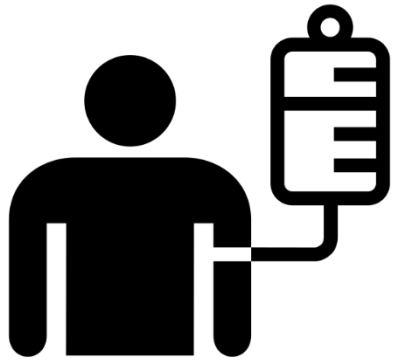
Central Line Associated Bloodstream Infection, Urinary Tract Infection, and Pneumonia Prevention

Los Angeles County ACH IP Course
April 11, 2024

Acute Care Hospital Online Infection Preventionist Course
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Central Line Associated Bloodstream Infection Prevention



Created by Luis Prado
from the Noun Project

CLABSI Prevention Objectives

- Describe the etiology and epidemiology of central line associated bloodstream infections (CLABSI)
- Identify patients at risk for CLABSI
- Review evidence-based CLABSI prevention care practices
- Discuss adherence monitoring and feedback

Central Line

- Intravascular catheter that terminates at or close to the heart or one of the great vessels (NHSN definition)
- Used for infusion, withdrawal of blood or hemodynamic monitoring
- Multiple types
  - Nontunneled (subclavian, jugular)
  - Peripherally inserted central catheters (PICCs)
  - Tunneled (Broviac, Hickman, Groshong)
  - Dialysis catheter (Quinton)
  - Implanted ports (Permacath)

Peripherally inserted central line catheter (PICC) that terminates at the heart is one example of a central line

NHSN Patient Safety Module, Chapter 4 (PDF) (www.cdc.gov/nhsn/pdfs/pscmanual/pcsmanual_current.pdf)

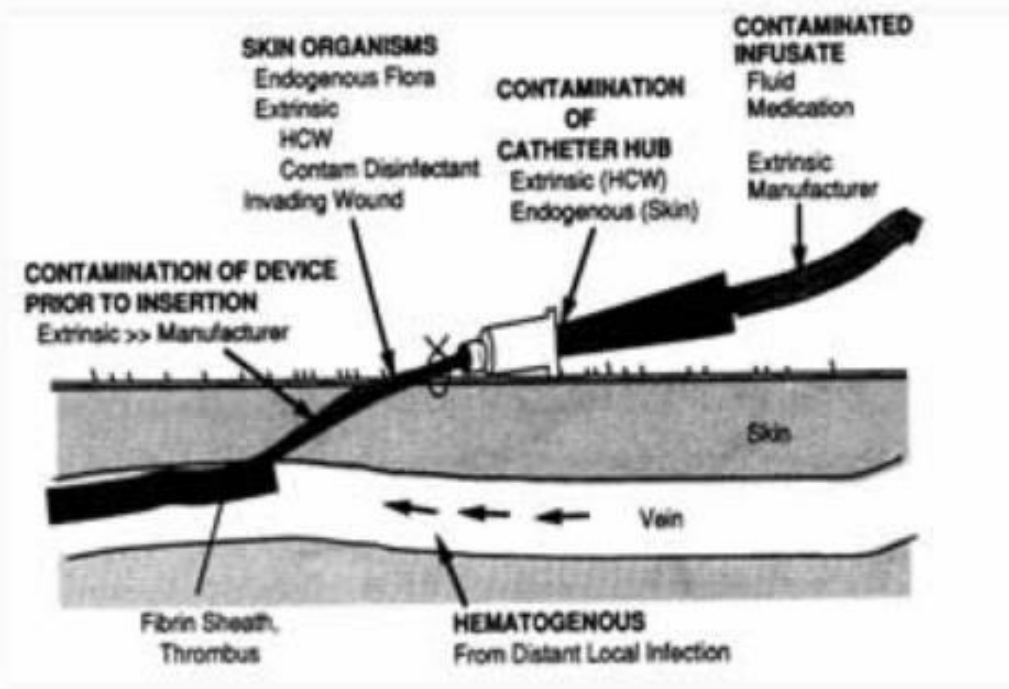
CLABSI Pathogenesis

Common mechanisms

- Extraluminal contamination
  - Migration of pathogens along external surface of central line catheter to bloodstream
  - Contamination during insertion
- Intraluminal contamination
  - Pathogens migrate via internal surface of the catheter
    - Medication or fluid administration
  - Contaminated access ports used to inject or infuse

Less common mechanisms

- Seeding from another infection site source
- Contaminated infusates



CLABSI tools Appendix 3
(www.ahrq.gov/hai/clabsi-tools/appendix-3.html#sl7)

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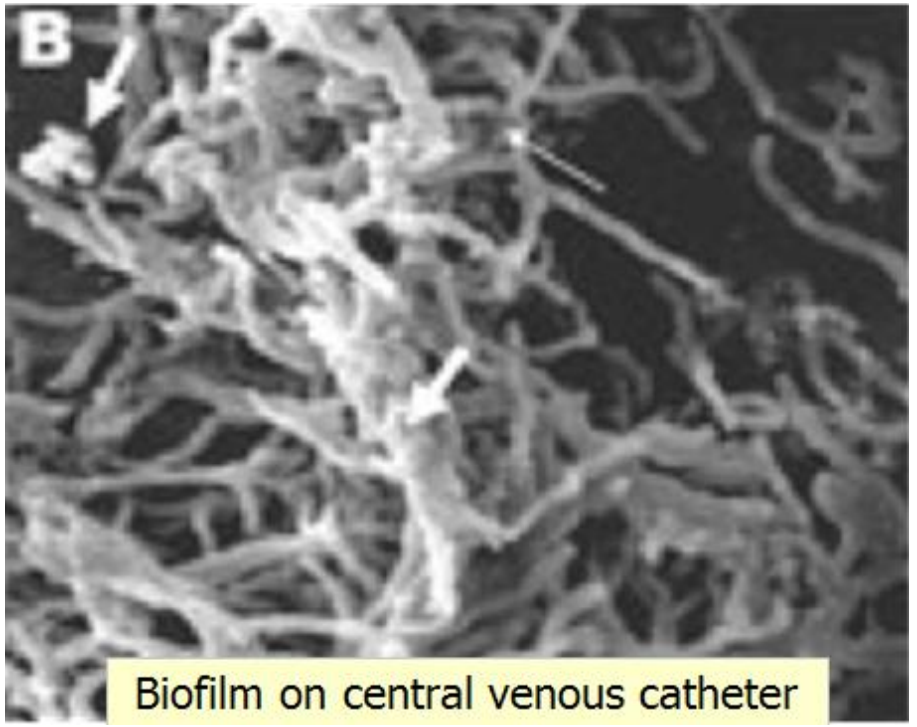
Biofilms

- Aggregation of microorganism growth
- Catheter surface formation
- Contributes to CLABSI risk
- *Candida auris* has the capacity to form biofilms with enhanced ability to cause illness
- Coagulase-negative Staphylococci capable of forming strong biofilms



Biofilm on central venous catheter

Biofilm-forming Capability of Highly Virulent, Multidrug-Resistant Candida Auris (www.ncbi.nlm.nih.gov/pmc/articles/PMC5324806/)

Central venous catheter biofilm formation (www.ivteam.com/intravenous-(literature/clabsi/central-venous-catheter-biofilm-formation/)

Common Adult CLABSI Pathogens Reported to NHSN

	ICU	Hospital Ward	LTAC
• Coagulase-negative Staphylococci	17%	10.9%	10.7%
• Enterococcus faecalis	12.5%	8.7%	13.2%
• Candida albicans	12.1%	6.7%	5.5%
• Other Candida spp.	8.6%	5.9%	9.9%
• Staphylococcus aureus	7.4%	15.4%	11%
• Enterococcus faecium	7.2%	4.9%	5.9%
• Candida glabrata	7%	4.4%	4.2%
• Klebsiella spp.	4.7%	9.1%	10.6%
• Echerichia coli	3%	6.8%	4.1%

The Top 15 CLABSI Pathogens Reported to NHSN, by Location Type, Adults, 2018-2021 (Table 4.)

(https://www.cdc.gov/nhsn/hai-report/data-tables-adult/table-4.html)

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CLABSI Risk Factors

Higher Risk

Modifiable

- Multiple catheters
- Multiple lumen catheters
- Excessive line manipulation
- Emergency insertion
- Prolonged duration
- Prolonged hospital stay prior to line insertion
- Neutropenia
- Prematurity
- Total parenteral nutrition
- **Hemodialysis**

Lower Risk

- Single lumen catheters
- Elective insertion
- Removing lines promptly
- Specialized inserter
- Optimal site selection
  - Subclavian

Hemodialysis

- Central line catheters are the most common cause of BSI in dialysis patients
  - 7X higher CLABSI risk than arteriovenous fistulas or grafts

Vascular Access Type	Rate (per 100 patient-months)
AV fistula	0.26
AV graft	0.39
Other vascular access type	0.67
Central venous catheter	2.16

- Hemodialysis providers **and contractors should be included** in CLABSI prevention education and competency evaluation programs

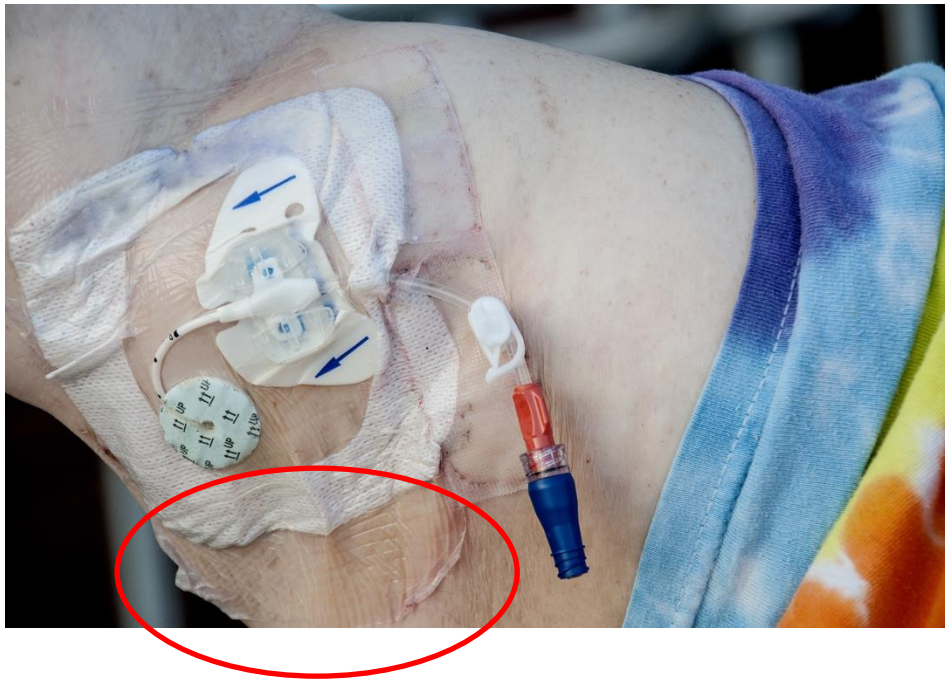
CLABSI Prevention – What works?

