ANTIMICROBIAL STEWARDSHIP

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MV-Health

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ANTIMICROBIAL STEWARDSHIP

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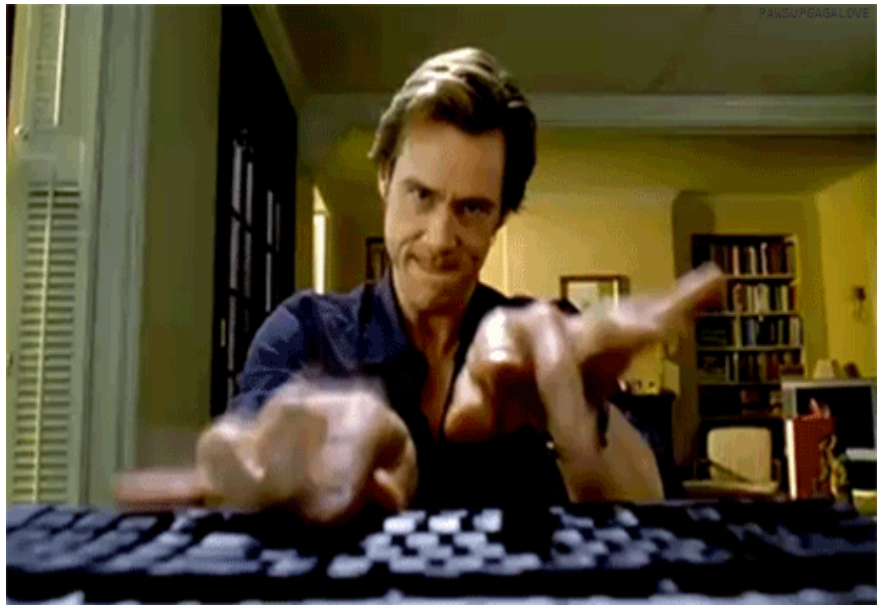
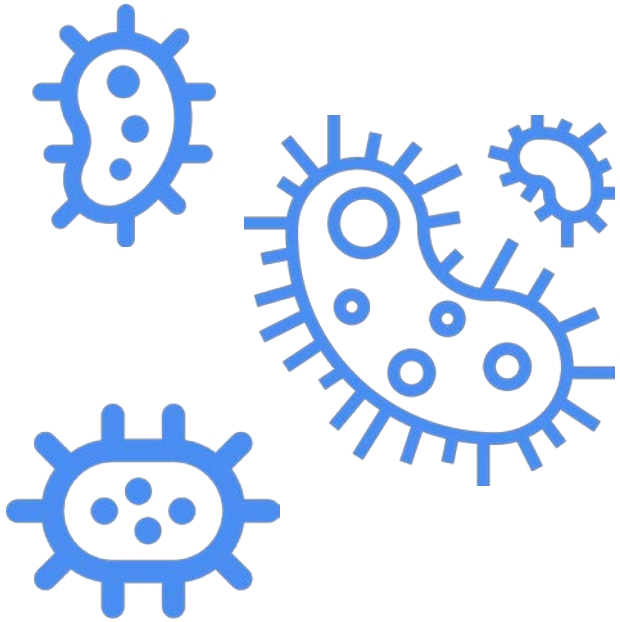
DEFINITIONS



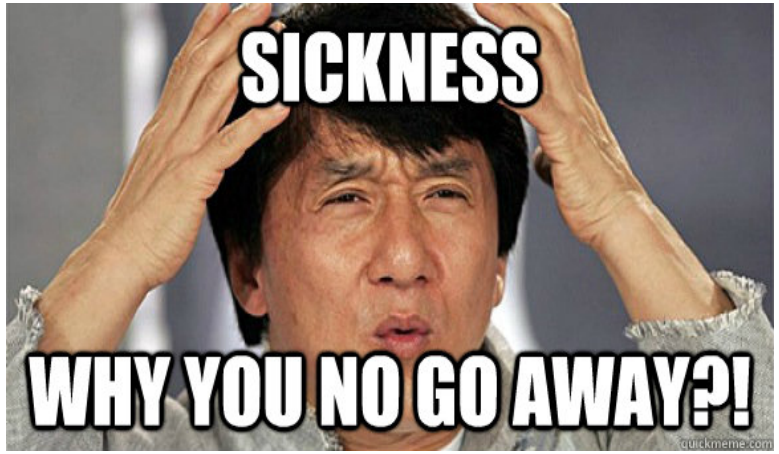
- Antimicrobial - an agent that kills microorganisms or inhibits their growth.
- Stewardship - being good stewards, preserving antibiotic effectiveness and restoring antibiotic effectiveness
- Antimicrobial Resistance - the ability of microbes to grow in the presence of a chemical (drug) that would normally kill them or limit their growth.



