ANTIMICROBIAL STEWARDSHIP PROGRAM (ASP) FOR THE INFECTION CONTROL PRACTITIONER

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OBJECTIVES

- **Identify current antimicrobial practice guidelines**
- **Identify The Role Of IPAC in ASP**

FACT

- One of the greatest achievements in science and medicine of the last century was the discovery and the subsequent development of antibiotics for human use.

ANTIMICROBIAL RESISTANCE: A GROWING P

DONEC QUIS NUNC

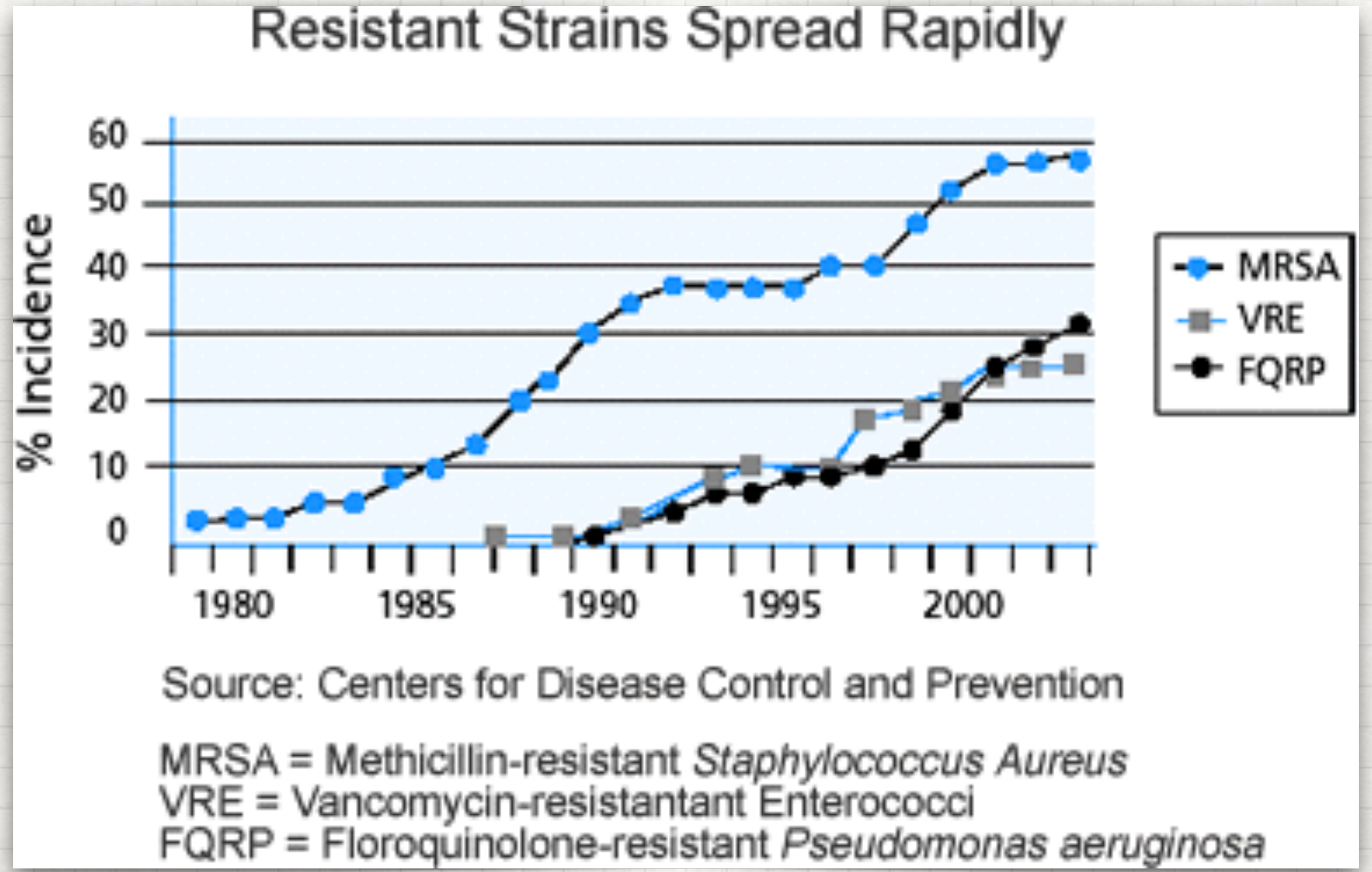
- In 2004, approximately 2 million people experienced a hospital-acquired infection
- 90,000 of these infections were fatal
- 1 death every six minutes
- The WHO has identified antimicrobial resistance as 1 of the 3 greatest threats to human health.