Best sources for **evidence-based CLABSI prevention practice** recommendations

- **Guidelines for the Prevention of Intravascular Catheter-related Infections, 2014** (www.jstor.org/stable/10.1086/676533)
- **CDC Checklist for CLABSI Prevention of CLABSI** (www.cdc.gov/hai/pdfs/bsi/checklist-for-CLABSI.pdf)
- **SHEA/IDSA Healthcare-associated Infections: A Compendium of Prevention Recommendations** 2022 (www.guidelinecentral.com/guideline/2117032/)

CLABSI Prevention – What Works in ACHs?

- Central line insertion practices (CLIP)
- Proper line maintenance
- Clinical staff trained and competency verified
  - Return demonstration inclusion in plan
  - Document competency evaluation
- Adherence monitoring and feedback
  - Assess prevention care practices



Prevention "Bundles"

- Group of practices with high-level clinical evidence of effectiveness
- Improvements are synergistically greater when applied together
- Benefits of bundle adoption
  - Minimizes practice variations among health care providers
  - Enhances adherence to a set of recommendations
  - Allows adherence to standardized practices

The whole is greater than the sum of its parts!

Central Line Insertion Practices (CLIP) Bundle

- Hand hygiene performed
- Appropriate skin prep
  - Chlorhexidine gluconate (CHG) for most patients
  - Povidone iodine, alcohol or CHG for children <60 days old
- Skin prep agent has completely dried before insertion
- All **5** maximal sterile barriers used
  - Sterile gloves, sterile gown, cap, mask worn, and large sterile drape (covers patient's entire body)

All providers should be empowered to stop the insertion if improper insertion practice observed

CDC CLIP Bundle, NHSN Jan 2021 (PDF)
(www.cdc.gov/nhsn/pdfs/pscmanual/5psc_clipcurrent.pdf)

Preparing for Central Line Insertion (CLIP)

- All-inclusive catheter cart/kit
- Optimal catheter site selection
  - Lower risk insertion site if possible
  - Avoid femoral site
  - Subclavian vein preferred for non-tunneled catheters in adults

Hand Hygiene

- Hand hygiene performed prior to accessing central line
- Do not palpate over insertion site without sterile gloves
- Hand hygiene performed when changing gloves during dressing changes
  - Old dressing removed, gloves are doffed and hand hygiene performed
  - New gloves donned and new dressing applied

CLIP - Maximum Sterile Barriers

Line inserter and assistant

- Cap
- Mask
- Sterile gown
- Sterile gloves

Patient

- Large sterile drape
- Should cover patient from head to toe
- Small opening for insertion site

CLIP – Appropriate Skin Antisepsis

- Skin antisepsis should be performed just prior to line insertion
- **Chlorhexidine gluconate (CHG)** for patients ≥ 60 days old unless there is a documented contraindication to CHG
- Povidone iodine, alcohol, CHG* or other specified for children < 60 days old

*FDA has labeled CHG to be used with care in premature infants and infants less than 2 months of age

CLIP – Skin Antisepsis Completely Dried Before Insertion

- The skin antisepsis agent needs to be allowed to dry completely before puncturing site
- Insertion site should not be palpated after the antiseptic has been applied unless aseptic technique can be maintained

Central Line Dressing

- Sterile gauze dressing or a sterile, transparent, semipermeable dressing should be placed over the insertion site
- For patients 18 years of age or older a CHG impregnated dressing (FDA approved for CLABSI prevention) should be used unless the facility has demonstrated success at preventing CLABSI with basic prevention practices

Daily Review of Line Necessity

- Perform daily review of central line necessity
  - Document review in patient record
  - Appropriate use examples:
    - Chemotherapy
    - Extended antibiotic course
    - Hemodialysis
    - Total parenteral nutrition (TPN)
- Remove unnecessary central lines promptly
  - Infection risk increases with duration of line

Central Line Care and Maintenance

Central line maintenance bundle includes:

- Perform hand hygiene prior to central line care
- Disinfect hub and access ports before use
- Access catheters exclusively with sterile devices
- Replace wet, soiled or dislodged sterile dressings or devices immediately
- Use aseptic technique with clean or sterile gloves
- Change gauze dressings at least every two days
- Change semipermeable dressings and administration sets at least every seven days
  - Change sets no more frequently than every four days

Daily Bathing with Chlorhexidine

- Perform daily chlorhexidine bathing (2% solution) in select populations
  - ICU patients
  - Hospital units with continued CLABSI
  - SNF residents with a central line (shown to reduce MDRO)
- CHG bathing lowers microbial burden on patient's skin and the hands of healthcare workers
- Systematic review of 25 published studies concluded “CHG bathing of patients is associated with a consistent, clinically important, and statistically significant reduction in risk of healthcare-associated BSIs”*

*Musuuza JS, BMC Inf Dis 2019

Additional CLABSI Prevention Practices

If CLABSIs continue after evaluating and ensuring staff adherence to basic CLABSI prevention practices:

- Change central line dressings to chlorhexidine-impregnated dressings (CHG)
  - Residents 18 years of age and older
  - CLABSI rates were decreased with CHG use in some studies, not in others
- Consider antiseptic impregnated caps to cover access ports (port protectors)

Blood Culture Sampling

- Peripheral site sample, if possible, is recommended
  - Central line sampling may result in a false positive result and administration of unnecessary antibiotics
  - Results are more accurate if one blood sample is from peripheral site, one sample from central line
- Disinfect the tops of the culture bottles, and allow to dry, after removing the cap and before injecting blood
  - Rubber septum under the culture bottle cap is not sterile

Antibiotic Prescribing and Use

(www.cdc.gov/antibiotic-use/core-elements/collecting-cultures.html)

Notes on Drawing Blood Cultures

- Disinfect the peripheral site and central line port and allow to dry
  - Do NOT fan the site to dry antiseptic faster
- Do not draw blood cultures at the same time
  - If ordered 15 mins apart, wait the appropriate time before redrawing second sample
- Culturing the catheter tip will NOT be accurate

Antibiotic Prescribing and Use
(www.cdc.gov/antibiotic-use/core-elements/collecting-cultures.html)

Measuring Prevention Practices

Process and Outcome Measures

- Monitoring required for
  - Adherence to practices known to reduce infections
    - **Process** measure
  - CLABSI incidence data
    - **Outcome** measure

Facility Role in CLABSI Prevention

- Policies and practices reflect current evidence-based recommendations
  - CDC and SHEA/IDSA guidelines
- Staff competency ensure upon hire and at least annually
  - New hire orientation
  - Annual skills fair
  - Documented return demonstration to ensure competency
- Adherence monitored for prevention practices
  - Provide feedback to frontline staff