WHAT MAKES US SICK?

“MICROBES”

- Organisms too small for the eye to see and are found everywhere on Earth
- There are many types of Microbes:
  Bacteria, Viruses, Fungi, and Parasites
- While most microbes are harmless and even beneficial to living organisms, some can cause disease among humans, other animals and plants.
- The Disease causing microbes are called pathogens; sometimes referred to as “germs” or “bugs”
- All types of microbes have the ability to develop resistance to the drugs created to destroy them, becoming drug resistant organisms.



Examples of Disease-Causing Microbes

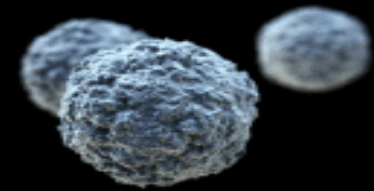
Strep throat

Bacteria
Group A *Streptococcus*

Food poisoning

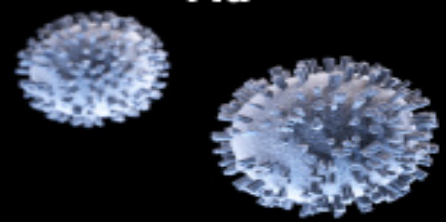
Bacteria
Salmonella

Common cold



Virus
Rhinovirus

Flu

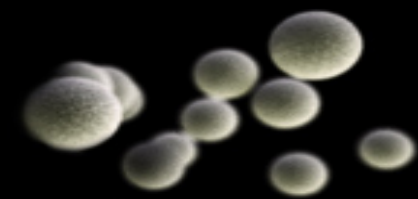


Virus
Influenza virus

Athlete's foot

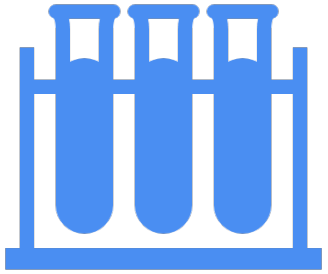
Fungi
Trichophyton

Malaria



Parasite
Plasmodium

WHAT ARE ANTIMICROBIALS?

