

The Crisis of Antimicrobial Resistance

A Call to Action

2015 Update

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INSIGHTS FOR HEALTHCARE PROFESSIONALS
(A partnership with Medical World Americas)

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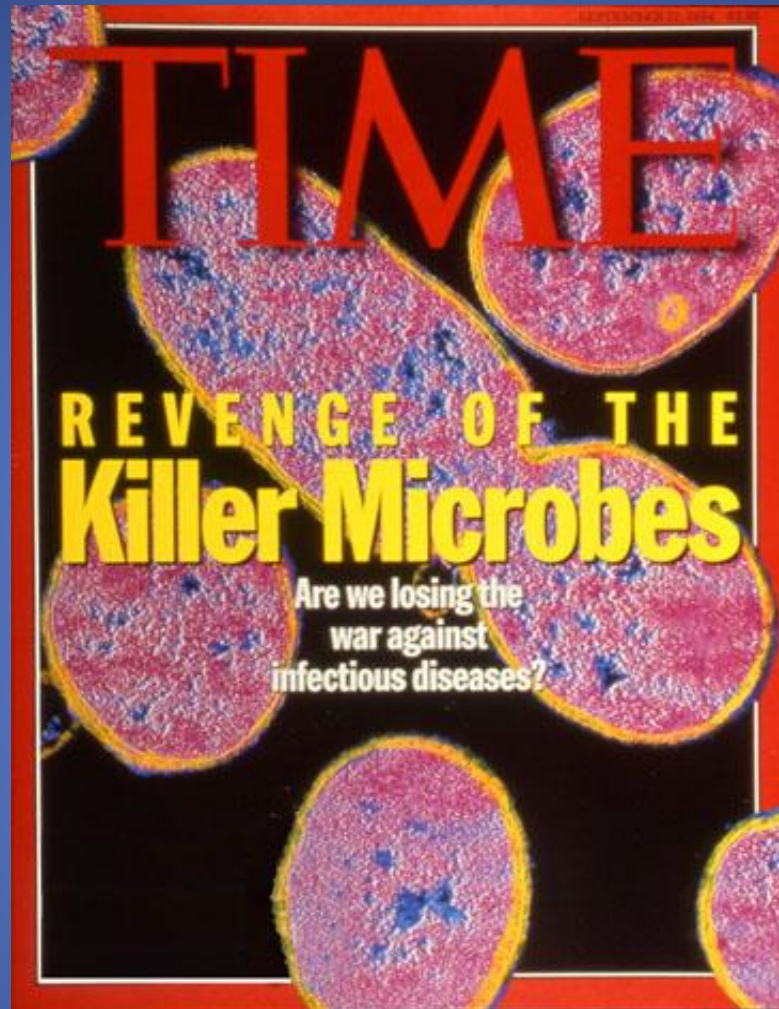
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Crisis



**Success
strategy**



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MEDICAL SCOPES LINKED TO SPREAD OF "SUPERBUG"

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“WE HAVE MET THE ENEMY AND HE IS US”

Walt Kelly

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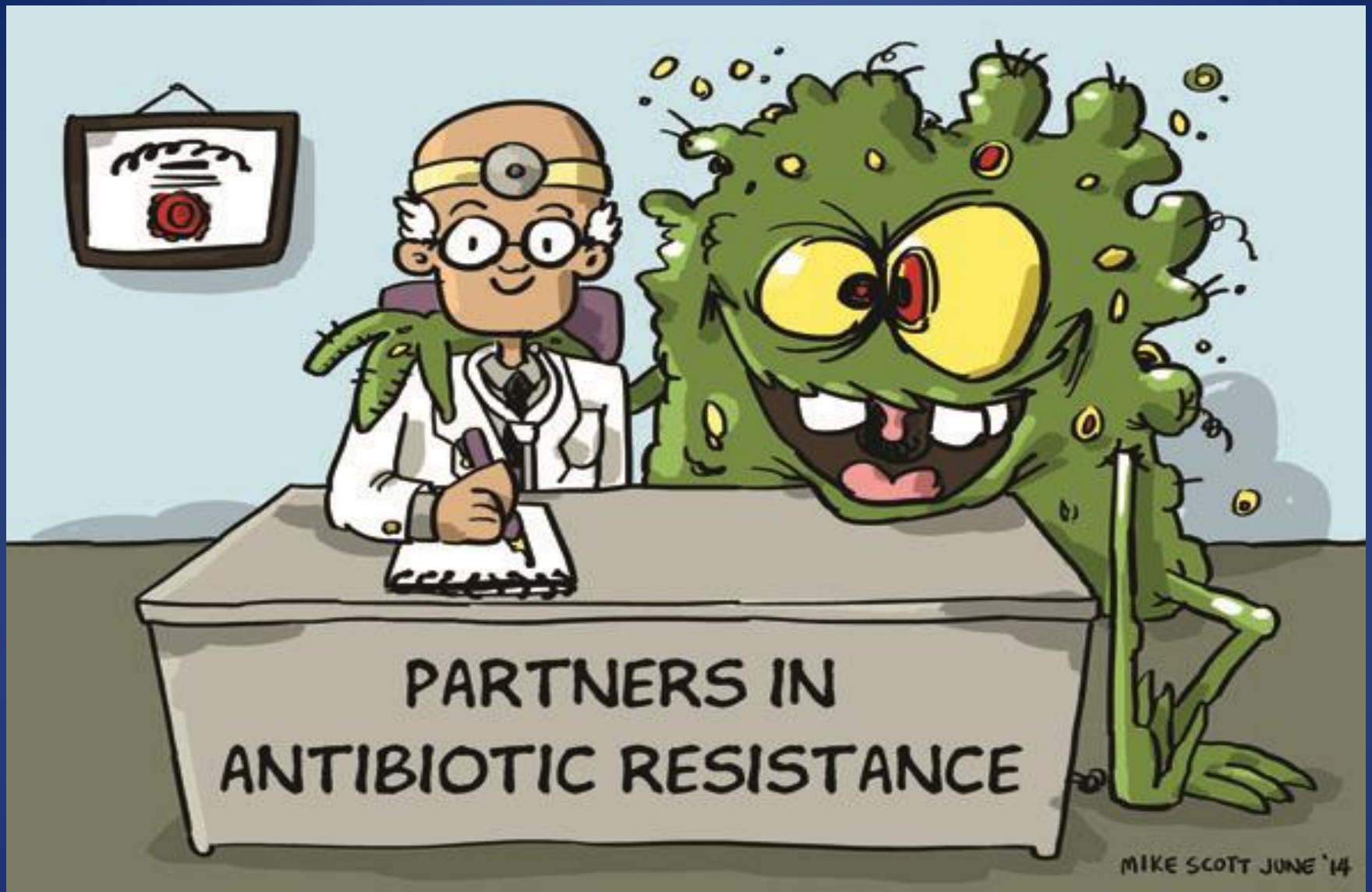


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Learning Objectives

- Review trends in antimicrobial resistance
- Effective antimicrobial stewardship
- Stakeholder engagement

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Consequences of inappropriate antibiotic use

BACKGROUND

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“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.”

When and Who Said this?

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Policy Statement on Antimicrobial Stewardship by the Society for Healthcare Epidemiology of America (SHEA), the Infectious Diseases Society of America (IDSA), and the Pediatric Infectious Diseases Society (PIDS)

“antimicrobial stewardship and other efforts to limit the emergence and transmission of antimicrobial resistance must be viewed as the fiduciary responsibility of all healthcare institutions across the continuum of care.”

Infect Control Hosp Epidemiol 2012;33(4):322-327

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Power of Antibiotics

Disease	Pre-Antibiotic Death Rate	Death With Antibiotics	Change in Death
Community Pneumonia ¹	~35%	~10%	-25%
Hospital Pneumonia ²	~60%	~30%	-30%
Heart Infection ³	~100%	~25%	-75%
Brain Infection ⁴	>80%	<20%	-60%
Skin Infection ⁵	11%	<0.5%	-10%
<i>By comparison...treatment of heart attacks with aspirin or clot busting drugs⁶</i>			-3%

¹IDSA Position Paper '08 Clin Infect Dis 47(S3):S249-65; ²IDSA/ACCP/ATS/SCCM Position Paper '10 Clin Infect Dis In Press; ³Kerr AJ. Subacute Bacterial Endocarditis. Springfield IL: Charles C. Thomas, 1955 & Lancet 1935 226:383-4; ⁴Lancet '38 231:733-4 & Waring et al. '48 Am J Med 5:402-18; ⁵Spellberg et al. '09 Clin Infect Dis 49:383-91 & Madsen '73 Infection 1:76-81; ⁶88 Lancet 2:349-60

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Bad Bugs, No Drugs¹

Declining research investments in antimicrobial development^{2,3}

The Antimicrobial Availability Task Force of the IDSA identified problematic pathogens including gram-negative bacteria²

Problematic pathogens can “escape” the activity of antibacterial drugs³

– “**ESKAPE**” (ESCAPE) pathogens include

- *Escherichia coli*
- *Staphylococcus aureus*
- *Klebsiella pneumoniae* (*C. difficile*)
- *Acinetobacter baumannii*
- *Pseudomonas aeruginosa*
- *Enterobacter spp*

1. Infectious Diseases Society of America. *Bad Bugs, No Drugs: As Antibiotic Discovery Stagnates, A Public Health Crisis Brews*. July, 2004.
2. *Clin Infect Dis*. 2006;42:657-68.
3. *Clin Infect Dis*. 2009;48:1-12.

BAD BUGS, NO DRUGS

As Antibiotic Discovery Stagnates ...
A Public Health Crisis Brews



Infectious Diseases Society of America

July 2004



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The Perfect Storm

Antimicrobial Resistance



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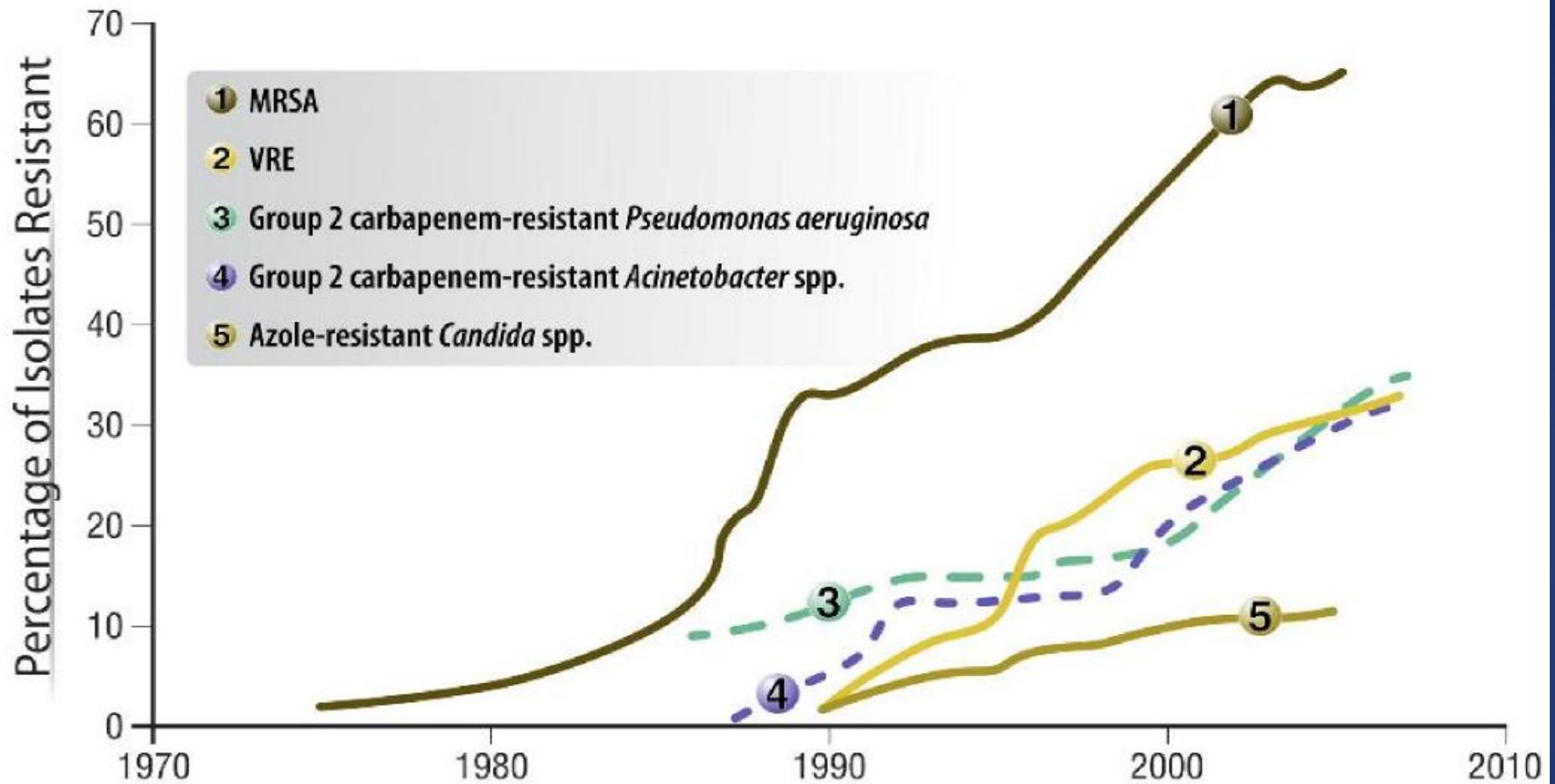
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Antimicrobial Resistance



