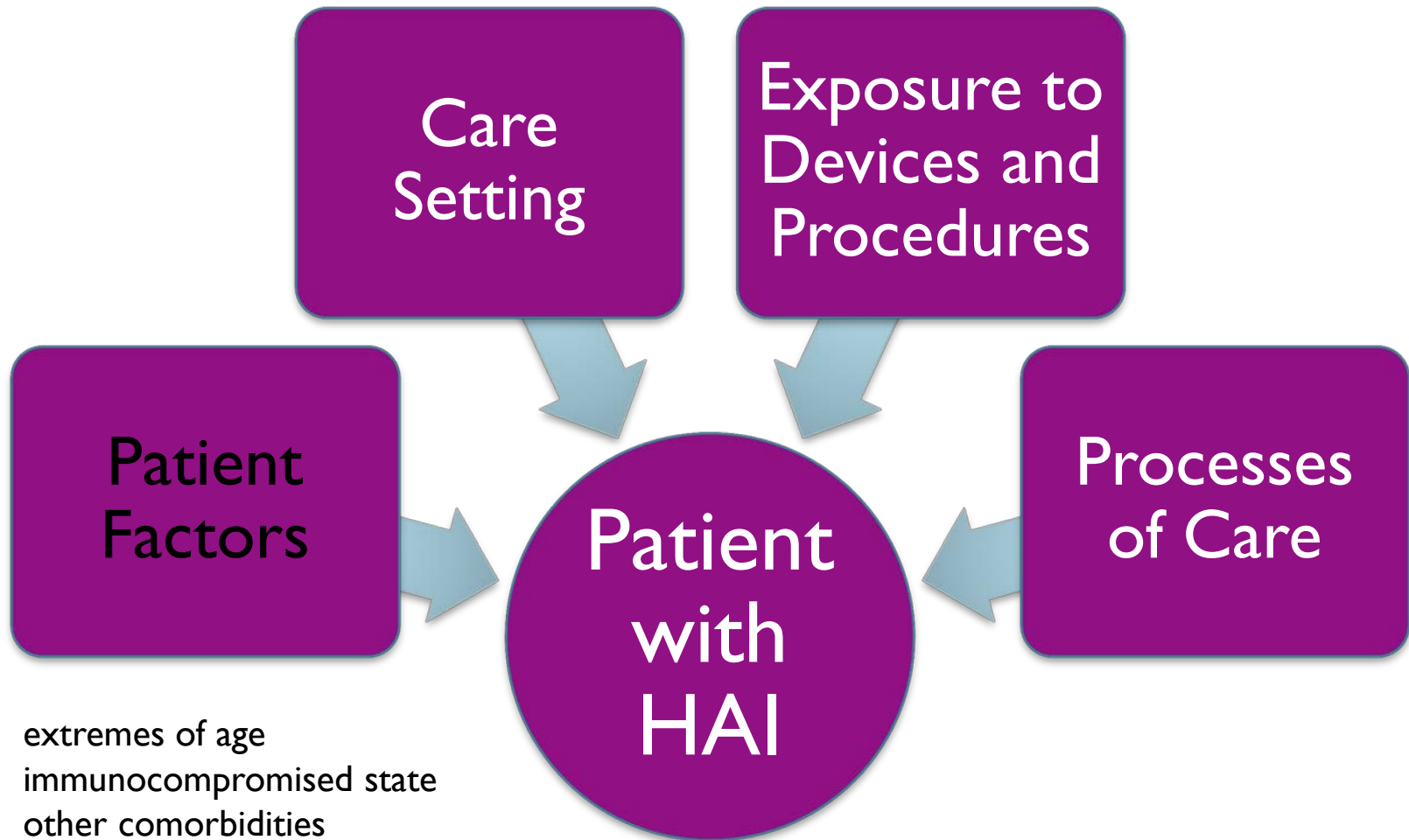




# Epidemiology of HAI



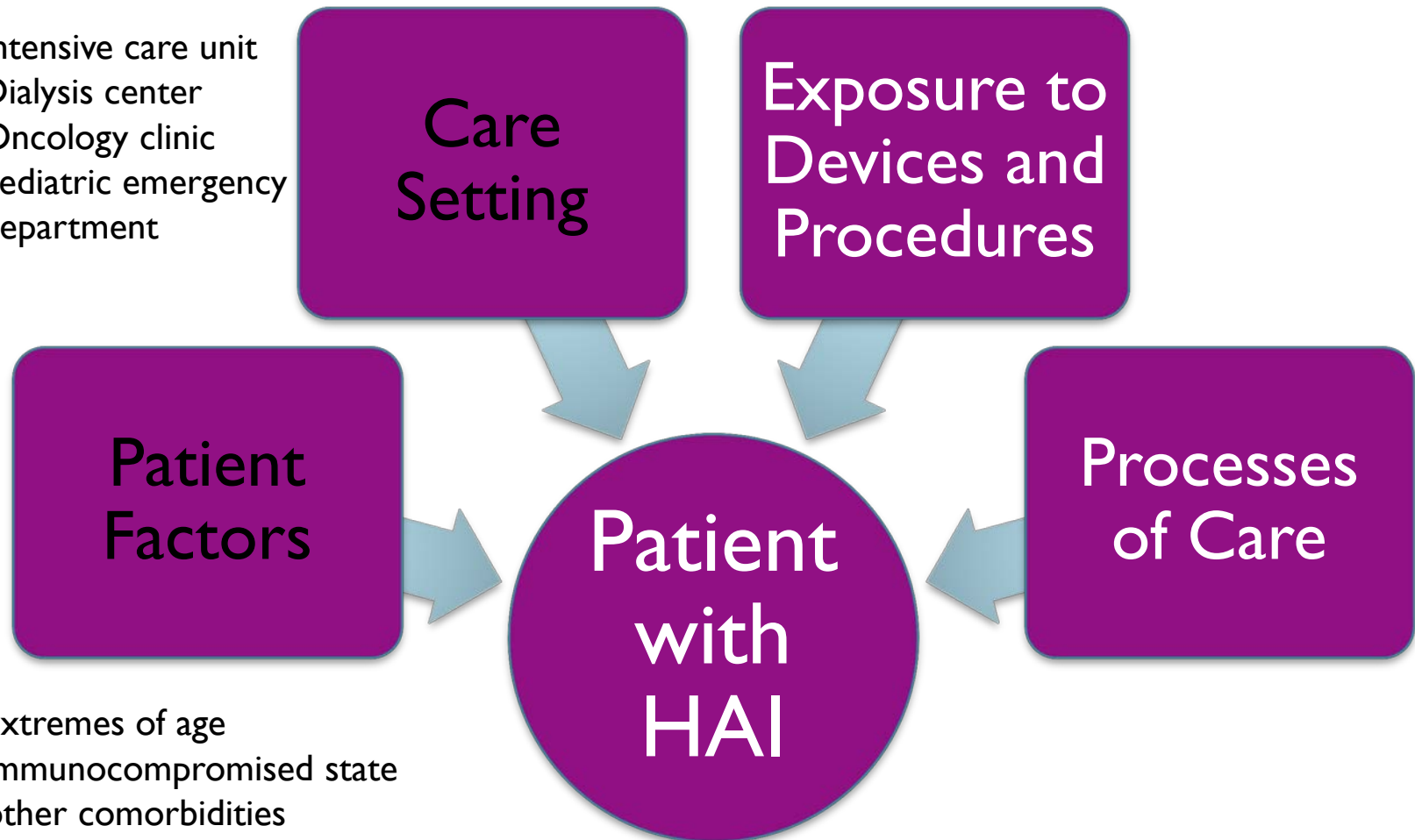
# Epidemiology of HAI



- extremes of age
- immunocompromised state
- other comorbidities

# Epidemiology of HAI

- Intensive care unit
- Dialysis center
- Oncology clinic
- Pediatric emergency department