Dellit TH. Clin Infect Dis 2007 Jan 15;44(2):159

GAZZA, SYRIA, IRAQ.....

INTRODUCTION

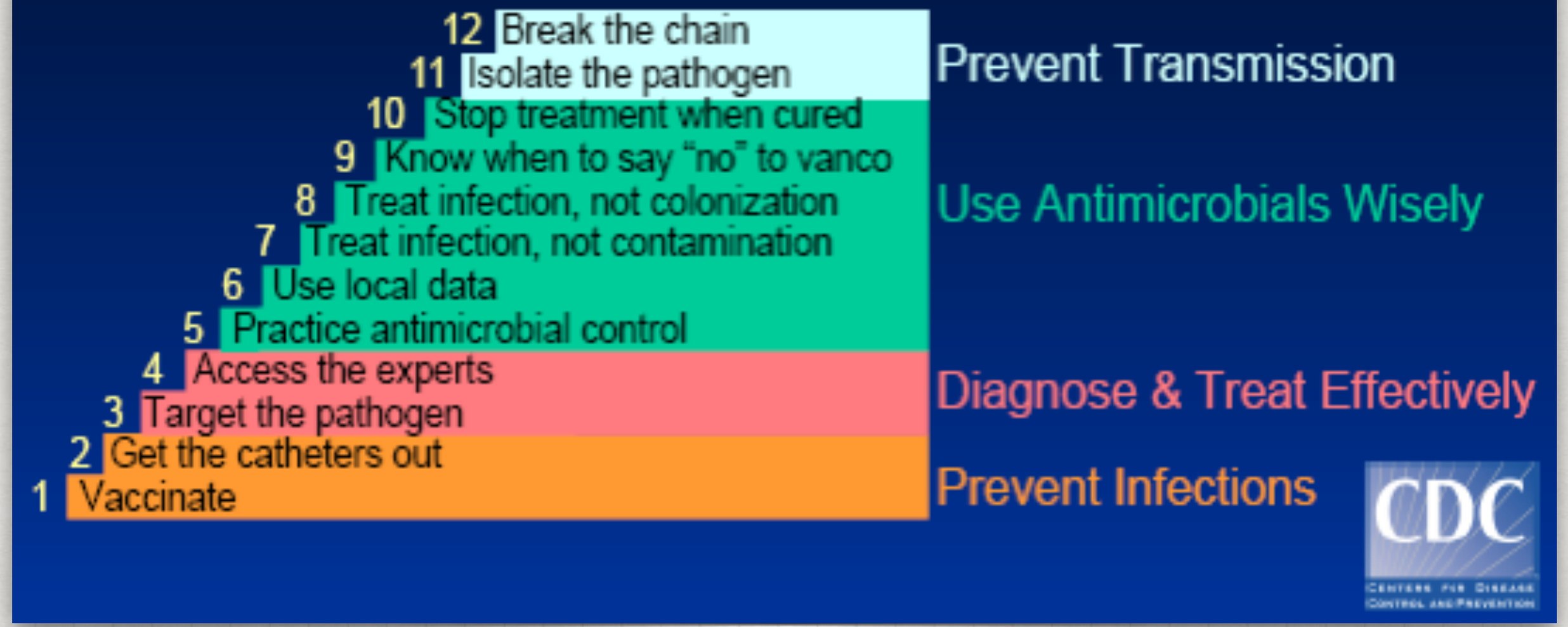
- Antibiotic misuse is a serious patient safety concern and a national public health priority.
- Improper antibiotic use have led to selection of antibiotic-resistant bacteria and Clostridium difficile infection, which ultimately led to poor patient outcomes.
- It is estimated that up to 50% of antimicrobial use is inappropriate in acute care settings and
- up to 75% of antibiotic use in inappropriate in long-term care facilities.



