

Choosing Antibiotics Wisely

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disclosure

- ▶ No conflict of interest

objectives

After this session, participants will be able to:

1. Describe the role and necessity of antimicrobial stewardship programs
2. Identify interventions that are employed by antimicrobial stewardship programs to improve the quality of care
3. Implement principles of antimicrobial stewardship and best practice in their own prescription practices and help to educate others



JOINT ANTIBIOTIC STEWARDSHIP PROGRAM FOR
CIUSSS WEST-CENTRAL MONTREAL

JASPRO PROAC

PROGRAMME D'ANTIBIOGOUVERNANCE CONJOINT DU
CIUSSS DU CENTRE-OUEST DE L'ÎLE-DE-MONTRÉAL

Caveat

- ▶ Infectious diseases
 - ▶ Evidence based medicine vs expert opinion
 - ▶ 2011 analysis >50% of IDSA recommendations were based on level III evidence
- ▶ Local microbiology is important
- ▶ Affiliated infectious diseases units, infection prevention and control units, and antimicrobial stewardship programs should be your primary resource

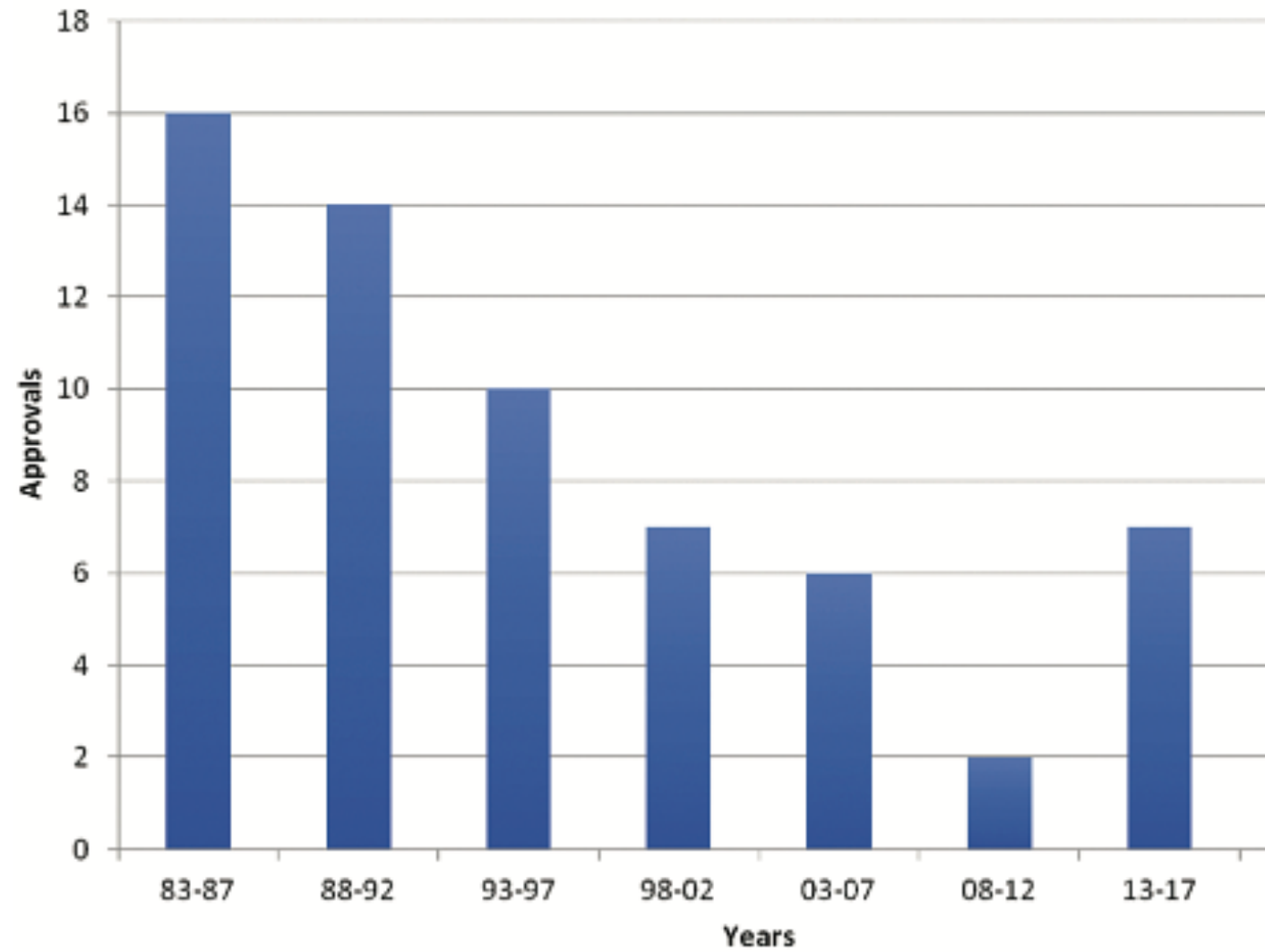
Antibiotics in FDA Approval Pipelines

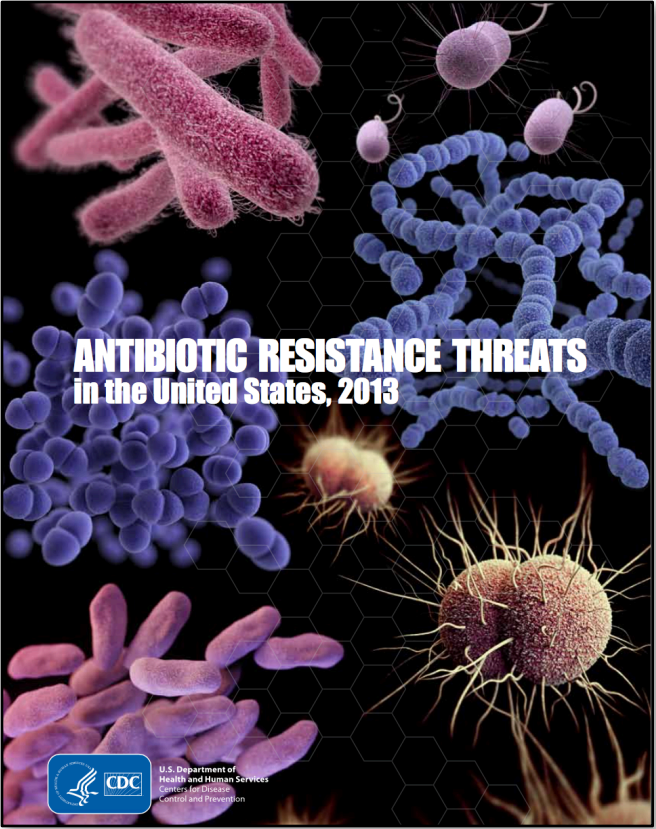
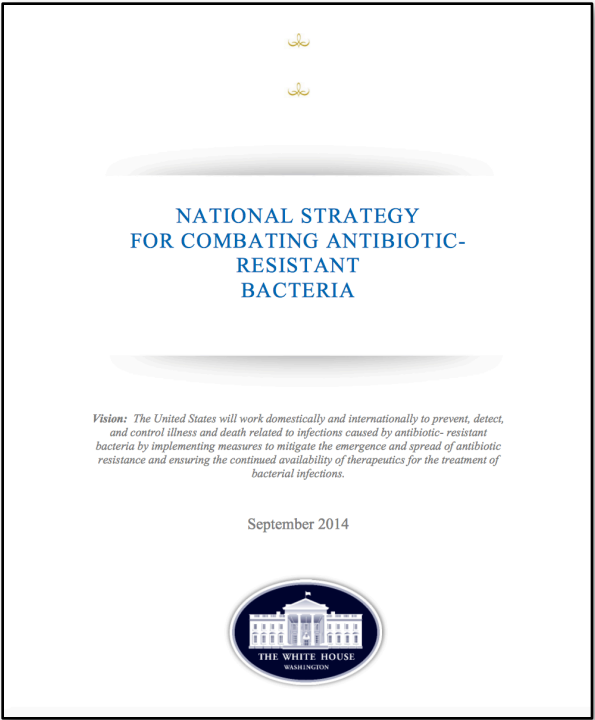
- ▶ Meropenem-vaborbactam
- ▶ Delafloxacin
- ▶ Lefamulin
- ▶ Fosfomycin – IV
- ▶ Plazomicin
- ▶ Cefiderocol
- ▶ Omadacycline
- ▶ Iclaprim
- ▶ Relebactam(-imipenem)
- ▶ Eravacycline



Ten new **ANTIBIOTICS** by 2020

FDA Antibiotic Approvals





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Canadian Institutes of Health Research

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Infection and Immunity

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About CIHR's Antimicrobial Resistance Initiatives

Antimicrobial resistance is recognized internationally as an emerging health crisis that threatens to undermine our ability to control bacterial infections. The complacency generated by the success of antibiotics has led to their widespread overuse and misuse, accelerating the generation of multi-drug resistant Enterococci (VRE) and Clostridium difficile have entered the public consciousness, and pose a serious health threat. If the spread of antimicrobial resistance is not checked, and if new methods for treating bacterial infections are not found, we face returning to a pre-antibiotic-like era. Antimicrobial resistance has been a research priority of the CIHR Institute of Infection and Immunity (I1) since its inception, and a number of strategic research initiatives have been launched to address this global health problem, including with the Safe Food and Water Initiative, the Novel Alternatives to Antibiotics (NAAT) initiative, the Canada-UK Partnership on Antibiotic Resistance, and most recently the Joint Programming Initiative on Antimicrobial Resistance (JPIAMR).

