

Fifteen strategies for hospital infection prevention and control

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Surgical Infection prevention

A Historical perspective

- 3500 years ago the Suśruta-saṃhitā to Halstead (19th Century)
- The principles is as follows. –
 - 1) Gentle handling of tissue,
 - 2) Meticulous haemostasis,
 - 3) Preservation of blood supply,
 - 4) Strict aseptic technique,
 - 5) Minimum tension on tissues,
 - 6) Accurate tissue apposition,
 - 7) Obliteration of dead space



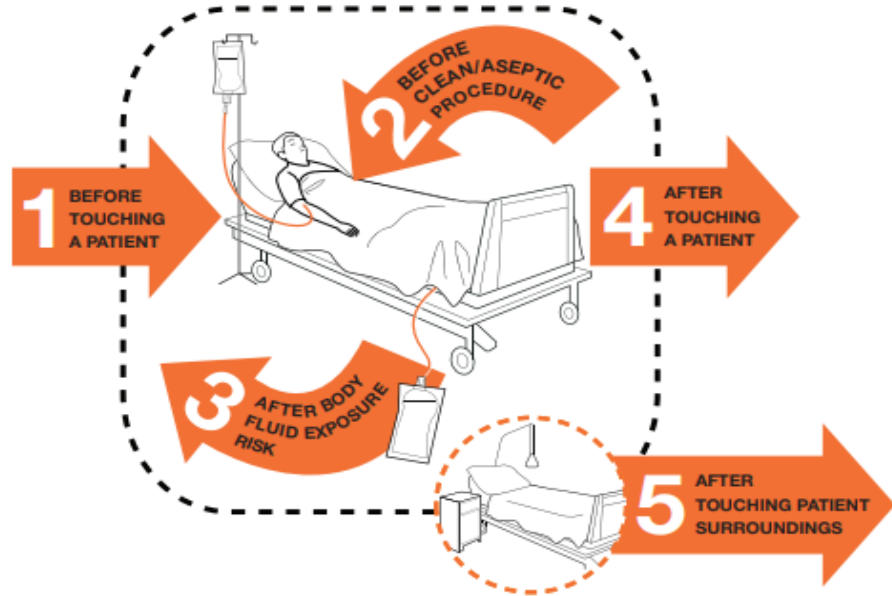


"To prevent a heart attack, take one aspirin every day. Take it out for a run, then take it to the gym, then take it for a bike ride..."

Prevention is better than cure

- According to the CDC Atlanta, one out of every 20 hospitalized patients will contract a healthcare-associated infection.
- The spread of these infections, however, can be controlled.
- There are several simple and cost-effective strategies that can help prevent infections
- This presentation focuses on 15 simple strategies for prevention of infections

Your 5 Moments for Hand Hygiene

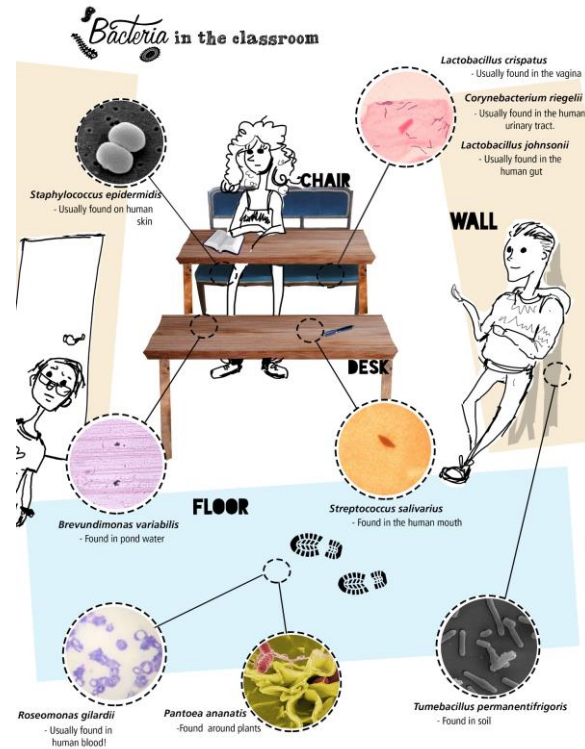


1. Hand Hygiene.



- A physicians healing touch is always been a hall mark of care
- The same hands can also spread infections
- According to the CDC, Hand Hygiene is the simplest approach to preventing the spread of infections and needs to be incorporated into the culture of the organization.
- Surgical team personnel should wash their arms and forearms before a procedure and put on sterile gloves, according to CDC guidelines for infection control.
- Steven J. Schweon, RN, MPH, infection prevention consultant and member of The Society for Healthcare Epidemiology of America, suggests the "[clean in, clean out](#)" approach, wherein hands and equipment are cleaned or disinfected on the way into the patient's room and on the way out again.

2. Environmental hygiene



- One of the most common sources of transmission of infection is environmental surfaces.
- Microbes are capable of surviving on environmental surfaces for months at a time
- When healthcare providers or patients touch these surfaces with their skin, the bacteria can be transmitted, causing infection
- Thus, it is essential that the environment be kept clean and disinfected.



2. Environmental hygiene

- Patients and their families can be made the biggest advocates of medical safety, especially with respect to maintaining a clean and sanitary environment
- Involve multidisciplinary environmental hygiene teams in meetings regarding adherence to infection prevention protocols.
- Sharing in-house surveillance data helps them relate housekeeping tasks with the spread of infection and helps ensure optimal environmental hygiene.