Accessed from http://www.idsociety.org/badbugsnodrugs.html February 1, 2008.

12 Steps to Prevent Antimicrobial Resistance: Hospitalized Adults

Clinicians hold the solution…
Take steps NOW to prevent antimicrobial resistance!



Centers for Disease Control and Prevention (CDC) 12 steps to prevent antimicrobial resistance. http://www.cdc.gov/drugresistance/healthcare/

WHAT IS: ANTIMICROBIAL STEWARDSHIP?

ASP

ARE DESIGNED TO PROMOTE JUDICIOUS USE OF ANTIMICROBIALS BY OPTIMIZING ANTIMICROBIAL SELECTION, DOSE, ROUTE, AND DURATION.

ANTIMICROBIAL STEWARDSHIP

- Primary Goal: to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use
  - Consequences
    - Toxicity
    - Selection of pathogenic organisms
    - Emergence of resistant pathogens
- Secondary goal: to reduce health care costs without adversely affecting the quality of care

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VANCOMYCIN

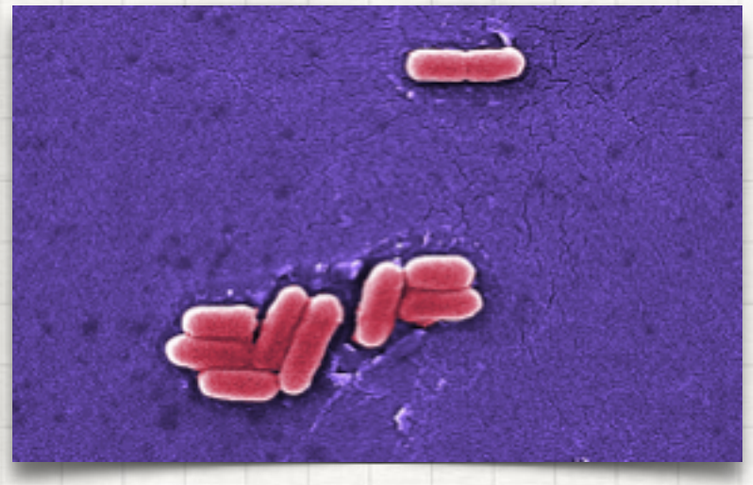
DONEC QUIS NUNC

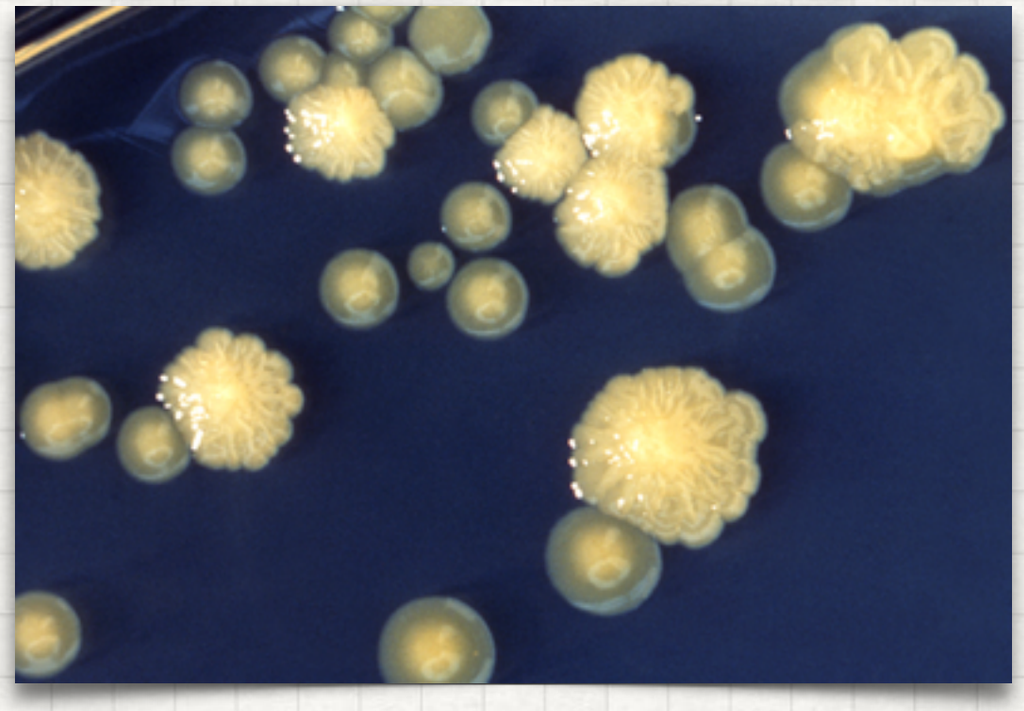
- Internal audit → poor compliance with CDC Hospital Infection Control Practices Advisory Committee (HICPAC) guidelines
    - CDC. Recommendations for preventing the spread of vancomycin resistance. MMWR 1995;44:RR-1
- Mandatory 72-hour stop time unless “vancomycin continuation form” was completed on return of culture and sensitivity data
- Agent was discontinued if patient did not meet criteria within 72 hours
- ID consult required to override automatic discontinuation