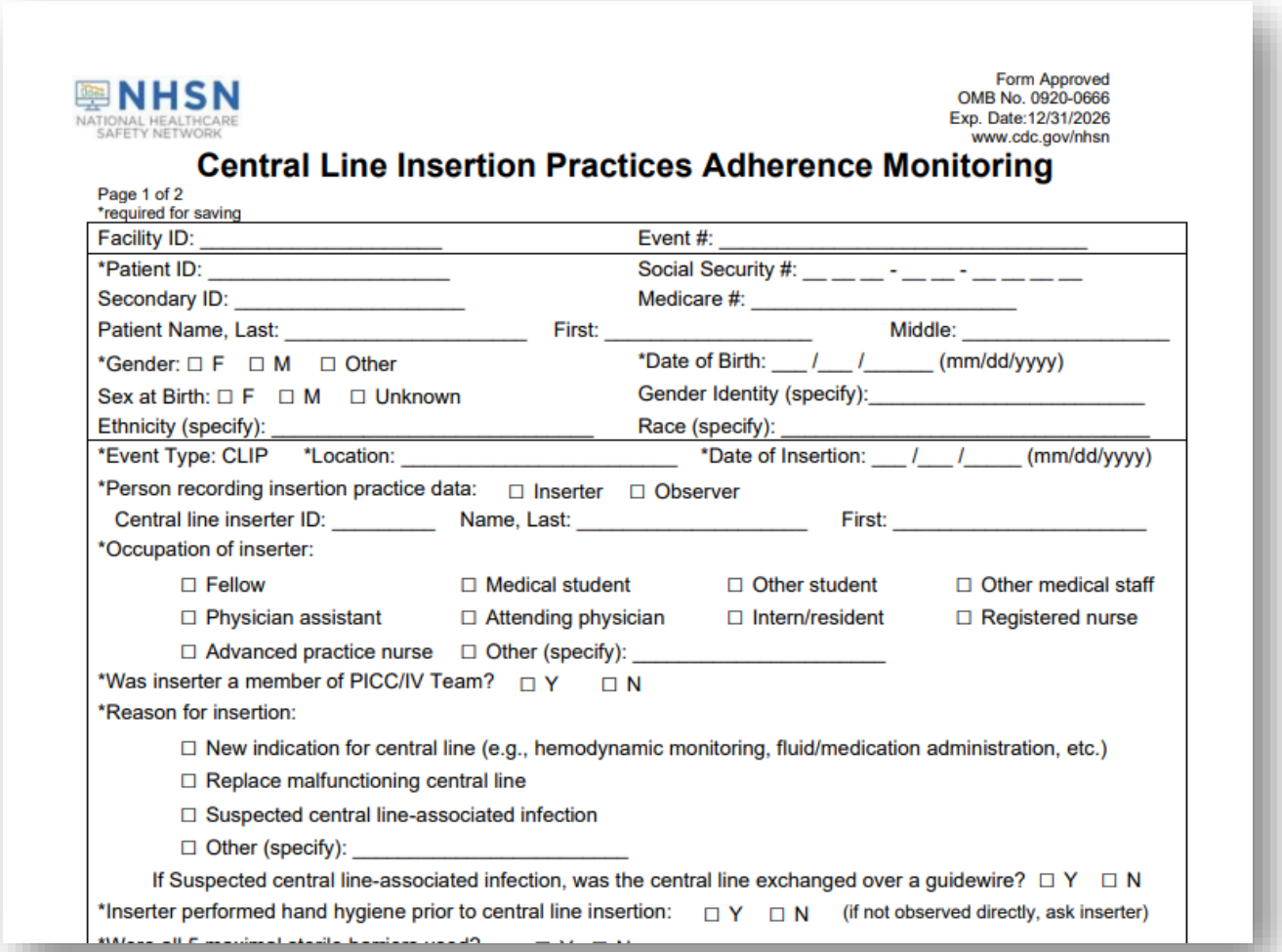
Adherence Monitoring and Feedback

- Care practice surveillance and adherence monitoring
  - Standardized tools to measure adherence
    - Adherence monitor examples
      - Review of line necessity on a daily basis
      - Removal of central lines done promptly
      - Medication injection through ports using “scrub-the-hub” practices
      - Port protectors in place when a port is not in use
      - Catheter site care and dressing practices
- Feedback provided to frontline staff and leadership
  - Adherence results and CLABSI incidence reported to each unit

Using CLIP to Monitor Central Line Insertion

Monitor CLIP adherence data:

- If patient(s) develops CLABSI within 7-10 days after central line insertion
- For increased CLABSI rates
  - Monitor CLIP in all locations where lines are inserted, including OR and interventional radiology



NHSN
NATIONAL HEALTHCARE SAFETY NETWORK

Form Approved
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Exp. Date:12/31/2026
www.cdc.gov/nhsn

Central Line Insertion Practices Adherence Monitoring

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Facility ID: _____ Event #: _____

*Patient ID: _____ Social Security #: __ __ __ - __ __ - __ __ __ __

Secondary ID: _____ Medicare #: _____

Patient Name, Last: _____ First: _____ Middle: _____

*Gender: ☐ F ☐ M ☐ Other *Date of Birth: ___ /___ /_____ (mm/dd/yyyy)

Sex at Birth: ☐ F ☐ M ☐ Unknown Gender Identity (specify):_____

Ethnicity (specify): _____ Race (specify): _____

*Event Type: CLIP *Location: _____ *Date of Insertion: ___ /___ /_____ (mm/dd/yyyy)

*Person recording insertion practice data: ☐ Inserter ☐ Observer

Central line inserter ID: _____ Name, Last: _____ First: _____

*Occupation of inserter:

☐ Fellow ☐ Medical student ☐ Other student ☐ Other medical staff

☐ Physician assistant ☐ Attending physician ☐ Intern/resident ☐ Registered nurse

☐ Advanced practice nurse ☐ Other (specify): _____

*Was inserter a member of PICC/IV Team? ☐ Y ☐ N

*Reason for insertion:

☐ New indication for central line (e.g., hemodynamic monitoring, fluid/medication administration, etc.)

☐ Replace malfunctioning central line

☐ Suspected central line-associated infection

☐ Other (specify): _____

If Suspected central line-associated infection, was the central line exchanged over a guidewire? ☐ Y ☐ N

*Inserter performed hand hygiene prior to central line insertion: ☐ Y ☐ N (if not observed directly, ask inserter)

[NHSN CLIP Checklist form](www.cdc.gov/nhsn/forms/57.125_CLIP_BLANK.pdf) (www.cdc.gov/nhsn/forms/57.125_CLIP_BLANK.pdf)

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Monitoring Central Line Access Maintenance

Residents developing a CLABSI more than 7-10 days after insertion should be assessed for adherence to line maintenance prevention practices

Observation	Patient 1		Patient 2		Adherence by Task # Yes	Adherence by Task # Obs
Supply kit is used for central line dressing changes.	(Yes)	No	(Yes)	No	2	2
Hand hygiene performed before **and** after manipulating the catheter (regardless of glove use).	Yes	(No)	Yes	(No)	0	2
Wet, soiled, or dislodged dressings are changed promptly.	(Yes)	No	(Yes)	No	2	2
Need for line assessed daily by a practitioner, with prompt removal of unnecessary lines.	(Yes)	No	Yes	(No)	1	2
Scrubbing method is used during dressing change when applying CHG to the insertion site.	(Yes)	No	Yes	No	1	1
Dressing is changed with aseptic technique, using clean gloves to remove the old dressing and sterile gloves when applying the new dressing.	(Yes)	No	Yes	No	1	1
The access port or hub is scrubbed immediately prior to each use with the appropriate antiseptic.	Yes	No	(Yes)	No	1	1
Antiseptic-containing protector caps are utilized for all line connectors if it is facility policy.	Yes	No	Yes	No	Not Policy	
The catheter is accessed with only sterile devices.	Yes	No	(Yes)	No	1	1
Daily bathing with a 2% CHG solution is done if facility policy.	(Yes)	No	(Yes)	No	2	2
Total # Yes 11	Total # Observations 14		#Yes/#observations x 100= 79% Adherence			

CDPH Adherence Monitoring Tools

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)

Monitoring Central Line Dressing Maintenance

Monitoring the the central line insertion site and dressing maintenance can provide insight into how infections may occur from the environment through the CVC portal of entry.

Central Line Maintenance Practices	Patient 1		Patient 2		Adherence by Task	
					# Yes	# Observed
Central line insertion date is documented.	(Yes)	No	(Yes)	No	2	2
Dressings wet, soiled, or dislodged are changed promptly.	(Yes)	No	(Yes)	No	2	2
Need for the line assessed daily by a practitioner, with prompt removal of unnecessary lines	Yes	(No)	Yes	(No)	0	2
Optimal site selected, avoid femoral site in adult patients.	(Yes)	No	(Yes)	No	2	2
Sterile gauze, sterile transparent or sterile semi-permeable dressing used to cover the catheter site is in place for ≤ 7 days (Mark "No" if no date on the dressing.)	Yes	(No)	Yes	(No)	0	2
Antiseptic-containing protector caps are utilized for all line connectors if facility policy.	(Yes)	No	(Yes)	No	2	2
A CHG-impregnated sponge applied at insertion site	(Yes)	No	(Yes)	No	2	2
Tubing and administration set have been in place for ≤ 7 days. (Mark "No" if no date on dressing.)	Yes	(No)	Yes	(No)	0	2
TPN/Lipids: tubing dated to ensure change every 24 hours.	Yes	No	Yes	No	None	Today
Daily bathing with a 2% CHG solution is done if facility policy.	(Yes)	No	Yes	(No)	1	2
Total # Yes 11	Total # Observations 18		#Yes/#observations x 100= 61 % Adherence			

[CDPH Adherence Monitoring Tools](www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)

Educate Patients to Help Prevent CLABSI

- **Instruct the patient to:**
  - Concerns the patient has should be reported to HCPs
  - HCPs reminded to follow the best infection prevention practices
  - Ask a healthcare provider if the central line is needed
    - Patient must understand the need for it and how long it will be in place
  - Patient to pay attention to the dressing and the area around it
    - If the dressing comes off, or the area around it is wet or dirty, inform HCP right away
  - Keep the central line or the central line insertion site dry

Central Line-associated Bloodstream Infections: Resources for Patients and Healthcare Providers
(www.cdc.gov/hai/bsi/clabsi-resources.html)

Educate Patients to Help Prevent CLABSI (continued)

- **Instruct the patient to:**
  - Tell the HCP if the area around the catheter is sore or red
  - Report fever or chills
  - Do not let any visitors touch the catheter, dressing, or tubing
  - Avoid touching the tubing and dressing as much as possible
  - Remind visitors that they must wash their hands before and after they visit

CLABSI Prevention Objectives

- HHS National 2020 Target Goal: Reduce CLABSI by 50% from 2015 baseline
  - Goal status pending; HHS is currently updating plan with new indicator targets and data
- Centers for Medicare and Medicaid Services (CMS) quality payment programs
  - Reduce payments for hospitals ranking among the lowest-performing (for example, high CLABSI)

National Action Plan for Prevention of HAI, last reviewed September 2021 (https://www.hhs.gov/oidp/topics/health-care-associated-infections/targets-metrics/index.html)

CMS Hospital-Acquired Condition (HAC) Reduction Program webpage (www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/HAC/Hospital-Acquired-Conditions)

CLABSI in California Hospitals in 2022

- Significant increases in CLABSI during the pandemic
- 2,330 CLABSI reported in 2022
  - 10% reduction in CLABSI compared to 2021
- 2023 CLABSI data will be available in 2024

Year	2015	2016	2017	2018	2019	2020	2021	2022
SIR	0.97	0.95	0.85	0.79	0.67	0.98	0.90	0.83

COVID-19 Pandemic

Healthcare-Associated Infections in California Hospitals Annual Report (https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/HAI-2022-Report-Final_ADA.pdf)

Preventing CLABSI: The MOST Important Things

- ❑ Provide a list of indications for central lines
- ❑ Education of HCP caring for central lines
- ❑ Use all-inclusive catheter cart or kit
- ❑ Disinfect port hubs before accessing
- ❑ Use port protectors when not in use
- ❑ Remove any non-essential catheters
- ❑ Change dressing every 7 days or when soiled
- ❑ Replace administration sets no sooner than every 96 hours
  - ❑ TPN, lipids changed every 24 hours
- ❑ Perform CLABSI surveillance with adherence monitoring