Canadian Research Coalition for Safe Food and Water

The Institute of Infection and Immunity (I1) spearheaded the formation of the Canadian Research Coalition for Safe Food and Water in 2001 by inviting members of Canada's food and water research and industry sectors to a workshop to develop a national food and water safety research agenda. Participants at this initial workshop formed the Canadian Research Coalition for Safe Food and Water which was formalized in October 2002. The Coalition is made up of 17 partners and has the goal of building a national coordinated research agenda in the area of microbial contamination of food and water and antimicrobial resistance in the food chain. The Coalition has supported the launch of two research initiatives: Microbial Safety of Food and Water-Needs, Gaps and Opportunities Assessment, launched in May 2002; and Microbial Contamination of Food and Water and Antimicrobial Resistance in the Food Chain-Phase II - Establishing a Framework, launched in November 2002. It also supported one project in collaboration with the Canadian Water Network through the Integrated Disinfectant Strategy Optimization program which focuses on the disinfection of Canada's drinking water.

Novel Alternatives to Antibiotics Initiative

The Funding Opportunity was designed to augment the existing research funding available through the CIHR of novel approaches to antibiotic resistance, including research areas such as phage therapy, bacteriophage, and other alternatives to antibiotics. The Funding Opportunity, launched in partnership with the funding of seven Seed Grants, two Fellowships, one Proof of Principle Award and one Emerging Team Grants for a total investment of more than \$13 million. Seed Grants are focused on no research capacity. The funding area of bacteriophage research.

ANTIBIOTIC AWARENESS

HEALTH CARE PROVIDERS PATIENTS ANTIBIOTIC USE & RESISTANCE ANTIBIOTIC AWARENESS WEEK ABOUT

English

Health Care Providers

Materials to Use with your Patients
Treatment Guidelines
Other Resources
Archives of Webinars

Materials to Use with your Patients

PRESCRIPTION PAD

This sheet can be used with patients (adults and children) who have a suspected viral infection. It provides information about symptomatic relief for infections and indicates when patients should consider a return visit.

