Ask an IP
Learning and Communication Series
Microbiology and Lab Essentials for SNF IP

Wednesday April 8th, 2026

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Los Angeles County Department of Public Health

County of Los Angeles Public Health

Disclosures

There is no commercial support for today's call

Neither the speakers nor planners for today's call have disclosed any financial interests related to the content of the meeting

This call is meant for healthcare facilities and is off the record and reporters should log off now

Housekeeping

- **Microphones** are disabled. For questions, please use the chat.
- **Cameras:** please keep them turned off during the presentation.
- **Recording**: the presentation is being recorded and will be posted on the Ask an IP Website within a week following the session.

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Contact Us: LACSNF@ph.lacounty.gov

Website:
http://publichealth.lacounty.gov/acd/AskAnIPProgram/index.htm

Questions

If you have any questions, please hold on to them until the Q & A portion at the end of the session.

Some of your questions that arise throughout the presentation may be answered during the presentation.

Thank you☺

Objectives

- Review basic microbiology concepts needed for Skilled Nursing Facility IPs
- Identify relevant infection prevention and control elements of lab: specimen collection, handling, technique
- Review key information on lab reports and how to read and interpret results

Microbiology Basics

Why does Lab and Microbiology matter?

- High MDRO burden in our SNFs
- Frequent antibiotic over-prescription and misuse
- Lab results help drive decisions