2. Environmental hygiene

- The care environment must be:
- visibly clean, free from non-essential items and equipment to facilitate effective cleaning
- well maintained and in a good state of repair
- Schedule:
 - A fresh solution of general purpose neutral detergent
 - 1,000ppm available chlorine should be used routinely on sanitary fittings.
 - Environmental cleaning schedules: responsibility for; frequency of; and method of environmental decontamination.



3. Screening and cohorting patients.

- Part of the initial health evaluation process should include consistent screening of patients,
- Patients who are suffering from the same disease or infection should be kept together in a designated area. "This is essential to ensure that cross infections do not happen,"
- Infections can spread easily from one patient to another if they are being treated in the same area, with the same staff and shared patient care equipment.
- Organizations must also evaluate whether the staff is adhering to specific protocols for specific infections.
- Cohorting may be
 - Patient-centric (i.e. Asthma)
 - Episode-centric (i.e. Pregnancy)
 - Encounter-centric (i.e. Appendectomy)



4. Vaccinations.

- The staff at a healthcare organization may sometimes be the cause of the spread of infections.
- They come into contact with patients with different types of diseases and may contract infections, according to the CDC.
- As a result, organizations must make sure that recommended vaccinations are being administered to their staff as recommended.
- "Keeping healthcare professionals healthy pays dividends," says Mr. Schweon.
- It results in decreased transmission risk to co-workers and patients.

5: Vaccinations and Monitoring antibody levels

VACCINES AND RECOMMENDATIONS IN BRIEF

Hepatitis B – If previously unvaccinated, give a 2-dose (Heplisav-B) or 3-dose (Engerix-B or Recombivax HB) series. Give intramuscularly (IM). For HCP who perform tasks that may involve exposure to blood or body fluids, obtain anti-HBs serologic testing 1–2 months after dose #2 (for Heplisav-B) or dose #3 (for Engerix-B or Recombivax HB).

Influenza – Give 1 dose of influenza vaccine annually. Inactivated injectable vaccine is given IM, except when using the intradermal influenza vaccine. Live attenuated influenza vaccine (LAIV) is given intranasally.

MMR – For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give subcutaneously (Subcut).

Varicella (chickenpox) – For HCP who have no serologic proof of immunity, prior vaccination, or diagnosis or verification of a history of varicella or herpes zoster (shingles) by a healthcare provider, give 2 doses of varicella vaccine, 4 weeks apart. Give Subcut.

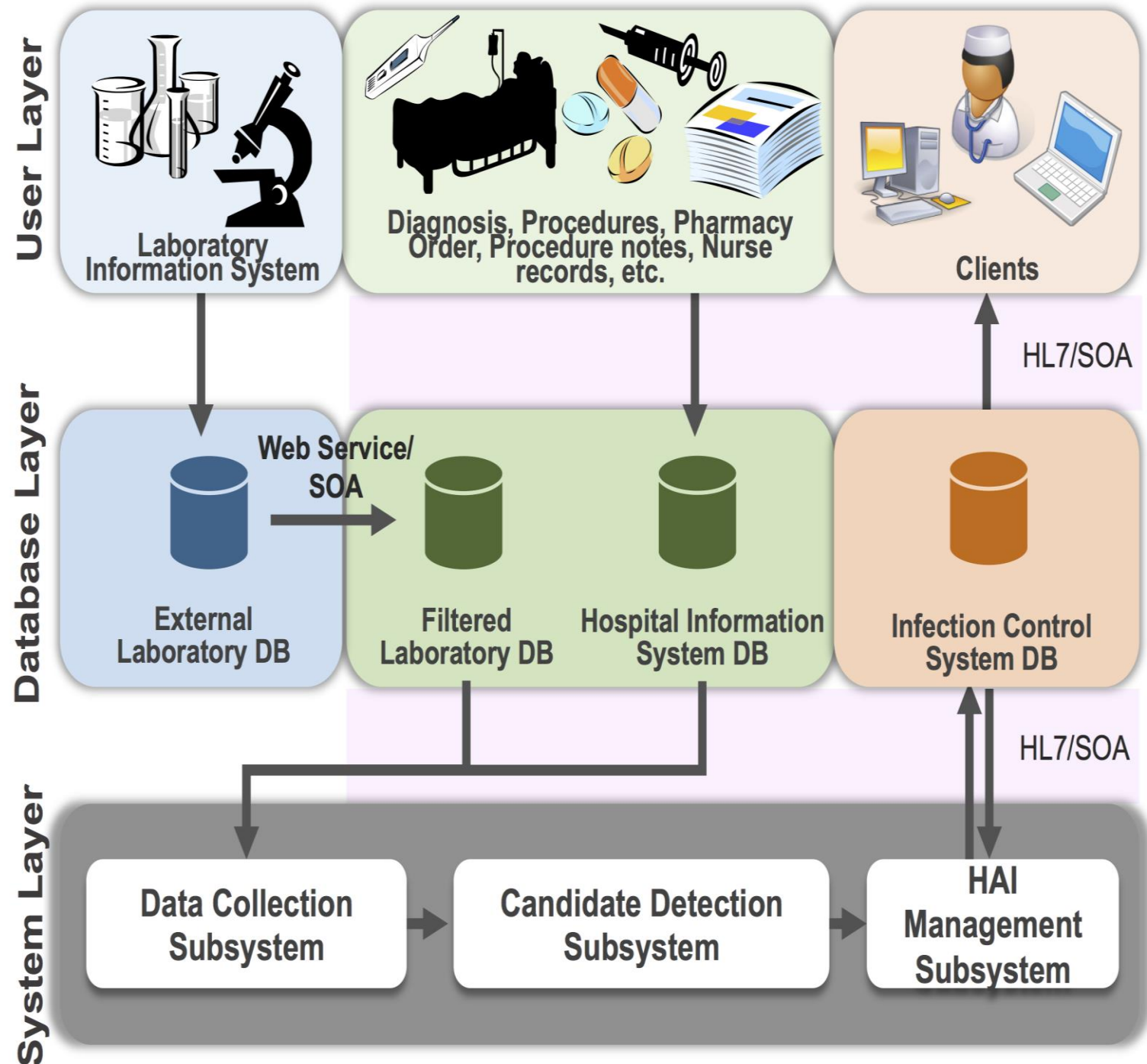
Tetanus, diphtheria, pertussis – Give 1 dose of Tdap as soon as feasible to all HCP who have not received Tdap previously and to pregnant HCP with each pregnancy (see below). Give Td boosters every 10 years thereafter. Give IM.