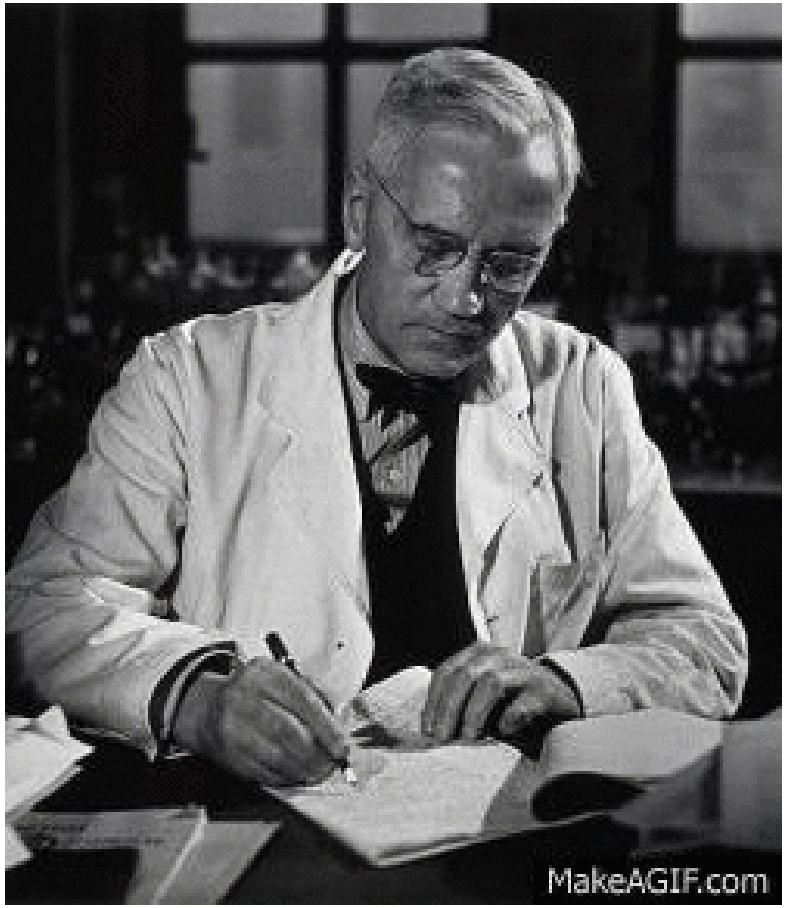


- Humans developed antimicrobials to destroy disease-causing microbes. The most commonly known antimicrobials are antibiotics, which target bacteria. Other forms of antimicrobials are antivirals, antifungals, and antiparasitics.
- Penicillin, the first commercialized antibiotic, was discovered in 1928 by Alexander Fleming. While it wasn't distributed among the general public until 1945, it was widely used in World War II for surgical and wound infections among the Allied Forces. It was hailed as a "miracle drug" and a future free of infectious diseases was considered. When Fleming won the Nobel Prize for his discovery, he warned of bacteria becoming resistant to penicillin in his acceptance speech.

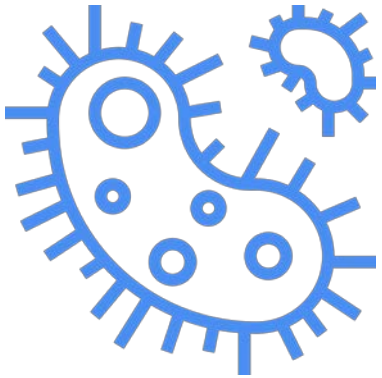
ALEXANDER FLEMING

New York Times
June 26, 1945

"The Microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out…In such cases the thoughtless person playing with penicillin is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted."



WHAT IS THE MAIN CAUSE OF RESISTANCE?