Infect Control Hosp Epidemiol. 2008;29:1012-1018.

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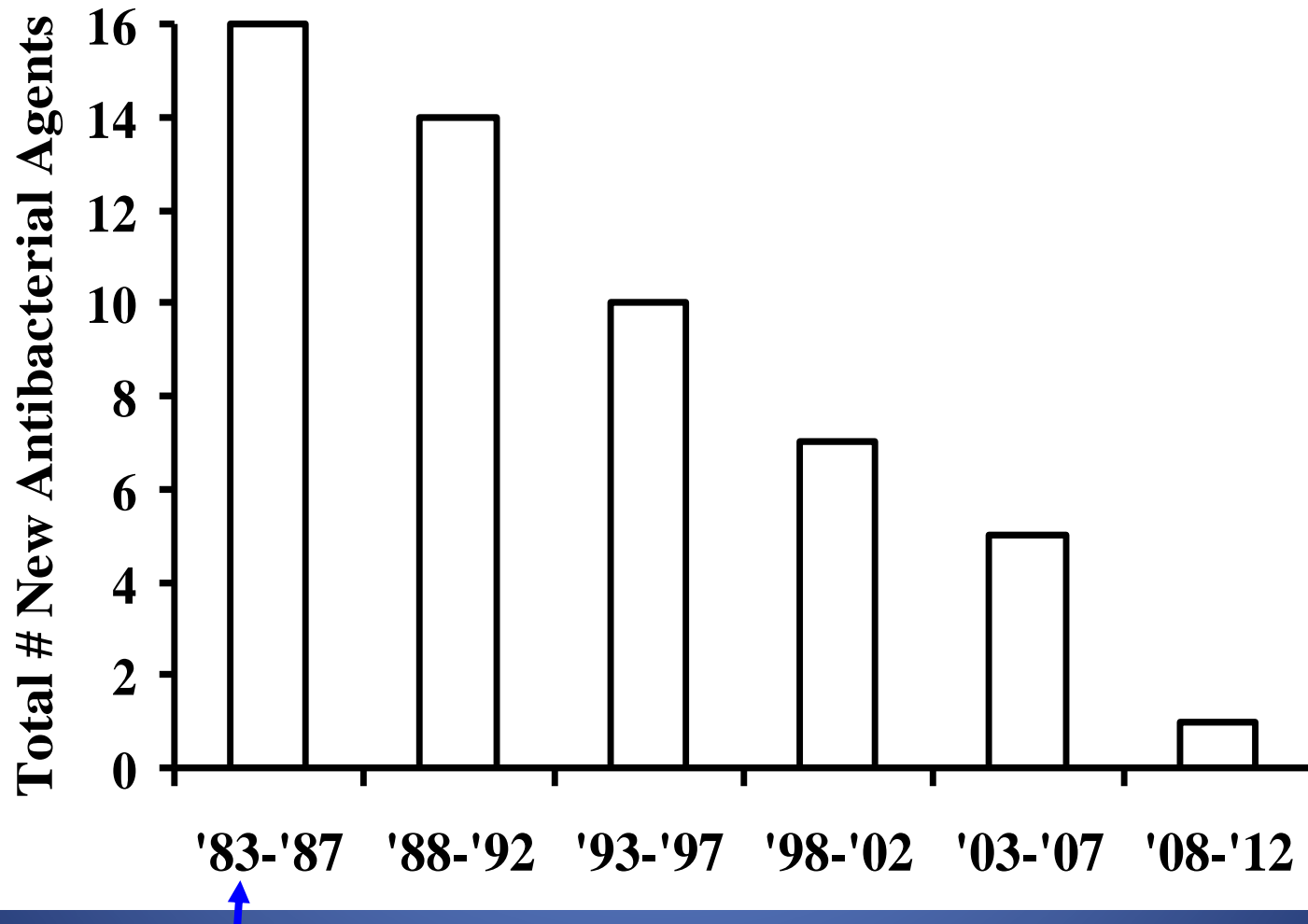
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Antibiotic Development



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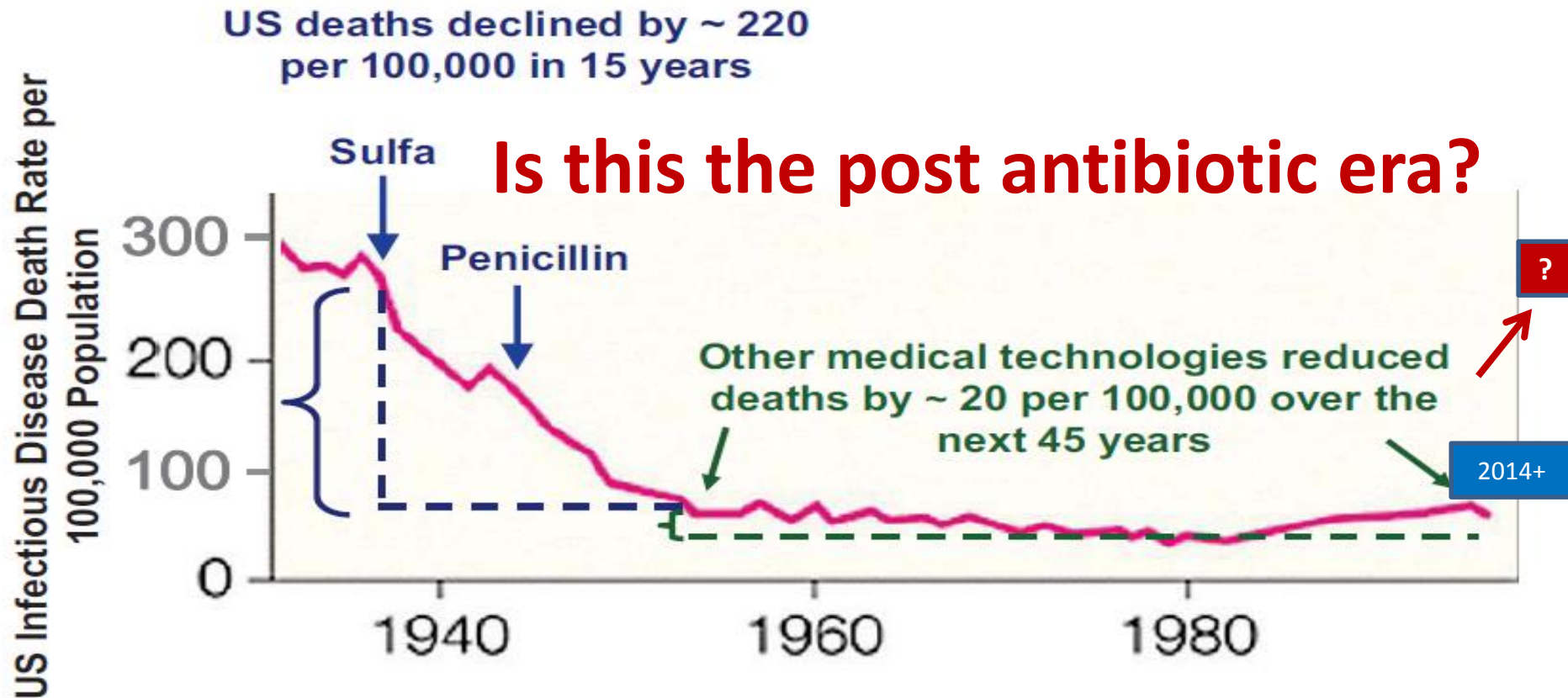


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Infectious Disease Mortality in the United States During the 20th Century



Modified from Armstrong, G. L. et al. JAMA 1999;281:61-6.

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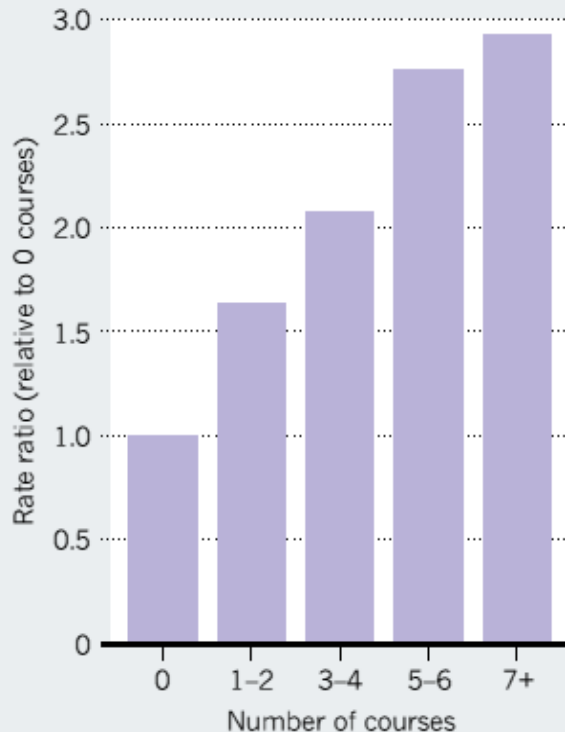


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Collateral Damage of Antibiotic Use

TROUBLING CORRELATION

The risk of inflammatory bowel diseases in children rises with the number of courses of antibiotics taken.