- Download a PDF that you can print for your office
- Request Free Printed Copies of the prescription pad

"SCRIPT" FOR DOCTORS

Completing the Prescription Pad, this document provides information on how to talk to patients about requests for antibiotics for viral infections. Instead of a "script" for your patients, it provides suggestions to help you promote appropriate antibiotic use.

- Download the Script

This document is a resource in development. Please let us know what you think about its usefulness and effectiveness.

FACTSHEETS

We recognize that antimicrobial resistance is not an issue that can be solved by only hospitals or governments. It is an issue that must be addressed collaboratively, by all the human, animal, and environmental health disciplines affected. To commemorate World Health Day, April 7, 2011, AntibioticAwareness.ca has launched 4 new factsheets that begin to address some of these individual sectors:

- Hospitals
- Food Animal Production
- Northwest and Remote Communities
- Community (Asian, Columbia examples)

Please provide feedback on the above factsheets to antibioticawareness@cihi.ca. Thank you!

Recent News / Nouvelles

- Sometimes the right prescription is no prescription
- Transcript of Dr. Saxinger's webinar of November 2013
- How nighttime microbes could spell the end of the world's antibiotic miracle
- VC: still, sometimes, break a murderous global microbe - to Canada
- Modern life versus microbes: Our obsession with clean living is harming us
- Fighting microbes with microbes: Can fecal transplants work where antibiotics fail?

Archives

Select Month

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DO BUGS NEED DRUGS?

A Community Program for Wise Use of Antibiotics

3 Key Messages

- Handwashing is the best way to stop the spread of infections.
- Not all bugs are created equal. Both bacteria and viruses cause infections but antibiotics only work against bacteria.
- Use antibiotics wisely to stop bacteria from becoming resistant to antibiotics.

The Antibiotic Hunters - World Premiere

A new documentary travels to an ocean reef, a rainforest canopy, a frigid cave and even the mouth of a giant lizard - all in the urgent search for new antibiotics. View the trailer at <http://vimeo.com/dreamlin/ah-trailer>. Not to be missed! March 5, 2015 at 8:00 pm on CBC The Nature of Things.

What is antibiotic resistance?

Dr. Eileen Heise, MD (FRCPC)

Tweets

Do Bugs Need Drugs @DoBugsNeedDrugs 23h
Happy Canned Food Month! FYI one of the most toxic (and useful) bacteria grows in improperly sealed cans <http://bit.ly/1PjWw> #aboutam

Ryan Lamers @RyanLamers 5 Mar
Good website for info. on infectious diseases and antibiotics: DoBugsNeedDrugs.org #not

Tweet to @DoBugsNeedDrugs

MSH + UHN ANTIBIOTIC STEWARDSHIP PROGRAM

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Our Purpose

To improve individual patient care, reduce hospital costs, and slow the spread of antimicrobial resistance by measuring and promoting the proper use of antimicrobials by choosing the appropriate agents, doses and durations.

"Getting patients the right antibiotics when they need them."

Check out our NEW videos on YouTube

MSH+UHN ASP
YouTube 182
LOGIN

Upcoming Events

- Clinical Vaccinology Course March 13, 2015
- 18th Annual Conference on Vaccine Research April 13, 2015
- The Grand Semi-Annual Denver TB Course April 15, 2015
- AMMI Canada - CACMID Annual Conference April 16, 2015

Full Events Calendar >

Antibiograms
All antibiograms for Mount Sinai Hospital and University Health

Information for Patients and Families
Using the right antibiotics in the right

Antimicrobial Stewardship Clinical Summaries
We have developed one-page

Search For All Content Enter Topic or Keyword... SEARCH

Browse Content

MSH + UHN ASP
Antimicrobial Stewardship Program

Antibiotic Stewardship

- ▶ “activity that includes appropriate selection, dosing, route, and duration of antimicrobial therapy”
- ▶ “optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms, and the emergence of resistance”

GUIDELINES

Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship

Timothy H. Dellit,¹ Robert C. Owens,² John E. McGowan, Jr.,² Dale N. Gerding,³ Robert A. Weinstein,⁴ John P. Burke,⁵ W. Charles Huskins,⁶ David L. Paterson,⁷ Neil O. Fishman,⁸ Christopher F. Carpenter,⁹ P. J. Brennan,⁹ Marianne Billeter,¹⁰ and Thomas M. Hooton¹¹

¹Harborview Medical Center and the University of Washington, Seattle; ²Maine Medical Center, Portland; ³Emory University, Atlanta, Georgia; ⁴Hines Veterans Affairs Hospital and Loyola University Stritch School of Medicine, Hines, and ⁵Stroger (Cook County) Hospital and Rush University Medical Center, Chicago, Illinois; ⁶University of Utah, Salt Lake City; ⁷Mayo Clinic College of Medicine, Rochester, Minnesota; ⁸University of Pittsburgh Medical Center, Pittsburgh, and ⁹University of Pennsylvania, Philadelphia, Pennsylvania; ¹⁰William Beaumont Hospital, Royal Oak, Michigan; ¹¹Ochsner Health System, New Orleans, Louisiana; and ¹²University of Miami, Miami, Florida

EXECUTIVE SUMMARY

This document presents guidelines for developing institutional programs to enhance antimicrobial stewardship, an activity that includes appropriate selection, dosing, route, and duration of antimicrobial therapy. The multifaceted nature of antimicrobial stewardship has led to collaborative review and support of these recommendations by the following organizations: American Academy of Pediatrics, American Society of Health-System Pharmacists, Infectious Diseases Society for Obstetrics and Gynecology, Pediatric Infectious Diseases Society, Society for Hospital Medicine, and Society of Infectious Diseases Pharmacists. The primary goal of antimicrobial stewardship is to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms (such as *Clostridium difficile*), and the emergence of resistance. Thus, the appropriate use of antimicrobials is an essential part of patient safety

and deserves careful oversight and guidance. Given the association between antimicrobial use and the selection of resistant pathogens, the frequency of inappropriate antimicrobial use is often used as a surrogate marker for the avoidable impact on antimicrobial resistance. The combination of effective antimicrobial stewardship with a comprehensive infection control program has been shown to limit the emergence and transmission of antimicrobial-resistant bacteria. A secondary goal of antimicrobial stewardship is to reduce health care costs without adversely impacting quality of care.