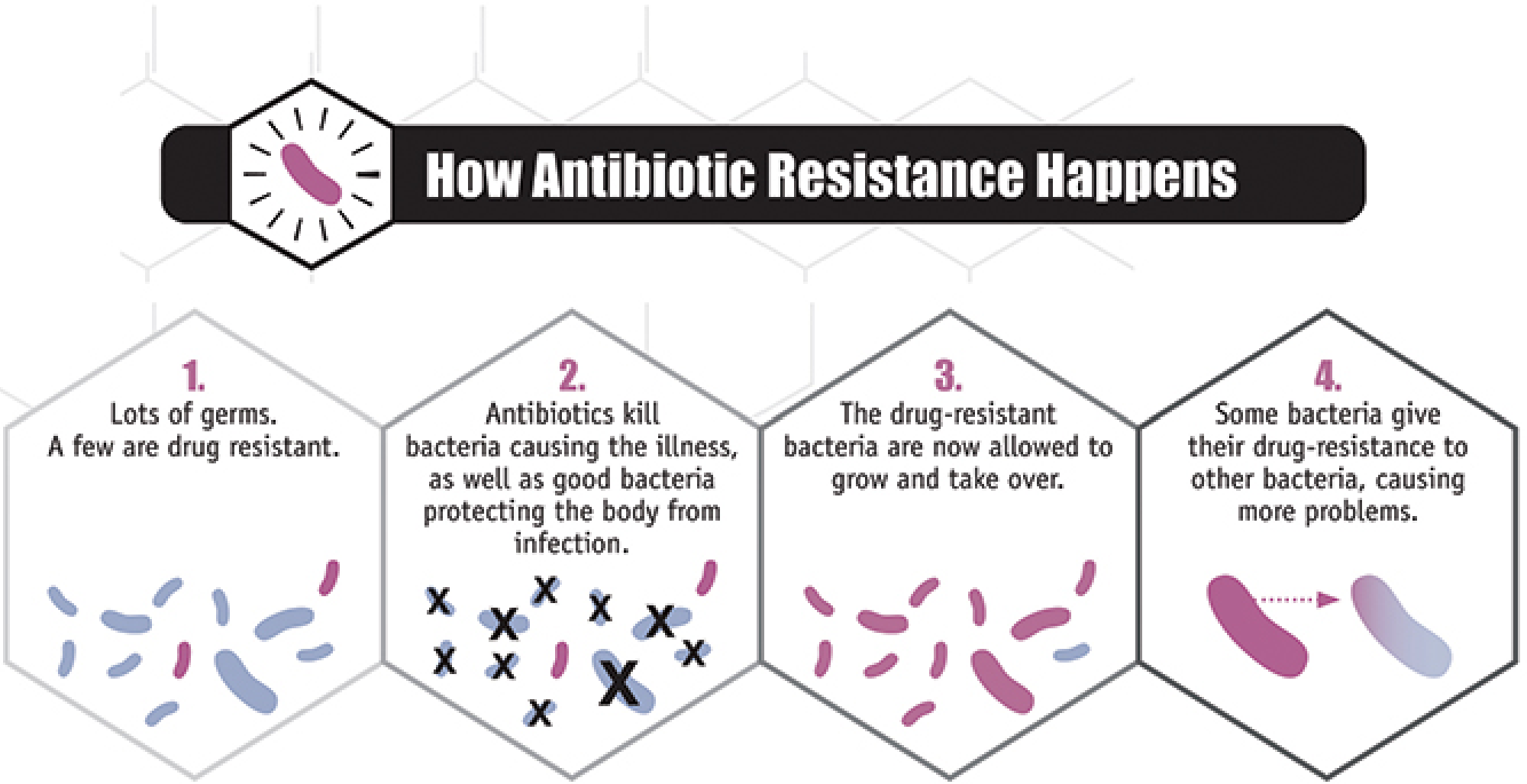
THE USE OF ANTIBIOTICS

This is the single most important factor leading to antibiotic resistance around the world. Simply using antibiotics creates resistance. These drugs should only be used to manage infections.

IN SHORT:

Huge number of people taking antibiotics for infections they do not have!!!

ANTIBIOTIC PRESSURE



TIMELINE LEADING TO ANTIMICROBIAL STEWARDSHIP

1930s

Sulfonamides, penicillin and streptomycin become available

Harnessing of antibacterial agents for clinical use begins

1940s

Penicillin resistance to Staph aureus is detected

1960s

Staph aureus resistance to methicillin emerges

1990s

MRSA is observed in over 53%of isolates obtained from ICU patients in a US surveillance system

IDSA/SHEA published "Guidelines for Antimicrobial Resistance in Hospitals"

ANTIBIOTIC FUN FACTS

- Antibiotics are among the most commonly prescribed drugs used in human medicine and can be lifesaving drugs.

- There are 141 antibiotics that have been created as of today.

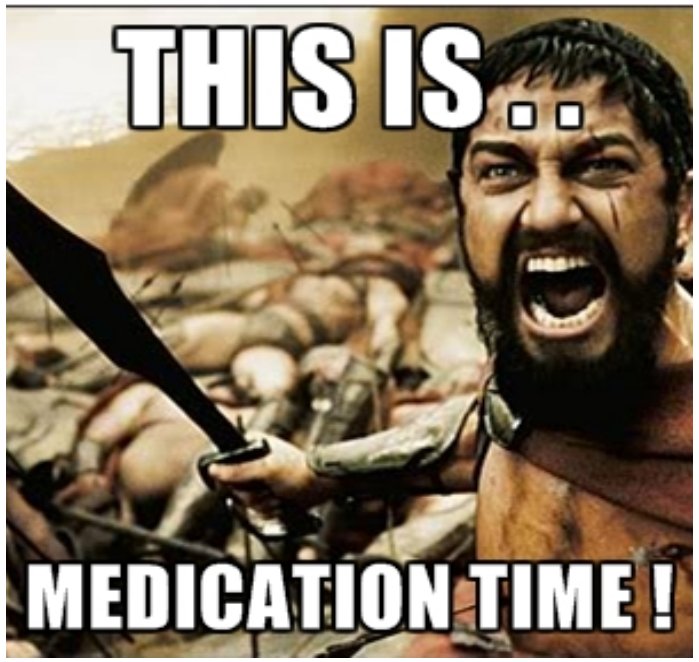
- While a new infectious disease has been discovered nearly every year over the past 30 years**, THERE HAVE BEEN NO NEW ANTIBIOTICS SINCE 1987 CREATED!!!!!**