- Average child receives 10-20 courses of antibiotics before age 18
- Antibiotics affect our resident microbiota and may not fully recover after a course of antibiotics
- Overuse of antibiotics may be contributing to obesity, DM, IBD, allergies, and asthma

Nature 2011;476:393

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Antimicrobial Resistance

- Increases mortality and morbidity
- Antimicrobial resistance is accelerated by excessive use of antibiotics
- Appropriate use of antibiotics reduces antimicrobial resistance
- Inadequate infection control propagates transmission of MDR strains
- Antibiotic-resistant infections have been estimated to cost the US healthcare system over \$20 billion annually

Emerg Infect Dis 2001; 7:286
Arch Intern Med 2003; 163:972
Infect Control Hosp Epidemiol 2003; 24:642
Nat Rev Microb 2004; 2:251
Clin Infect Dis 2009; 49:1175-84

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Practices That Promote Resistance

- Overuse of antibiotics in outpatient settings.
- Overuse of antibiotics in hospital settings.
- Misuse of antibiotic(s) .
- Poor compliance with regimens.
- Use of antibiotics in animals. (80% of antibiotics sold to farms)

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Antibiotics are misused in a variety of ways

- Given when they are not needed
- Continued when they are no longer necessary-duration
- Given at the wrong dose-renal and weight-based dosing
- Broad spectrum agents are used to treat very susceptible bacteria
- The wrong antibiotic is given to treat an infection

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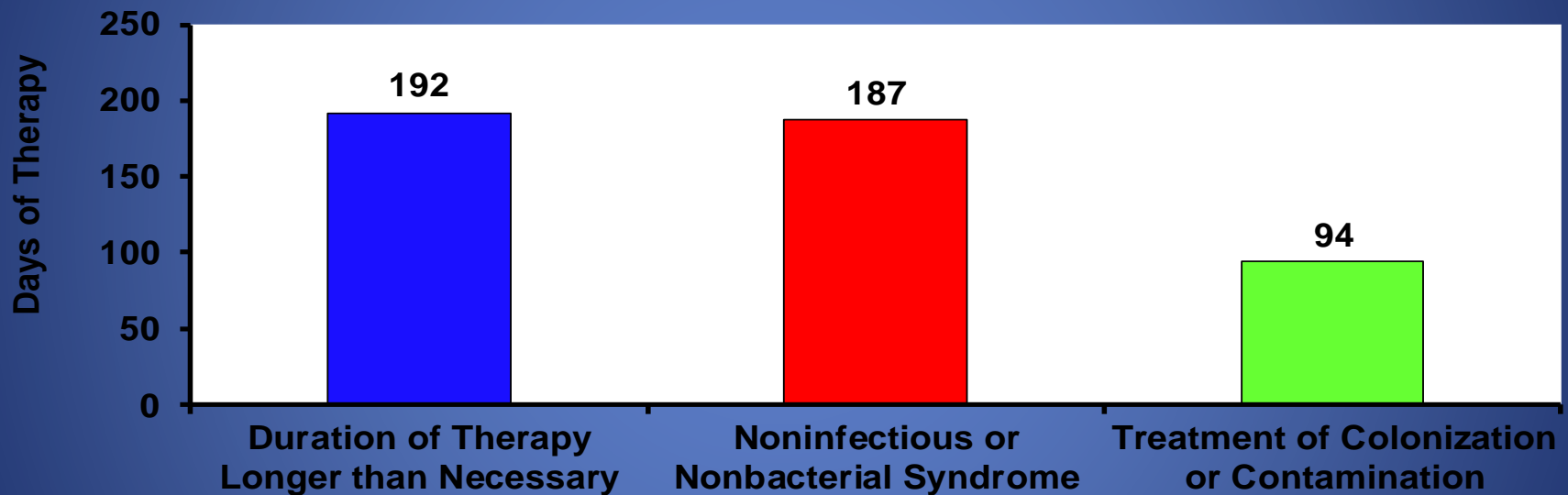


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Prospective observational study in ICU
576 (30%) of 1941 antimicrobial days of therapy deemed unnecessary

Most Common Reasons for Unnecessary Days of Therapy



Arch Intern Med. 2003;163:972-978.

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Common Outpatient Clinical Syndromes and Overtreatment

Condition	% bacterial	overtreatment
pneumonia	70%	30%
acute bronchitis	<< 5 %	70%
rhino-sinusitis	<<5 %	95%
UTI	100%	70% in elderly
cellulitis	100 %	30%

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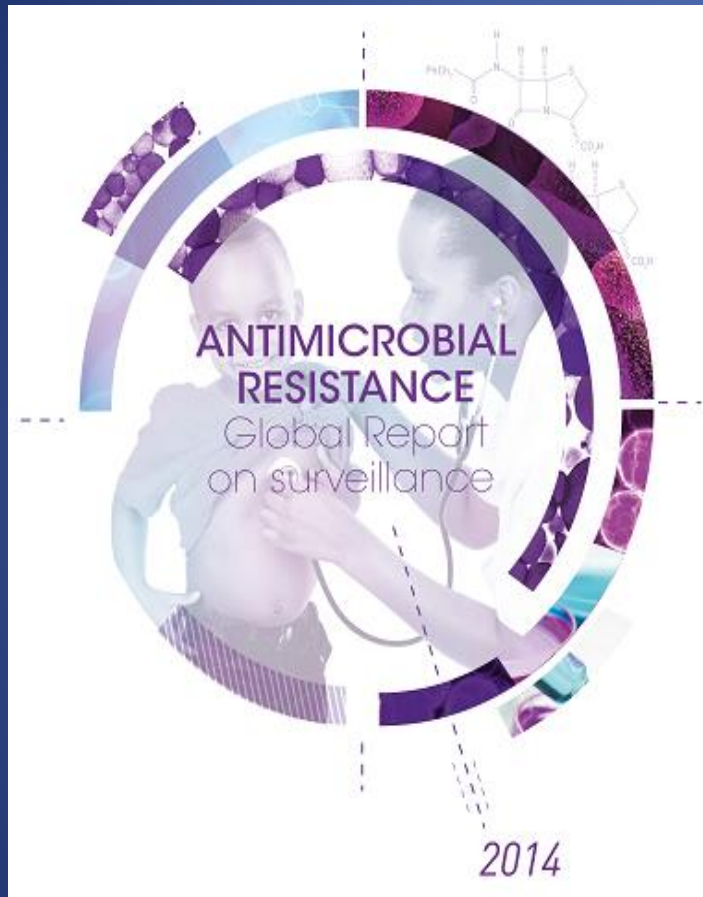


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WHO Report 2014



- All regions are experiencing resistance to carbapenems
- Resistance to fluoroquinolones is common
- Third-generation cephalosporins are ineffective to treat GC in multiple countries including US
- Key measures such as tracking and monitoring are inadequate and more needs to be done in improving appropriate antibiotic use, infection prevention, hand washing, and vaccinations

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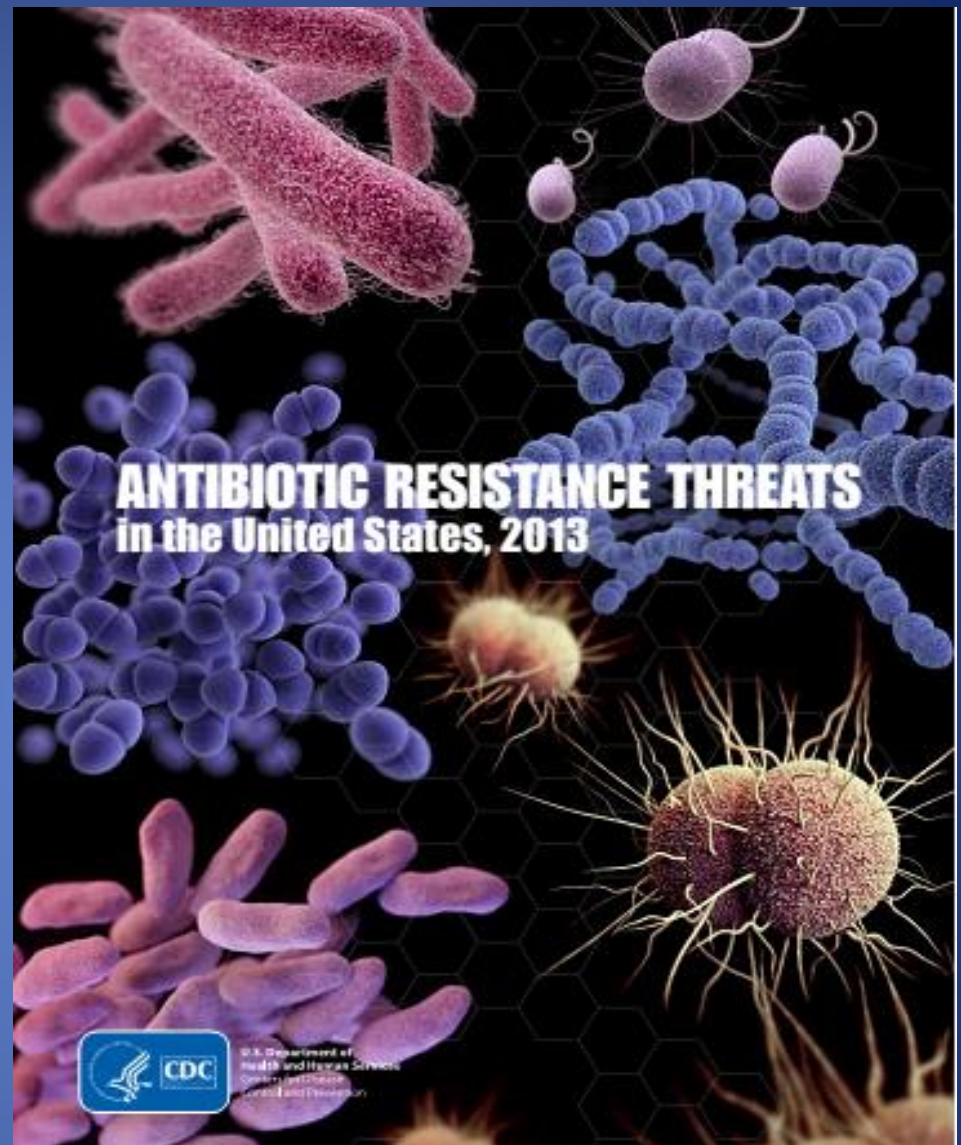
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CDC Report 2013



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NATIONAL SUMMARY DATA

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least  **2,049,442** illnesses,
 **23,000** deaths

*bacteria and fungus included in this report

Estimated minimum number of illnesses and death due to *Clostridium difficile* (*C. difficile*), a unique bacterial infection that, although not significantly resistant to the drugs used to treat it, is directly related to antibiotic use and resistance:

At least  **250,000** illnesses,
 **14,000** deaths

WHERE DO INFECTIONS HAPPEN?