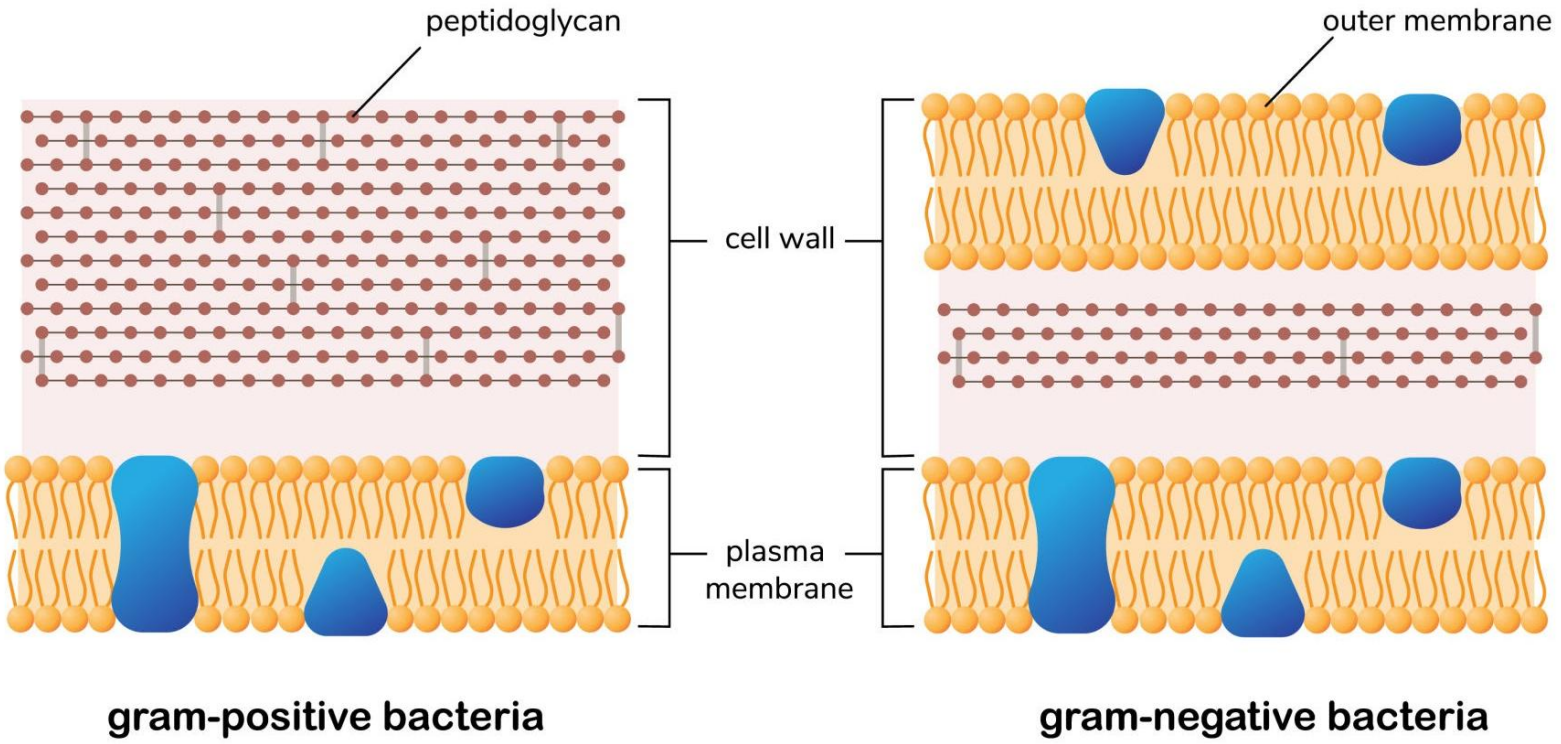
Microbes: The Invisible Threat

- Microbes vary in size and shape
- Invisible to the eye
- Can live on shared equipment, surfaces, and our SNF environment for extended periods of time…possibly forever
- A small “miss” in cleaning and disinfection today, can become a massive outbreak tomorrow.

The Big Three: Bacteria

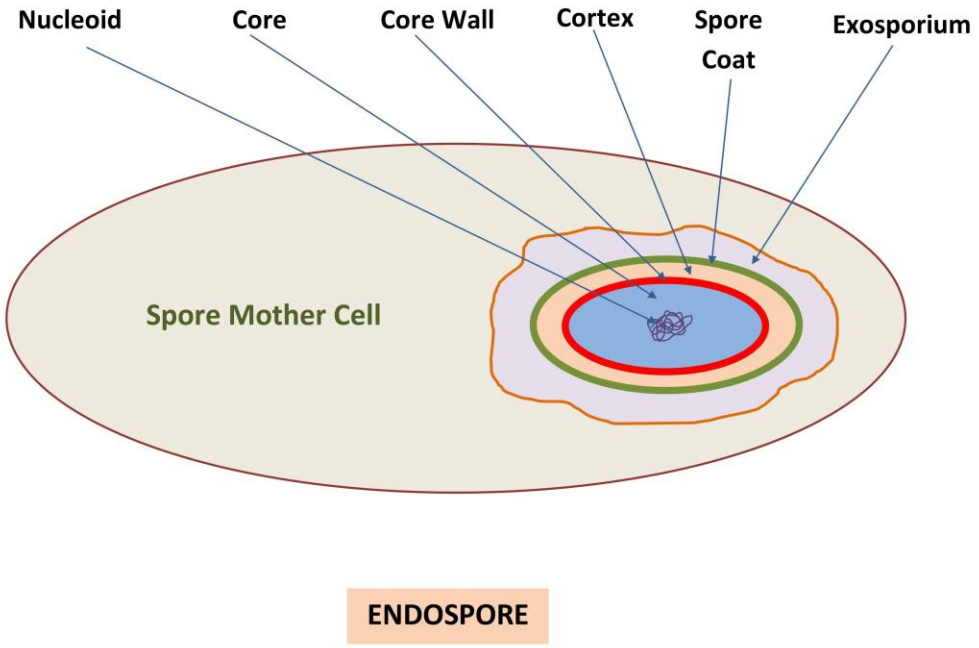
- Bacteria: tiny, single-celled microorganisms found everywhere on Earth
  - Soil, water, and in/on the human body
- Common infection causing bacteria in SNF:
  - Methicillin-resistant Staphlyoccous aureus (MRSA), Clostridioides difficile (C. diff), E. coli, Vancomycin-resistant enterococci (VRE), Pseudomonas aeruginosa, Klebsiella pneumoniae, Group A Streptococcus (GAS)
- Gram positive vs gram negative
- Antibiotic resistance increasing!
- Many bacteria (like E.coli) double every 20 minutes