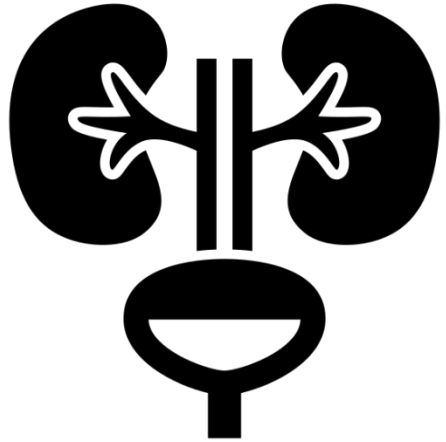
2022 IDSA Compendium of Strategies to prevent CLABSI in Acute Care Hospitals

(www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-central-lineassociated-bloodstream-infections-in-acutecare-hospitals-2022-update/01DC7C8BBEA1F496BC20C6E0EF634E3D)

Summary

- CLABSI is an infection that occurs when organisms enter a patient's bloodstream through a central line
- CLABSI bundles combine a series of evidence-based practices that create improvements that are synergistically greater when applied together
- Adherence monitoring to evidence-based care practices will reduce CLABSI incidence
- Feedback CLABSI incidence and adherence monitoring results to staff will improve outcomes

Urinary Tract Infection Prevention



Objectives –Urinary Tract Infection Prevention

- Describe healthcare-associated urinary tract infections (UTI)
- Review evidence-based clinical practices shown to prevent catheter-associated urinary tract infections (CAUTI)
- Discuss strategies to reduce CAUTI incidence rates
- Discuss adherence monitoring and feedback

UTI in Hospitals

- Urinary catheters are one of the most common medical devices used in hospitals
  - Often placed and maintained without appropriate clinical indication to justify risk
  - Increased catheter use increases the risk of developing CAUTI
  - Catheterization duration is most important risk for developing CAUTI
- UTI can lead to secondary bloodstream infection
- CAUTI is associated with increased mortality and length of stay
- Results in antimicrobial overuse and antimicrobial resistance

SHEA/IDSA Compendium 2022: Strategies to Prevent Catheter-Associated UTI in Acute-Care Hospitals
(www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-catheterassociated-urinary-tract-infections-in-acutecare-hospitals-2022-update/7A56FE9DABD0A9C670D728AD16F9FC48)

What is Bacteriuria?

- Bacteria can be present in the bladder *but not cause infection*
  - E. coli contamination can come from the perineum and rectum
  - No symptoms of infection with bacteria presence in urine
- Bacteriuria alone does not affect survival and **does not require antibiotics**
- Risk of bacteriuria increases with time with indwelling catheterization
  - Increases 3% - 7% for each day the catheter is indwelling

SHEA/IDSA Compendium 2022: Strategies to Prevent Catheter-Associated UTI in Acute-Care Hospitals
(www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-catheterassociated-urinary-tract-infections-in-acutecare-hospitals-2022-update/7A56FE9DABD0A9C670D728AD16F9FC48)

Urinary Catheter Use

- Use of indwelling urinary catheters is high
  - 12-16% of inpatient adults
  - Medical surgical unit: 10-30% patients
  - ICU: 60-90% patients
  - Nursing home: 7-10% residents
- 40-50% patients with a urinary catheter in hospital non-ICU ward do not have a valid indication for placement
- Physicians frequently unaware of use

SHEA/IDSA Compendium 2022: Strategies to Prevent Catheter-Associated UTI in Acute-Care Hospitals
(www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-catheterassociated-urinary-tract-infections-in-acutecare-hospitals-2022-update/7A56FE9DABD0A9C670D728AD16F9FC48

NHSN Patient Safety Manual, Chapter 7, UTI CDC: Catheter Associated UTI (2024 Update)
(www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf)

CAUTI Etiology

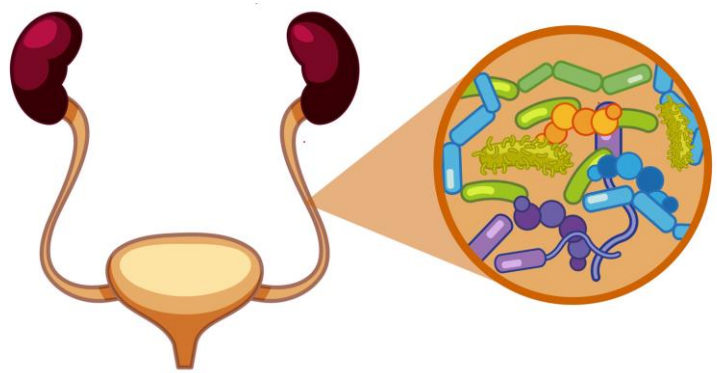
- Pathogen source
  - Patient's GI or perineal bacteria
  - Bacteria on hands of healthcare personnel (HCP)
- Microbes enter bladder via one of two routes
  - On the external surface of the catheter
  - On the inside of the catheter

Maki D & Tambyah P. Engineering out risk of Infection with urinary catheters. Emerg Infect Dis, 2001

(wwwnc.cdc.gov/eid/article/7/2/70-0342_article)

Common UTI Pathogens

	ICU	Hospital Ward	LTAC
• Echerichia coli	35.5%	32.5%	22.8%
• Select Klebsiella spp.	14.5%	15.4%	18.6%
• Pseudomonas aeruginosa	13.4%	15.1%	22.7%
• Enterococcus faecalis	12.4%	9.9%	6.4%
• Proteus spp.	4.6%	6.5%	8.7%
• Enterobacter	4.5%	4.2%	4.4%
• Enterococcus faecium	3.1%	2.6%	5.6%
• Coagulase-negative staphylococci	2.9%	2.0%	0.7%

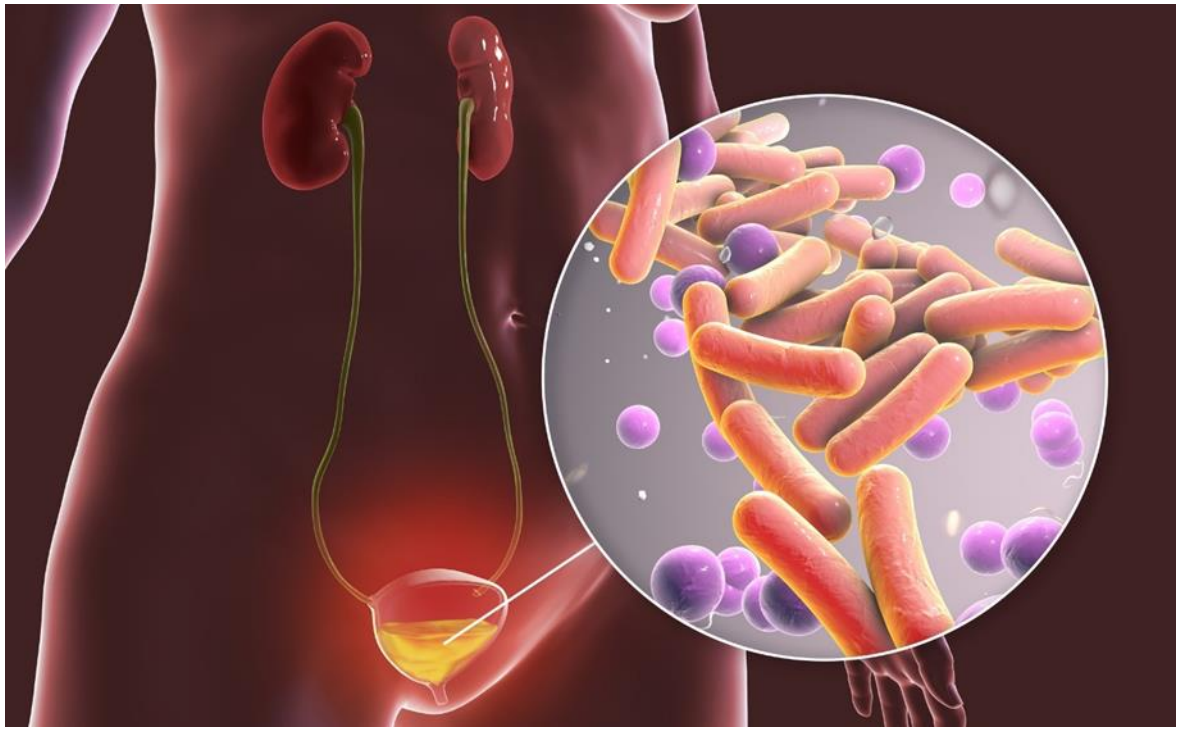


CDC NHSN HAI Pathogens, 2018-2021, Table 5

(www.cdc.gov/nhsn/hai-report/index.html)

CAUTI Complications

- Cystitis
- Pyelonephritis
- Bacteremia
- Septic shock
- May result in
  - Functional decline
  - Decreased mobility
  - Hospital admission
  - Death



Preventing CAUTI

- **69%** CAUTI can be prevented with currently recommended infection prevention practices
  - 380,000 infections prevented annually – 40,000 in California
  - 9,000 lives saved - ~1,000 in California

CDC CAUTI Prevention guidelines 2009 (PDF)
(www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf)

CAUTI Prevention – What works?