Martin et al. Am J Health-Sys Pharm 2005 Apr 1; 62: 732 - 738

Bad Bugs: No ESKAPE

- Enterococcus
- S. aureus
- Klebsiella spp.
- Acinetobacter
- P. aeruginosa
- Enterobacter spp.





ESCAPE: RECENT LITERATURE SUGGESTS WE SHOULD BE EXPANDING THIS LIST TO INCLUDE "C" FOR C DIFF DUE TO INCREASED PREVALENCE AND LACK OF APPROPRIATE ANTIMICROBIALS

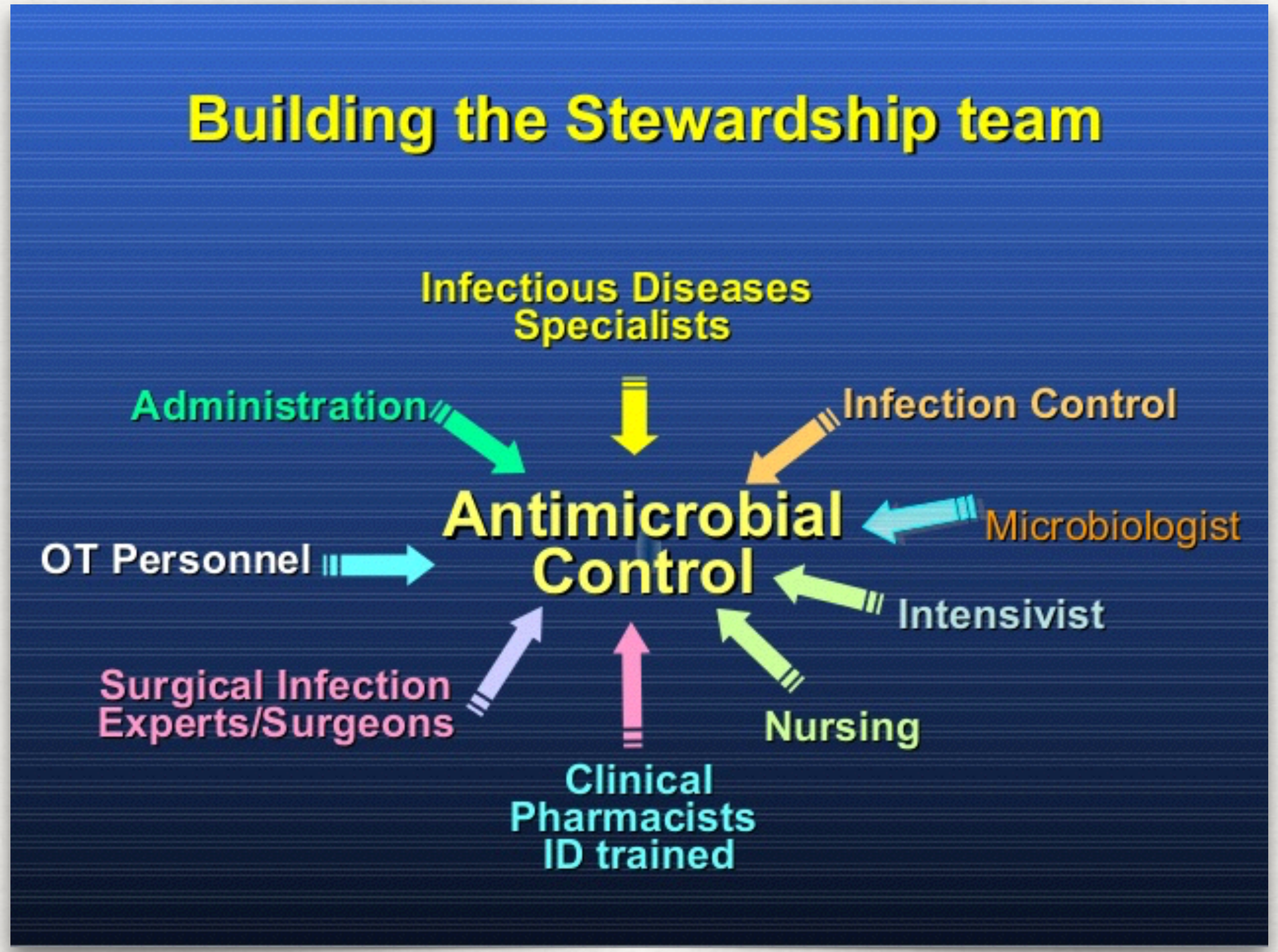
Boucher H, et al, Clin Infect Dis 2009;48:1-12
Patterson, et al, Clin Infect Dis 2009;49:992-3

