Collaborating with Acute Care Facilities

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Objectives

- Review the burden of health care associated infection (HAI) in Acute care and Long Term Care facilities (LTCF)
- Describe the benefits of Acute care and LTCF collaborative
- Share knowledge and expertise

HAI Burden
What is Known: Acute Care Settings

- **1.7 million infections (5% of all admissions)**
  - **Most (1.3 million) were outside of ICUs**
- **$28–33 billion in excess costs**
- **99,000 associated deaths**
- **Most common type of infections:**
  - **Bloodstream infections (BSI)**
  - **Urinary tract infections**
  - **Pneumonia**
  - **Surgical site infections**

Klevens, et al. Pub Health Rep 2007;122:160-6

Estimated Annual Hospital Cost of HAI by Site of Infection

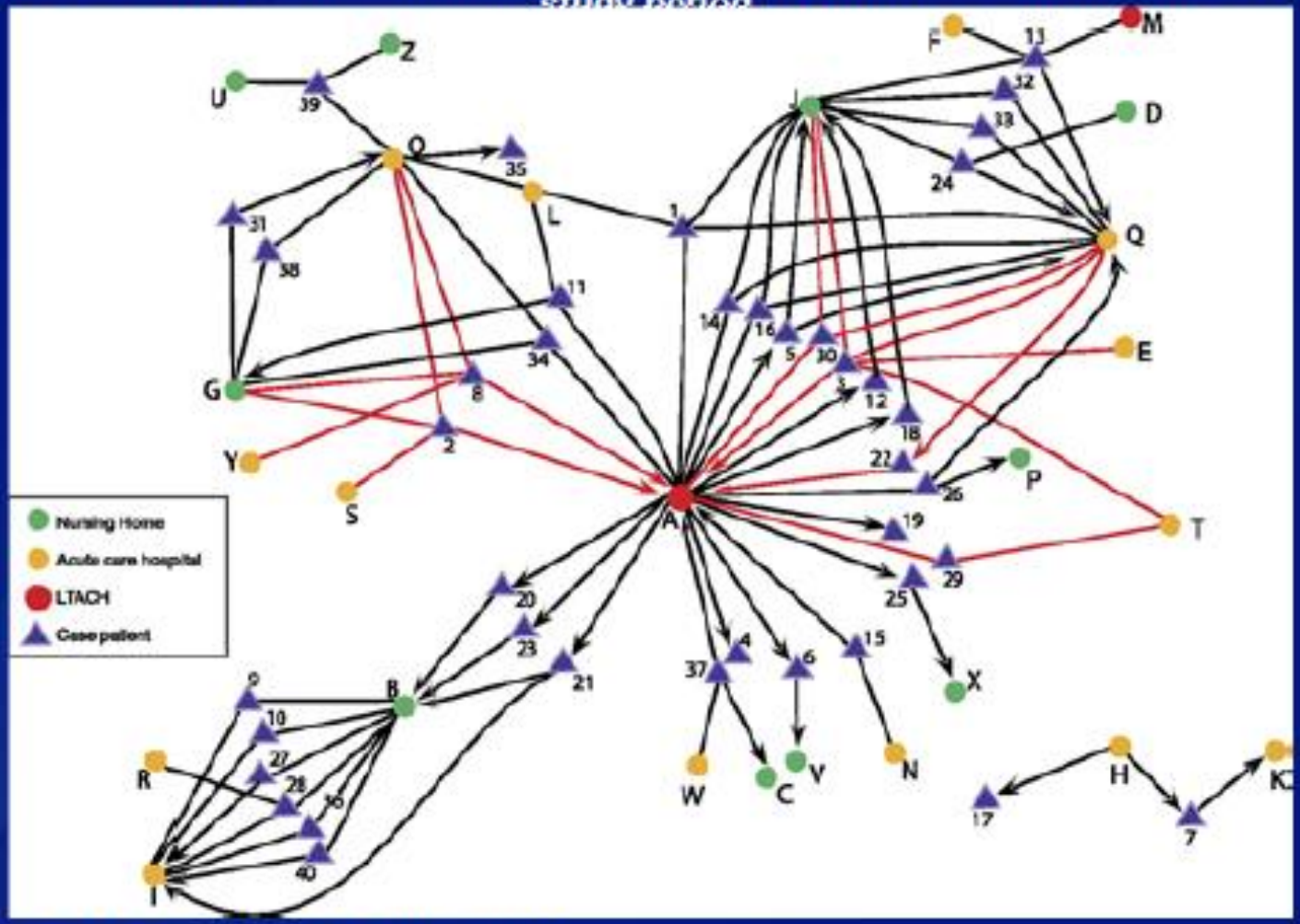
Major Site of Infection	Total infections	Hospital Cost per Infection (2002 $)	Total annual hospital cost (in millions $)	Deaths Per year
Surgical Site Infection	290,485	$25,546	7,421	13,088
Central line associated-Bloodstream Infection	248,678	$36,441	9,062	30,665
Ventilator-associated Pneumonia	250,205	$9,969	2,494	35,967
Catheter associated-Urinary Tract Infection	561,667	$1,006	565	8,205

Roberts RR, et al Clin Infect Dis 2003;36:1424-32.