These guidelines focus on the development of effective hospital-based stewardship programs and do not include specific outpatient recommendations. Although judicious use of antimicrobials is important in outpatient clinics and long-term care facilities, there are very few data regarding effective interventions, and it is unclear which interventions are most responsible for improvement in these settings.

The population targeted by these guidelines includes all patients in acute care hospitals. Most of the evidence supporting the recommendations in these guidelines is derived from studies of interventions to improve antimicrobial use for hospitalized adults. Many of these studies have focused on adults in intensive care units. Only a handful of studies have focused on hospitalized newborns, children, and adolescents. Few studies have included substantial populations of severely immunocompromised patients, such as patients undergoing

Received 3 October 2006; accepted 4 October 2006; electronically published 13 December 2006.

These guidelines were developed and issued on behalf of the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America.

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Clinical Infectious Diseases 2007;44:159-77

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Antimicrobial Stewardship



ACCREDITATION

CANADA

Better Quality. Better Health.

- Accreditation Canada recognizes the overuse of antimicrobials and risks associated with this
- Required Organization Practice (ROP)

“A successful antimicrobial stewardship program requires an inter-disciplinary approach, with collaboration between the antimicrobial stewardship team, pharmacy, and hospital infection control. The involvement and support of hospital administrators, medical staff leadership, and health care providers is essential.”

Paradigm shifts for stewardship

“Cost savings”



“Cost avoidance”



Comprehensive part of battling anti-microbial resistance



Overall quality of care, ROP of Accreditation Canada
(Performance tied to CEO rewards in US healthcare systems)

ASP – the nutshell version

- ▶ Correct Drug
- ▶ Correct Dose
- ▶ Correct Route
- ▶ Correct Diagnosis
- ▶ TDM (vancomycin, aminoglycosides, voriconazole, posaconazole)
- ▶ Education

Antimicrobial stewardship program

- ▶ **Preauthorization**
- ▶ **Prospective audit and Feedback**
- ▶ Clinical practice guidelines
- ▶ Interventions targeting syndromes or certain antimicrobials
- ▶ **Interventions designed to reduce antibiotic usage with strong association with CDI**

Antimicrobial stewardship program

- ▶ Strategies to encourage prescriber led review of appropriateness of antibiotic regimens (antibiotics time-outs, stop orders)
- ▶ Computerized decision support
- ▶ **PK monitoring**
- ▶ Alternative dosing of vancomycin and beta-lactams using PK/PD data to improve outcomes and decrease costs (i.e meropenem q6h vs q8h)

Antimicrobial stewardship program

- ▶ **IV to PO switch where indicated**
- ▶ Allergy consultation to improve safe use of guideline recommended beta-lactams
- ▶ **Reduction of antibiotics to shortest effective duration**
- ▶ Stratified antibiogram, Cascading antibiogram
- ▶ Use of rapid viral testing for respiratory pathogens
- ▶ Use of serial PCT in ICU patients
- ▶ ASP support in LTC and end of life care

Measures of Utilization

- ▶ DDD – Daily Defined Dose
 - ▶ Grams of antibiotic are normalized against a WHO standard that has been agreed to represent average usual use of an antibiotic.
 - ▶ ie 1 DDD for cephazolin = 3g / day
if you prescribe Ancef 2g IV q8h (6g / day), you are using 2 DDDs
 - ▶ Shortcomings: disease severity, obesity, renal insufficiency/dialysis, pediatrics
- ▶ DOT – Days of Therapy
 - ▶ Each antibiotic given on a given day contributes 1 DOT
- ▶ LOT – Length of Therapy
 - ▶ A single LOT is contributed for a day where at least 1 antibiotic has been administered
- ▶ **DDD / 1000 patient-days** (available readily in JGH pharmacy IS)
- ▶ DOT / 1000 patient-days (CDC benchmarks)

Effect of antibiotic stewardship on the incidence of infection and colonisation with antibiotic-resistant bacteria and *Clostridium difficile* infection: a systematic review and meta-analysis



David Baur*, Beryl Primrose Gladstone*, Francesco Burkert, Elena Carrara, Federico Foschi, Stefanie Döbele, Evelina Tacconelli

Summary

Background Antibiotic stewardship programmes have been shown to reduce antibiotic use and hospital costs. We aimed to evaluate evidence of the effect of antibiotic stewardship on the incidence of infections and colonisation with antibiotic-resistant bacteria.