ANTIBIOTIC RESISTANCE IS A THREAT

- **Nightmare germs called CRE** (carbapenem-resistant *Enterobacteriaceae*) can cause deadly infections and have become resistant to all or nearly all antibiotics we have today. CRE spread between health care facilities like hospitals and nursing homes when appropriate actions are not taken.
- **MRSA** (methicillin-resistant *Staphylococcus aureus*) infections commonly cause pneumonia and sepsis that can be deadly.
- The germ ***Pseudomonas aeruginosa*** can cause HAIs, including bloodstream infections. Strains resistant to almost all antibiotics have been found in hospitalized patients
- These germs are some of the most deadly resistant germs identified as **“urgent”** and **“serious”** threats

WHAT IS ANTIMICROBIAL STEWARDSHIP?

"Coordinated interventions designed to improve and measure the **APPROPRIATE USE OF ANTIMICROBIAL AGENTS** promoting the selection of the optimal antimicrobial drug regimen including dosing, duration of therapy, and route of administration"



-Society for Healthcare Epidemiology of America (SHEA).

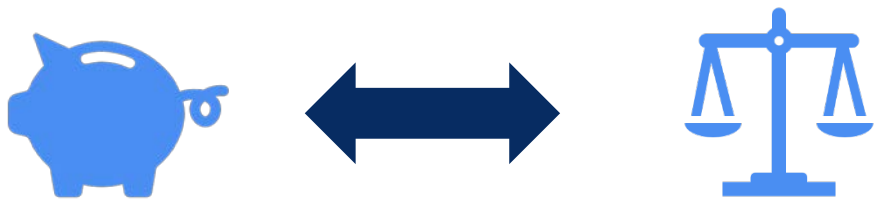
The Infectious Diseases Society of America (IDSA)

and the Pediatric Infectious Diseases Society (PIDS)

WHAT IS THE PURPOSE?

- The Primary Goal is to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use.

- The Secondary Goal is to reduce health-care costs without adversely impacting quality of care.