Best sources for **evidence-based CAUTI prevention practice** recommendations

- CDC/HICPAC CAUTI Prevention Guideline, 2009 (pdf)
  (www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/abs/guideline-for-prevention-of-catheterassociated-urinary-tract-infections-2009/B823CD4AB8B24925292E5B43758E3D41)
- SHEA/IDSA Compendium 2022: Strategies to Prevent Catheter-Associated UTI in Acute-Care Hospitals
  (www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-catheterassociated-urinary-tract-infections-in-acutecare-hospitals-2022-update/7A56FE9DABD0A9C670D728AD16F9FC48)

CAUTI Prevention Care Practices

CDC/HICPAC

- ❑ Insert catheters only for appropriate indications
- ❑ Leave in place only as long as needed
- ❑ Ensure only properly trained persons insert and maintain
- ❑ Perform hand hygiene
- ❑ Use aseptic technique and sterile equipment for insertion
- ❑ Maintain closed drainage system and unobstructed urine flow
- ❑ Use portable ultrasound devices to assess urinary retention, reduce unnecessary catheterizations (Category II)
- ❑ Implement improvement program to achieve appropriate use of catheters

CDC CAUTI Prevention guidelines 2009 (PDF) (www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf)

CAUTI Prevention Care Practices - continued

SHEA/IDSA

- ❑ Secure indwelling catheters
- ❑ Use smallest diameter catheter as possible
- ❑ Irrigate only if catheter is obstructed
- ❑ Keep collecting bag below the bladder
- ❑ Ensure adequate nutrition and hydration
- ❑ Consider alternatives to indwelling urinary catheters
  - External catheters
  - Intermittent catheterization

SHEA/IDSA Compendium 2022: UTI in Acute-Care Hospitals
(www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-catheterassociated-urinary-tract-infections-in-acutecare-hospitals-2022-update/7A56FE9DABD0A9C670D728AD16F9FC48)

Appropriate Indications for Urinary Catheters

- Acute urinary retention or obstruction
- Prolonged immobilization due to unstable spine or pelvic fracture
- Assist healing of perineal and sacral wounds in incontinent patients
- Hospice (end of life), comfort care, palliative care
- Chronic indwelling urinary catheter on admission
  - Necessity must still be evaluated on admission

CDC CAUTI Prevention guidelines 2009 (PDF)
(www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf)

Leave Indwelling Catheter in Place Only as Long as Needed

- Implement a process to assess daily the need for the indwelling urinary catheter
  - Physician reminders
  - Electronic medical record prompts
- Consider alternatives to indwelling urinary catheter
  - External catheters
  - Intermittent catheterization

Ensure Only Properly Trained Persons Insert and Maintain Indwelling Urinary Catheters

- Train HCP, family members, or the patient (if appropriate)
  - Correct technique of aseptic catheter insertion
  - Maintenance of the catheter
- Train HCP upon hire and at lease annually
- Make return demonstration part of the training to ensure competency

Perform Hand Hygiene

Perform hand hygiene:

- Immediately before and after catheter insertion
- Immediately before and after any catheter manipulation
  - Repositioning the catheter tubing or bag
  - Obtaining a specimen

Use Aseptic Technique and Sterile Equipment for Insertion of Indwelling Urinary Catheter

- Perform hand hygiene before and after procedure
- Ensure the following are used during insertion
  - Sterile gloves, drape, and sponges
  - Appropriate antiseptic or sterile solution for peri-urethral cleaning
  - A single use packet of lubricant jelly for insertion

Maintain Closed Drainage System and Unobstructed Urine Flow

A closed system prevents contamination and possible pathogens from entering the bladder

- Replace the catheter and collection system if breaks in aseptic technique during insertion, or disconnection, or leakage occurs
- Use urinary catheter systems with pre-connected, sealed catheter-tubing junctions
- Keep the catheter tubing below the bladder and free from kinking

CAUTI Prevention Bundle Examples

Insertion Bundle

- Verify need prior to insertion
- Insert urinary catheter using aseptic technique
- Maintain urinary catheter based on recommended guidelines

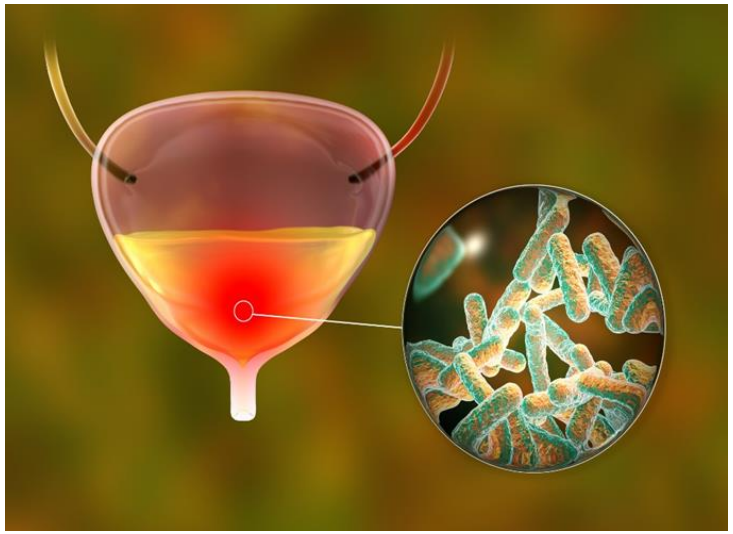
Maintenance Bundle

- Daily assessment of catheter need documented
- Tamper evident seal is intact
- Catheter secured to patient
- Hand hygiene performed before patient contact
- Daily meatal hygiene with soap and water
- Drainage bag emptied using a clean container
- Unobstructed flow maintained

APIC Preventing CAUTI, Patient-centered Approach 2012 (PDF)
(apic.org/Resource_/TinyMceFileManager/epublications/CAUTI_feature_PS_fall_12.pdf)

Not Recommended

No evidence that these practices prevent UTI



X Complex urinary drainage systems

X Routinely changing catheters or drainage bags

X Routine antimicrobial prophylaxis

X Cleaning the periurethral area with antiseptics

X Antimicrobial irrigation of the bladder

X Antiseptic / antimicrobial solutions instilled into drainage bags

X Routine screening or culturing

CDC CAUTI Prevention guidelines, 2009 (PDF)
(www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf)

Additional CAUTI Prevention Practices

Use when adherence to practices is high, but CAUTI still occur

- Consider alternatives to indwelling urinary catheters
- Use portable ultrasound devices to assess urinary retention, reduce unnecessary catheterizations
- Consider antimicrobial/antiseptic impregnated catheters
- Establish system for analyzing and reporting catheter use

Facility Role in CAUTI Prevention

- Ensure policies and practice reflect current evidence-based recommendations
  - HICPAC/CDC 2022 guidelines
- Ensure staff competency upon hire and at least annually
  - New hire orientation
  - Annual skills fair
  - Return demonstration to ensure competency
- Establish an adherence monitoring program for core care practices
  - Use standard tools to measure adherence
- Perform UTI surveillance
- Provide feedback to frontline staff and leaders
  - Present adherence results with UTI/CAUTI incidence

Adherence (Process) Measures

Measure catheter use:

- Days with Foley catheter ÷ patient days for the months (x100) = __% utilization rate
- Number of urinary catheter days ÷ number of predicted urinary catheter days = Standardize Utilization Ratio (SUR)

Measure health care provider adherence:

- Hand hygiene
- Documentation of catheter insertion and removal
- Daily assessment of indwelling urinary catheter
- Documentation of indications for use

Infection (Outcome) Measure

Track infections:

- Perform UTI surveillance using standardized definitions and protocols
- Bacteria in urine alone is not an infection
  - Must evaluate for other UTI symptoms or have supporting laboratory data

NHSN Patient Safety Manual, Chapter 7, UTI CDC: Catheter Associated UTI (2024 Update)
(www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf)

Indwelling Urinary Catheter Adherence Monitoring Tool

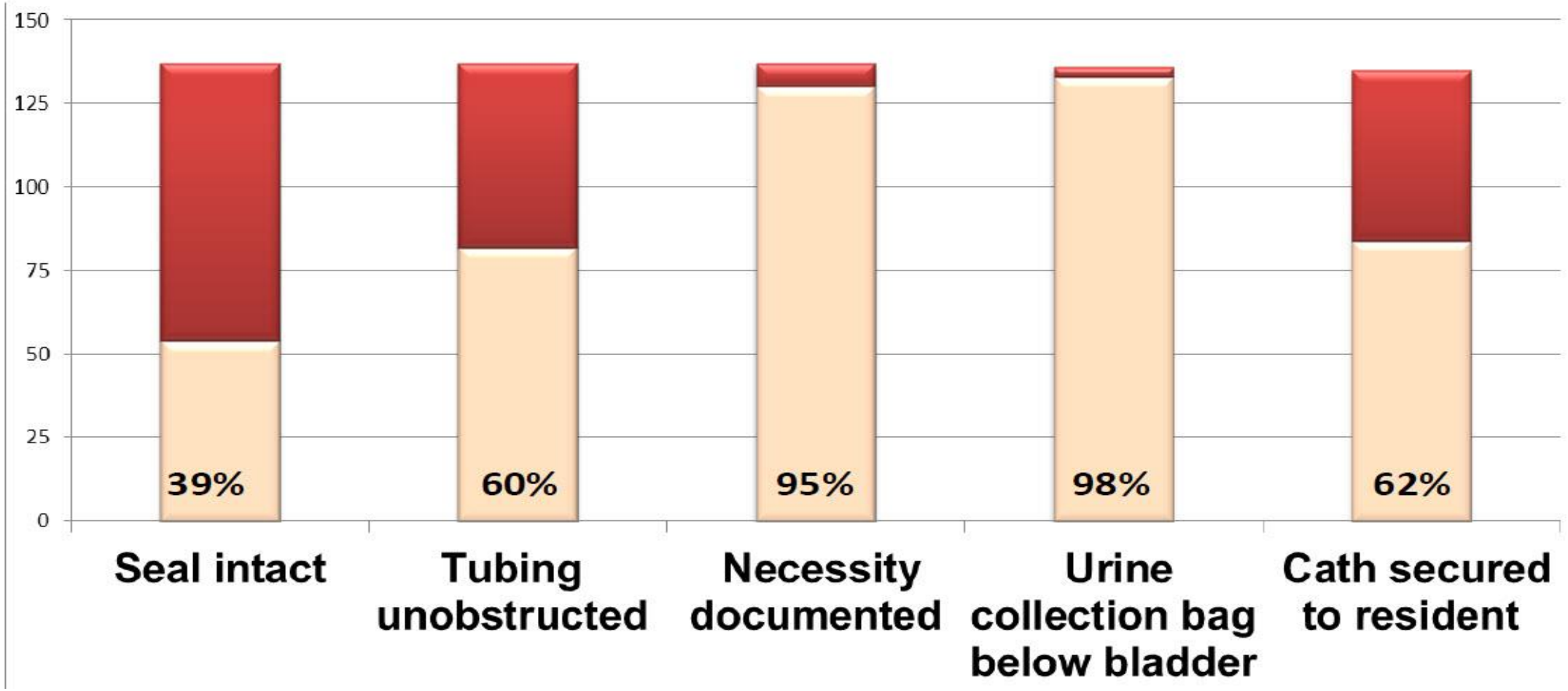
Urinary Catheter Care Practices	Indwelling Urinary Catheter Patient/Resident 3		Indwelling Urinary Catheter Patient/Resident 3		Adherence by Task	
					# Yes	# Observed
The indwelling urinary catheter is being used for an appropriate indication	☐ Yes	☐ No	☐ Yes	☐ No	2	2
Necessity for continuing the indwelling urinary catheter is documented in the medical record	☐ Yes	☐ No	☐ Yes	☐ No	2	2
The seal between the catheter and collecting tubing is intact.	☐ Yes	☐ No	☐ Yes	☐ No	0	2
The catheter tubing is unobstructed and not twisted, kinked, or looped.	☐ Yes	☐ No	☐ Yes	☐ No	1	2
The urine collection bag is below the level of the bladder.	☐ Yes	☐ No	☐ Yes	☐ No	1	2
The catheter is secured to the patient/resident.	☐ Yes	☐ No	☐ Yes	☐ No	0	2