Gram-positive vs gram-negative cell wall



Endospores

- "Super-survivors"
- Tough, dormant, and non-reproductive structures
- Examples: C. diff
- Sporicidal used to disinfect



The Big Three: Fungi

- A type of yeast that behaves like a superbug that can persist on surfaces for weeks
- Example: C. Auris, which is very relevant to our county.
- Environmental contamination
- Can be hard to treat
- Thrives in settings with elderly residents with weakened immune systems

The Big Three: Viruses

- A tiny, infectious agent smaller than a bacteria
- Can multiply rapidly
- Infects host cells
- Cannot survive and reproduce on their own
- Preventing transmission is key! Some can live on surfaces longer than others
- Common viruses in SNFs:
  - influenza, SARS-COV-2, RSV, Norovirus

Audience Question:

- What is a common example of a BACTERIA that is found in SNFs?

Pathogen vs Normal Flora

- Normal Flora: permanent residents, these are the helpful and neutral microbes that live on our skin layers and usually protect us
- Pathogens: unwanted visitors, these are things that do not belong on the outside of our body, they are designed to invade tissues, bypass our immune system, and cause active disease
- **In a SNF setting, some of our "normal" flora can become a pathogen if it gets in the wrong place**
  - For example: a skin microbe entering the bloodstream through IV or a surgical wound. OR GI microbe entering through catheter, urinary tract

Audience Question:

- What is the difference between normal skin flora and a pathogen?

The Lab is Your Friend

Specimen Collection: Sources

- Urine
- Wound
- Stool
- Respiratory
- Blood

Specimen Collection: Urine

- Clean-catch midstream: used for residents who can follow command/don't have indwelling device
- Indwelling catheter (Foley): never collect from drainage bag. Specimen must be taken from sampling port using a sterile syringe after disinfecting the port
- Straight catheter: used when a clean catch is impossible and permanent catheter isn't present
- **Note: don't test asymptomatic residents**
- **Note: make sure sample is filled to the "fill line"**

Specimen Collection: Wound

- Wound swab: clinical staff should clean the wound with sterile saline first to remove surface debris before swabbing the deep tissue or the “leaning edge” of the wound to find the true pathogen
- Cellulitis: generally diagnosed clinically, but sometimes drainage (or exudate) fluid can be tested/collected
- **Note: clean surface before swabbing**

Specimen Collection: Respiratory

- Sputum: can be challenging to collect with elderly residents
- Nasopharyngeal (NP) or anterior nares swabs: primarily for viral PCR testing (COVID, Flu, RSV)
- Oropharyngeal (throat) swabs: used for suspected strep or other bacterial pharyngitis
- **Note: deep cough is better than spit**

Audience Question:

- What type of lab testing does your facility use for Respiratory specimens?

Specimen Collection: Stool (GI)

- C. diff testing: lab needs stool (most likely liquid stool). Testing a formed (non-liquid) stool can often lead to detecting colonization vs active infection, which may result in over-treatment
- Rectal swab: often used for “Screening” to see if a resident is a carrier of VRE or CRE upon admission from hospital
- **Note: liquid stool only for C.diff PCR**

Specimen Collection: Blood

- Source: usually two sets from two different sites
- **Note: contamination from skin flora can be a major issue here, and is a big reason why proper skin antisepsis is essential knowledge for all of your staff**

Preparation and Supplies

- Make sure you have all supplies when you begin collection
- Check expiration dates
- Ensure the right container for the right test
- Pre-labeling

Specimen Collection: Technique

- Preparation & Supplies
- Sterile environment (aseptic technique)
- Hand hygiene & PPE

Scenario:

- A nurse is about to collect a wound specimen, she did not bring gloves with her. She proceeds to collect specimen without gloves, and sends off to the lab.

- What went wrong with this scenario?

Scenario: Answer

- No gloves
- No aseptic technique
- Could have resulted in false positive

Hand hygiene and PPE

- Glove changes
- Hand hygiene: prior, during, and after
- TBP, if needed.