Methods For this systematic review and meta-analysis, we searched PubMed, the Cochrane Database of Systematic Reviews, the Cochrane Central Register of Controlled Trials, and Web of Science for studies published from Jan 1, 1960, to May 31, 2016, that analysed the effect of antibiotic stewardship programmes on the incidence of infection and

Lancet Infect Dis 2017

Published Online

June 16, 2017

[http://dx.doi.org/10.1016/S1473-3099\(17\)30325-0](http://dx.doi.org/10.1016/S1473-3099(17)30325-0)

See Online/Comment

[http://dx.doi.org/10.1016/S1473-3099\(17\)30344-4](http://dx.doi.org/10.1016/S1473-3099(17)30344-4)

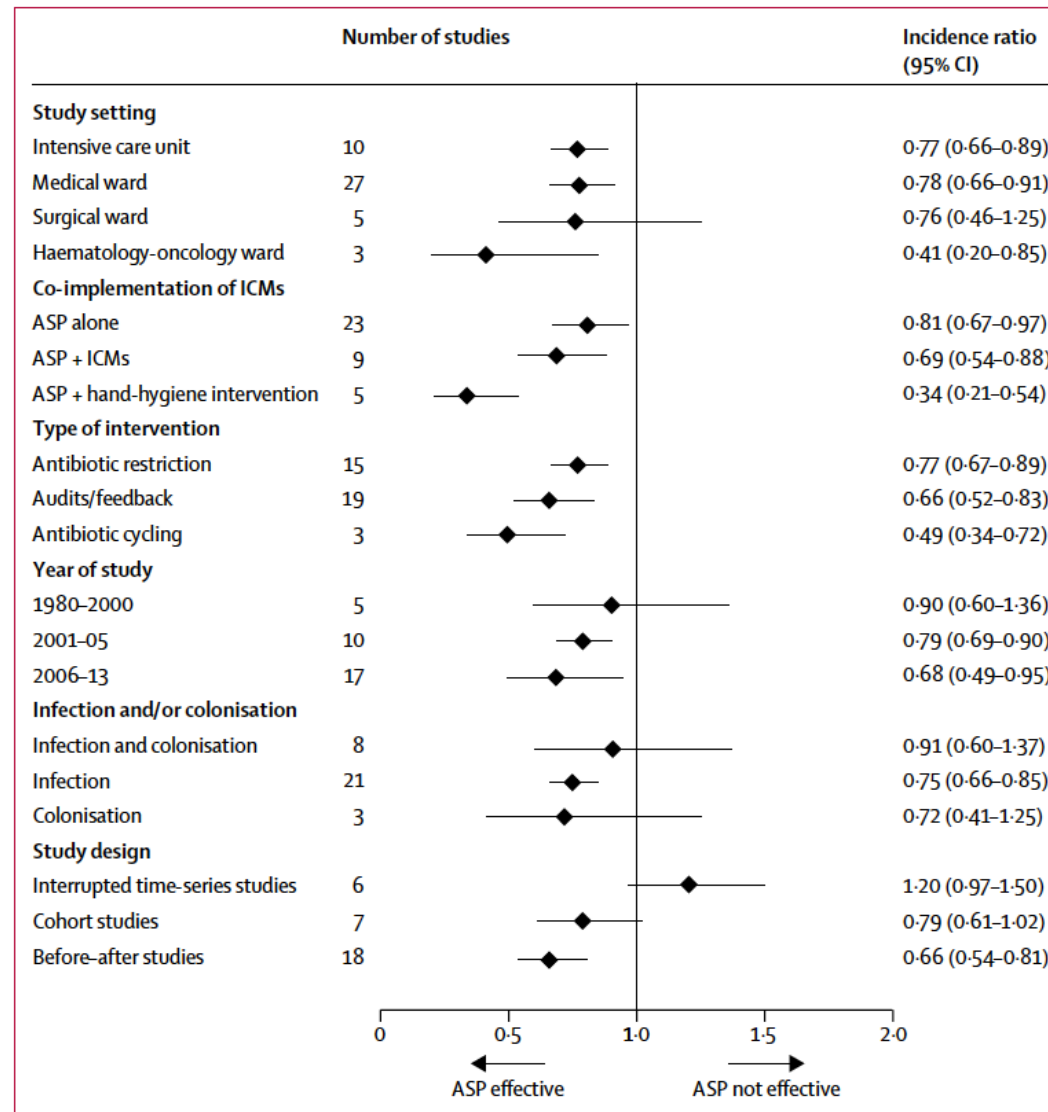


Figure 5: Summary forest plot of the incidence ratios for studies investigating the effect of ASPs on antibiotic resistance, according to study characteristics
 ICM=infection control measure. ASP=antibiotic stewardship programme.