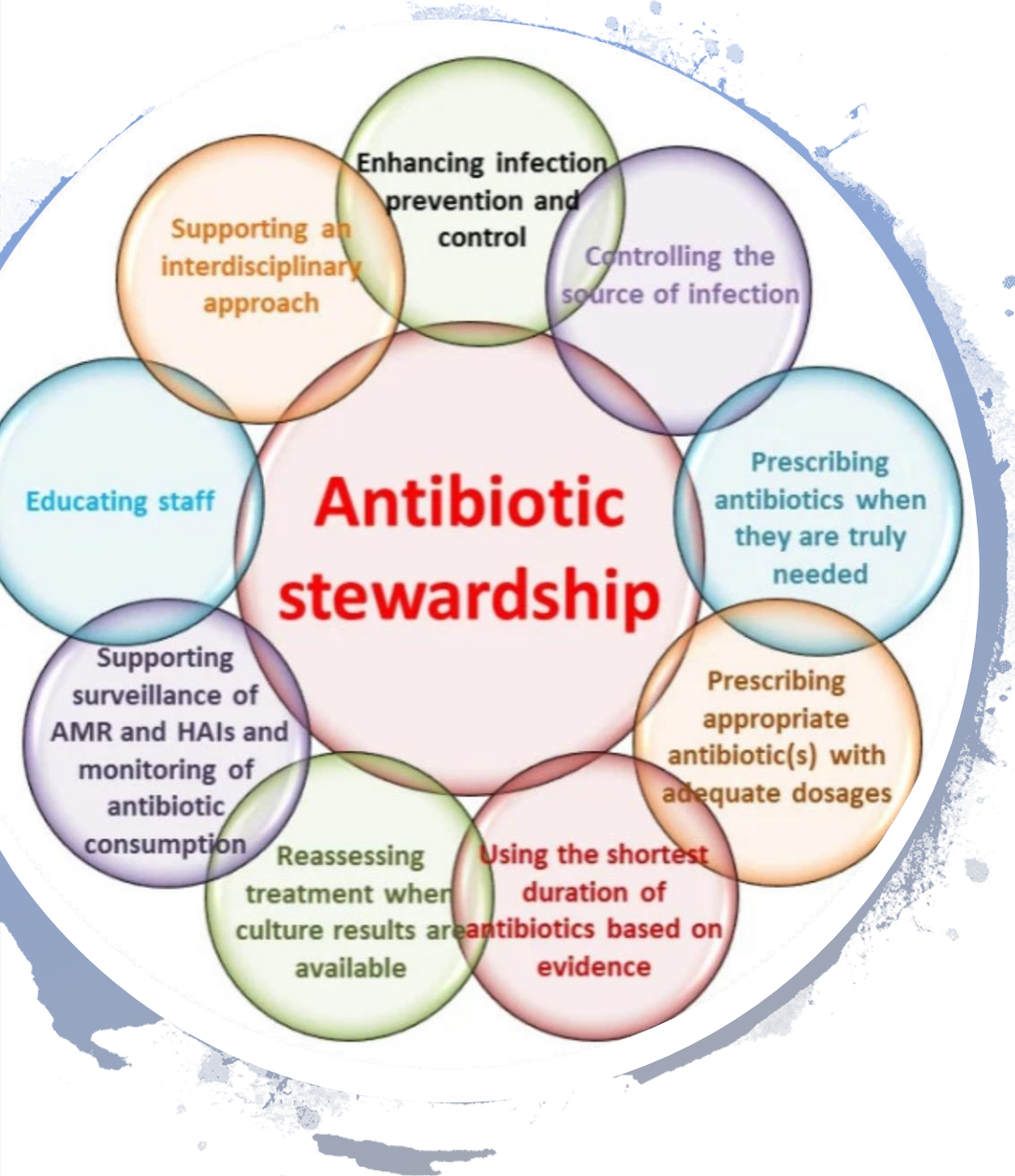
Meningococcal – Give both MenACWY and MenB to microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*. Every 5 years boost with MenACWY if risk continues. Give MenACWY and MenB IM.

- Anti HBs
- Anti Mumps
- Anti Measles
- Anti Rubella
- Anti Tetanus
- Anti Varicella

6. Surveillance

- Through surveillance, organizations should gather data regarding infection patterns at their facility.
- They should also regularly assess current infection prevention protocols.
- Having a robust infection surveillance program helps organizations measure outcomes, assess processes of care and promote patient safety
- Share the data collected
- "Communicate, display and discuss all process and outcomes measures with all stakeholders".