Sterile environment

- Site preparation
- Aseptic technique
- Contamination awareness

Scenario:

- There is a patient urine sample that has been sitting at the nurse's station for 3 hours before going to the lab.
- Urine specimen was sent to the lab.
- Lab results came back: patient is positive for UTI

- What is wrong this picture?

Scenario: Answer

- Specimen was out too long
- Should not have been sent to lab
- Improper handling may result in false positive (e.g., UTI)

Handling and Transport

- Urine: sterile container, and refrigerate immediately to prevent “overgrowth” of bacteria, fill to line.
- Blood: fill to the designated line, and keep at room temperature, never refrigerate blood cultures
- Wound: store at room temperature
- Respiratory: place swabs in viral transport media, or sterile cup (sputum), refrigerate immediately
- Stool: sterile, leak proof container, fresh stool should be refrigerated immediately if it can not be examined and processed within two hours of collection, refrigerated sample should be tested within 24-48hrs.

Specimen processing

- Make sure your staff and receiving lab or transport staff know procedures for handling and transporting specimen
- Detail any methods used in policies
- May also specify any selective culture media or supplements used

Volume and quality

- Enough to test depending on sample or test
- Representative sampling

Documentation

- Current antibiotics
- Source specificity
- Proper labeling is a key first step in antibiotic stewardship

Audience Question:

- Have you had a physician prescribe antibiotics for a patient with an organism they have a documented history of being resistant to?
- If yes, what did you do in this situation?

How to Read Lab Reports for SNF IPs

Things that should be on the report!

- Header Information
- Patient details
- Sample information
- Specimen processing
- Microbiological analysis
- Reference range and interpretation
- Reporting units

Header Information

- Name and logo of the lab and/or facility included
- Report title displayed (i.e. urine culture report)
- Patients full name, Date of birth, and unique id

Patient details

- Patient details: age, gender, relevant medical history or presumptive dx sometimes included
- Date and time of sample collection
- Ordering physicians name and contact information

Sample Information

- Type of sample collected (i.e. midstream urine, catheterized urine, etc.)
- Date and time that sample was received at lab
- Mention any special instructions related to sample handling, if applicable

Microbiological Analysis

- Results of testing/culture results information
- Positive or negative results clearly presented for things like Respiratory PCR
- Including type and number of microorganisms isolated
- Colony count is included for each identified organism
- Indicates whether microorganism are categorized as significant or contaminants
- Includes antimicrobial susceptibility testing (AST) results for significant isolates

Positive, Negative, Indeterminate

- Positive: pathogen found, triggers next step in identification and/or susceptibility testing
- Negative: no significant pathogen present, or no bacteria grew after certain indicated time-period
  - Can be a false negative if resident is on antibiotics before sample taken
- Indeterminate: can mean that the sample was contaminated with skin or environmental bacteria, typically 3 or more, usually results in a re-collection for clarity.

Colony counts CFU (colony forming units)

- <10,000 CFU/mL: normal or insignificant
- 10,000-100,000 CFU/mL: gray zone, interpreted in combination with symptom presentation
- >100,000 CFU/mL: typically, a confirmed infection, however high colony count with no symptoms is colonization, not infection.

Colonization vs Infection

- Colonization refers to the presence and multiplication of microorganisms on or in the body without causing symptoms or an immune response. In contrast, infection occurs when these organisms invade body tissues, causing damage, an immune response, and clinical symptoms of disease
- Just because a microbe is there on a skin swab or chronic wound does not mean its causing disease
- We treat the patient, and not just a lab report. There are many things that go into a diagnosis and treatment.
- Prevent the over prescription of antibiotics as much as we can

Microorganism Identification

- Genus and species: Escherichia (genus) coli (species) = E. coli
- Significance: pathogen vs skin flora for example, C. Auris vs Staph epidermidis

Sensitivity

- Antimicrobial Susceptibility Testing = AST
- Susceptible: use this
- Intermediate: use with caution
- Resistant: do not use!
- MIC: minimum inhibitory concentration: lowest does of a drug that stops bug from growing