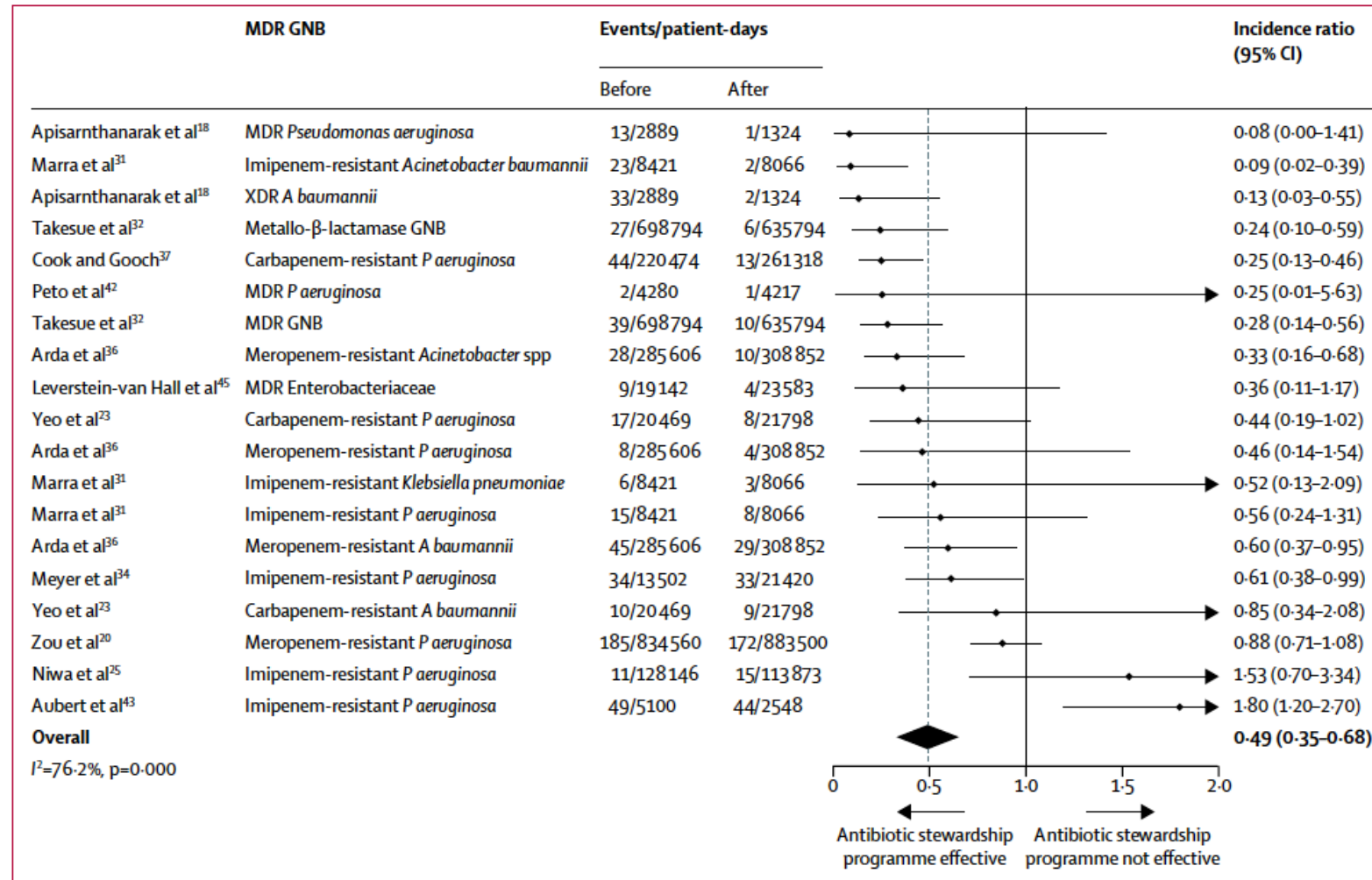


Figure 2: Forest plot of the incidence ratios for studies of the effect of antibiotic stewardship on the incidence of MDR GNB
 GNB=Gram-negative bacteria. MDR=multidrug-resistant. XDR=extensively drug-resistant.

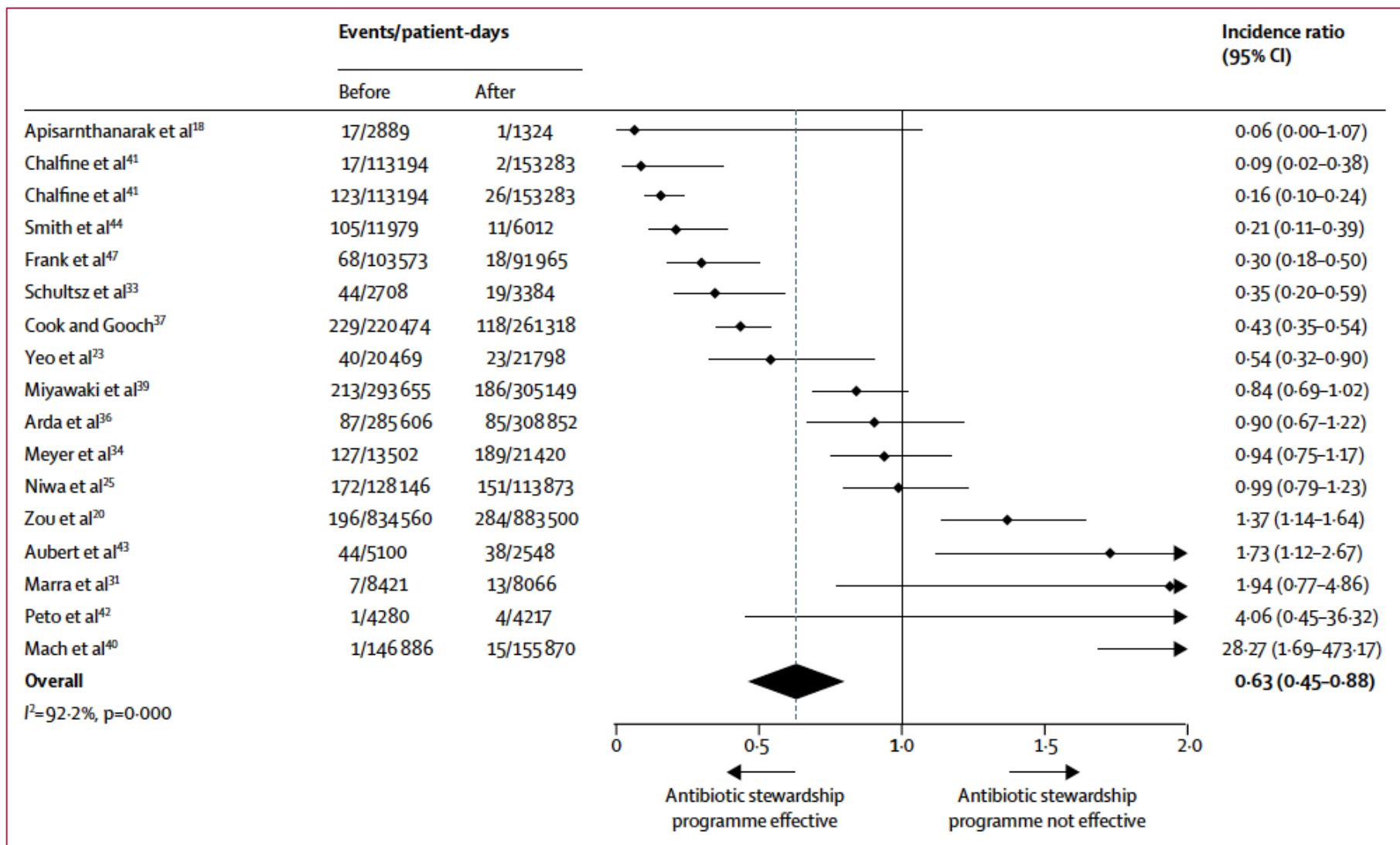


Figure 3: Forest plot of the incidence ratios for studies of the effect of antibiotic stewardship on the incidence of meticillin-resistant *Staphylococcus aureus*