Annual Impact of HAIs in LTC Setting

1.6-3.8 million HAIs[1]	• Leading cause of mortality, morbidity, resulting in 388,000 deaths
150,000-300,000 hospital admissions	• 26-50% due to infections • $673 million-$2 billion for hospitalizations[2]
Up to 70% of residents receive an antibiotic[4]	• UTI's most commonly treated infection (32%)[3] • Up to 75% of antibiotics prescribed incorrectly[4] • $38-137 million on antimicrobial therapy[2]
7-10% of all LTC residents have a urinary catheter[6]	• 88% placed in LTC or non-acute care settings[5] • 99% of catheterized residents have asymptomatic bacteriuria within 30 days[7]

Exposure network graph demonstrating the relationships of cases to long-term acute care hospitals (LTACHs), acute care hospitals, and nursing homes during the entire 12-month study period

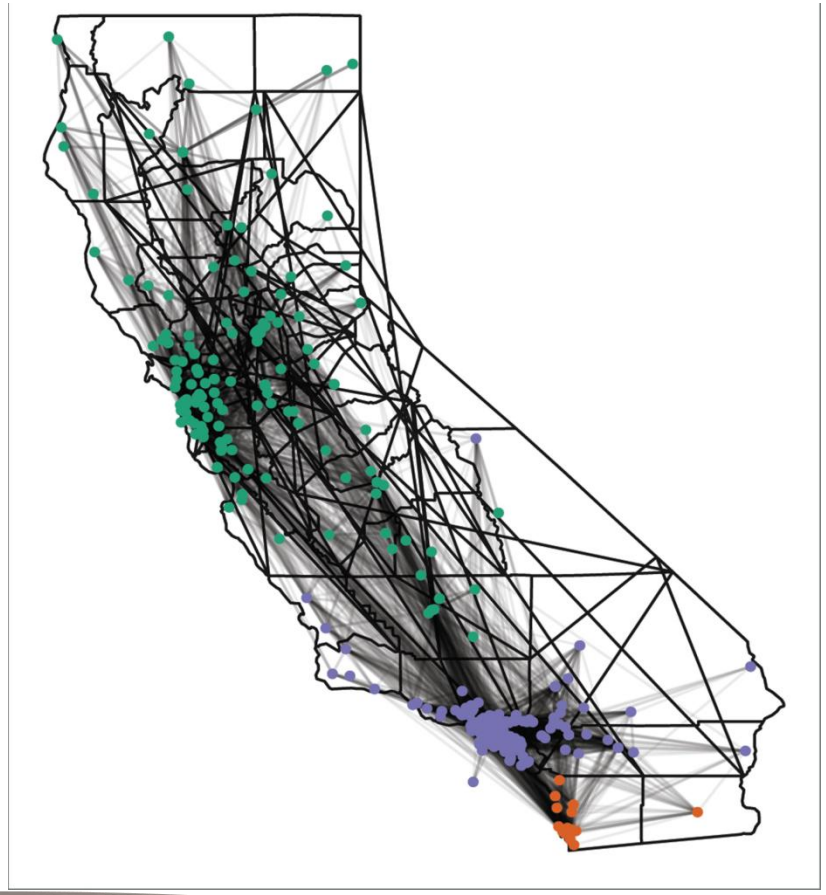


Won S Y et al. Clin Infect Dis. 2011;53:532-540

Transfers Contribute to C difficile Rate

Hospital Transfer Network Structure as a Risk Factor for *Clostridium difficile* Infection

- Hospital C difficile rates strongly predicted by
  - Total transfers from other hospitals/LTCF
  - Transfers from multiple other hospitals/LTCF



Infect Control Hosp Epidemiol. 2015 September ; 36(9): 1031–1037.

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Prevention Strategies: Supplemental

- Extend use of Contact Precautions beyond duration of diarrhea (e.g., 48 hours)*
- **Presumptive isolation for symptomatic patients pending confirmation of CDI**
- Optimize testing for CDI
- Implement soap and water for hand hygiene before exiting room of a patient with CDI
- Implement universal glove use on units with high CDI rates*
- Use Sporicidal agent for environmental cleaning
- Clinical and environmental services staff training
- **Community Outreach to local long term care facilities**

* *Not included in CDC/HICPAC 2007 Guideline for Isolation Precautions*

Recommendations for CRE Control

- Hand hygiene performance at 100%
- Contact precautions for CRE colonization/infection at 100%
- Education of staff/patients/families
- Minimize invasive devices (central line, Foley, etc.)
- Antibiotic stewardship with use reduction
- Track CRE colonization/infection/acquisition
- Detect unrecognized CRE colonization
  - CRE screening cultures
- **Develop regional control group to share data, policies, procedures, expertise**

Multifacility Cooperation Critical in Infection Prevention

Facilities work together to protect patients.