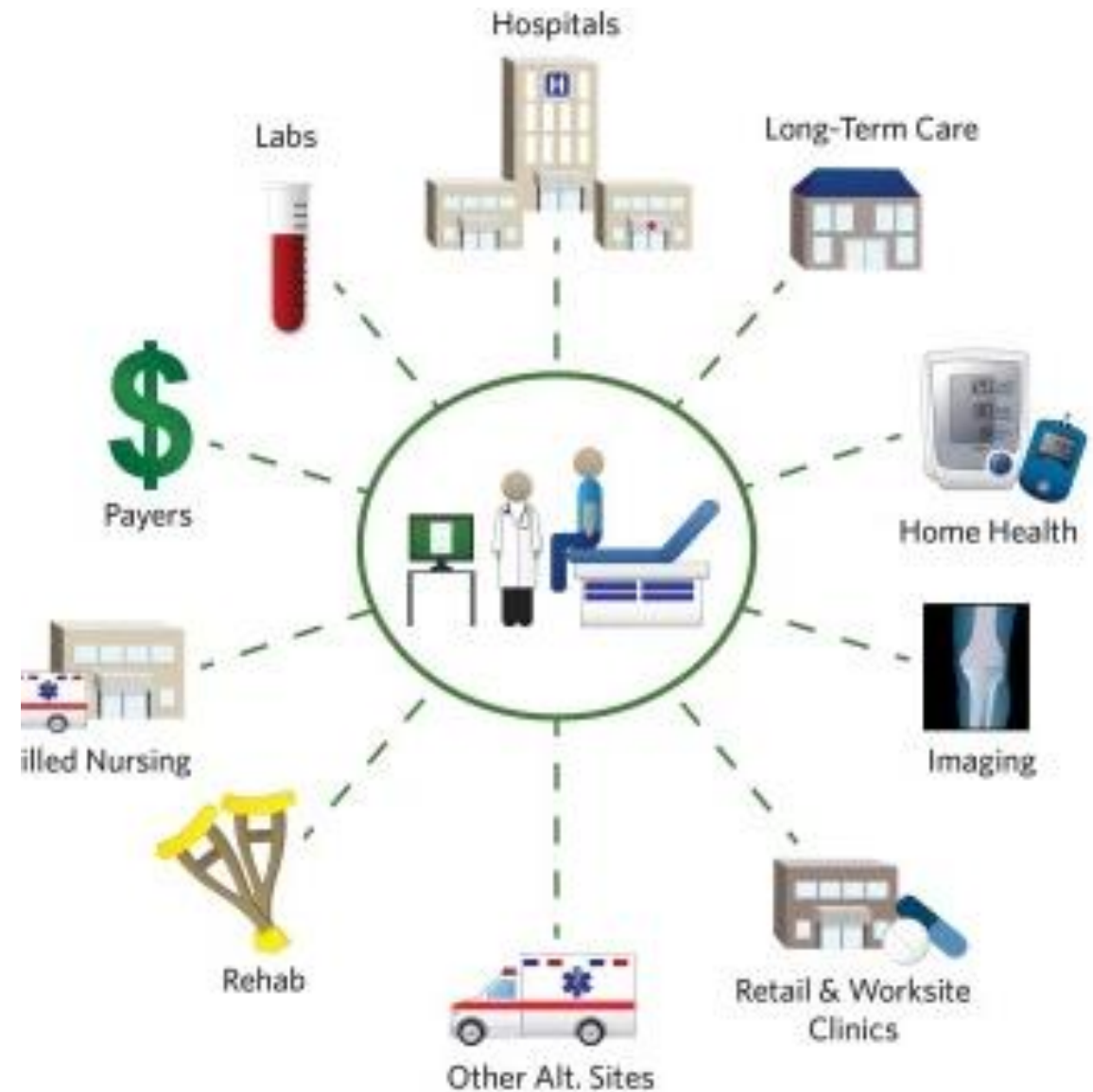


7. Antibiotic stewardship.

- The misuse and overuse of antibiotics can put patients at a risk of contracting infections
- Inappropriate antibiotic use may also result in resident microbes in patients becoming resistant to some drugs.
- If those patients contract an infection, it becomes harder to treat them.
- Establish a program to assist with appropriate antibiotic selection and dosing.
- This helps optimize patient outcomes and minimize adverse events like C. difficile infection and antibiotic toxicity.