Antibiotic-resistant infections can happen anywhere. Data show that most happen in the general community; however, most deaths related to antibiotic resistance happen in healthcare settings, such as hospitals and nursing homes.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

- \$20 billion in excess direct healthcare costs
- costs to society for lost productivity as high as \$35 billion a year (2008 dollars)
- The use of antibiotics is the single most important factor leading to antibiotic resistance
- ↑ *C. difficile* infections¹
 - 453,000 case 2011
 - 29,000 deaths 2011

1. *N Engl J Med* 2015; 372:825-834

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Antibiotic misuse adversely impacts patients- *C. difficile*

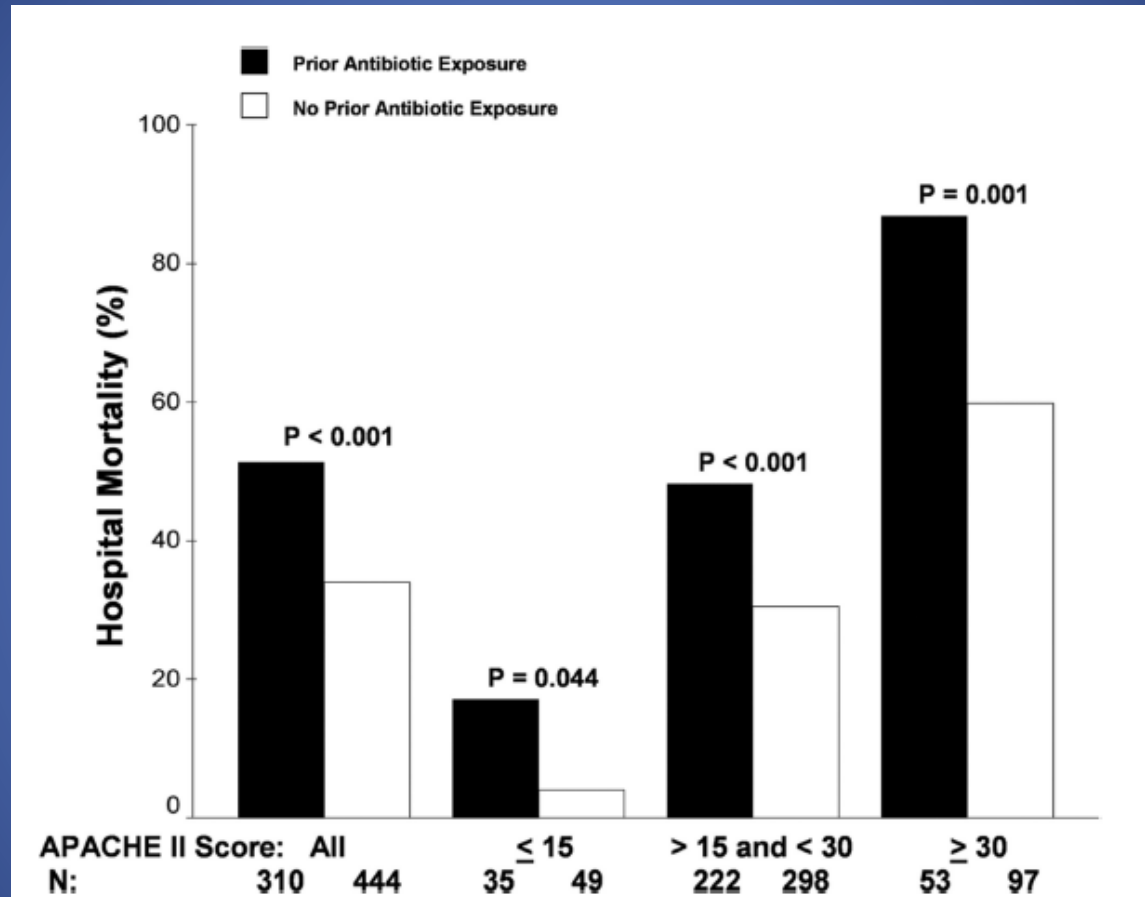
- Antibiotic exposure is the single most important risk factor for the development of *Clostridium difficile* infection (CDI).
 - Up to 85% of patients with CDI have antibiotic exposure in the 28 days before infection¹
- 20% of patients admitted to the ICU with CDI were receiving antibiotics without evidence of infection with an accompanying 28% in-hospital mortality²

¹ *Infect Control Hosp Epidemiol* 2007; 28:926–931.

² *BMC Infect Dis* 2007; 7:42



Overuse of Antibiotics: Impact of Previous Therapy in Gram-Negative Severe Sepsis



Crit Care Med 2011; 39:1859

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Overuse of Antibiotics: Impact of Previous Therapy in Gram-Negative Severe Sepsis

Table 5. Multivariate analysis of independent risk factors for hospital mortality^a

Variable	Adjusted Odds Ratio	95% Confidence Interval	<i>p</i>
Prior antibiotic exposure	1.70	1.41–2.06	.005
Use of vasopressors	1.83	1.47–2.29	.006
<i>Pseudomonas</i> infection	1.75	1.39–2.21	.016
Inappropriate initial therapy	2.03	1.66–2.49	<.001
Acute Physiology and Chronic Health Evaluation II score (1-point increments)	1.13	1.11–1.15	<.001
Number of organ failures (one-organ increments)	1.93	1.73–2.14	<.001

Crit Care Med 2011; 39:1859

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Basic principles and strategies

Antimicrobial management program (amp)

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Why We Need to Improve Antibiotic Use

- Antibiotics are misused in hospitals
- Antibiotic misuse adversely impacts patients and society
- Antibiotics are the only drug where use in one patient can impact the effectiveness in another
- Improving antibiotic use improves patient outcomes and saves money
- **Improving antibiotic use is a public health imperative**

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Magnitude of Antimicrobial Use

- Antibiotics are the second most commonly used class of drugs in the United States
- More than 8.5 billion dollars are spent on anti-infectives annually
 - ✓ 200-300 million antimicrobials prescribed annually
 - ✓ 53% for outpatient use
- 30-50% of all hospitalized patients receive antibiotics
- Studies estimate up to 50% of antibiotic use is either unnecessary or inappropriate across all type of health care settings

Clin Infect Dis 2007; 44:159-177

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Four Core Actions

- Preventing infections and preventing the spread of resistance
- Tracking resistant bacteria
- Improving the use of today's antibiotics
(antimicrobial stewardship)
- Promoting the development of new antibiotics and developing new diagnostic tests for resistant bacteria

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Antimicrobial Stewardship: Definition

- A system of informatics, data collection, personnel, and policy/procedures which promotes the optimal selection, dosing, and duration of therapy for antimicrobial agents throughout the course of their use.
- An effective antimicrobial stewardship program will limit inappropriate and excessive antimicrobial use, but more importantly improve and optimize therapy and clinical outcomes for the individual infected patient.

Ohl CA. *Seminar Infect Control* 2001;1:210-21.

Ohl CA. *J. Hosp Med.* In press.

Dellit TH, et. al. *Clin Infect Dis.* 2007;44:159-177

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Antimicrobial Stewardship: Goals

- Improve patient outcomes
- Optimize selection, dose and duration of Rx
- Reduce adverse drug events including secondary infection (e.g. *C. difficile* infection)
- Reduce morbidity and mortality
- Prevent or slow the emergence of antimicrobial resistance
- Reduce length of stay
- Reduce health care expenditures

MacDougall CM and Polk RE. Clin Micro Rev 2005;18(4):638-56.

Ohl CA. *J. Hosp Med.* In press.

Dellit TH, et. al. Clin Infect Dis. 2007;44:159-177

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Appropriate antibiotic therapy

Strategies

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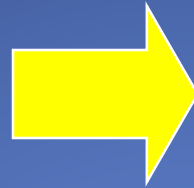


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Front-end Approach

Physician writes order
for “Restricted Drug”



Order arrives in pharmacy,
pharmacist informs the
physician and primary nurse
that the drug is
“restricted”/“Not part of the
pathway”/“non-formulary”



Prescribing Physician and the
“GATE KEEPER” converse



Approval or Alternative
Antibiotic Selected

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Front-end Approach

Advantages

- Direct control over antimicrobial use
- Effective control of antimicrobial use during outbreaks
- Decreased inappropriate use of antimicrobials (and thus costs)

Disadvantages

- Personnel needs
- Antagonistic relationship (loss of autonomy)
- Therapy may be delayed
- Manipulation of the system
- ID physicians often exempt
- Effectiveness in decreasing resistance is less clear
- No impact on de-escalation or duration

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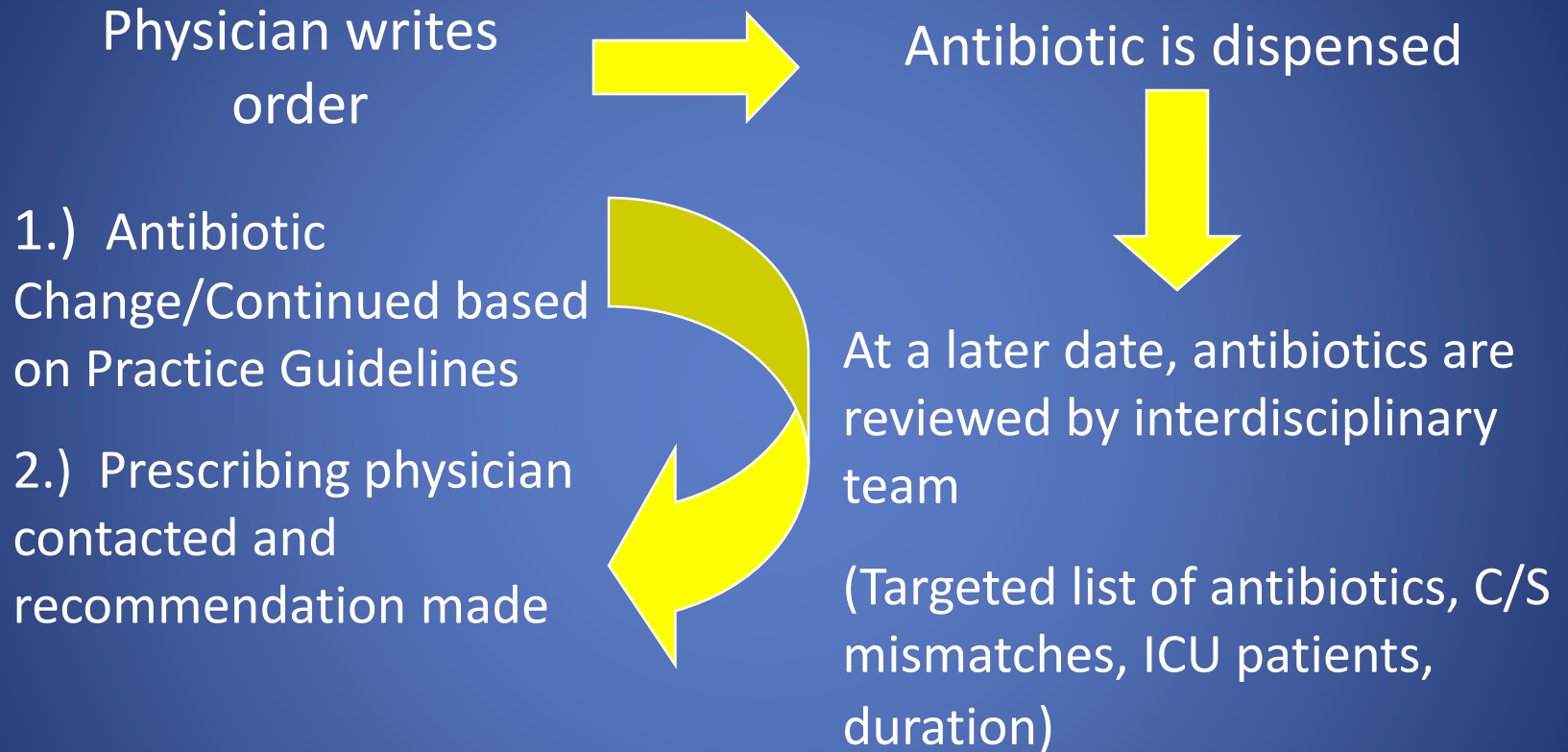
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Prospective Audit and Feedback (back-end approach)



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Prospective Audit and Feedback

Advantages

- Prescriber autonomy maintained
- Educational opportunity provided
- Patient information can be reviewed before interaction
- Inappropriate antimicrobial use decreased
- Impact duration and de-escalation

Disadvantages

- Compliance voluntary
- Identification of patients may require computer support
- Prescribers may be reluctant to change therapy if the patient is doing well
- Some inappropriate antimicrobial use permitted (with retrospective audit)

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Guidelines/Clinical Pathways/EBOS*

Protocols to guide therapy for a given infection

- Specific to institutional formulary, patient populations, and resistance patterns
- Evidence-based
- **Advantages**
 - Appropriate antimicrobial use may increase
 - Form of education
- **Disadvantages**
 - Adherence is usually voluntary
 - “Cookbook medicine”
 - Maintenance is required

*Guidelines may not be appropriate for all situations. Decisions should be based on clinical judgment and consideration for individual patients.