Common Approach *(Not enough)*

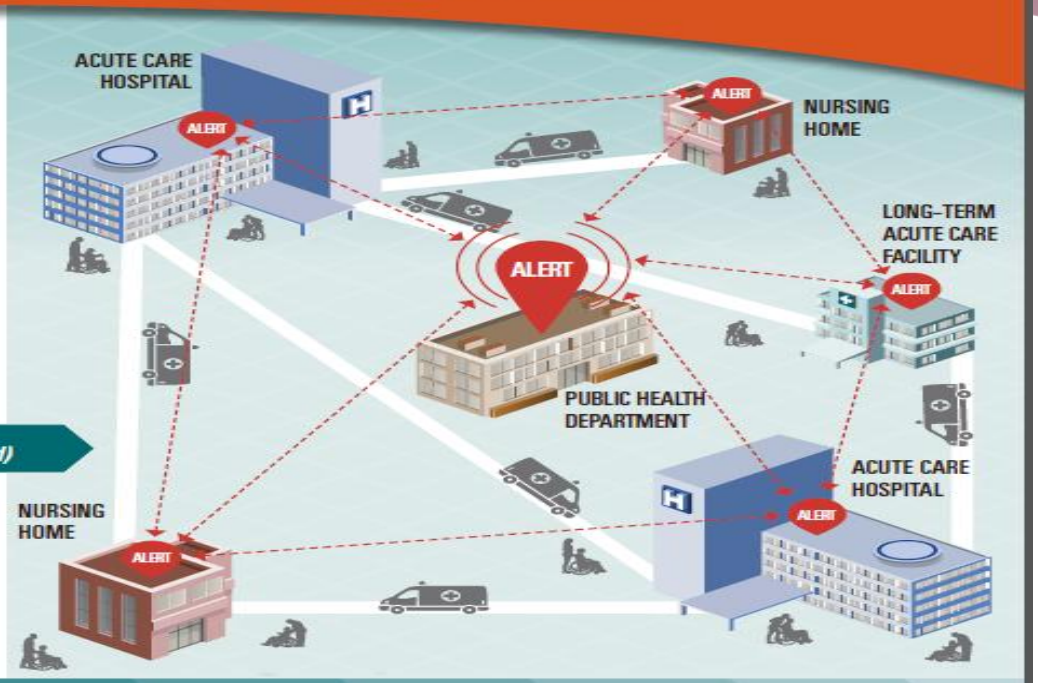
- Patients can be transferred back and forth from facilities for treatment without all the communication and necessary infection control actions in place.

Independent Efforts *(Still not enough)*

- Some facilities work independently to enhance infection control but are not often alerted to antibiotic-resistant or *C. difficile* germs coming from other facilities or outbreaks in the area.
- Lack of shared information from other facilities means that necessary infection control actions are not always taken and germs are spread to other patients.

Coordinated Approach *(Needed)*

- Public health departments track and **alert** health care facilities to antibiotic-resistant or *C. difficile* germs coming from other facilities and outbreaks in the area.
- Facilities and public health authorities share information and implement shared infection control actions to stop spread of germs from facility to facility.



More patients get infections when facilities do not work together.

(Example: 5 years after CRE enters 10 facilities in an area sharing patients)

Common Approach (status quo)
2,000 patients will get CRE.
CRE will impact 12% of patients.

Independent Efforts
1,500 patients will get CRE.
CRE will impact 8% of patients.

Coordinated Approach
400 patients will get CRE.
CRE will impact 2% of patients.

SOURCE: CDC Vital Signs, August 2015.

3

How to start a Collaborative to Improve Patient Safety?

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Resources

1. **Leadership Support and buy in**
2. **Physicians support**
3. **Infection Prevention Team, Pharmacy Laboratory**
   - **Who has vested interest?**
4. **Partner with LA County Antimicrobial Resistance Network**
   - **Signed agreement**

Be Patient and Establish Relationships

- Initiated CRE collaborative meeting in 2014-15
  - Local Acute Care Facilities/LTCF
- June 2016
  - PVHMC/ LTCF/LAPHD/HSAG
  - 8 facilities attended
  - NHSN reporting, Case Management, Infection Prevention
  - Phone call follow up
- June 2017
  - PVHMC/LTCF/LA PHD ARN
  - 9 Facilities attended
  - Survey mailed before to assess the need/structure
  - Antimicrobial stewardship, UTI and MDRO/CDI

Be Patient and Establish Relationships

- End of 2017 – 2018
  - Signed agreement with one facility
  - Infection Prevention/ID Pharmacy/Lab/LA ARN
  - Two onsite meetings to conduct gap analysis
  - Future Follow up meetings

LOS ANGELES COUNTY ANTIMICROBIAL RESISTANCE NETWORK (ARN)

