Carbapenem Resistant Enterobacteriaceae (CRE): An Emerging Pathogen in the Bay Area

APIC San Francisco Bay Area
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Carbapenem-resistant *Enterobacteriaceae* (CRE)

- One of 3 pathogens identified by CDC as an urgent threat

- Invasive CRE infections result in 40-50% mortality
- CRE often carry genetic mechanisms that confer resistance to many other antimicrobials, leaving limited treatment options
- CRE are highly transmissible, and resistance can be transferred between organisms (i.e. *Klebsiella* → *E.coli*)

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CRE in California

- 2012 CRE Prevalence Survey (n=319 hospitals)
  - Assessment of CRE infection prevention measures, screening practices, laboratory protocols, and staff awareness
  - Prevalence of carbapenem non-susceptible *Klebsiella* spp.

- Highest prevalence of carbapenem non-susceptible *Klebsiella* spp. among patients from:
  - Los Angeles metro area
  - Long Term Acute Care (LTAC) hospitals

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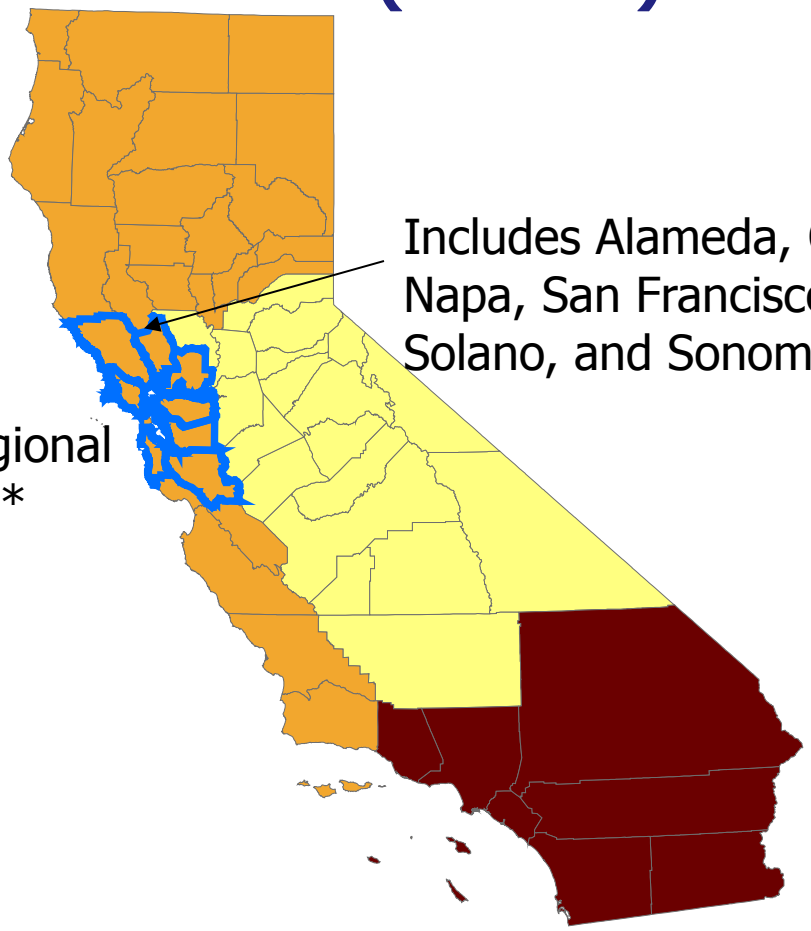
Bay Area

2012 Regional Prevalence of CRE *Klebsiella* Species per 1000 Isolates (95% Confidence Interval)

5.2 (3.4-7.3)



Includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma

Key to California Regional CRE *Klebsiella* Rates*

- 0.00-2.99
- 3.00-24.99
- 26.00-65.00

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*Rates are per 1000 isolates and adjusted for patient days

CRE in Northern California

- **"In regions with no or few CRE colonized or infected patients, there may be a critical opportunity to prevent further emergence of CRE by taking an aggressive approach early in the process."** – CDC CRE Toolkit, 2012

- Multiple clusters and outbreaks of CRE during recent years in northern California acute and long-term care facilities highlight opportunities to prevent further spread of CRE in California

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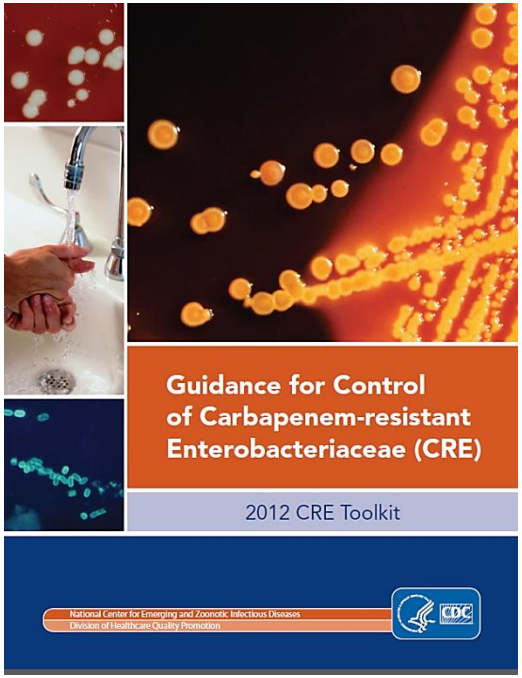
CRE Prevention Strategies for Acute and Long-term Care Facilities