Example of MDRO Lab Report

Reportable Tests: Blood Culture Gram Negative Pathogen Panel

See Values: Klebsiella pneumoniae, DNA (A), OXA (CRE resistance gene), DNA (A)

Blood Culture GN Panel, PCR (Final result)

Test Analyte	Result Value
Escherichia coli, DNA	Not Detected
Pseudomonas aeruginosa, DNA	Not Detected
Klebsiella pneumoniae, DNA	**Detected (A)**
Klebsiella oxytoca, DNA	Not Detected
CTX-M (ESBL resistance gene), DNA	Not Detected
Enterobacter species, DNA	Not Detected
Proteus species, DNA	Not Detected
Acinetobacter species, DNA	Not Detected
Citrobacter species, DNA	Not Detected
OXA (CRE resistance gene), DNA	**Detected (A)**
IMP (CRE resistance gene), DNA	Not Detected
KPC (CRE resistance gene), DNA	Not Detected
VIM (CRE resistance gene), DNA	Not Detected
NDM (CRE resistance gene), DNA	Not Detected

Scenario: Candida

You have a new admission to your facility. They have no known history of MDROs, no indwelling device, no wounds, and does not meet criteria for EBP or any other TBP.

The sending facility then sends a lab report that confirms that patient has >100,000 CFU/mL of *Candida albicans.*

- What type of precautions would you place this patient on after these results?

Scenario: Candida (Answer)

- What type of precautions would you place this patient on after these results?

- **Standard Precautions**

Applying Lab results to IP practice

- TBP initiation
- Cohorting
- PPE decision making

Scenario: TBP after Lab Result

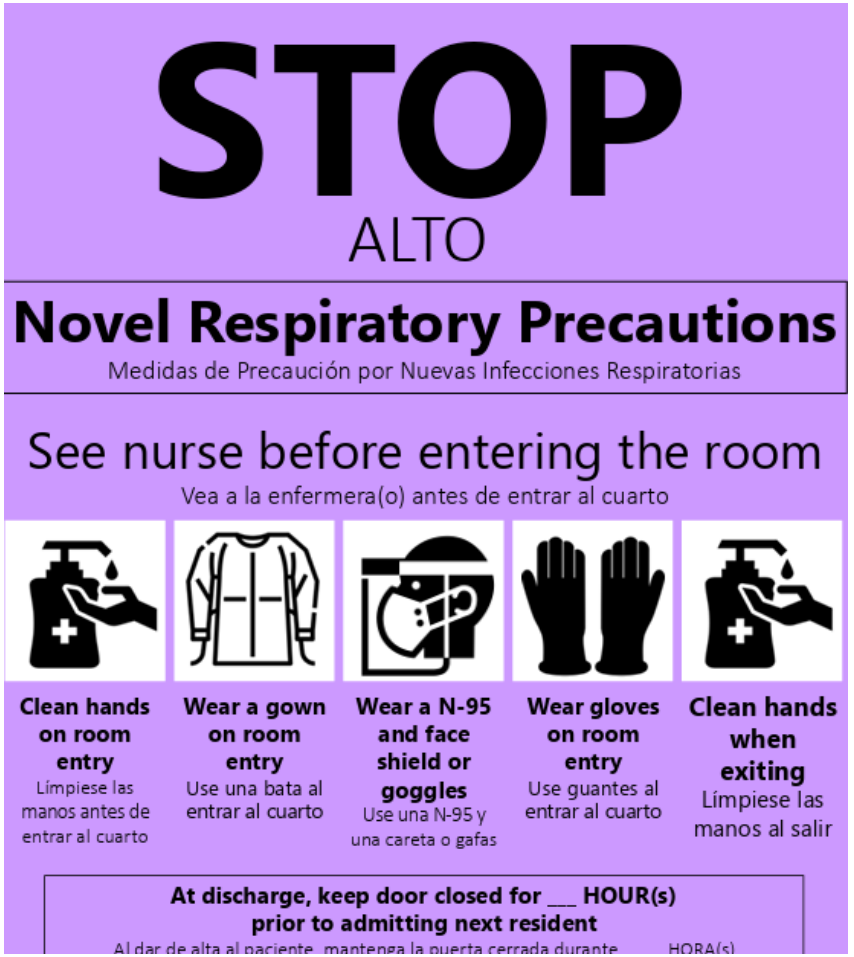
- A patient is displaying respiratory symptoms and physician suspects it to be COVID-19. Patient is placed on Novel Respiratory Precautions (gown, glove, N95, eye protection). They collect a respiratory panel.
- Respiratory Panel comes back: Negative for COVID 19, Negative for RSV, and Positive for Influenza

- Would you keep the patient on Novel Respiratory Precautions?