Acute Care Hospital (ACH) Task	Skilled Nursing Facility (SNF) Task	Rationale
Commitment Phase		
• Leadership signs the ARN commitment form and returns to LACDPH	• Leadership signs the ARN commitment form and returns to LACDPH	• Consents facilities to participate in LAC ARN. • Satisfies Core Elements for AS for Nursing Homes - Leadership Commitment *Reference: The Core Elements of Antibiotic Stewardship for Nursing Homes*
• Identify an ARN champion (one who will lead communication between your facility to your network SNFs and LACDPH)	• Identify an ARN champion (one who will lead communication between your facility to your network ACH).	• Establishes a single point of accountability for each facility. • Satisfies Core Elements for AS for Nursing Homes - Accountability
• Identify your multidisciplinary ARN team (staff who will support activities in your network SNFs). • Ensure you have a committed ID Pharmacist available.	• Identify your multidisciplinary ASP team (staff who will support activities in your facility).	• Establishes a team within each facility. • Satisfies Core Elements for AS for Nursing Homes - Accountability
• Provide LACDPH with copy of SNF antimicrobial stewardship policy.	• Provide a copy of facility antimicrobial stewardship policy, if available, to your network ACH. • Determine which policies, if any, are being followed. Inform your network ACH. Provide documentation (i.e., tracking logs, data) if available.	• Assesses current implementation of AS policies. • Identifies gaps and directs activities/priorities that may be implemented.

LOS ANGELES COUNTY ANTIMICROBIAL RESISTANCE NETWORK (ARN)

Initial Assessment Phase		
• Provide your network SNFs with the baseline SNF AS assessment survey, to be completed by the AS lead/champion.	• ARN champion and/or ASP lead completes the baseline SNF AS assessment survey.	• Assesses current AS activities. • Identifies gaps. • Directs focus for activities and priorities.
• Conduct on-site evaluation of SNF, with LACDPH staff present.	• Participate in an on-site visit from your network ACH and LACDPH. • Ensure all multidisciplinary ASP team members are present.	• Allows LACDPH and ACH to conduct an on-site assessment of SNF, to identify gaps, and where to focus efforts.
• Review network SNF AS policies, protocols and procedures. • Identify areas for change and improvement. • Work with LACDPH to develop and implement prescribing policies and guidelines to improve antibiotic use.	• Provide current AS policies, protocols, and procedures to ACH. • Identify areas for change and improvement. • Work with your network ACH to develop and implement prescribing policies and guidelines to improve antibiotic use.	• Prioritizes interventions based on the needs of facility. • Satisfies Core Elements for AS for Nursing Homes – Action • Implements prescribing policies.

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Baseline Data Collection Phase		
• Provide support to SNF in obtaining antibiogram data from reference laboratory(ies). • Provide your ACH cumulative annual antibiogram (electronically, in Excel format).	• Request antibiogram data from your reference laboratory (electronically, in Excel format). • Provide to network ACH.	• Satisfies Core Elements for AS for Nursing Homes - Tracking
• Provide data on your facility's CDI rates, including hospital- and community- acquired. • Share your data and network SNF data with LACDPH.	• Provide data on your facility's CDI rates, including hospital- and community- acquired. • Share with your network ACH.	• Provides baseline data to assess change over time.
• Provide available data on antimicrobial use at your facility. • Provide available data on antimicrobial use at network SNF.	• Provide available data on antimicrobial use at your facility to your network ACH.	• Provides baseline data to assess change over time.

LOS ANGELES COUNTY ANTIMICROBIAL RESISTANCE NETWORK (ARN)

Education and Engagement Phase		
• Organize and host kick-off LAC ARN project meeting with LACDPH and network SNFs. • Provide feedback from baseline SNF AS assessment survey and onsite evaluation(s). • Introduce ID pharmacist as a resource to network SNFs.	• Attend LAC ARN project kick-off meeting with network ACH and LACDPH. • Establish relationship with ID pharmacist from network ACH. • Receive feedback from baseline SNF AS assessment survey and onsite evaluation. Work with your team to identify ways to mitigate gaps and reach goals.	• Develops system of support from ACH and LACDPH staff with AS expertise. • Satisfies Core Elements for AS for Nursing Homes - Drug Expertise • Establishes communication between facilities. • Establishes action plan.
• Organize and host clinician and nursing education events for network SNF(s).	• Participate in clinician and nurse education events held by your network ACH.	• Satisfies Core Elements for AS for Nursing Homes - Education • Ensures clinicians are receiving up-to-date antibiotic prescribing guidelines. • Ensures nurses are receiving up-to-date stewardship best practices.
• Provide guidance to SNF on monitoring at least one process measure of antibiotic use and at least one outcome from antibiotic use in their facility. • Provide guidance to SNF on establishing policy guidelines to guide practice changes and track the impact of the new interventions.	• Establish guidelines to monitor at least one process measure of antibiotic use and at least one outcome from antibiotic use in facility. • Establish policies and/or protocols to guide practice changes and track the impact of the new interventions. • LACDPH available to assist in data collection and analysis.	• Satisfies Core Elements for AS for Nursing Homes – Tracking • Demonstrates that antibiotic stewardship activities are successful in improving patient outcomes *References:* *The Core Elements of Antibiotic Stewardship for Nursing Homes* *Appendix A: Policy and practice actions to improve antibiotic use* *The Core Elements of Antibiotic Stewardship for Nursing Homes- Appendix B: Measures of Antibiotic Prescribing, Use and Outcomes*