#Yes 6 Total # Observations 12 Total #Yes / Total # observations *100 = % 50% Adherence

CDPH Adherence Monitoring Tools (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)

California Department of PublicHealth

CDPH CAUTI Observations, 131 Facilities, 2016



Preventing CAUTI: The MOST Important Things

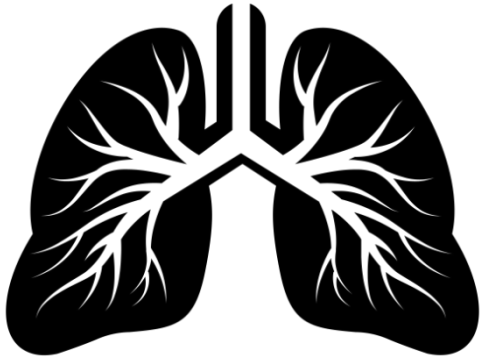
Prevent Catheter Associated UTI - Avoid Antibiotics

- ❑ Insert catheters only for appropriate indications
- ❑ Leave in place only as long as needed
- ❑ Ensure only properly trained persons insert and maintain
- ❑ Perform hand hygiene
- ❑ Use aseptic technique and sterile equipment for insertion
- ❑ Maintain closed drainage system and unobstructed urine flow
- ❑ Implement improvement program to achieve appropriate use of catheters

Summary

- CAUTI can lead to bloodstream infections
- Adherence monitoring to evidence-based care practices will reduce CAUTI incidence
- Feedback CAUTI incidence and adherence monitoring results to staff will improve outcomes

Respiratory Infection Prevention



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from the Noun Project

Objectives – Respiratory Infection Prevention

- Describe the problem of healthcare-associated pneumonia in acute care facilities
- List evidence-based pneumonia prevention care practices
- Review the importance of a water management plan to prevent healthcare-associated *Legionella*
- Review influenza prevention strategies
- Describe adherence monitoring of prevention practices

Risk Factors for HAI Pneumonia

- Factors enhancing colonization of oropharynx or stomach
  - Antimicrobials
  - Admission to ICU
  - Underlying chronic lung disease
- Patients at risk for aspiration
  - Initial or repeat endotracheal intubation
  - Nasogastric tube insertion
  - Supine position, coma, post-surgery, immobilization
- Prolonged mechanical ventilation
- Host factor extremes
- Age, malnutrition, severe underlying conditions

NHSN Chapter 6: Pneumonia Event (www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf)

SHEA/IDSA Compendium 2022: Strategies to Prevent HAI Pneumonia in Acute-Care Hospitals (PDF) (www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-ventilatorassociated-pneumonia-ventilatorassociated-events-and-nonventilator-hospitalacquired-pneumonia-in-acutecare-hospitals-2022-update/A2124BA9B088027AE30BE46C28887084)

Pathogenesis of HAI Pneumonia

Bacteria may invade the lower respiratory tract by

- Aspiration
  - Persons with abnormal swallowing
    - Depressed consciousness
    - Postoperative patients
    - Ventilator patients
- Inhalation of aerosols containing bacteria
- Hematogenous spread from a distant body site

NHSN Chapter 6: Pneumonia Event (www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf)

SHEA/IDSA Compendium 2022: Strategies to Prevent HAI Pneumonia in Acute-Care Hospitals (PDF) (www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-ventilatorassociated-pneumonia-ventilatorassociated-events-and-nonventilator-hospitalacquired-pneumonia-in-acutecare-hospitals-2022-update/A2124BA9B088027AE30BE46C28887084)

Hospital-Acquired Pneumonia

- Pneumonia accounts for approximately 15% of all HAI in acute care hospitals
- In a 2015 point prevalence survey(PPS), pneumonia was the most common HAI
  - 32% of cases were ventilator associated
  - Ventilated patients are at higher risk for pneumonia
- Among hospitalized patients with HAI pneumonia, mortality as high as 33%

NHSN Chapter 6: Pneumonia Event
(www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf)

CDC/HICPAC Guidelines for Preventing Health-Care Associated Pneumonia, 2003 (Last reviewed 2015)
(www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm)

Pneumonia Prevention in Hospitals – What works?

Best sources for **evidence-based pneumonia prevention practice** recommendations

- **CDC/HICPAC** Pneumonia Prevention Guideline, 2003
- **SHEA/IDSA** Strategies to Prevent Healthcare Associated Pneumonia in Acute Care Hospitals, 2014 (Updated 2022)

Preventing Hospital-acquired Pneumonia

- Hospital staff educated about pneumonia prevention practices
- Patients encouraged in post operative coughing, deep breathing, and early ambulation
- Respiratory equipment and devices cleaned before sterilization or disinfection
  - Cleaned shortly after use
  - Appropriate rinsing, drying and packaging ensured
- Aspiration of secretions avoided
- Regular oral care with an antiseptic agent provided

CDC/HICPAC Guidelines for Preventing Health-Care Associated Pneumonia, 2003

(www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm)

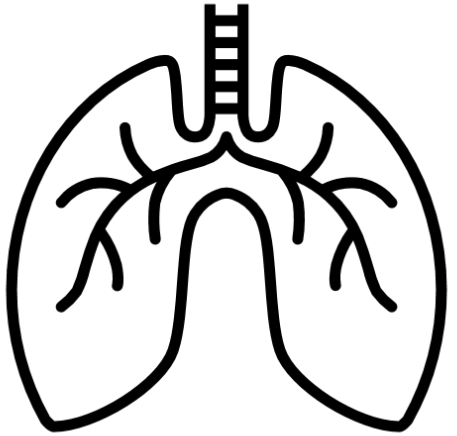
Standard Precautions for Pneumonia Prevention

HCP must follow Standard precautions consistently!

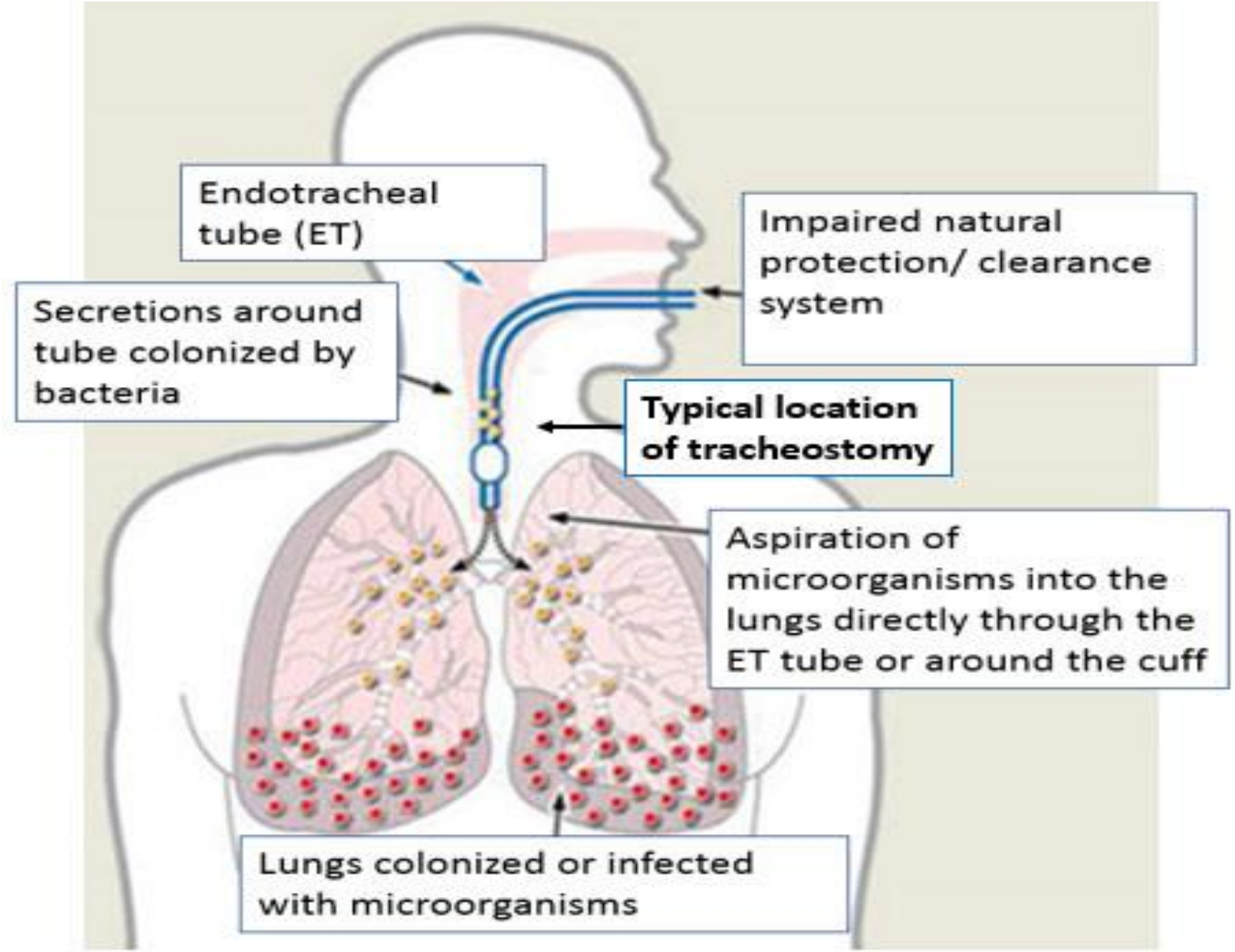
- Perform hand hygiene before and after patient care
- Wear gloves when handling respiratory secretions
- Change gloves and perform hand hygiene between patients and after touching contaminated equipment