WHAT IS ANTIMICROBIAL STEWARDSHIP

ULTIMATE GOAL IS IMPROVED PATIENT CARE AND HEALTHCARE OUTCOMES

Dellit TH, et al. CID 2007;44:159-77,
Hand K, et al. Hospital Pharmacist 2004;11:459-64
Paskovaty A, et al IJAA 2005;25:1-10

BUILDING THE TEAM



ANTIMICROBIAL STEWARDSHIP STRATEGIES

- Front end: Formulary restriction and preauthorization
- Back end: Interventions after antimicrobials have been prescribed
- BOTH: Prospective audit with intervention and feedback

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Paskovaty A, et al IJAA 2005;25:1-10

SUPPLEMENTAL STRATEGIES

- Education, guidelines, clinical pathways
- Dose optimization via PK-PD
- De-escalation/Streamlining
- Antimicrobial order forms/order sets
- IV-PO switch
- Computerized decision support
- Antimicrobial cycling
- Combination therapy

"FRONT END"

- **Restriction at the time the antimicrobial is prescribed:**
  - **Formulary vs non-formulary**
  - **Target specific antimicrobials associated with high rates of resistance or $$$**
    - **May target a specific disease or indication**
- **In order to receive restricted antibiotics, a prescriber must discuss with stewardship team**
- **performed by either an infectious diseases physician and/or a clinical pharmacist with infectious diseases training**
- **Requires resources early in the intervention process**

"BACK END"

- **Prescribers are allowed to order antibiotics upon admission**
- **Antibiotic orders are reviewed at specified intervals after initiation**
- **May be restricted to particular patient populations**
    - **Ex: Tazocin in ICU for up to 72 hours**
    - **Ex: Echinocandins in Febrile Neutropenia**
- **May be restricted to formulary drugs or by using a clinic pathway or protocol**
    - **Ex: Pneumonia protocol**

Evidence Based

Improve patient safety

ANTIMICROBIAL STEWARDSHIP PROGRAMS

Improve community resistance profiles

Financially self-supporting

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BARRIERS TO IMPLEMENTING ASP

- Staff may not want to assume “added” responsibility without compensation
- Hospital administration may not pay for antibiotic management without guaranteed pharmacy savings
- Damaged relations could lead to decreased request for consultation and lost income
- only 18% of infectious diseases physicians participating in antimicrobial stewardship programs are reimbursed for their services,

TOOLS FOR SUCCESS

- Multidisciplinary team
- Periodic feedback to physicians regarding program's benefits
- Focused goals

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Makassed Islamic Charitable Hospital Jerusalem

Infectious Diseases Unit

Antibiotics stewardship Program

Day:- ..... Date:-...../...../.....