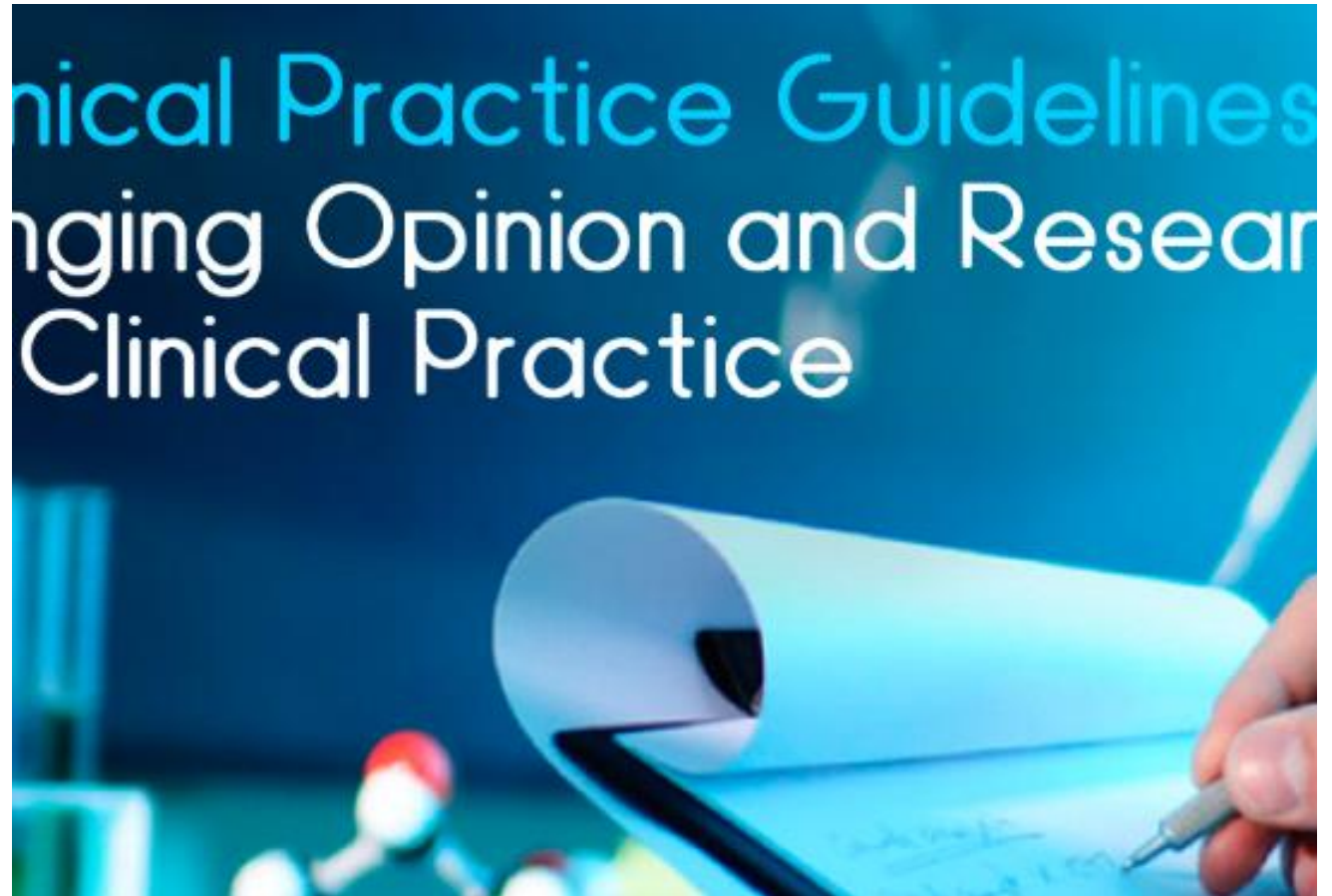
8. Care coordination.

- Patient-centered care coordination is a foundational standard of nursing practice.
- Furthermore, the ANA indicates that nurses illustrate the proper leadership, education and skills needed to work in partnership with other members of the health care team in order to coordinate successful transitional patient care.
- It has been seen that when nurses become leaders in transitional patient care, the quality and satisfaction of patients increase and health care resources become more efficient resulting in fewer costs
- Breakdown of communication in the surgical preparation, planning and postoperative care management among various care providers during the care transition process can lead to surgical site infections that could otherwise be avoided
- Organizations must avoid situations where a certain process is overlooked by a department that assumes another department has already completed that it.
- "Activities must be timed and accountability should be specifically assigned,"



9. Following the evidence.

- Keeping abreast of the latest findings regarding the spread of infections and strategies for prevention is essential for a successful infection prevention program.
- It is important to first look at the reality of your organization's processes and perform your own gap assessment before adopting new practices.
- What is new in the infection prevention field may not necessarily be the best fit for your organization.



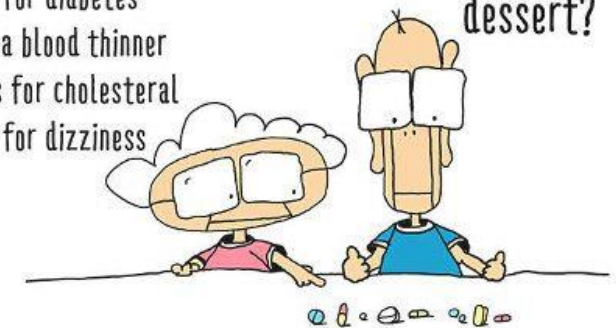
10. Appreciating all the departments that support the infection prevention program

- An organization's culture may need to shift from thinking that only infection preventionists are accountable for infection prevention
- All caregivers are accountable
- To encourage infection prevention protocols, healthcare professionals should show appreciation for all the people who help keep infections at bay
 - People who prepare surgical instruments
 - Preparing the food safely for patients
 - Caregiver Staff
 - Visitors.



That pill is for your heart
that one is for your eyes
that one is for blood pressure
That's for diabetes
that's a blood thinner
That is for cholesterol
That's for dizziness

What's for
dessert?