CDC/HICPAC Guidelines for Preventing Health-Care Associated Pneumonia, 2003 (Last reviewed 2015)
(www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm)

Ventilator-Associated Pneumonia (VAP)



VAP Pathogenesis



Ventilator-Associated Pneumonia (VAP)

- Up to 46% of hospitalized patients with VAP die
  - Varies with patient population and organism type
  - Highest mortality in patients with severe illness

CDC/HICPAC Guidelines for Preventing Health-Care Associated Pneumonia, 2003

(www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm)

Etiology of Hospital-acquired VAP

Early onset

- Occurs in first four days of admission to an ICU or intubation for mechanical ventilation
- Usually associated with non-multidrug-resistant organisms such as *S. aureus* (most common), *E. coli, Klebsiella spp., Proteus spp., S. pneumoniae, and H. influenzae*

Late onset

- Occurs after 4 days in ICU stay
- Associated with Pseudomonas aeruginosa, MRSA, and Acinetobacter spp., strains that are usually multi-antibiotic-resistant

Guideline for the Prevention of Healthcare Associated Pneumonia, 2003 (PDF)
(www.cdc.gov/infectioncontrol/pdf/guidelines/healthcare-associated-pneumonia-H.pdf

VAP Prevention Challenges - Non-modifiable Risk Factors

In addition to being intubated and requiring mechanical ventilation, many patients have pre-existing conditions that put them at higher risk for VAP

- Head trauma
- Coma
- Nutritional deficiencies
- Immunocompromised
- Multi organ system failure
- Acidosis
- History of smoking or pulmonary disease

VAP Prevention: Modifiable Risk Factors

Some factors that put patients at risk for VAP **can be** minimized by evidence-based care practices

- Preventing aspiration of secretions
- Reducing duration of ventilation
- Reducing colonization of airway and digestive tract
- Preventing exposure to contaminated equipment

Prevent Aspiration of Secretions

- Maintain head of bed at 30-45 degrees elevation
- Avoid unplanned extubation and re-intubation
  - Accidental ETT dislodgement during care
  - Resident pulls at trach and tubing
- Use cuffed tube with in-line suctioning
- Encourage early mobilization with physical/occupational therapy
- Manage oral secretions

Reduce Duration of Ventilation

- Evaluate sedation with goal to improve mobility and wean off ventilation
  - Sedation vacation means reducing or stopping medications that sedate, such as opiates or diazepam
- Assess readiness to wean from ventilation daily depending on the underlying diagnosis
- Conduct spontaneous breathing trials with provider input

Some may not be feasible for patients requiring long term ventilator support

Reduce Colonization of Airway and Digestive Tract

- Use cuffed endotracheal tube or tracheostomy tube with inline suctioning
  - Minimizes secretions above cuff; reduces contamination of lower airway
- Avoid acid suppressive therapy for patients not at high risk for stress ulcer or stress gastritis
  - Increases colonization of the digestive tract-the acidity of the stomach kills bacteria

Reduce Colonization of Airway and Digestive Tract - Continued

- Perform regular oral care with an antiseptic agent
- Reduce the opportunities to introduce pathogens into the airway
  - Perform good hand hygiene
  - Use gloves for contact with respiratory secretions or contaminated objects; follow with hand hygiene
  - Educate staff to avoid contaminating the endotracheal or tracheostomy tube from patient mouth flora or HCP hands
  - Avoid introducing pathogens from patient's other body sites or the environment

Prevent Exposure to Contaminated Equipment

- Use sterile water to rinse reusable respiratory equipment
- Remove condensate from ventilatory circuits
- Change ventilatory circuit only when malfunctioning or visibly soiled
- Disinfect/sterilize and store respiratory equipment effectively
  - Avoid storing in places where the equipment can be contaminated

Hospital's Role in VAP Prevention

- California HAI public reporting laws do not require hospitals to track and report VAP to CDPH
- The law does require hospitals to implement VAP prevention guidelines and process measures
  - Process measures include monitoring adherence to VAP prevention practices

California Health and Safety Code 1288.9 (b)

Sample Adherence Monitoring Tool - VAP Prevention

Ventilator Pneumonia Prevention Observations	Pt 1		Pt 2		Adherence by Task	
					#Yes	# Obs
Head of bed 30-45 degrees	**Yes**	No	Yes	**No**	1	2
Sedation vacation documented	Yes	**No**	Yes	**No**	0	2
Readiness to wean documented	**Yes**	No	**Yes**	No	2	2
Oral care with an antiseptic agent is performed regularly (per policy)	Yes	**No**	Yes	**No**	0	2
Hand hygiene performed before providing care	Yes	**No**	Yes	**No**	0	2
Sterile water used to rinse reusable respiratory equipment	**Yes**	No	**Yes**	No	2	2
Condensate in ventilatory circuit is removed	**Yes**	No	Yes	**No**	1	2
Ventilatory circuit is changed only when malfunctioning or soiled	**Yes**	No	**Yes**	No	2	2
# Yes 8	# Observed 16		#Yes/#Observed = % Adherence		50 %	

Preventing Pneumonia Through Immunization

- Promote pneumococcal vaccine
  - Required by CMS
  - Adults who have never received any Pneumococcal vaccination:
    - Give 1 dose of 15-valent pneumococcal conjugate vaccine (PCV15), or PVC20 vaccine
  - Adults who have received previous pneumococcal vaccination:
    - Refer to CDC Adult Immunization Schedule
    - Vaccination will depend on previous vaccine type received and risk factors

CDC Adult Immunization Schedule 2023
(www.cdc.gov/vaccines/schedules/easy-to-read/adult.html#schedule)

Preventing Pneumonia Through Immunization

- Promote annual ACH patient influenza vaccination
  - Have an annual event to educate and promote vaccine
- Promote annual influenza vaccination for HCP and staff
  - Myths dispelled such as “I get sick from the flu shot”

CDC Adult Immunization Schedule 2023
(www.cdc.gov/vaccines/schedules/easy-to-read/adult.html#schedule)

Adult Immunization Schedule by Age (Addendum updated February 29, 2024)

Vaccine	19-26 years	27-49 years	50-64 years	≥65 years
COVID-19	1 or more doses of updated (2023–2024 Formula) vaccine (See notes)			
Influenza inactivated (IIV4) or Influenza recombinant (RIV4)	1 dose annually			
or Influenza live attenuated (LAIV4)	or 1 dose annually			
Respiratory Syncytial Virus (RSV)	Seasonal administration during pregnancy. (See notes)			≥60 years
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (See notes)			
	1 dose Tdap, then Td or Tdap booster every 10 years			
Measles, mumps, rubella (MMR)				
Varicella	2 doses		2 doses	

CDC Adult Immunization Schedule by Age (Updated 2024)
(www.cdc.gov/vaccines/schedules/hcp/imz/adult.html#table-age)

Legionnaire's Disease

- Severe form of pneumonia
- 85% caused by inhaling or aspirating the bacteria *Legionella pneumophila* serotype 1
  - Other serotypes also cause Legionnaire's Disease 15%
  - Not transmitted person-to-person
- Often requires hospitalization
- Incubation period 2-10 days prior to onset of symptoms
- Fatal in 10% of cases overall and 25% of healthcare- associated cases

CDC What Clinicians Need to Know about Legionnaires' Disease (PDF)
(www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf)

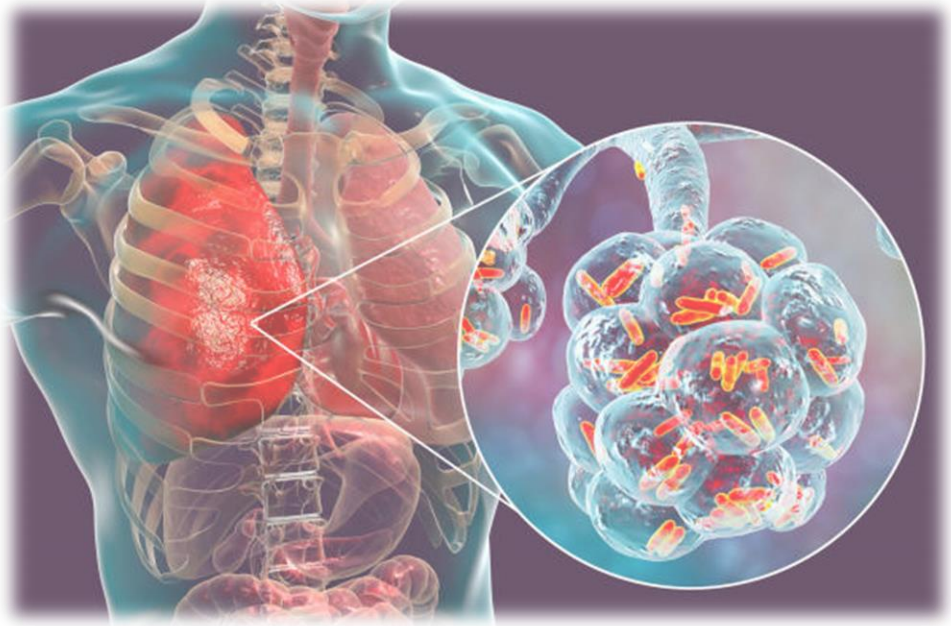
Legionella in California and the United States

California cases reported between 2013-2019

- Total Legionella cases – 3,159
- Healthcare-associated – 103 (3.3%)
- Non-healthcare-associated – 525 (16.6%)

U.S. Legionella cases 2010-2019

  - 82,352 cases
- **U.S. Cases 2019**
  - 6,955 cases
  - 1,284 (18%) with healthcare exposure
    - 10% from LTC exposure