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Care Setting

Exposure to Devices and Procedures

- Vascular catheter
- Prosthetic joints
- Elective surgeries

Patient Factors

Patient with HAI

Processes of Care

- Extremes of age
- Immunocompromised state
- Other comorbidities

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Patient Factors

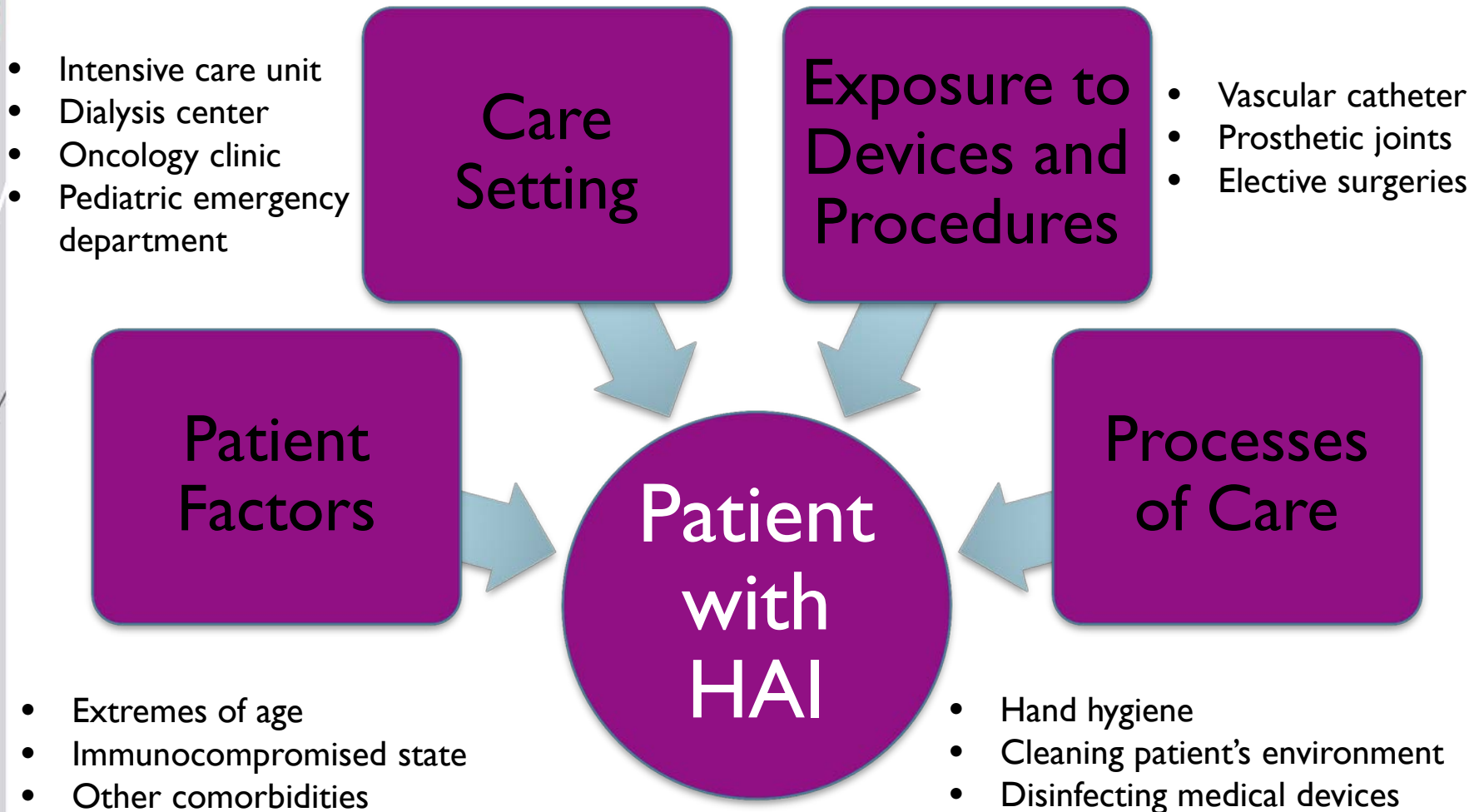
Patient with HAI

Processes of Care

- Extremes of age
- Immunocompromised state
- Other comorbidities

- Hand hygiene
- Cleaning patient's environment
- Disinfecting medical devices

# Epidemiology of HAI



# Preventing HAI

- Numerous evidence-based guidelines for HAI prevention
  - In 2011, it was estimated that ~60-75% of HAI could be prevented using current knowledge
- 2011 HHS created roadmap to eliminate HAI with 5-year targets

Metric	Source	National 5-year Prevention Target
Bloodstream infections	NHSN	50% reduction
Adherence to central-line insertion practices	NHSN	100% adherence
<i>Clostridium difficile</i> (hospitalizations)	HCUP	30% reduction
<i>Clostridium difficile</i> infections	NHSN	30% reduction
Urinary tract infections	NHSN	25% reduction
MRSA invasive infections (population)	EIP	50% reduction
MRSA bacteremia (hospital)	NHSN	25% reduction
Surgical site infections	NHSN	25% reduction
Surgical Care Improvement Project Measures	SCIP	95% adherence

# Preventing HAI

- Numerous evidence-based guidelines for HAI prevention
  - Using current knowledge, ~60-75% of HAI can be prevented
- 2011 DHHS created roadmap to eliminate HAI with 5-year targets

Metric	Source	National 5-year Prevention Target	On Track to Meet 2013 Targets?
Bloodstream infections	NHSN	50% reduction	Yes
Adherence to central-line insertion practices	NHSN	100% adherence	Retired
<i>Clostridium difficile</i> (hospitalizations)	HCUP	30% reduction	No
<i>Clostridium difficile</i> infections	NHSN	30% reduction	Data not yet available*
Urinary tract infections	NHSN	25% reduction	Yes
MRSA invasive infections (population)	EIP	50% reduction	Yes
MRSA bacteremia (hospital)	NHSN	25% reduction	Data not yet available*
Surgical site infections	NHSN	25% reduction	Yes
Surgical Care Improvement Project Measures	SCIP	95% adherence	Yes



# Strategies to prevent healthcare-associated infections

**Prevent transmission from patients/staff**

**Minimize risk by reducing exposure**

**Prevent microbial contamination and invasion**

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*Medical devices and procedures that cross barriers create opportunity for invasive infection*

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# Strategies to prevent healthcare-associated infections

## **Prevent transmission from patients/staff**

*Hands and respiratory secretions harbor hundreds of potential pathogens*

## **Minimize risk by reducing exposure**

*Medical devices and procedures that cross barriers create opportunity for invasive infection*

## **Prevent microbial contamination and invasion**

*80% of HAI arise from a patient's own flora*

# Challenges to Preventing HAI

- HAI perceived by some as “the cost of giving advanced health care”
- Success is invisible and often measured by rates and numbers
- Behavioral change is difficult to achieve and sustain
- Preventive efforts often require cooperation between different groups of healthcare workers