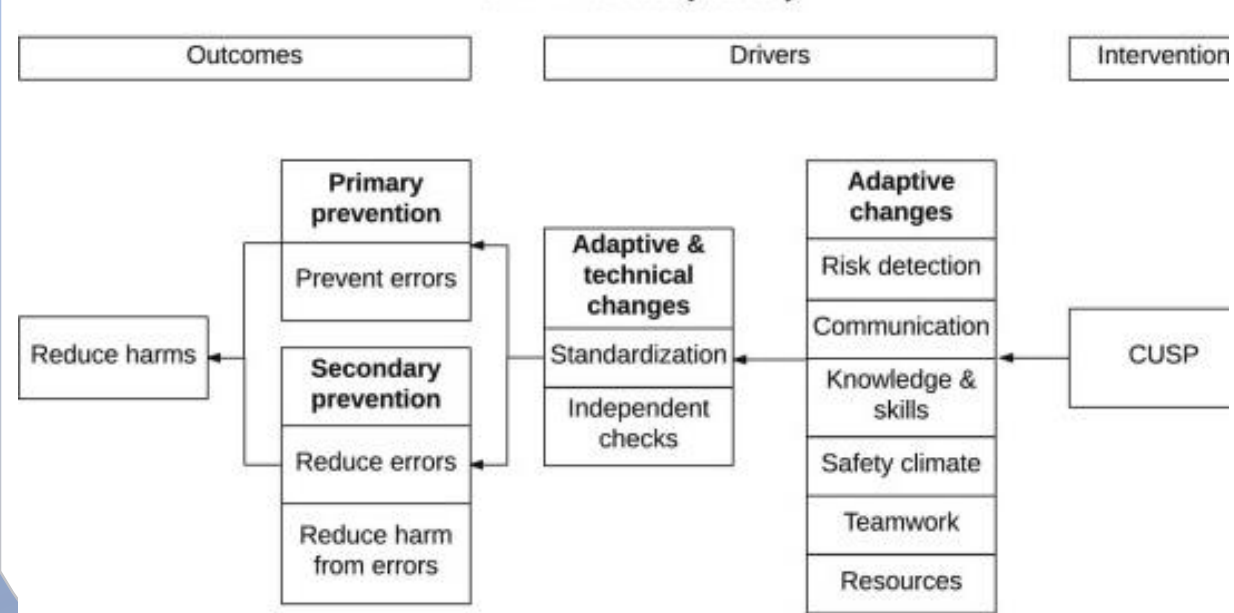


UNDER CARDIAC ARREST

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11. CUSP based Safety Programs.

Driver Diagram of Impact of the Comprehensive Unit-based Safety Program (CUSP) on Ambulatory Safety



- The Comprehensive Unit-based Safety Program is a structured strategic framework for patient safety improvement that integrates communication, teamwork and leadership
- The Comprehensive Unit-based Safety Program is designed to:
 - Improve patient safety awareness and systems thinking at the unit level
 - Mobilize staff to identify and resolve patient safety issues
 - Create a patient safety partnership between executives and frontline caregivers
 - Provide tools to help CUSP teams investigate and learn from defects and improve teamwork and safety culture



12. Rapid diagnosis of infections: syndromic approach

- Rapid evolution of technology: Probe based methods, NGS etc...
- PCR based procedures are used predominantly for rapid diagnosis of pathogens
- Multiplex PCRs enable us to rapidly look at multiple genes within the same bacterium and also distinguish genotypes and differentiate bacterial genera
- Real time PCR helped truly multiplex and identify multiple and simultaneously quantify pathogens
- Probe hybridization of amplicons was the next step to a syndromic approach
- DNA sequencing using NGS enabled us to identify the genotype of unknown pathogen without using pathogen specific primers
- NGS also helped in metagenomic analysis of mixed bacterial populations

13: PPE: Enhanced Barrier Precautions

- CDC recently introduced a new approach called [Enhanced Barrier Precautions](#) to help address these challenges.
- Enhanced Barrier Precautions fall between Standard and Contact Precautions
- Require gown and glove use for certain residents during specific high-contact resident care activities that have been found to increase the risk for MDRO transmission.
- Enhanced Barrier Precautions are recommended for preventing the transmission of novel or targeted MDROs in nursing homes involved in a public health containment response.

Personal Protective Equipment



- **Gloves**
- Aprons
- Gowns
- Protective eyewear
- Face shields
- Masks

Precautions	Applies to:	PPE used for these situations:	Required PPE	Room restriction
Enhanced Barrier Precautions	<ul style="list-style-type: none"> •All residents with <i>any of the following</i>: Wounds and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ ventilator) regardless of MDRO colonization status. •Infection or colonization with a novel or targeted MDRO <i>when Contact Precautions do not apply</i>. Facilities may consider applying Enhanced Barrier Precautions to residents infected or colonized with other epidemiologically-important MDROs based on facility policy. 	<ul style="list-style-type: none"> •During high-contact resident care activities: Dressing •Bathing/showering •Transferring •Providing hygiene •Changing linens •Changing briefs or assisting with toileting •Device care or use: central line, urinary catheter, feeding tube, tracheostomy/ventilator •Wound care: any skin opening requiring a dressing 	Gloves and gown prior to the high-contact care activity (change PPE before caring for another resident) (Face protection may also be needed if performing activity with risk of splash or spray)	None

13: PPE: Enhanced Barrier Precautions



14: Injection safety

- It is estimated that 16 billion injections are provided worldwide in developing and transitional countries. Only 5% are given for immunization purposes and 5% for contraceptive and other reasons.
- 90% of all injections are for medical/therapeutic reasons.
- **Unsafe injection practices** that have resulted in disease transmission have most commonly included:
 - Using the same syringe to administer medication to more than one patient
 - Accessing a medication vial or bag with a syringe that has already been used to administer medication to a patient, then using the remaining contents from that vial or bag for another patient
 - Using medications packaged as single-dose or single-use for more than one patient
 - Failing to use aseptic technique when preparing and administering injections