Patient information:

Name: _____ File no. _____ Admission Date: ___/___/_____

Ward: _____ Gender: _____ Age:_____ Wt (kg):_____

Allergies to antimicrobial: ☐ no allergy ☐ not documented ☐ Present (specify drug and nature): _____

Clinical information:

Admitting diagnosis: _____

WBC: _____ SrC: _____ CrCl(ml/min):_____ CRP: _____ Other lab tests: _____

Microbiology:

Blood culture: _____

Urine culture: _____

Screening: _____

Other cultures: _____

Antibiotic information:

Antibiotic #1		**Antibiotic #2**		**Antibiotic #3**		**Antibiotic #4**	
Start	Stop	Start	Stop	Start	Stop	Start	Stop
/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Indication:		Indication:		Indication:		Indication:	

Note:-

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Infectious Diseases Unit

Antibiotics, Antifungal & Antiviral Prices

Antimicrobial	NIS	Antimicrobial	NIS
Acyclovir (Zovirax) 250 mg IV	(13)		
Amikacin *500mg* vial	(14)		
Amphotericin B (Fungizone) 50 mg IV	(80)		
Ampicillin (Penibrin) *1g* vial	(7)	Ampicillin (Penibrin) 500mg vial	(6)
Amoxicillin/ Clavulinate (Augmentin) 875mg 14 tab	(25)	Amoxicillin/Clavulinate (Augmentin) 500mg 20 tab	(22)
Azithromycin *500mg* vial	(110)	Azithromycin (Azimex) *500mg* 6 tab	(27)
Caspofungin (Cancidas) 50 mg	(2177)	Caspofungin (Cancidas) 70mg	(2767)
Cefazoline *1g* vial	(8)		
Ceftazidime (Fortum) *1g* vial	(18)		
Cefotaxime (Claforan) *1g* vial	(27)		
Ceftriaxone (Rocephin, Pan–Ceftriaxone) *1g*	(7)		
Cefuroxime (Zinacef, Pan–Cefuroxime) *1 g vial*	(6)	Cefuroxime (Zinnat) *500mg*10 tab	(25)
Ciprofloxacin (Ciproxin) vial	(20)	Ciprofloxacin 500 (ciprodex) 10 tab	(25)
		Ciprofloxacin 250 10 tab	(19)
Clindamycin *600mg* amp	(15)	Clindamycin *150mg* 16 tab	(20)
Cloxacillin (Orbenil) *500mg* vial	(5)		
Colistin *1mil unit* vial	(20)		
Doxycycline (Doxylin) *100mg* 10tab	(14)		
Ertapenem (Invanz) *1g* vial	(230)		
Fluconazole 100 mg IV	(32)		
Fusidic acid (Fucidin 2% cream 15g)	(22)	Fucidin–H 15g cream	(24)
Fusidic acid/ Betamethasone (Fucicort 15g cream)	(30)		
Gentamicin *80mg* amp	(5)		
Imipenem and Cilastatin (Tienam) *500mg* vial	(48)		
Levofloxacin (Tavanic) vial *500mg*	(158)	Levofloxacin (Tavanic) *500mg 7* tab	(60)
Linezolide (Zyvox) 600mg IV	(690)		
Meropenem *1g* vial	(53)		
Metronidazole (Flagyl) 500mg	(5)		
Miconazole cream 2%	(16)	Miconazole/ Daktazole cream	(10)
Moxifloxacin *400mg* vial	(180)		
Mupirocin 2% 15g oint	(20)	Mupirocin Bactroban nasal	(23)
Penicillin G *5000000 IU* vial	(15)	Penicillin VK 250mg 28 tab	(22)