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The 5 Ds*

1. Right **D**agnosis
 - What infection syndrome is being treated?
 - Have appropriate diagnostic tests been collected?
2. Right **D**rug
 - Demonstrated effective per local epidemiology
 - Safest
 - Least “resistance-ogenic” – narrowest spectrum
 - Least expensive
3. Right **D**ose
4. Right **D**uration:
 - Minimal duration undefined for many indications
 - For most: resolution of systemic and improvement in local manifestations
5. Right **D**e-escalation: change to narrowest spectrum/safest/least expensive regimen when:
 - Justified by culture results (positive or negative)
 - Clinical improvement (e.g., IV to PO switch)

*David Schwartz, MD

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Obtain Cultures Prior to Starting Antibiotics!

- Develop a process to ensure cultures are properly and consistently ordered
 - Nursing to ensure safe/timely collection of specimens from appropriate source
- Develop processes to ensure cultures are properly and promptly transported and processed
- Develop standards for and assess reliability of processes for ordering and obtaining a culture

ARHAI. Antimicrobial stewardship: “*start smart-then focus*”. Guidance for antimicrobial stewardship in hospitals (England). November, 2011.

Eur J Clin Microbiol Infect Dis. 2009;28(2009):1447-1456.

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Am J Infect Control. 2013;41(2013):365-367.

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Choice of Empiric Agent

**MAXIMIZE
COVERAGE**

against most likely
pathogens

**MINIMIZE
SELECTION**

for resistance



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Considerations in Empiric Choice

Microbe

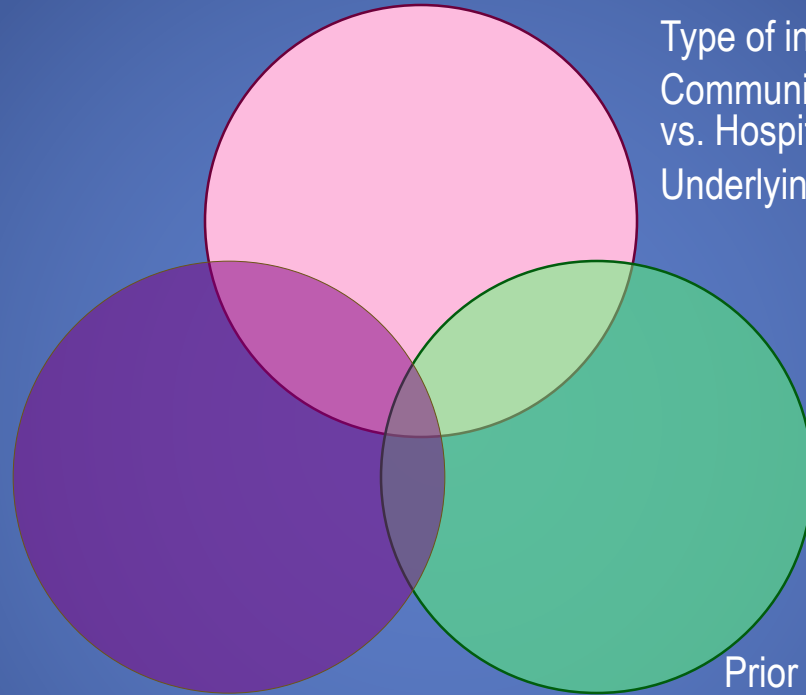
Local antibiogram
ICU vs. Non-ICU

Host

Type of infection
Community-Acquired vs. LTC
vs. Hospital-Acquired
Underlying comorbidities

Drug

Prior antibiotic therapy
Selection based on potential for resistance
Need for multiple agents



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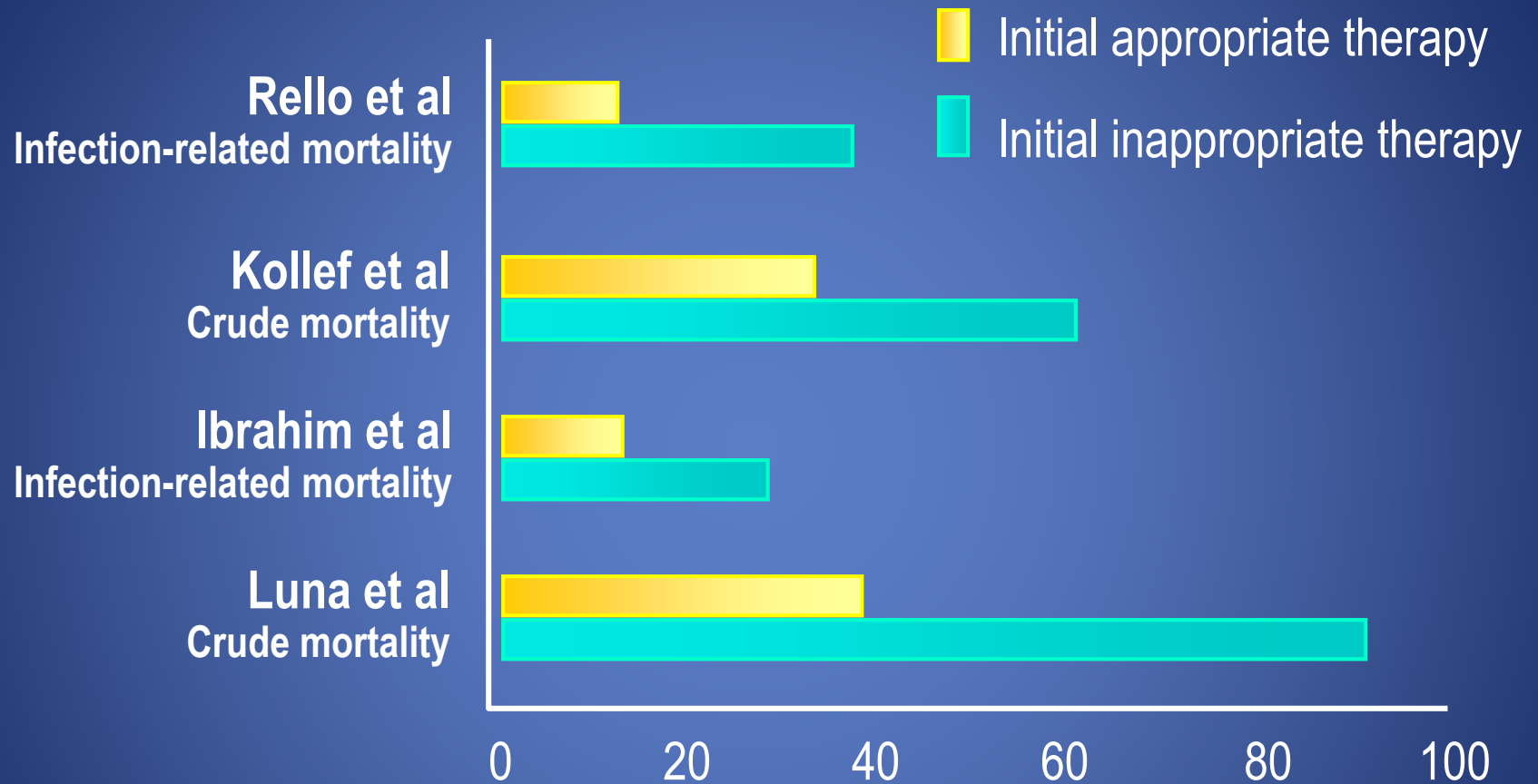
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Appropriate antimicrobial therapy cannot wait



Am J Respir Crit Care Med 1997;156:196–200 Chest 1998;113:412–420
Chest 2000;118:146–155 Chest 1997;111:676–685

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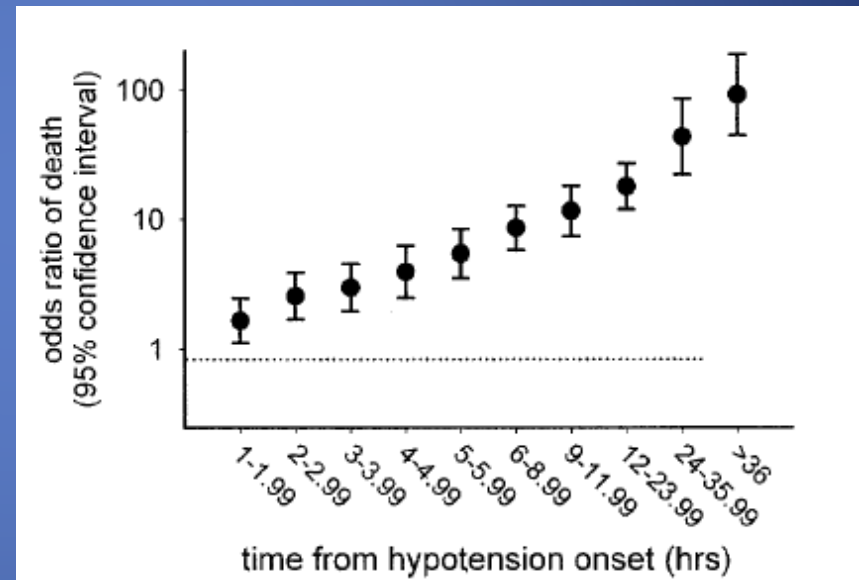
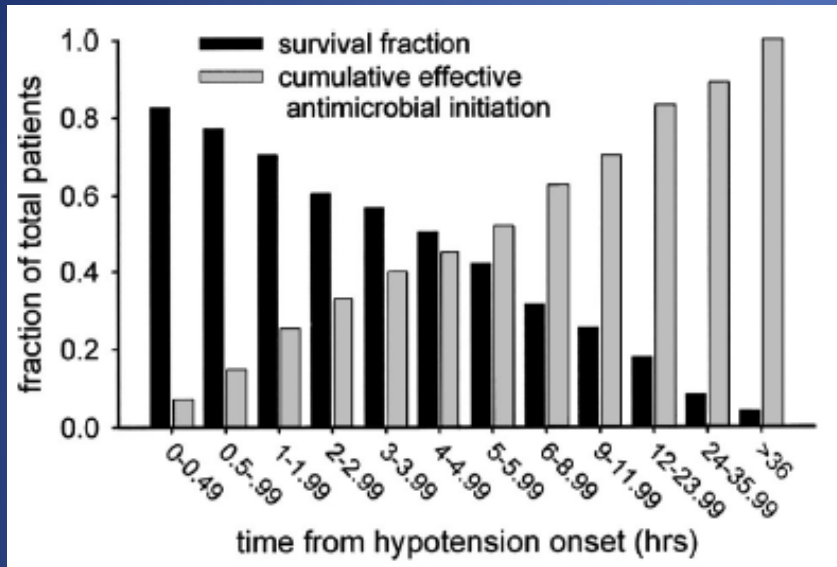
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Appropriate antimicrobial therapy cannot wait