Scenario: TBP after Lab Result (Answer)

Would you keep the patient on Novel Respiratory Precautions?

No!



Scenario: Stool

- A patient is suspected of having C. diff. A stool sample is collected and sent to the lab. The result is negative for C. diff but positive for Norovirus.
- What precautions would you place this patient on?

Scenario: Stool (Answer)

- What precautions would you place this patient on?
- Contact!

Common Pitfalls with Lab

- Treating colonization
- Repeat testing with no indication (over-testing)
- Misinterpreting lab results
- Incorrect antibiotic prescription
- Delay in specimen transport
- Improper specimen collection/handling
- Delay in interpreting lab results

When to report to public health?

- Report, sometimes labs send report to Public Health directly
- Share new reporting form for clusters/suspected OBs

Please Post
Revised 9.19.25

REPORTABLE DISEASES AND CONDITIONS

Title 17, California Code of Regulations (CCR), § 2500

is the duty of every health care provider, knowing of or in attendance on a case or suspected case of any of the diseases or conditions listed below, to report to the local health officer for the jurisdiction where the patient resides. "Health care provider" encompasses physicians (surgeons, osteopaths, oriental medicine practitioners), veterinarians, podiatrists, physician assistants, registered nurses (nurse practitioners, nurse midwives, school nurses), infection control professionals, medical examiners/coroners, dentists, and chiropractors, as well as any other person with knowledge of a case or suspected case. **All reports must include hospitalization status if known.**

Note: This list is specific to Los Angeles County and differs from state and federal reporting requirements ★

- Report **immediately** by telephone for both confirmed and suspected cases.
- Report by telephone **within 1 working day** from identification.
- Report by telephone **within 24 hours** for both confirmed and suspected cases.
- Report by electronic transmission (including FAX or email), telephone or mail within **1 working day** from identification.
- Report by electronic transmission (including FAX or email), telephone or mail within **7 calendar days** from identification.
- Mandated by and reportable to the Los Angeles County Department of Public Health.

If enrolled, report electronically via the **National Healthcare Safety Network** (www.cdc.gov/nhsn/index.html). If not enrolled, use the LAC DPH **CRE Case Report Form** (publichealth.lacounty.gov/acd/Diseases/EpiForms/CRERepSNF.pdf)

For TB reporting: contact the TB Control Program (213) 745-0800 or visit www.publichealth.lacounty.gov/tb/healthpro.htm

For HIV/STD reporting: contact the Division of HIV and STD Programs. HIV (213) 351-8516, STDs (213) 368-7441 www.publichealth.lacounty.gov/dhsp/ReportCase.htm

For laboratory reporting: www.publichealth.lacounty.gov/lab/index.htm **For veterinary reporting**: www.publichealth.lacounty.gov/vet/index.htm