COUNTY OF LOS ANGELES
Public Health

LOS ANGELES COUNTY ANTIMICROBIAL RESISTANCE NETWORK (ARN)

Prospective Data Collection and Assessment Phase		
• Collect data on hospital CDI rates, including hospital and community acquired. Share this and SNF data with LACDPH.	• Collect data on facility CDI rates, including hospital and community acquired. Share with network ACH.	• Assesses impact of LAC ARN.
• Provide available data on antimicrobial use.	• Provide available data on antimicrobial use. • LACDPH can assist.	• Assesses impact of LAC ARN.
• Provide SNF with mid- and post-surveys. • Collect responses and share with LACDPH. • If needed, work with LACDPH to identify further areas for improvement.	• Complete mid- and post- surveys to assess impact of work. • Share completed surveys with your network ACH. • If needed, work with your network ACH to identify further areas for improvement.	• Assesses impact of LAC ARN. • Identifies areas for improvement.

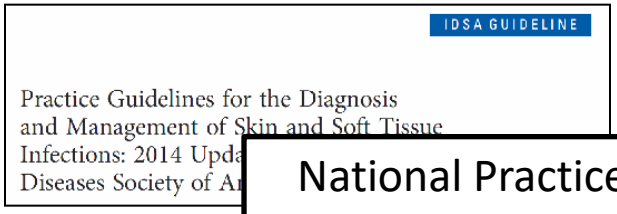
Resources to offer

- Infection Prevention Support
  - Policies, education materials/tools, NHSN
- Pharmacy
  - Antimicrobial Stewardship Policy, tools
- Laboratory
  - Reports
  - Antibiogram
  - Testing
- LTCF
  - Lab, Pharmacy, Clinical Team

Bedside Nurse Driven Antimicrobial Stewardship and Infection Prevention Rounds

- Twice weekly rounds in telemetry unit
- Rounds team:
  - Primary Nurse, Charge Nurse, Nurse Manager, Nurse Practitioner, Pharmacist, Infection Preventionist
- Target Patients
  - Antibiotics for 48+ hours, Acid suppressants for 24+ hours, Central line or Urinary catheter
- Results
  - Significant reductions in acid suppressant and Foley catheter utilization
  - Numeric reductions in length of stay, antibiotic utilization, nosocomial *C. difficile* infection

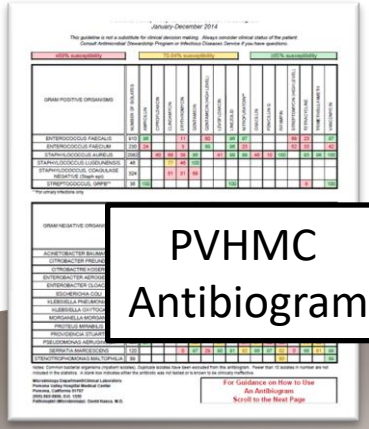
Pocket Guide for Empiric Antibiotic Therapy


IDSA GUIDELINE

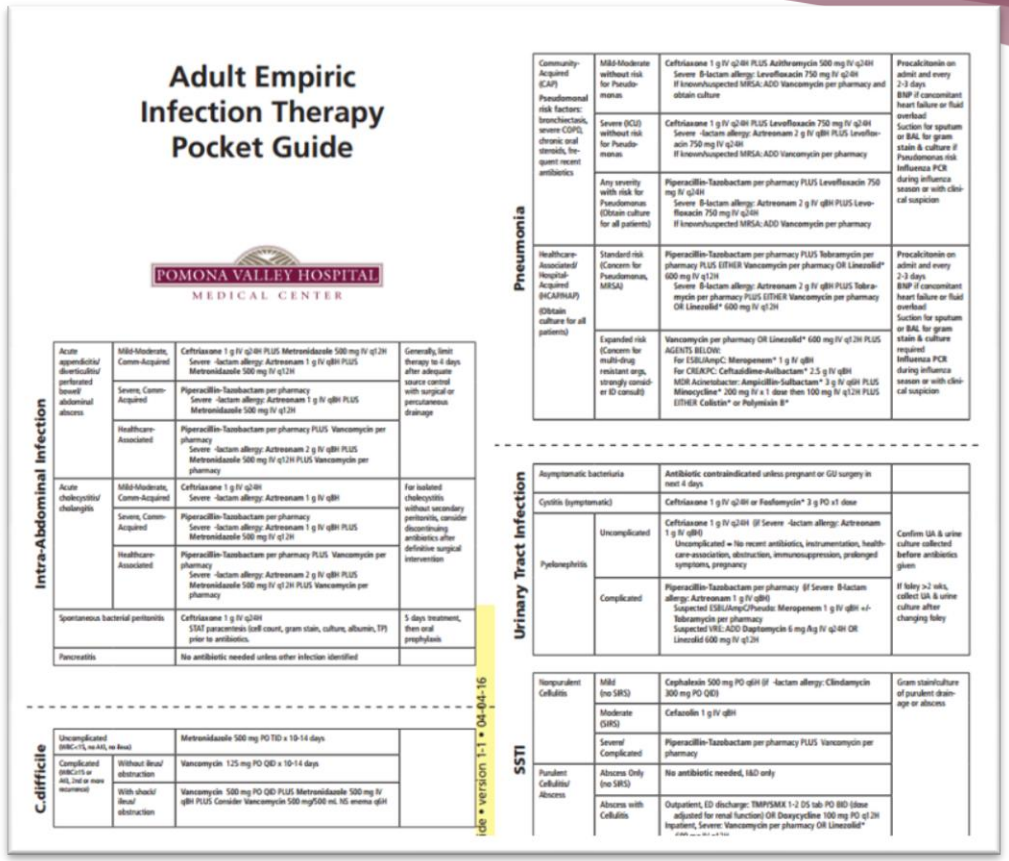
Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Upda
Diseases Society of Am