Crit Care Med 2006; 34:1589

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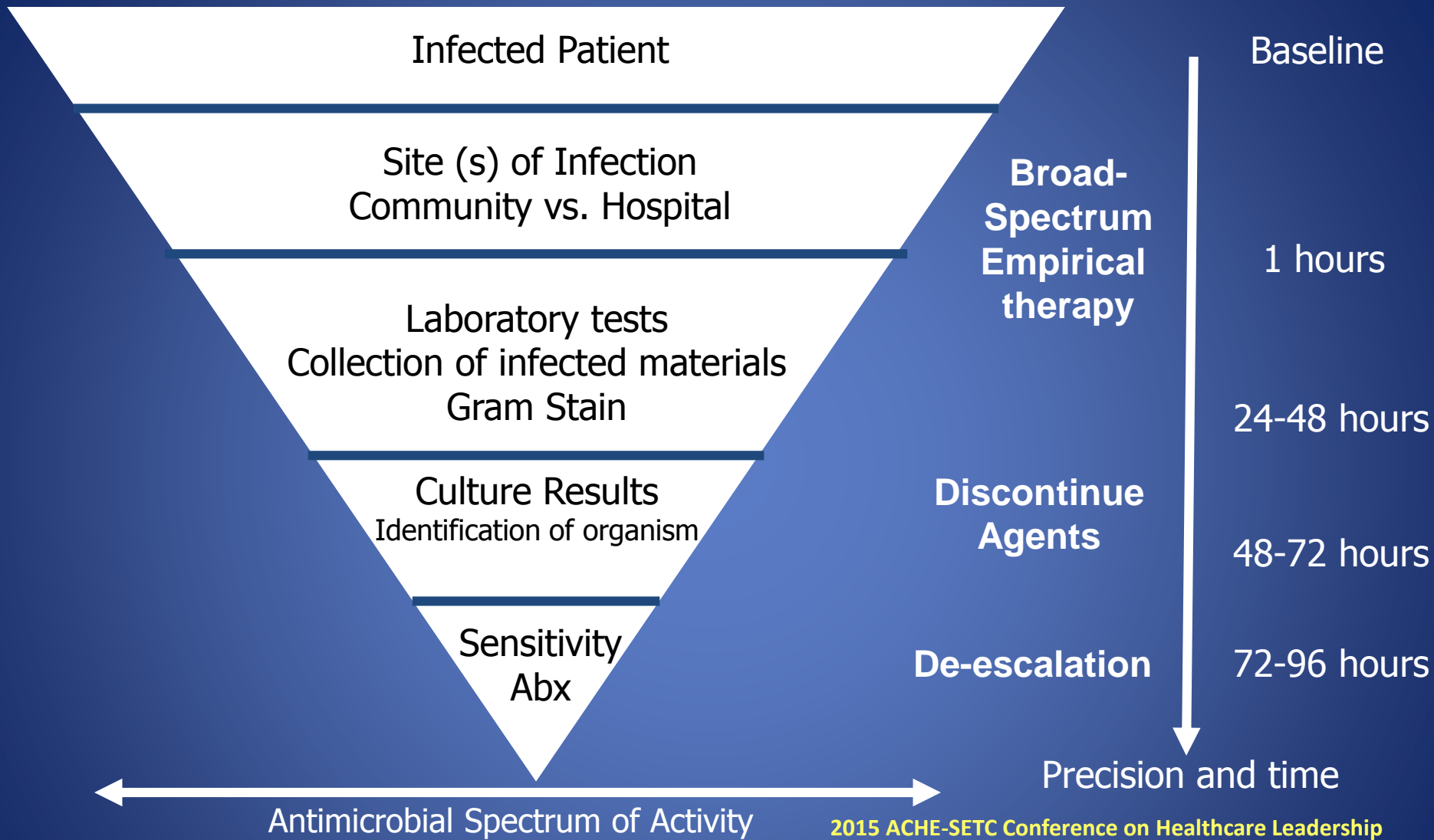
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De-escalation Timeline



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De-Escalation: Definition

Modification of the initial empiric antimicrobial regimen based on culture results, other laboratory tests, and clinical status of the patient

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De-Escalation: Goals

- Changing from a broad-spectrum antibiotic to one with a narrower spectrum if appropriate
- Eliminate overlapping or combination therapy targeting causative organism or
- Stopping antimicrobial therapy when a non-infectious etiology most likely
- Administer antimicrobial therapy for the correct duration
- Decrease antimicrobial exposure → reduce adverse events
- Cost savings

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De-escalation of Therapy

- Decrease number of agents and/or spectrum of activity as appropriate in response to culture results and clinical outcomes
- Optimizing initial therapy may oppose steps to limit use of broad-spectrum agents
 - De-escalation recognizes both aspects
- **Advantages**
 - Allows initial use of broad-spectrum therapy
 - Narrows therapy when appropriate
 - Improves outcomes
 - Reduces adverse events
 - May influence future prescribing behavior
 - Decreases inappropriate use of antimicrobials
 - Reduces costs
- **Disadvantages**
 - Prescribers may be reluctant to change therapy if the patient is doing well
 - If not done correctly, may narrow therapy “inappropriately”

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De-escalation: Lessons learned

The most common reasons for **not** de-escalating:

- Lack of conclusive microbiology
 - Continued use of broad-spectrum antimicrobial therapy
- Diagnostic uncertainty
 - Treatment of fever, colonization and/or contamination
- Insecurity
 - Treatment of noninfectious syndrome associated with fever
- Duration longer than necessary leading to increase adverse events
- Highlight duration of therapy for broad-spectrum antibiotics
 - Engage all members of the interdisciplinary healthcare team in monitoring

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Antibiotic Time Out

ANTIBIOTIC TIME OUT



This patient has received >72 hours of antibiotic therapy.

Please re-evaluate the need for continuation of antibiotics and assess for the following:

- ☐ presence of an infection; if presentation is not consistent with likely infection please discontinue antibiotic therapy;
- ☐ the ability to streamline/de-escalate therapy based upon culture and susceptibility results;
- ☐ ensure that a written order for an antibiotic stop date is present in the medical record if treatment does continue.

Thank you.

Antimicrobial Management Team

Please see the reverse side for antimicrobial treatment duration recommendations.

*****THIS IS NOT PART OF THE PERMANENT MEDICAL RECORD*****

- Trigger tool to stop and reassess antibiotic therapy
- Targeted at all providers for Med/Surg patients
- Guided assessment at 72 hrs
- Treatment duration recommendations included for key infections

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De-escalation of empiric therapy is associated with lower mortality in patients with severe sepsis and septic shock

- Identification of causative pathogen was 77% Bacteremia was present in 38%
- Antimicrobial therapy was adequate in 88% of cases
- Hospital mortality was 27% with therapy de-escalation, 33% in those with no treatment change and 43% in those with treatment escalation

Intensive Care Med. 2014 Jan;40(1):32-40.

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De-escalation of empiric therapy is associated with lower mortality in patients with severe sepsis and septic shock

- Propensity score-adjusted multivariate regression analysis independently associated with increased mortality:
 - Septic shock (OR 1.7)
 - Higher SOFA score on day of culture results (OR 1.11)
 - Inadequate empiric antimicrobial therapy (OR 2.03)
- De-escalation therapy proved protective (OR 0.55) controlled for severity and other confounders

Intensive Care Med. 2014 Jan;40(1):32-40.

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De-escalation of empiric therapy is associated with lower mortality in patients with severe sepsis and septic shock

Reasons:

- Reduce adverse events
- Optimize therapy based on site of infection and PK/PD of drug(s)
- Use drug more active against confirmed pathogen: e.g. change from vancomycin to β -lactam for MSSA
- Lower risk for HAI resistant infection

Intensive Care Med. 2014 Jan;40(1):32-40.

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Duration: Avoid automatic 10-14 day courses

- New evidence for duration of therapy

- Uncomplicated urinary tract infection: 3-5 days¹
- Community-acquired pneumonia: 3-7 days²
- Ventilator-associated pneumonia: 8 days³
- CR-BSI Coagulase-negative staphylococci: 5-7 days⁴
- Acute Hem Osteomyelitis in children-21 days⁵
- Meningococcal meningitis-7 days⁶
- Uncomplicated secondary peritonitis with source control: 4-7 days⁷
- Uncomplicated SSTI 5 days⁸



1. *Clin Infect Dis* 1999; 29:745-758

2. *Clin Infect Dis* 2007; 44:S27-72

3. *JAMA* 2003; 290:2588-2598

4. *Clin Infect Dis* 2009; 49:1-45

5. *Pediatr Infect Dis* 2010; 29:1123-1128

6. *N Engl J Med* 1997; 336:708-716

7. *Clin Infect Dis* 2010; 50:133-164

8. *Arch Intern Med* 2004; 164:1669-1674

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Potential benefits of an Antimicrobial Management Program

Amp Impact

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Favorable Impact of a Multidisciplinary Antibiotic Management Program

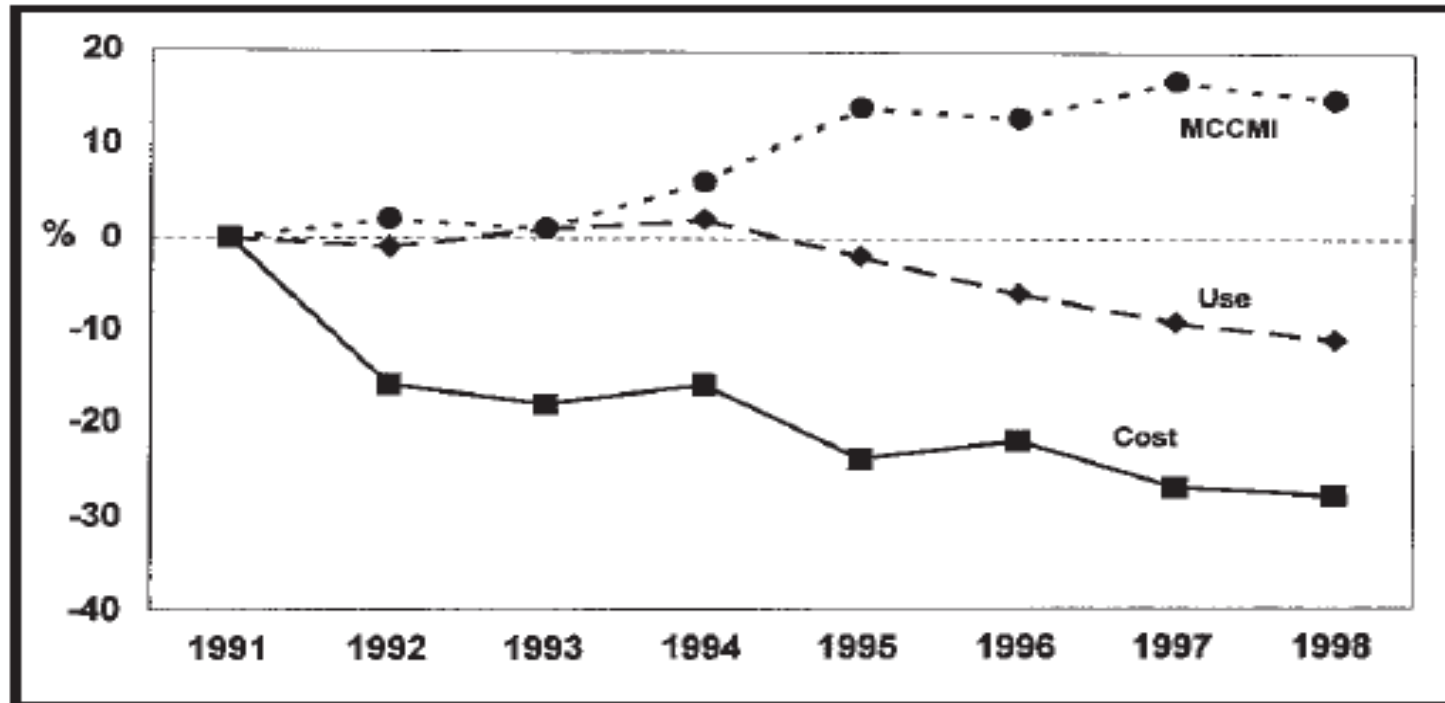


FIGURE 1. Parenteral antibiotic use, cost per 1,000 patient-days, and Medicare Case Mix Index (MCCMI) trends following implementation of the antibiotic management program expressed as a percentage of preintervention observations.