REPORTABLE COMMUNICABLE DISEASES

- Anaplasmosis
- Anthrax, human or animal
- Babesiosis
- Botulism, foodborne or wound
- Botulism, infant—Reportable to CDPH IBTPP (see below[1])
- Brucellosis, animal; except infections due to *Brucella canis*
- Brucellosis, human
- Campylobacteriosis
- *Candida auris*, colonization or infection
- Carbapenem-Resistant *Enterobacteriaceae* (CRE), including *Klebsiella sp.*, *E. coli*, and *Enterobacter sp.*, in acute care hospitals or skilled nursing facilities ★±
- Chagas Disease ★
- Chancroid ■
- Chickenpox (Varicella), only hospitalizations, deaths, and outbreaks (≥3 cases, or one case in a high-risk setting)
- Chikungunya Virus Infection
- Cholera
- Ciguatera Fish Poisoning
- Foodborne Outbreak; 2 or more suspected cases from separate households with same assumed source
- Giardiasis
- Gonococcal Infection ■
- *Haemophilus influenzae*, invasive disease only, all serotypes, less than 5 years of age
- Hantavirus Infection
- Hemolytic Uremic Syndrome
- Hepatitis A, acute infection
- Hepatitis B, specify acute, chronic, or perinatal
- Hepatitis C, specify acute, chronic, or perinatal
- Hepatitis D (Delta), specify acute or chronic
- Hepatitis E, acute infection
- Human Immunodeficiency Virus (HIV), acute infection ■ (§2641.30-2643.20)
- Human Immunodeficiency Virus (HIV) infection, any stage ■*
- Human Immunodeficiency Virus (HIV) infection, progression to stage 3 (AIDS) ■*
- Influenza-associated deaths in laboratory
- Paralytic Shellfish Poisoning
- Paratyphoid Fever
- Pertussis (Whooping Cough)
- Plague, human or animal
- Poliovirus Infection
- Psittacosis
- Q Fever
- Rabies, human or animal
- Relapsing Fever
- Respiratory Syncytial Virus, only deaths in a patient less than 5 years of age
- Rickettsial Diseases (non-Rocky Mountain Spotted Fever), including Typhus and Typhus-like Illnesses
- Rocky Mountain Spotted Fever
- Rubella (German Measles)
- Rubella Syndrome, Congenital
- Salmonellosis, other than Typhoid Fever
- Scombroid Fish Poisoning
- Shiga toxin, detected in feces
- Shigellosis
- Silicosis
- Smallpox (Variola)

CAHAN: CALIFORNIA HEALTH ALERT NETWROK

- OFTEN sends alerts about specific resistance patterns in LA that labs help track, might be beneficial to track
- Also we send MDRO updates via email and our newsletter and our website, so it is good to bookmark and sign up for these alerts

Scenario: Urine Culture

A resident has a positive urine culture but no signs or symptoms of a UTI

Should this resident be treated with antibiotics?

Does this require isolation or EBP?

Scenario: Urine Culture Answers

A resident has a positive urine culture but no signs or symptoms of a UTI

Should this resident be treated with antibiotics? No!

Does this require isolation or EBP?

No isolation or EBP based on this alone

Scenario: UTI

A resident has a positive urine culture + confusion, but no fever or urinary symptoms

Is this a UTI?

Should antibiotics be started?

Scenario: UTI Answer

A resident has a positive urine culture + confusion, but no fever or urinary symptoms

Is this a UTI?

Should antibiotics be started?

Not, necessarily a UTI. Avoid treating based on confusion alone. Confusion alone is not enough to diagnose a UTI. This is a common pitfall in SNFs.

Key takeaways

- Lab results do not always equal active infection/infection
- Always assess the resident clinically
- Specimen collection matters
- Use results to guide your infection prevention practices

Resources

- LACDPH: LTCF Program Page http://publichealth.lacounty.gov/acd/LTCF/index.htm LACDPH: MDRO Page http://publichealth.lacounty.gov/acd/mdro/index.htm CDPH HAI Program https://www.cdph.ca.gov/Programs/CHCQ/HAI we should say, " CDPH recently updated their website, so if you had older bookmarks, you may need to update them" CDC: Long-Term Care Infection Prevention https://www.cdc.gov/longtermcare/index.html
- APIC GUIDE TO LAB: https://www.apic.org/Resource_/TinyMceFileManager/2016/IPs_Guide_to_the_Lab_012016.pdf

Project Firstline Training

- https://reg.learningstream.com/view/cal10a.aspx?ek=&ref=&aa=0&sid1=0&sid2=0&as=72&wp=593&tz=0&ms=0&nav=0&cc=0&cat1=0&cat2=0&cat3=0&aid=LACPH&rf=&pn=0

- 11 Self-Paced trainings on our PFL Website, basic infection prevention trainings, for frontline staff

Questions