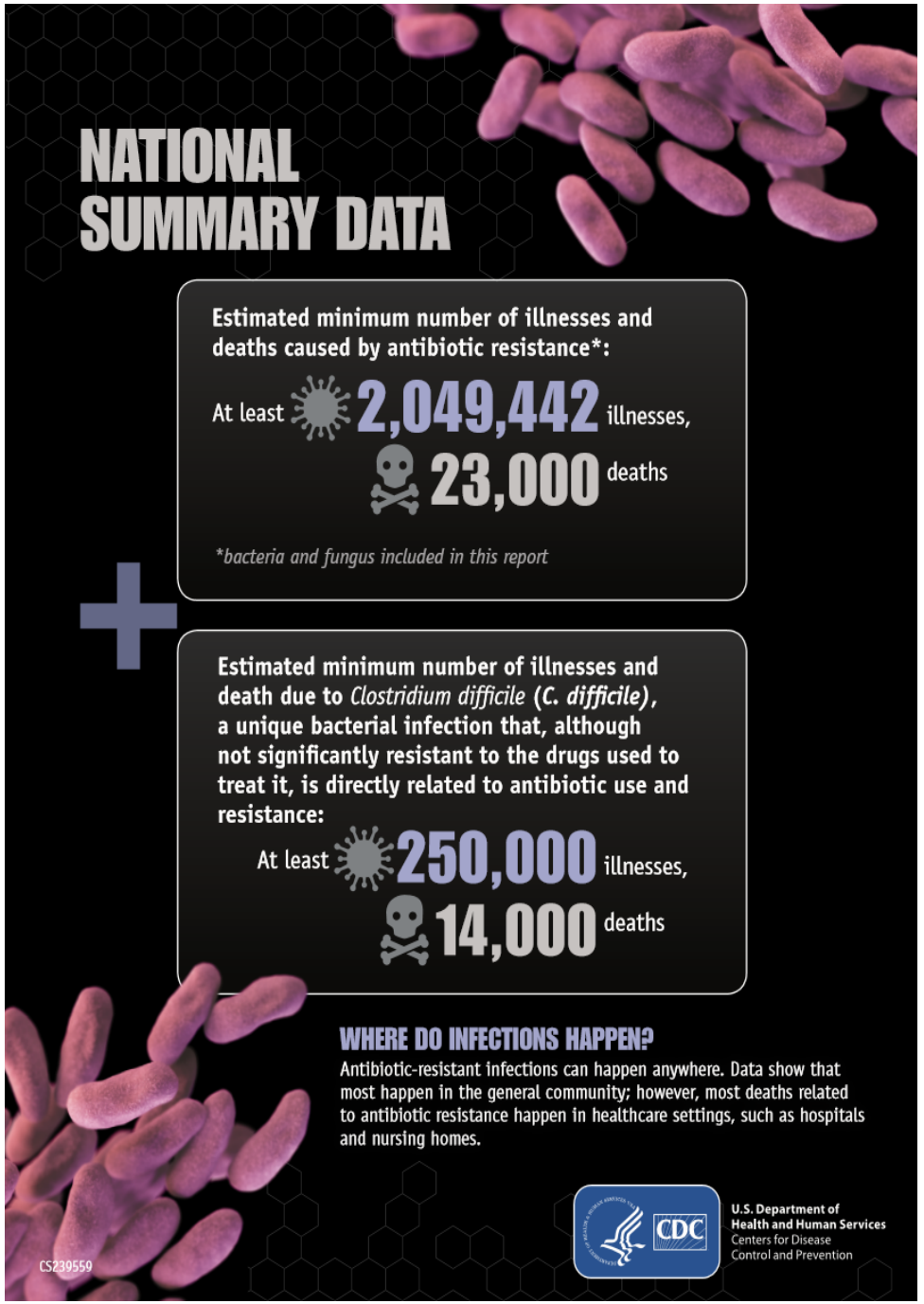


RESISTANCE

ANTIBIOTIC RESISTANCE

- CDC/US
  - More than 2 Million Infections per year
  - More than 23,000 deaths per year
  - Excess Cost of $20 Billion per year

- CDC: **“A PUBLIC HEALTH CRISIS”**
- WHO: **“A MAJOR THREAT TO HUMAN HEALTH”**
- DOD: **“A THREAT TO NATIONAL SECURITY”**



TYPICAL INPATIENT ADMISSION

1) Timely Antibiotic Initiation

- The nurse receives the orders.
- Reviews the dose/time for accuracy
- Checks for allergies
- Administers and records the antibiotics

TYPICAL INPATIENT ADMISSION

2) Early and Appropriate Cultures

- The nurse obtains the cultures before starting antibiotics.
- Sends the cultures to the microbiology laboratory.
- Monitors the culture results and reports results to the physician