Infect Control Hosp Epidemiol 2003; 24:699-706

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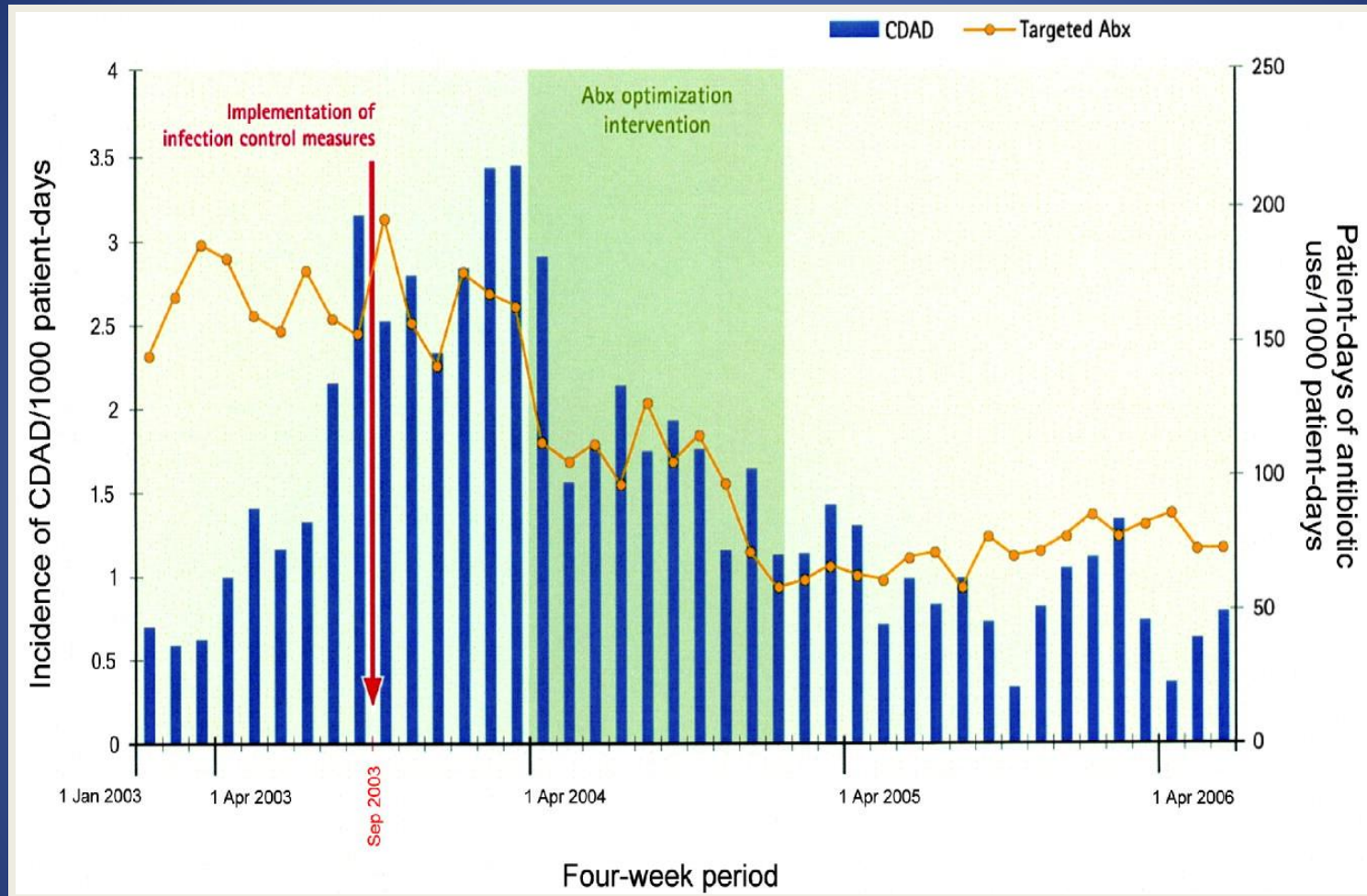
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Correlation between antibiotic consumption and nosocomial *C. difficile* disease



Clin Infect Dis 2007;45 S112

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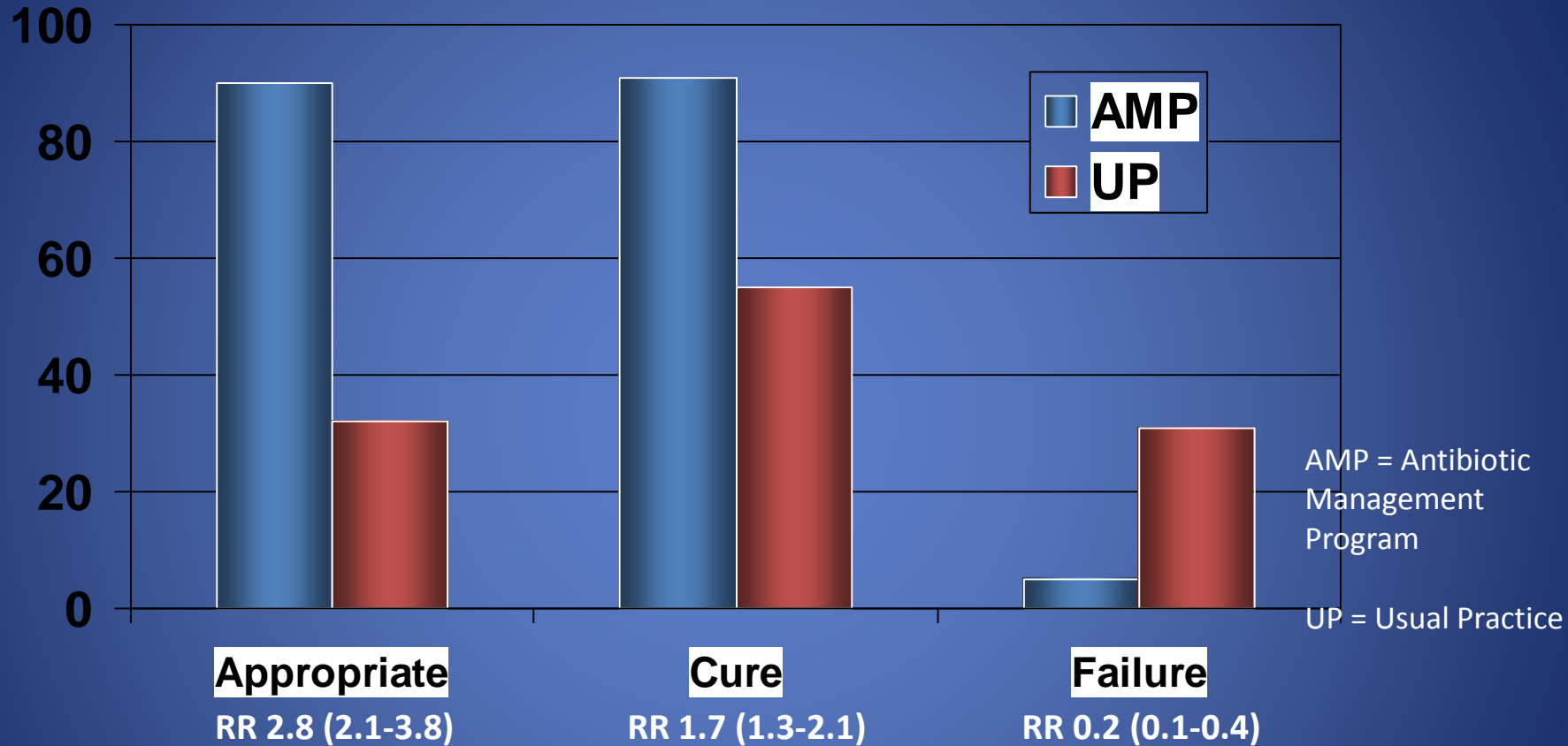
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Clinical Outcomes Better With Antimicrobial Management Program



Am J Med. 2006;119:S53.

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Effect in the ICU Setting

Rational use protocol

- Antibiotic use controlled by 4 ICU physicians (members of ARC)
- Written algorithms for use
- Systematic reassessment at days 3, 7, 10
- Twice-weekly meetings

Results

- Antibiotic use ↓ 36%
- Resistant nosocomial infections ↓ 52% ($P < .05$)
- MRSA ↓ at yr 3; Enterobacteriaceae R at yr 4
- No change in PsA resistance or ESBL producers

Year	1994	1995†	1996	1997	1998
Total NI* Patients	99	97	105	116	109
Total Days of Antibiotic Use	3,658	3,314	2,974	2,496	2,311
Total Antibiotic Costs (Euro)	64,500	52,200	50,100	40,950	42,000
% Antibiotic Resistance	44%	53%	39%	31%	21%

† Start of program

* NI = Nosocomial infection

Inten Care Med. 2003;29:49-54.

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Effect on a General Medical Unit

- Reviewed 500 patients admitted before and after implementation of the program
 - Short-term analysis
 - Prospective, pharmacy-based 4-year program follow-up study
- Multi-faceted program for improving in-hospital antibiotic use and related costs
 - Formulary (no changes made)
 - Continued education; antibiotic use guidelines; weekly rounds
 - Prior authorization
- Inclusion criteria: admission to general wards or ICU and hospital stay ≥ 24 hours

Clin Infect Dis. 2004;38:348-356.

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Effect on a General Medical Unit

- 16% fewer patients received an antibiotic
- Quality of care was not compromised
- Decrease in infectious disease-specific mortality from 4.0% to 2.4%
- Cost reductions continued over 4 years of study
- Primary cost-lowering factors
 - Reduction in antibiotic prescriptions
 - More diligent use of broad-spectrum antibiotics

Clin Infect Dis. 2004;38:348-356.

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Value of Stewardship Programs

- Effective programs can be financially self supporting and improve patient care
- Comprehensive programs have consistently demonstrated a decrease in antimicrobial use (22-36%), with annual savings of \$200,000-900,000 in both larger academic hospitals and smaller community hospitals
- 51/66 (77%) studies of interventions to improve antibiotic use in hospitals had positive results

Cochrane Database of Syst Rev 2005

Clin Infect Dis 2007;44:159-77.

Infect Control Hosp Epidemiol 2014; 35(10): 1209-1228.