National Practice Guidelines

PVHMC Antibiotic Formulary


January-December 2014

PVHMC Antibiogram


Adult Empiric Infection Therapy Pocket Guide

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Intra-Abdominal Infection

Acute appendicitis/diverticulitis/perforated bowel/abdominal abscess	Mild-Moderate, Comm-Acquired	Ceftriaxone 1 g IV q24H PLUS Metronidazole 500 mg IV q12H Severe -lactam allergy: Aztreonam 1 g IV q8H PLUS Metronidazole 500 mg IV q12H	Generally, limit therapy to 4 days after adequate source control with surgical or percutaneous drainage
	Severe, Comm-Acquired	Piperacillin-Tazobactam per pharmacy Severe -lactam allergy: Aztreonam 1 g IV q8H PLUS Metronidazole 500 mg IV q12H	
	Healthcare-Associated	Piperacillin-Tazobactam per pharmacy PLUS Vancomycin per pharmacy Severe -lactam allergy: Aztreonam 2 g IV q8H PLUS Metronidazole 500 mg IV q12H PLUS Vancomycin per pharmacy	
Acute cholecystitis/cholangitis	Mild-Moderate, Comm-Acquired	Ceftriaxone 1 g IV q24H Severe -lactam allergy: Aztreonam 1 g IV q8H	For isolated cholecystitis without secondary peritonitis, consider discontinuing antibiotics after definitive surgical intervention
	Severe, Comm-Acquired	Piperacillin-Tazobactam per pharmacy Severe -lactam allergy: Aztreonam 1 g IV q8H PLUS Metronidazole 500 mg IV q12H	
	Healthcare-Associated	Piperacillin-Tazobactam per pharmacy PLUS Vancomycin per pharmacy Severe -lactam allergy: Aztreonam 2 g IV q8H PLUS Metronidazole 500 mg IV q12H PLUS Vancomycin per pharmacy	
Spontaneous bacterial peritonitis		Ceftriaxone 1 g IV q24H STAT paracentesis (cell count, gram stain, culture, albumin, TP) prior to antibiotics.	5 days treatment, then oral prophylaxis
Pancreatitis		No antibiotic needed unless other infection identified	

C.difficile

Uncomplicated (WBC<15, no AKI, no ileus)		Metronidazole 500 mg PO TID x 10-14 days
Complicated (WBC>15 or AKI, 3rd or more recurrence)	Without ileus/obstruction	Vancomycin 125 mg PO QID x 10-14 days
	With shock/ileus/obstruction	Vancomycin 500 mg PO QID PLUS Metronidazole 500 mg IV q8H PLUS Consider Vancomycin 500 mg/500 mL NS enema q6H