CORE

1. Hand Hygiene
2. Contact Precautions
3. Healthcare Personnel Education
4. Minimize Device Use
5. Patient and Staff Cohorting
6. Laboratory Notification
7. Antimicrobial Stewardship
8. CRE Screening

Supplemental

1. Active Surveillance Testing
2. Chlorhexidine Bathing



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Regional Coordination of CRE Prevention

Public Health Activities

- Perform regional surveillance to measure scope of CRE problem
- Provide feedback to facilities on CRE prevalence
- Educate all healthcare facilities on CRE epidemiology and need for increasing vigilance
- Educate all healthcare facilities on CRE prevention measures

Facility-based Activities

- Engage administrators to prioritize CRE prevention and ensure control plan
- Provide training to HCWs
- Review practices to ensure core CRE prevention measures are in place
- Ensure CRE screening is being performed when necessary

- **Ensure communication of CRE status upon inter-facility transfers**

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Measures to Limit CRE Introduction and Spread Within and Across Facilities

- In facilities without previously identified CRE, consider targeted active CRE surveillance cultures and preemptive contact precautions for patients at risk for CRE
  - Recent stay at LTAC hospital
  - Multiple co-morbidities
  - Open wounds
  - Presence of indwelling devices
  - History of high antimicrobial use
- In facilities with known CRE, consider enhanced surveillance to identify additional CRE cases and prevent further intra-facility CRE transmission

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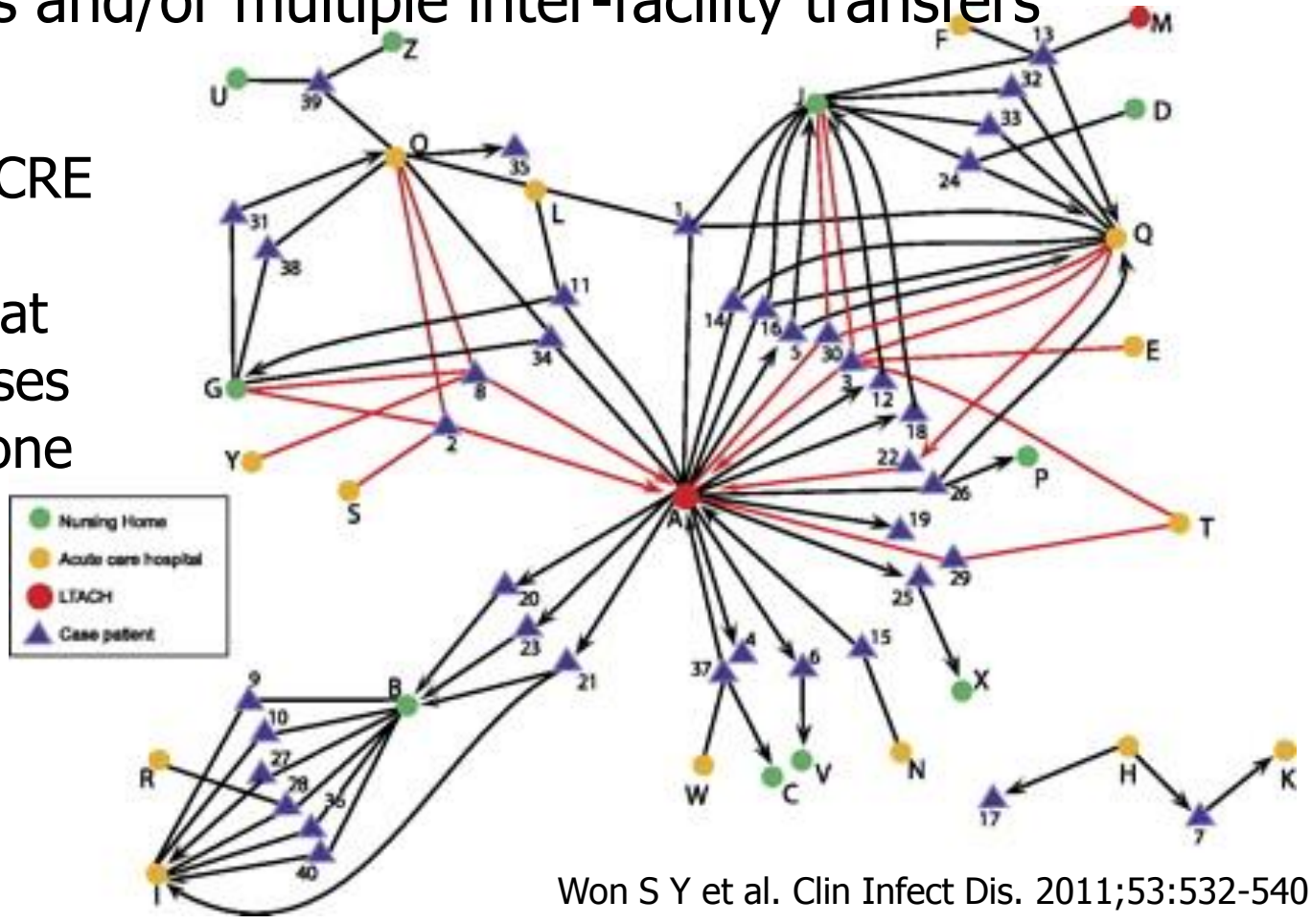
CRE and LTAC Hospitals