Daily round info sheet

Date: \ \

قسم جراحة الاعصاب	Day care\الطوارىء	العيادات
.1	.1	.1
.2	.2	.2
.3	.3	.3
.4	.4	.4
قسم النسائية والتوليد	قسم الخداج	قسم العناية المركزة
.1	.1	.1
.2	.2	.2
.3	.3	.3
.4	.4	.4
قسم انعاش الاطفال	قسم الاطفال	قسم الجراحة
.1 .4	.1 .4	.1 .4
.2 .5	.2 .5	.2 .5
.3 .6	.3 .6	.3 .6
انعاش جراحة الاعصاب	قسم العظام	
.1	.1	.4
.2	.2	.5
.3	.3	.6
قسم قلب كبار	قسم الباطني	
.1 .4	.1 .4	
.2 .5	.2 .5	
.3 .6	.3 .6	
قسم قلب صغار	قسم عناية القلب	
.1 .4	.1 .4	
.2 .5	.2 .5	
.3 .6	.3 .6	

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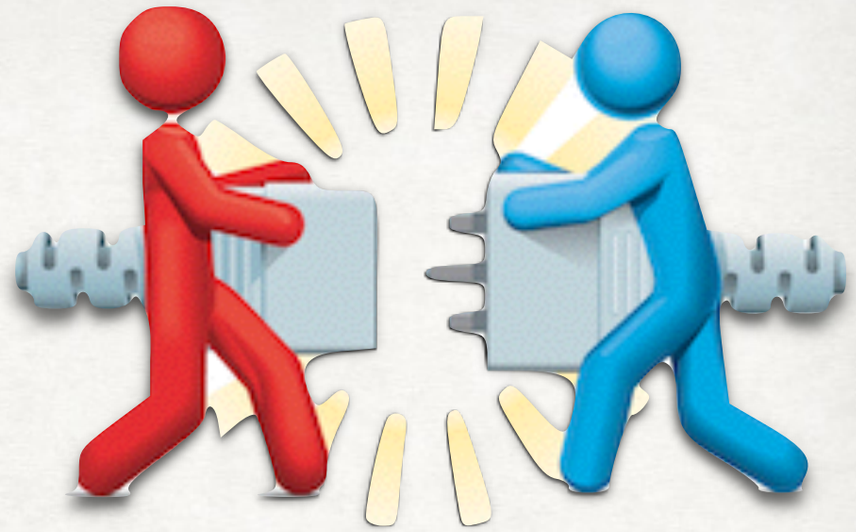
Time to sample Drug Level

- **Peak concentration: 30 minutes to 1 hour after the end of the infusion.**
  - For Gentamicin **multiple daily** doses 30 minutes after the end of the infusion of the 4th dose.
  - For Gentamicin **once daily** dose 30 minutes after the end of the infusion of any dose.
  - For Vancomycin 1 hours after the end of the infusion.

- **Trough concentration: 30 minutes before giving the next dose.**
  - For Gentamicin **multiple daily** doses 30 minutes before 4th dose.
  - For Gentamicin **once daily** dose 30 minutes before next dose.
  - For Vancomycin 30 minutes before 4th dose.

ANTIMICROBIAL STEWARDSHIP FOR THE ICP



- Assistant with early identification of organisms and infected patients to further the mission of stewardship program.

- Plays a pivotal role in the development, justification, and impact measurement of an antimicrobial stewardship program.

- Can promote compliance with standard and transmission-based precautions, bundle-care practices, vaccination efforts, and hand hygiene.

- Educating staff, patients, and visitors.

CONCLUSIONS

- Antimicrobial stewardship can play a key role in the reduction of *C difficile* infection
- Implementing successful stewardship programs involves multiple strategies, administrative support, and effective collaboration of a multidisciplinary team
- Every ounce of stewardship counts – start small, think big!
- Infection preventionists can enhance stewardship efforts through patient identification,prevention of device-related infections, and through input in the development of drug and disease state bundles.