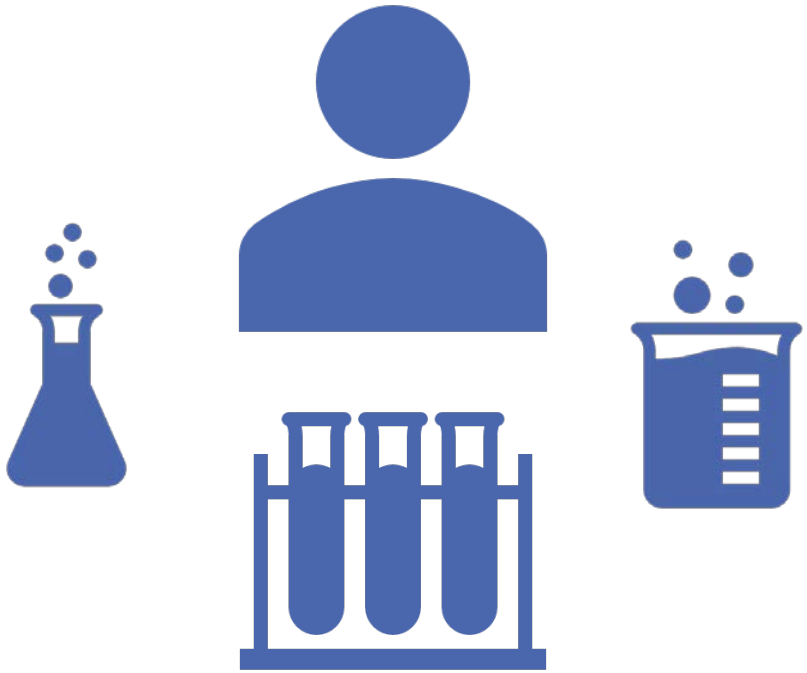
TYPICAL INPATIENT ADMISSION

3) Med Rec: Accurate Antibiotic Allergy History

- The nurse takes the allergy history
- Performs Medication Reconciliation and records this in the medical record.

TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

4) Antibiotic adjustment based on microbiology reports



- Laboratory and radiology reports “chase” the patient and are typically first received by the bedside nurse.
- Results are coordinated by the nurse and communicated to treating physicians.

TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

5) Antibiotic dosing, culture and sensitivity reporting, de-escalation

- The nurse updated clinical and laboratory results (renal function, drug levels, etc.) and preliminary/final microbiology results.

TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

6) Adverse Events

- The nurse monitors and reports to the physician and pharmacist any adverse events

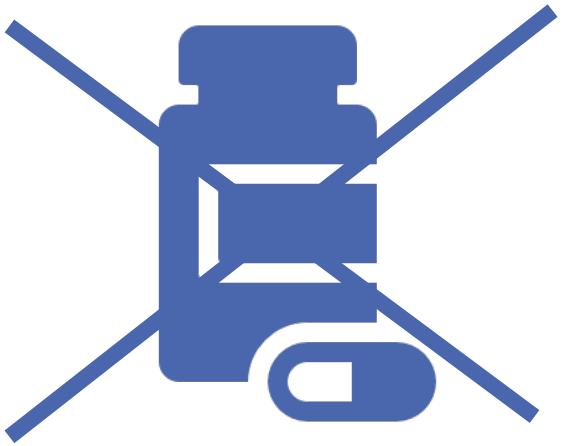
TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

7) Antibiotic Orders

- The nurse reviews any changes of medications based on the patient's clinical status.

TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

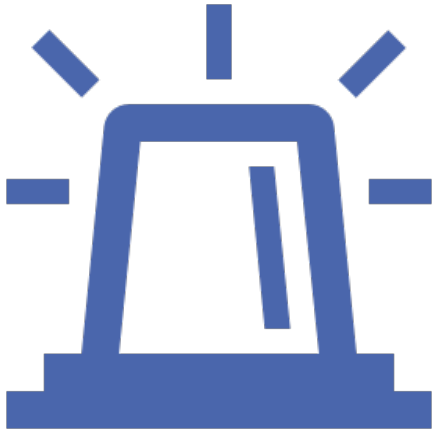
8) Antibiotic resistance



- The nurse reviews culture and sensitivity results and reports bug/drug mismatches.