LTAC hospitals have the greatest numbers of CRE positive patients as a result of caring for patients after lengthy hospitalizations and/or multiple inter-facility transfers

An outbreak of KPC-producing CRE in Indiana and Illinois found that 24 (60%) of cases were linked to one LTAC hospital.

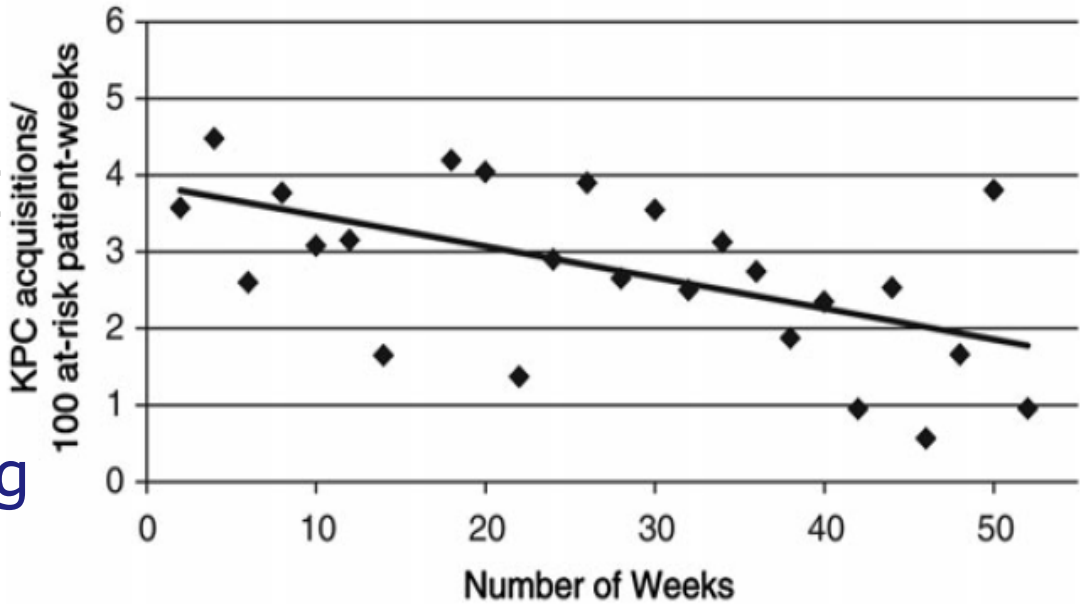


Won S Y et al. Clin Infect Dis. 2011;53:532-540

Infection Control Interventions Can Reduce CRE Transmission

A bundled approach reduced incidence of CRE colonization by half:

- Daily CHG bathing
- Adherence monitoring
- HCW education



- Screening patients upon admission
- Semi-monthly surveillance cultures
- Contact isolation and cohorting of CRE colonized and infected patients

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Hayden, et al Clin Infect Dis. 2015; 60:1154-1161

CDPH HAI Program Antimicrobial Resistance (AR) Laboratory Surveillance Network

- Primary goal: Determine and monitor AR prevalence
- Assess laboratory AR capacity
  - Identify and characterize AR pathogens
  - Perform surveillance cultures
  - Electronically report laboratory data
- Establish network of clinical laboratories, hospital infection prevention staff, and state and local PH agencies
  - Share/receive regional AR prevalence data, determine AR reference testing resources

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Discussion

- How much CRE are you seeing at your facility?
- Does your facility conduct CRE screening:
  - Upon admission?
  - Patients with risk factors for CRE?
  - Patients in high-risk units?
  - When CRE transmission is suspected?
- Does your facility place patients with known CRE colonization or infection in contact precautions?
- Does your facility cohort patients and staff for patients with known CRE colonization or infection?
- Does your facility use an interfacility transfer form, and/or perform any follow-up communication to facilities receiving patients with known CRE?

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Questions?

For more information, please contact
The HAI Program at
HAIProgram@cdph.ca.gov

Thank you

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