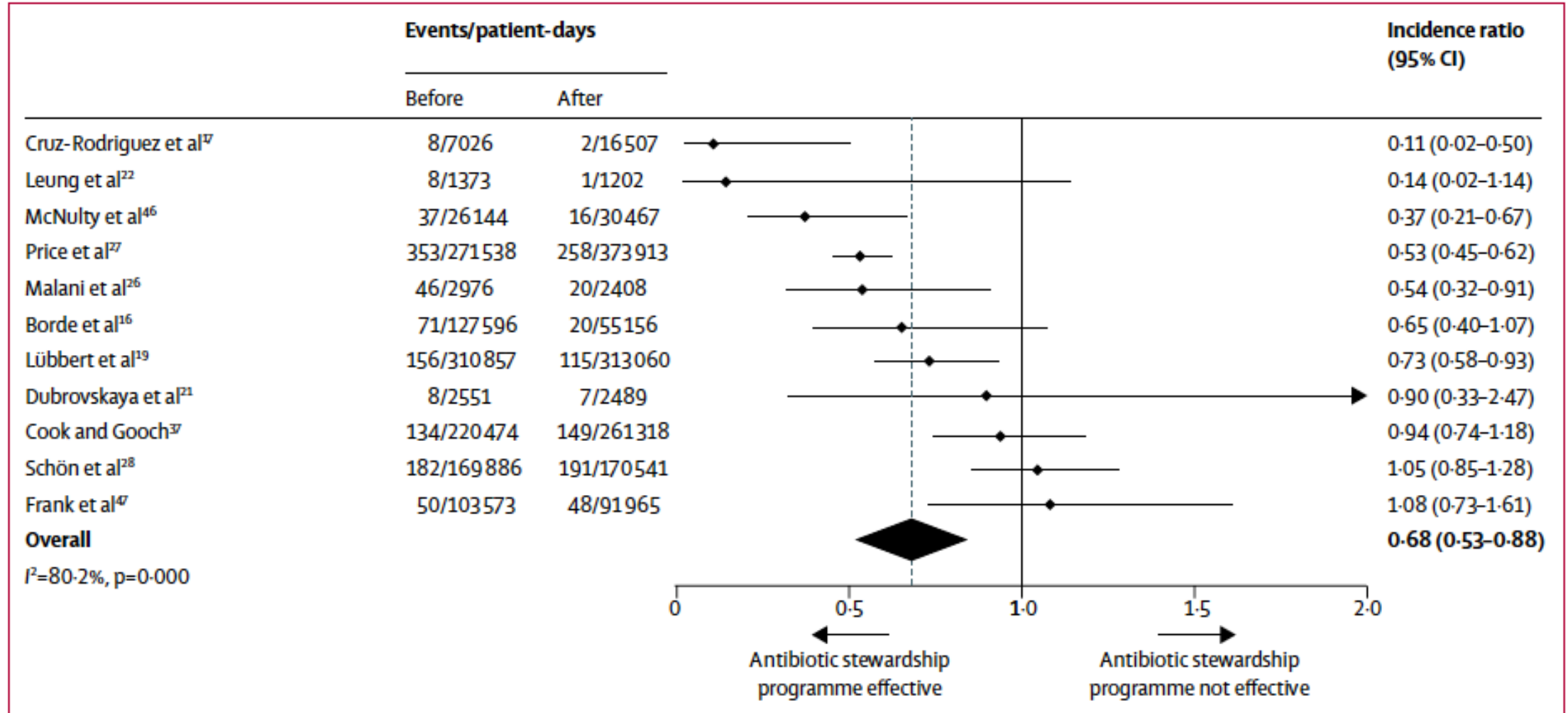


Figure 4: Forest plot of the incidence ratios for studies of the effect of antibiotic stewardship on the incidence of *Clostridium difficile* infections



Restrict Antibiotics to **Bacterial** Infection

- ▶ Don't prescribe antibiotics in vaccinated children more than 6 months old and adults in whom you suspect acute otitis media, unless there is either a perforated tympanic membrane with purulent discharge or a bulging tympanic membrane with one of the three following criteria:
 - ▶ Fever ($\geq 39^{\circ}\text{C}$)
 - ▶ Moderately or severely ill
 - ▶ Significant symptoms lasting > 48 hours
- ▶ Don't routinely prescribe antibiotics unless the patient's modified Centor score is ≥ 2 AND throat swab culture (or rapid antigen test if available) confirms presence of Group A Streptococcus.

Restrict Antibiotics to **Bacterial** Infection

- ▶ Don't prescribe antibiotics for bronchitis/asthma/bronchiolitis exacerbations.
- ▶ Don't prescribe antibiotics for ILI unless there is clear evidence of secondary bacterial infection (see the recommendations for otitis media, pharyngitis, sinusitis, pneumonia).
- ▶ Don't prescribe antibiotics unless there is clear evidence of secondary bacterial infection (see the recommendations for otitis media, pharyngitis, sinusitis, pneumonia).
- ▶ Don't prescribe antibiotics for sinusitis unless symptoms have persisted for greater than 7-10 days without improvement.