Pneumonia

Community-Acquired (CAP) Pseudomonal risk factors: bronchiectasis, severe COPD, chronic oral steroids, frequent recent antibiotics	Mild-Moderate without risk for Pseudomonas	Ceftriaxone 1 g IV q24H PLUS Azithromycin 500 mg IV q24H Severe B-lactam allergy: Levofloxacin 750 mg IV q24H If known/suspected MRSA: ADD Vancomycin per pharmacy and obtain culture
	Severe (ICU) without risk for Pseudomonas	Ceftriaxone 1 g IV q24H PLUS Levofloxacin 750 mg IV q24H Severe -lactam allergy: Aztreonam 2 g IV q8H PLUS Levofloxacin 750 mg IV q24H If known/suspected MRSA: ADD Vancomycin per pharmacy
	Any severity with risk for Pseudomonas (Obtain culture for all patients)	Piperacillin-Tazobactam per pharmacy PLUS Levofloxacin 750 mg IV q24H Severe B-lactam allergy: Aztreonam 2 g IV q8H PLUS Levofloxacin 750 mg IV q24H If known/suspected MRSA: ADD Vancomycin per pharmacy
Healthcare-Associated/Hospital-Acquired (HCAP/HAP) (Obtain culture for all patients)	Standard risk (Concern for Pseudomonas, MRSA)	Piperacillin-Tazobactam per pharmacy PLUS Tobramycin per pharmacy PLUS EITHER Vancomycin per pharmacy OR Linezolid* 600 mg IV q12H Severe B-lactam allergy: Aztreonam 2 g IV q8H PLUS Tobramycin per pharmacy PLUS EITHER Vancomycin per pharmacy OR Linezolid* 600 mg IV q12H
	Expanded risk (Concern for multi-drug resistant orgs, strongly consider ID consult)	Vancomycin per pharmacy OR Linezolid* 600 mg IV q12H PLUS AGENTS BELOW: For ESBL/AmpC: Meropenem* 1 g IV q8H For CRE/KPC: Ceftazidime-Avibactam* 2.5 g IV q8H MDR Acinetobacter: Ampicillin-Sulbactam* 3 g IV q6H PLUS Minocycline* 200 mg IV x 1 dose then 100 mg IV q12H PLUS EITHER Colistin* or Polymixin B*

Procalcitonin on admit and every 2-3 days
BNP if concomitant heart failure or fluid overload
Suction for sputum or BAL for gram stain & culture if Pseudomonas risk
Influenza PCR during influenza season or with clinical suspicion

Procalcitonin on admit and every 2-3 days
BNP if concomitant heart failure or fluid overload
Suction for sputum or BAL for gram stain & culture required
Influenza PCR during influenza season or with clinical suspicion

Urinary Tract Infection

Asymptomatic bacteriuria		Antibiotic contraindicated unless pregnant or GU surgery in next 4 days
Cystitis (symptomatic)		Ceftriaxone 1 g IV q24H or Fosfomycin* 3 g PO x1 dose
Pyelonephritis	Uncomplicated	Ceftriaxone 1 g IV q24H (If Severe -lactam allergy: Aztreonam 1 g IV q8H) Uncomplicated = No recent antibiotics, instrumentation, health-care-association, obstruction, immunosuppression, prolonged symptoms, pregnancy
	Complicated	Piperacillin-Tazobactam per pharmacy (If Severe B-lactam allergy: Aztreonam 1 g IV q8H) Suspected ESBL/AmpC/Pseudo: Meropenem 1 g IV q8H +/- Tobramycin per pharmacy Suspected VRE: ADD Daptomycin 6 mg/kg IV q24H OR Linezolid 600 mg IV q12H

Confirm UA & urine culture collected before antibiotics given

If foley >2 wks, collect UA & urine culture after changing foley

SSTI

Nonpurulent Cellulitis	Mild (no SIRS)	Cephalexin 500 mg PO q6H (If -lactam allergy: Clindamycin 300 mg PO QID)
	Moderate (SIRS)	Cefazolin 1 g IV q8H
	Severe/Complicated	Piperacillin-Tazobactam per pharmacy PLUS Vancomycin per pharmacy
Purulent Cellulitis/Abscess	Abscess Only (no SIRS)	No antibiotic needed, I&D only
	Abscess with Cellulitis	Outpatient, ED discharge: TMP/SMX 1-2 DS tab PO BID (dose adjusted for renal function) OR Doxycycline 100 mg PO q12H Inpatient, Severe: Vancomycin per pharmacy OR Linezolid*

Gram stain/culture of purulent drainage or abscess

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Something to discuss?

INFECTION CONTROL TRANSFER FORM

This form should be sent with the patient/resident upon transfer. It is NOT meant to be used as criteria for admission, only to foster the continuum of care once admission has been accepted.

Affix any patient labels here

Demographics

Patient/Resident *(Last Name, First Name)*:

Date of Birth: | MRN: | Transfer Date:

Sending Facility Name:

Contact Name: | Contact Phone:

Receiving Facility Name:

⚠ Currently in Isolation Precautions? ☐ Yes

If Yes, check: ☐ Contact ☐ Droplet ☐ Airborne ☐ Other:

☐ No isolation precautions

Organisms

Did or does have (send documentation, e.g. culture and antimicrobial test results with applicable dates):	Current (or previous infection or colonization, or ruling out*
MRSA	☐
VRE	☐
Acinetobacter resistant to carbapenem antibiotics	☐
E. coli, Klebsiella or *Enterobacter* resistant to carbapenem antibiotics (CRE)	☐
E. coli, Klebsiella resistant to expanded-spectrum cephalosporins (ESBL)	☐
C. difficile	☐
Other^: *^e.g. lice, scabies, disseminated shingles, norovirus, influenza, TB, etc.*	☐ (current or ruling out*)

*Additional information if known:

☐ No known MDRO or communicable diseases

Symptoms

Check yes to any that currently apply**:

☐ Cough/uncontrolled respiratory secretions
☐ Incontinent of urine
☐ Vomiting
☐ Concerning rash (e.g.; vesicular)
☐ Acute diarrhea or incontinent stool
☐ Draining wounds
☐ Other uncontained bodily fluid/drainage

**NOTE: Appropriate PPE required ONLY if incontinent/drainage/rash NOT contained.

☐ No Symptoms / PPE not required as "contained"

PPE

PERSONAL PROTECTIVE EQUIPMENT CONSIDERATIONS

☐ ☐ ☐

CHECK ALL PPE TO BE CONSIDERED AT RECEIVING FACILITY

ANY YES ← Answers to sections above → ALL NO

Person completing form:
Role: Date:

Other MDRO Risk Factors

Is the patient currently on antibiotics? ☐ Yes ☐ No

Antibiotic:	Dose, Frequency:	Treatment for:	Start date:	Stop date:

Does the patient currently have any of the following devices? ☐ Yes ☐ No

☐ Central line/PICC, Date inserted:
☐ Hemodialysis catheter
☐ Urinary catheter, Date inserted:
☐ Suprapubic catheter
☐ Percutaneous gastrostomy tube
☐ Tracheostomy
☐ Fecal management system

IZ

Were immunizations received at sending facility? ☐ Yes ☐ No

If yes, specify: Date(s):

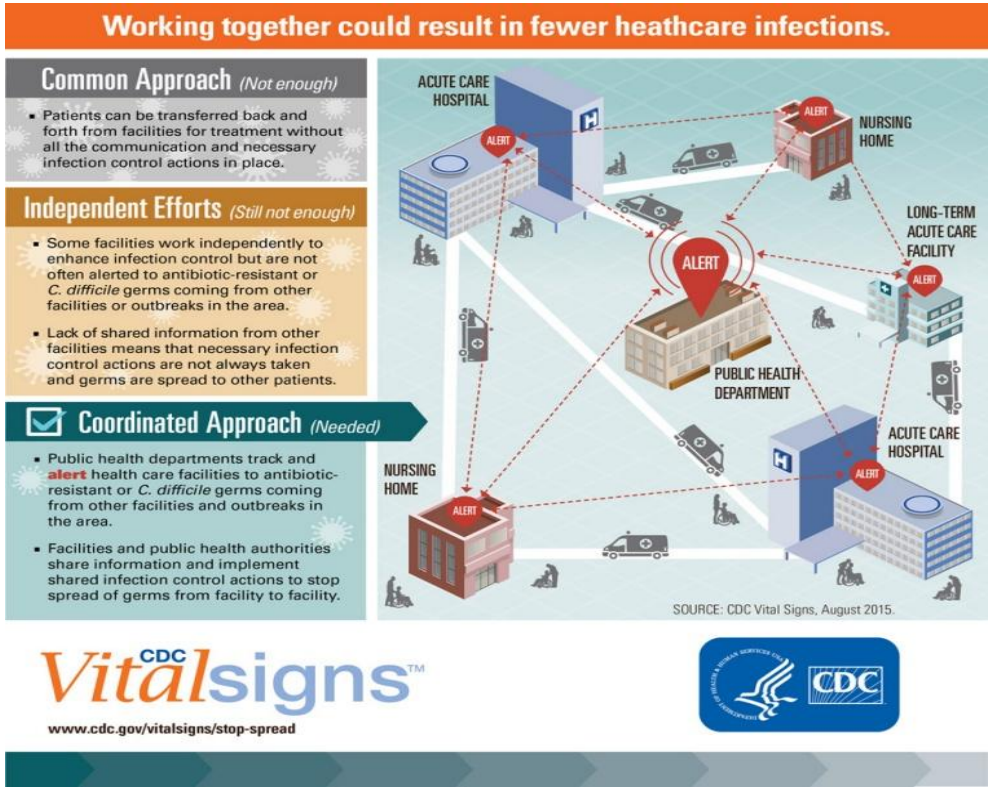
Health Care Ecosystem Microbiome

- Patient safety best served through cooperation between
  - Acute care hospitals
  - Nursing homes
  - Long term hospitals
  - Outpatient care
- Infection control
- Antibiotic stewardship
- Customer Satisfaction

Source: Centers for Disease Control and Prevention. "Making Healthcare Safer: Stop Spread of Antibiotic Resistance." *CDC Vital* Signs. August 2015.

Resources for Regional Infection Prevention and Antibiotic Stewardship Teamwork

- LA County Public Health
  - Infection prevention consultative assessment
  - Regional antimicrobial resistance network



Source: Centers for Disease Control and Prevention. "Making Health Care Safer: Stop Spread of Antibiotic Resistance." *CDC Vital* Signs. August 2015.

Thank you

- LA PHD ARN
  - Alicia Pucci, RN, BSN, PHN
  - Dr. James McKinnell
  - Sandeep Bhaurla, MPH
  - Karen Cho, RN, PHN
- PVHMC Team

Questions

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