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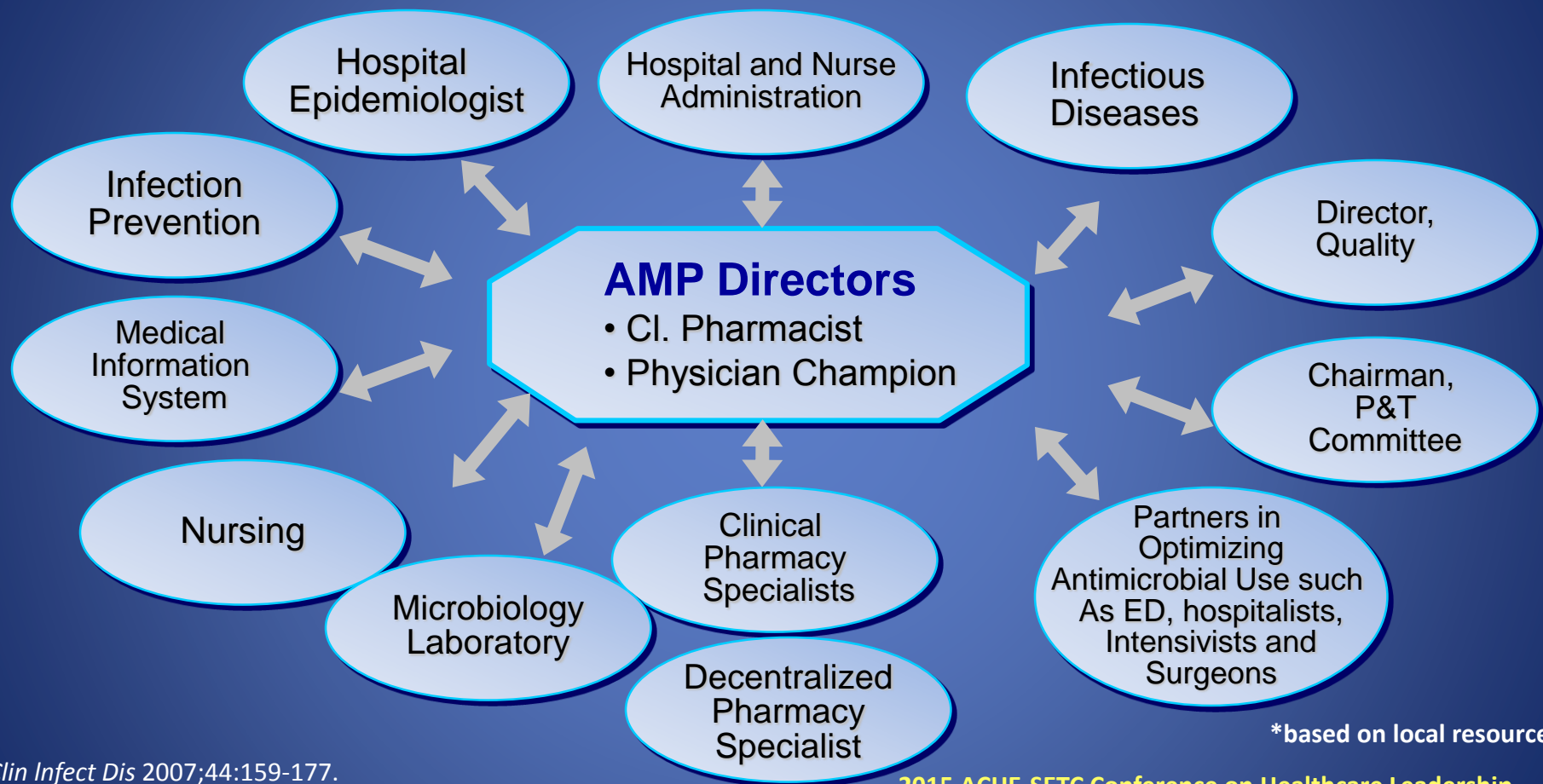


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Antimicrobial Stewardship Team

Multidisciplinary Team Approach to Optimizing Clinical Outcomes*



Clin Infect Dis 2007;44:159-177.

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Suggested Measurements

Clinical

- Length of stay
- Clinical cure/failure rates
- Readmission rates (30 days)
- Resistance rates
- Infection-related mortality
- *C. Diff* infections

Process

- Dose optimization
- Adherence to hospital specific guidelines
- Appropriate de-escalation/streamlining
- Appropriateness of therapy
- Cultures before antibiotics

Outcomes

Humanistic

- Adverse drug events avoided
- Time to receipt of appropriate antimicrobials
- Duration of antimicrobial therapy
- IV/PO conversion rates
- Outpatient intravenous therapy rates

Economic

- Antimicrobial utilization (DDD or DOT)
- Hospital wide antimicrobial expenditures
- Relative consumption use
- Rate of intravenous antimicrobial use
- Nonformulary agents avoided

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Key Elements for Successful AMP

- Establish compelling need and goals for ASP
- Senior leadership support
- Effective local physician champion
- Adequate resources and competencies (pharmacy, infection preventionist [IP], microbiology, information technology [IT])
- Primary objectives: optimize clinical outcomes and reduce adverse events, not reduce costs
- Good teamwork
- Agreed upon process and outcome measures

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Antibiotic Treatment in Hospitals: Checklist

1. **Leadership commitment:** Dedicate necessary human, financial, and IT resources
2. **Accountability:** Appoint a single leader responsible for program outcomes-this is usually a physician
3. **Drug expertise:** Appoint a single pharmacist leader to support improved prescribing
4. **Act:** Take at least one prescribing improvement action, such as “antibiotic timeout”
5. **Track:** Monitor prescribing and antibiotic resistance patterns
6. **Report:** Regularly report to interdisciplinary team the prescribing and resistance patterns, and steps to improve
7. **Educate:** Offer team education about antibiotic resistance and improving prescribing practice

MMWR March 2014

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NATIONAL ACTION PLAN FOR COMBATING ANTIBIOTIC-RESISTANT BACTERIA

MARCH 2015



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National Action Plan highlights

The plan sets 1-, 3-, and 5-year targets in each of the five overarching goals, which are to:

- slow the emergence of resistant bacteria and prevent the spread of resistant infections;
- strengthen national one-health surveillance efforts to combat resistance (the "one-health" approach to disease surveillance integrates data from multiple monitoring networks, according to the White House);
- advance development and use of rapid and innovative diagnostic tests for the identification and characterization of resistant bacteria;
- accelerate basic and applied research and development for new antibiotics, other therapeutics, and vaccines; and
- improve international collaboration and capacities for antibiotic resistance prevention, surveillance, control, and antibiotic research and development

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National Action Plan continued

The plan sets goals for eradicating pathogens that have been labeled urgent or serious threats by the Centers for Disease Control and Prevention. The 2020 targets include:

- a 50% reduction from 2011 estimates in the incidence of *Clostridium difficile*
- a 60% reduction in hospital-acquired Carbapenem-resistant Enterobacteriaceae infections
- a 35% reduction in hospital-acquired multidrug-resistant *Pseudomonas* species infections
- 50% reduction from 2011 estimates in methicillin-resistant *Staphylococcus aureus* bloodstream infections
- by 2020, the action plan seeks a 50% reduction in inappropriate antibiotic use in outpatient settings and a 20% reduction in inpatient settings,
- by 2020 the development and wide dissemination of rapid diagnostic tests that can be used in a physician's office or at the hospital bedside to distinguish between viral and bacterial infections, and thus help ensure more appropriate use of therapeutics.

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We choose to go to the moon in this decade and do other things, not because they are easy, but because they are hard, because the goal will serve to organize and measure the best energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win

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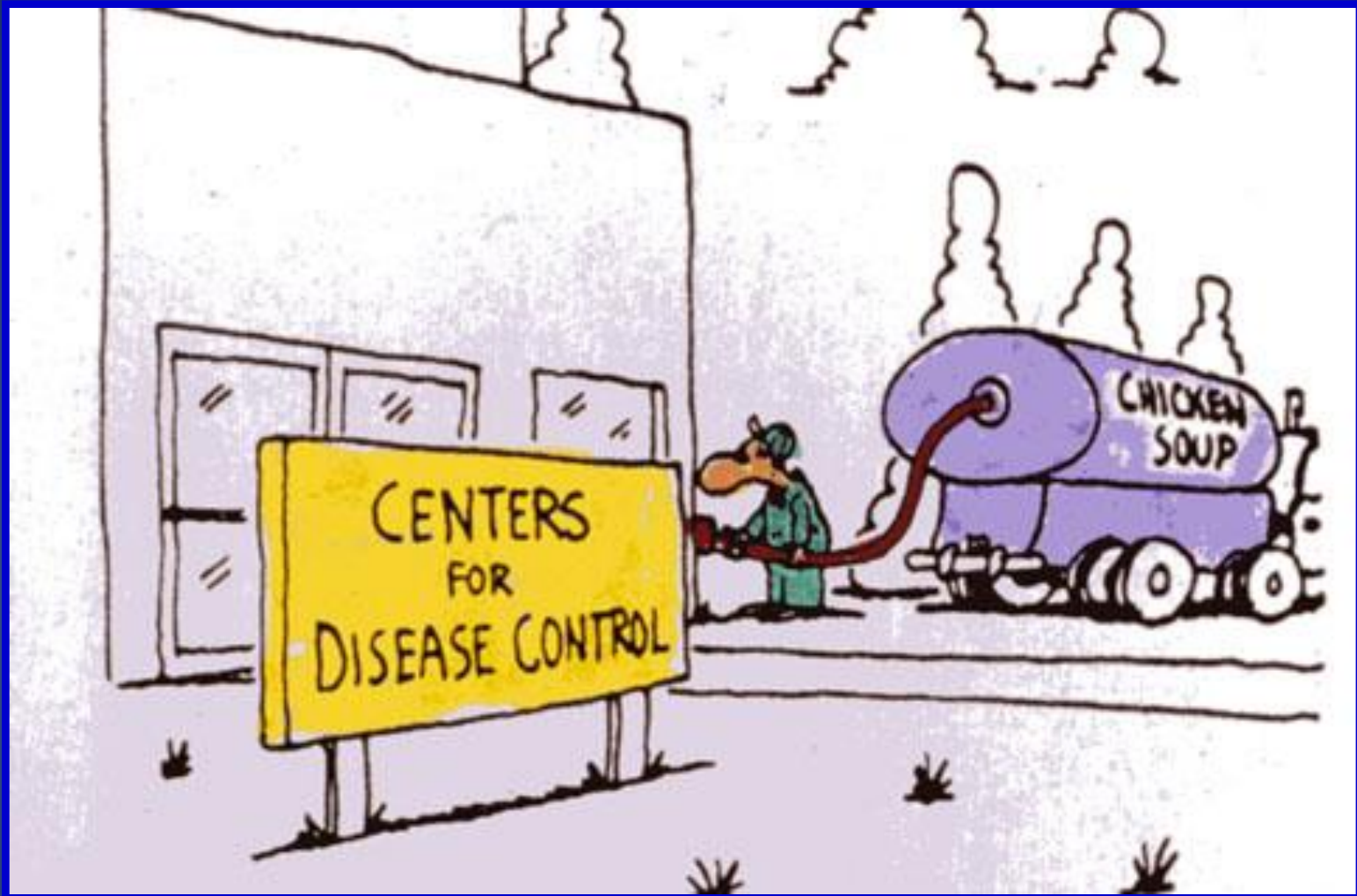


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Biography

Edward J. Septimus, M.D., F.I.D.S.A, F.A.C.P, F.S.H.E.A. has been practicing medicine for over three decades. His current position is Medical Director Infection Prevention and Epidemiology Clinical Services with HCA Healthcare System. In addition to his role with HCA, Dr. Septimus holds a faculty position as Clinical Professor at Texas A&M Medical School and Affiliate Professor, Distinguished Senior Fellow, School of Public Health, George Mason University.

Dr. Septimus is a member of many prestigious professional organizations. He has just finished a three year term on the Board of Directors of the Infectious Diseases Society of America (IDSA), and is on the IDSA Quality Improvement Task Force, and IDSA Antimicrobial Resistance Work Group. Dr. Septimus has also served on the IDSA Clinical Affairs Committee, IDSA Program Committee, and IDSA State and Regional Board including chair for two years. He was the first recipient of the IDSA Annual Clinician Award. He served on the Houston Medical Advisory Steering Committee on Terrorism and the MRSA Work Group for the Texas Department of Health and recently was appointed to the Infectious Diseases Workgroup for the Texas Department of Health and the FDA Anti-Infective Drug Advisory Group. He also serves on the Leading Practice Advisory Panel for VHA, the Board International Society for Antimicrobial Resistance, the SHEA/IDSA Antimicrobial Stewardship Task Force and the SHEA HCW Influenza Vaccine Working Group.

Dr. Septimus received his medical degree from Baylor College of Medicine in Houston in 1972 and went on to complete his postgraduate training in internal medicine and infectious diseases at Baylor College of Medicine in Houston.

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