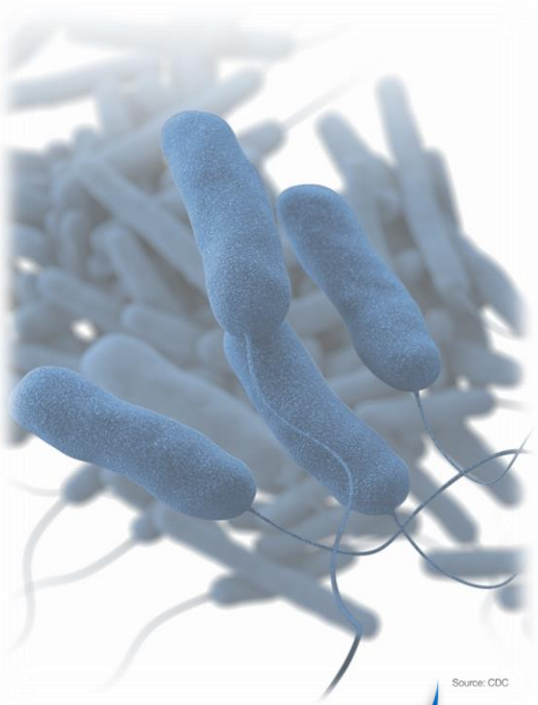
Legionnaire's Disease Surveillance Summary Report, United States 2018-2019 (cdc.gov)

(www.cdc.gov/legionella/health-depts/ surv-reporting/2018-19-surv-report-508.pdf)

California Department of PublicHealth

Legionella

- Naturally found in fresh water
- Grows best in
  - Man-made water environments with temperatures 77°-107.6° F
  - Stagnation, scale and sediment
  - Presence of certain aquatic amoebae
- Identified in health care facilities
  - Showers (potable water)
  - Cooling towers (as part of large air conditioning systems)
  - Decorative fountains
  - Hot tubs



Risk Factors for *Legionella* Pneumonia

- Immunosuppressed hosts
- Solid organ transplant recipients
- Advanced age
- Male gender
- Cigarette smoking
- Alcohol abuse
- Chronic pulmonary disease
- Corticosteroid usage
- Renal failure

APIC Text 2018:
Healthcare Associated Pathogens and Diseases: *Legionella pneumonophila*

Laboratory Test for Legionella

- Urinary antigen test
  - Detects most common cause- L. pneumophilia serogroup 1
- Lower respiratory secretion, tissue, or pleural fluid culture
  - Detects other *Legionella* species
  - Ordered if urinary antigen test is negative, and *Legionella* is suspected

Report all positive Legionella cases to local public health and CDPH L&C District Office

Water Management Plan

Perform Risk Assessment for facility to reduce risk of exposure to *Legionella* – **Required!**

- Observe for areas that may be breeding grounds for *Legionella:*
  - Standing water
  - Water fountains
  - Hot tubs
- If in a large facility with cooling towers: Culture cooling towers and water storage units regularly, and maintain HVAC systems to prevent air conditioning condensate to pool
  - What actions taken if culture is positive
  - Flush plumbing of resident rooms that are not used for more than one week
  - Elements included in facilities Policy and Procedure Manual

CDC Legionella Environmental Assessment Form
(www.cdc.gov/legionella/downloads/legionella-environmental-assessment.pdf)

Influenza

- Caused by Influenza virus
  - Influenza A and B most common
- "Flu season" is late fall to early spring (October – March)
  - Varies from season to season depending on flu strain
  - Recommendation for vaccination before end of October
- Elderly are at highest risk for serious influenza complications
- Severe illness may lead to life-threatening pneumonia
  - 417 influenza deaths in 2023 in California

CDPH Influenza, RSV, and Other Respiratory Diseases
(www.cdph.ca.gov/Programs/CID/DCDC/pages/immunization/influenza.aspx)

Influenza Epidemiology

- Incubation period 1-4 days
- Highly contagious during first 3 days of illness
- Symptoms
  - Fever ≥100°F
  - Muscle aches
  - Headache
  - Fatigue
  - Sore throat
  - Runny nose
  - Non-productive Cough
- Older patients may have subtle changes in mental status and a temperature below normal
- Symptoms are like that of COVID-19 – **suspect BOTH**
  - COVID-19 will be discussed in a separate module

Key Facts About Influenza (Flu) | CDC

(www.cdc.gov/flu/about/keyfacts.htm)

Influenza Etiology

- Spread by viral particles' contact with the respiratory tract
  - Infected person coughs or sneezes (droplets)
  - Uninfected person inhales the viral particles
- Can survive on surfaces for 24-48 hours (contact)
- Transmission can occur:
  - Person to person (droplets)
  - Person-object-person (direct or indirect contact)

Key Facts About Influenza (Flu) | CDC
(www.cdc.gov/flu/about/keyfacts.htm)

Transmission-based Precautions for Influenza

- Droplet precautions
  - + Standard precautions
- Implement precautions for suspect and confirmed influenza for 7 days after illness onset or 24 hours after resolution of fever and respiratory symptoms, whichever is longer
  - Place ill patient in private room or cohort with other influenza positive patients
  - Keep symptomatic patients in the room; serve meals in their rooms

Prevention Strategies for Seasonal Influenza in Healthcare Settings
(www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm)

Influenza Prevention in Healthcare Facilities

- Vaccination of **healthcare workers** and **patients/residents**
- "*Cover Your Cough*" signage
  - Patients, residents and visitors encouraged to practice respiratory hygiene and cough etiquette
- Visitor screening during flu season
- Visitation restrictions
- Work restrictions for ill employees
- HCP and staff adherence to hand hygiene
- Transmission-based precautions for suspect influenza immediately

Cover Cough CDC
(www.cdc.gov/flu/pdf/protect/cdc_cough.pdf)

Prevention Strategies for Seasonal Influenza in Healthcare Settings
(www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm)

Facility Role in Respiratory Infection Prevention

- Ensure policies reflect current recommended practices
  - CDC guidelines
- Ensure staff competency upon hire and at least annually
  - New hire orientation
  - Annual skills fair
  - Return demonstration to ensure competency
- Establish an adherence monitoring program for measuring prevention care practices
  - Use tools to measure adherence
- Provide feedback to frontline staff and leaders
  - Present adherence results to each unit

Pneumonia Prevention: The Most Important Things

All Patients

- ❑ Promote patient and HCP influenza vaccination
- ❑ Promote pneumonia vaccine
- ❑ Ensure adequate nutrition and hydration
- ❑ Perform regular oral care
- ❑ Perform hand hygiene
- ❑ Ensure effective water management program
- ❑ Encourage early mobilization

Additional Practices for Patients on Mechanical Ventilation

- ❑ Maintain HOB 30-45 degrees
- ❑ Avoid gastric distention
- ❑ Assess readiness to wean
- ❑ Use cuffed ETT with inline suctioning
- ❑ Avoid acid suppressive therapy if possible
- ❑ Prevent exposure to contained equipment

Monitor adherence!

Summary

- Evidence-based prevention care practices can prevent healthcare-associated pneumonia in hospitals
- Pneumonia prevention includes programs to vaccinate health care providers
- Complications of ventilated patients are common, but many VAP are preventable
- A comprehensive water management program reduces risk for Legionnaire's disease
- Maintain a facility annual influenza plan
- Adherence monitoring of prevention care practices and providing feedback to frontline staff improves outcomes

Questions?

For more information, contact the HAI Program at

HAIProgram@cdph.ca.gov

Thank you!

Additional CLABSI Prevention References and Resources

- CDC Webpage: Central Line-associated Bloodstream Infection (CLABSI) (www.cdc.gov/hai/bsi/bsi.html)
- Central Line-associated Bloodstream Infections: Resources for Patients and Healthcare Providers (www.cdc.gov/hai/bsi/clabsi-resources.html)
- 2022 IDSA Compendium of Strategies Update (www.idsociety.org/practice-guideline/compendium-of-strategies-to-prevent-hais/#StrategiestoPreventVAP/VAE/NV-HAP20May2022)
- HAI Pathogens and Antimicrobial Resistance Report, 2018-2021 (www.cdc.gov/nhsn/hai-report/data-tables-adult/index.html)
- The Joint Commission CLABSI Toolkit (www.jointcommission.org/resources/patient-safety-topics/infection-prevention-and-control/central-line-associated-bloodstream-infections-toolkit-and-monograph/clabsi-toolkit---introduction/)

Additional CAUTI Prevention References and Resources

- APIC Preventing CAUTI: A patient-centered approach ,2012, (apic.org/Resource_/TinyMceFileManager/epublications/CAUTI_feature_PS_fall_12.pdf)
- CDC Webpage: Catheter-associated Urinary Tract Infections (CAUTI) (www.cdc.gov/hai/ca_uti/uti.html)
- 2022 IDSA Compendium of Strategies Update (www.idsociety.org/practice-guideline/compendium-of-strategies-to-prevent-hais/#StrategiestoPreventVAP/VAE/NV-HAP20May2022)
- HAI Pathogens and Antimicrobial Resistance Report, 2018-2021 (www.cdc.gov/nhsn/hai-report/data-tables-adult/index.html)
- HICPAC Guideline for Prevention of Catheter Associated Urinary Tract Infections, 2009, reviewed 2015 (www.cdc.gov/infectioncontrol/guidelines/cauti/index.html/CAUTIguideline2009final.pdf)
- The Power of 10: Your Role in Stopping UTIs The Power of 10: Your Role in Stopping UTIs (apic.org/Resource_/TinyMceFileManager/Topic-specific/APIC_Infographic_-_LTC_-_FINAL-02.jpg)

Additional Respiratory Infection Prevention References and Resources

- CMS Requirement to Reduce Legionella Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD) (PDF) (www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf)
- Coffin, S, et al. Strategies to Prevent Ventilator-Associated Pneumonia in Acute Care Hospitals. *Infect Control Hosp Epidemiol* ,29:S31-S40, 2008
- Greene LR, Sposato K, Farber MR, Fulton TM, Garcia RA. Guide to the Elimination of Ventilator – Associated Pneumonia. Washington, D.C.: APIC, 2009
- NHSN Patient Safety Module: Chapter 6 (PNEU/VAP) (PDF) (www.cdc.gov/nhsn/PDFs/pscManual/6pscVAPcurrent.pdf)