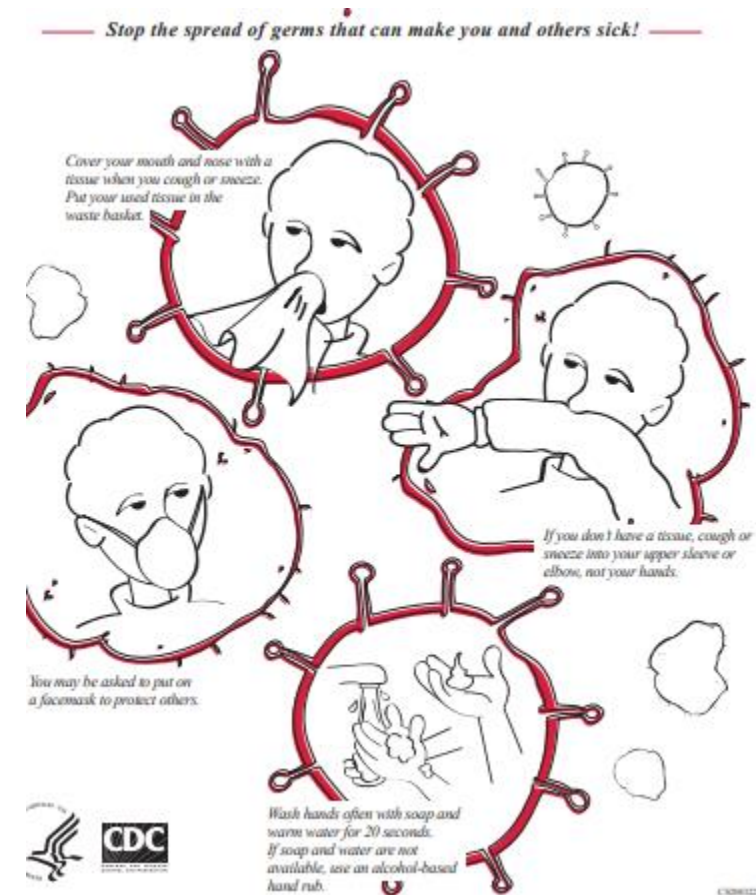
15: respiratory hygiene/cough etiquette



- Respiratory and cough hygiene is designed to minimise the risk of cross-transmission of respiratory illness (pathogens):
- Cover the nose and mouth with a disposable tissue when sneezing, coughing, wiping and blowing the nose.
- Dispose of all used tissues promptly into a waste bin.
- Wash hands with non-antimicrobial liquid soap and warm water after coughing, sneezing, using tissues, or after contact with respiratory secretions or objects contaminated by these secretions.

15: Respiratory hygiene/cough etiquette

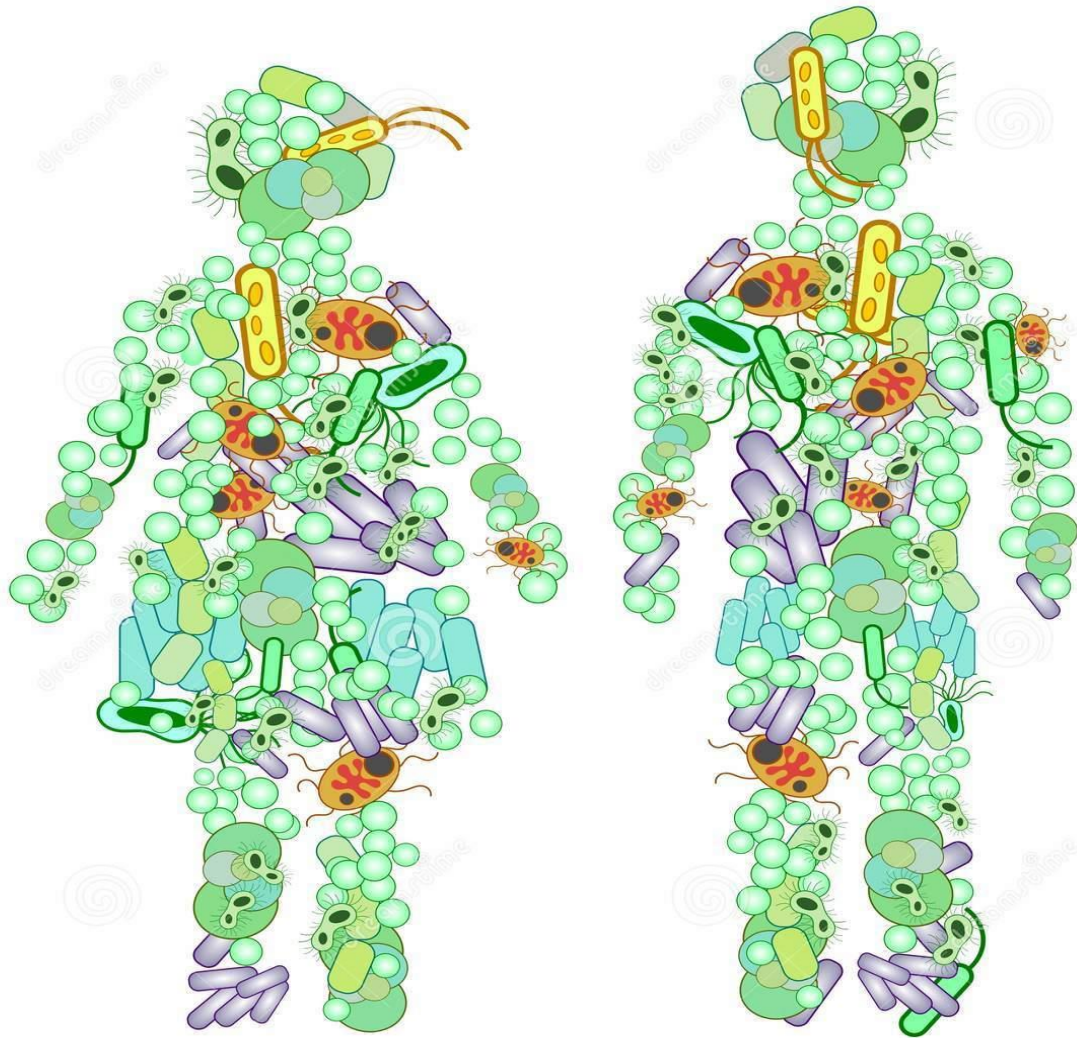
- Where there is no running water available or hand hygiene facilities are lacking, staff may use hand wipes followed by ABHR and should wash their hands at the first available opportunity.
- Keep contaminated hands away from the eyes nose and mouth.
- Staff should promote respiratory and cough hygiene helping those (e.g. elderly, children) who need assistance with this e.g. providing patients with tissues, plastic bags for used tissues and hand hygiene facilities as necessary.