TYPICAL INPATIENT STAY
Daily 24hr Clinical Progress Monitoring

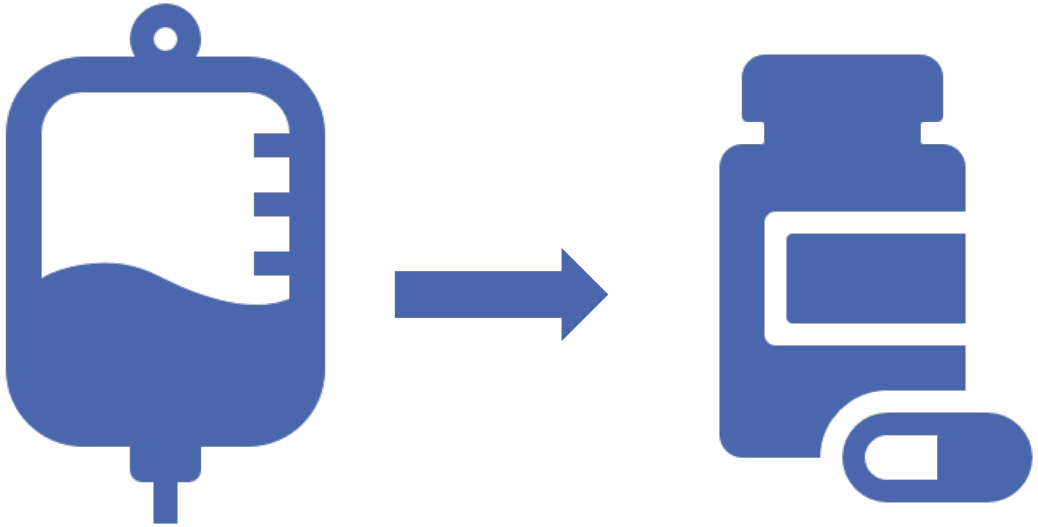
9) Superinfection /Resistant Infection



- The nurse monitors changes in patient response and initiates appropriate changes in isolation precautions.

TYPICAL INPATIENT DISCHARGE

10) Transition I.V. to P.O. Antibiotic, Out Patient Antibiotic Therapy (OPAT)



- The nurse monitors clinical progress and patient's capacity to take oral medications.

TYPICAL INPATIENT DISCHARGE

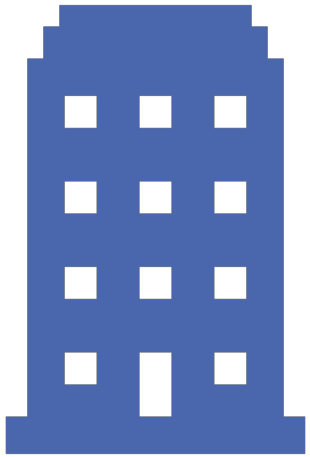
11) Length of Stay

- The nurse appraises the physician and case managers of the patient's status.

TYPICAL INPATIENT DISCHARGE

12) Out-patient Visiting Nurse Association (VNA)/Skilled Nursing Facility (SNF)/ Long Term Care Facility (LTCF) transition management, readmission to hospital

- The nurse communicates the patient's diagnosis, management, and medications to the nurse at the VNA/SNF/LTCF.



Are Nurses ABX prescribers? NO
ABX Stewards? YEEEESSSS

Stewardship: the conducting, supervising, or management of something; especially, the careful and responsible management of something entrusted to one's care.

GOOD NURSING IS GOOD STEWARDSHIP

and

ANTIMICROBIAL STEWARDSHIP IS GOOD NURSING

Every time antibiotics are prescribed:

1. Order recommended cultures before antibiotics are given and start drugs promptly.

2. Make sure indication, dose, and expected duration are specified in the patient record.

3. Reassess within 48 hours and adjust Rx if necessary or stop Rx if indicated.

Specific recommendations for common prescribing situations:

Rx for urinary tract infections

- Make sure that culture results represent true infection and not just colonization.
  - Assess patient for signs and symptoms of UTI.
  - Make sure that urinalysis is obtained with every urine culture.
- Treat for recommended length of time and ensure that planned post-discharge treatment takes into account the antibiotics given in the hospital.

Rx for pneumonia

- Make sure that symptoms truly represent pneumonia and not an alternate, non-infectious diagnosis.
- Treat for the recommended length of time and ensure that planned post-discharge treatment takes into account the antibiotics given in the hospital.

Rx for MRSA infections

- Verify that MRSA is growing in clinically relevant cultures. Do not use vancomycin to treat infections caused by methicillin-susceptible staph (and not MRSA).

Patient/Family Education

1. Speak up
2. Keep Hands Clean
3. Get Smart
4. Know Signs and Symptoms
5. Watch Out
6. Protect Yourself

THANK YOU!!!

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Questions?

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