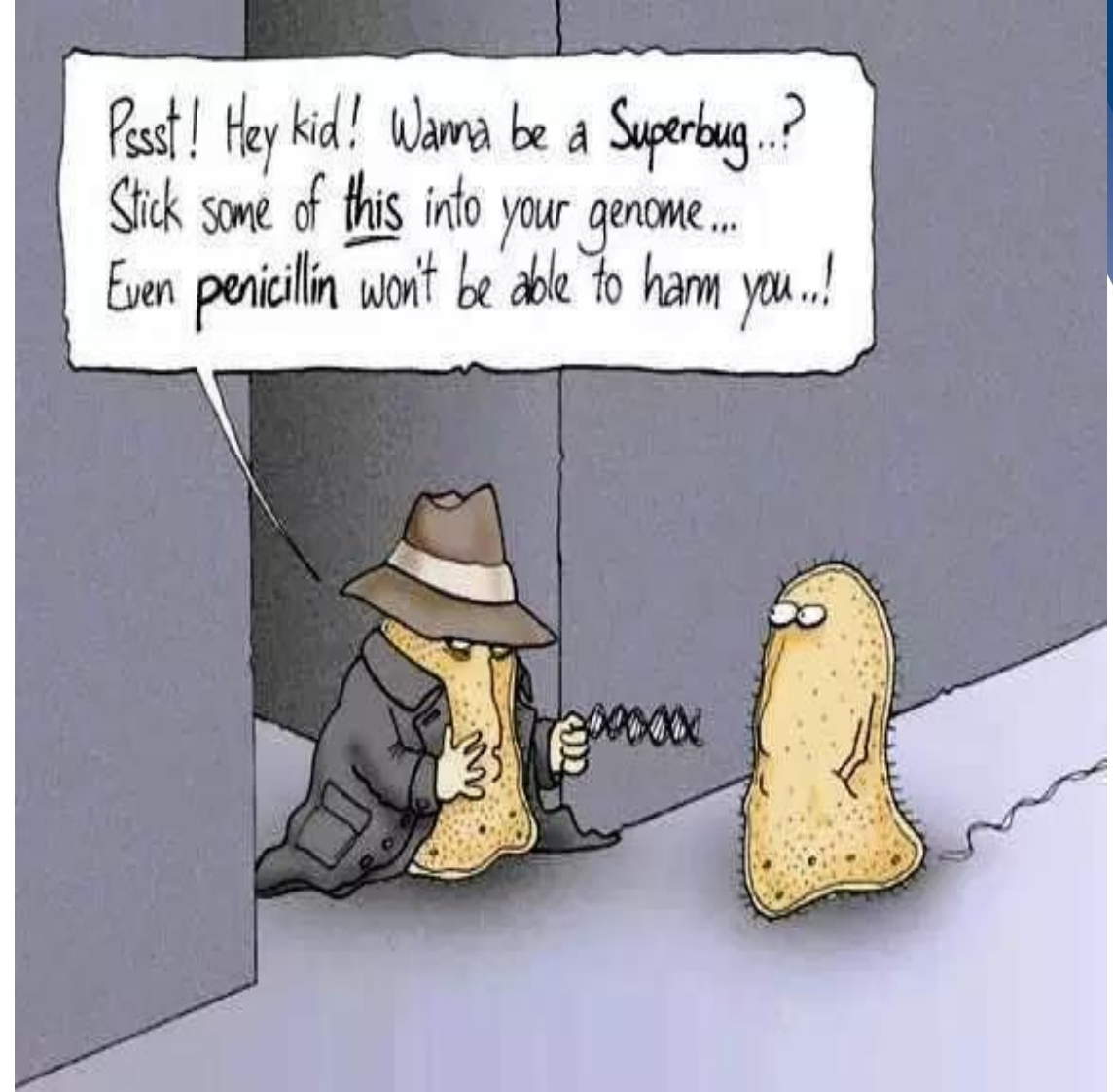
Infection control made easy

- Each of these strategies helps organizations keep the spread of infections at bay.
- When implemented, supported and carried out together, these 15 strategies are instrumental in ensuring the success of an infection prevention program at an organization.

Appreciation of all teams	Cohorting	Injection safety
Antibiotic stewardship	Enhanced barrier precautions	Rapid diagnosis of infections
Care coordination	Environmental Hygiene	Surveillance for infectious disease
Cough etiquette	Following evidence	Vaccination
Cusp	Hand Hygiene	Vaccination efficacy



Thank you



Thank you