Rx

Patient Name : _____ Date : _____

.....

The symptoms you presented with today suggest a VIRAL infection.

- Upper Respiratory Tract Infection (Common Cold) : Lasts 7-14 days
- Flu : Lasts 7-14 days
- Acute Pharyngitis ("Sore Throat") : Lasts 3-7 days, up to ≤10 days
- Acute Bronchitis/"Chest Cold" (Cough) : Lasts 7-21 days
- Acute Sinusitis ("Sinus Infection") : Lasts 7-14 days

You have not been prescribed antibiotics because antibiotics are not effective in treating viral infections.
Antibiotics can cause side effects (e.g. diarrhea, yeast infections) and may cause serious harms such as severe diarrhea, allergic reactions, kidney or liver injury.

When you have a viral infection, it is very important to get plenty of rest and give your body time to fight off the virus.

If you follow these instructions, you should feel better soon :

- » Rest as much as possible
- » Drink plenty of fluids
- » Wash your hands frequently
- » Take over-the-counter medication, as advised :

- Acetaminophen (e.g. Tylenol®) for fever and aches
- Ibuprofen (e.g. Advil®) for fever and aches
- Naproxen (e.g. Aleve®) for fever and aches
- Lozenge (cough candy) for sore throat
- Nasal Saline (e.g. Salinex®) for nasal congestion
- Other : _____

(e.g. Nasal decongestant if Salinex® does not work, for short-term use only!)

Please return to your provider if :

- » Symptoms do not improve in _____ day(s), or worsen at any time
- » You develop persistent fever (above 38°C, or _____ as directed)
- » Other : _____

Prescriber _____

.....



This "Viral Prescription Pad" has been adapted from the RQHR Antimicrobial Stewardship Program www.rqhealth.ca/antimicrobialstewardship and is available in other languages. <http://www.rxfiles.ca/rxfiles/uploads/documents/ABX-Viral-Prescription-Pad-Languages.pdf>
Visit www.RxFiles.ca/ABX for more information.

Restrict Antibiotics to **Bacterial** Infection

- ▶ Don't prescribe antibiotics for pneumonia unless there is objective evidence.
- ▶ Don't routinely prescribe antibiotics for exacerbations of Chronic Obstructive Pulmonary Disease unless there is clear increase in sputum purulence with either increase in sputum volume and/or increased dyspnea

Rx DELAYED PRESCRIPTION

About Your Delayed Prescription

WAIT. Don't fill your prescription just yet. Your health care provider believes your illness may resolve on its own. Follow the steps below to get better.

First, continue to monitor your symptoms over the next few days and try the following remedies to help you feel better:

- Get lots of rest.
- Drink plenty of water.
- For a sore throat: ice chips, throat lozenges or spray, or gargle with salt water.
- For a stuffy nose: saline nasal spray or drops.
- For fever and pain relief: acetaminophen or ibuprofen.
- Other: _____

Wash your hands often to avoid spreading infections.

If you don't feel better in _____ days, go ahead and fill your prescription at the pharmacy.

If you feel better, you do not need the antibiotic and the prescription can be thrown out.

If things get worse, please contact your health care provider.

Antibiotics should only be taken when medically necessary. Unwanted side effects like diarrhea and vomiting can occur, along with destruction of your body's good bacteria that can leave you more susceptible to infections.

To learn more, visit www.choosingwiselycanada.org/antibiotics



Restrict Antibiotics to Bacterial **infection**

- ▶ Don't prescribe antibiotics after incision and drainage of uncomplicated skin abscesses unless extensive cellulitis exists. | [Emergency medicine #5](#)
- ▶ Don't prescribe antibiotics for asymptomatic bacteriuria (ASB) in non-pregnant patients. | [Hospital medicine #2](#)
- ▶ Don't order peri-operative antibiotics beyond a 24-hour post-operative period for non-complicated instrumented cases in patients who are not at high risk for infection or wound contamination. Administration of a single pre-operative dose for spine cases without instrumentation is adequate. | [Spine #5](#)
- ▶ Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present. | [Geriatrics #1](#)
- ▶ Don't recommend antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present. | [Nursing #8](#)

Restrict Antibiotics to Bacterial **infection**

- ▶ Don't use antimicrobials to treat asymptomatic bacteriuria in the elderly. | [Urology #4](#)
- ▶ Do not treat asymptomatic urinary tract infections in catheterized patients. | [Physical medicine and rehabilitation #1](#)
- ▶ Don't routinely prescribe intravenous forms of highly bioavailable antimicrobial agents for patients who can reliably take and absorb oral medications. | [Infectious disease #1](#)
- ▶ Don't prescribe alternate second-line antimicrobials to patients reporting non-severe reactions to penicillin when beta-lactams are the recommended first-line therapy. | [Infectious disease #2](#)

Case – Antibiotic interactions, AE profile

75F
AF, HTN, cystocele
left her medication list at home, DSQ is
down

Concerned about dysuria and frequency
for the past 3 days
No systemic symptoms

UA –nit +LE

Rx ciprofloxacin 250mg PO bid x 3 days

DO TAKE A FULL MEDICATION HISTORY, BE AWARE OF INTERACTIONS, ANTAGONISM AND ADVERSE EFFECT PROFILES

- ▶ Important interactions may occur
- ▶ ↑INR
 - ▶ Warfarin ↔ □ FQ
 - ▶ Warfarin ↔ macrolides
 - ▶ Warfarin ↔ SXT-TMP
- ▶ QTc prolongation, risk of malignant arrhythmia
 - ▶ Especially elderly women
 - ▶ Especially if slower HR

case – weight-based dosing

36M body builder

Episodic constipation

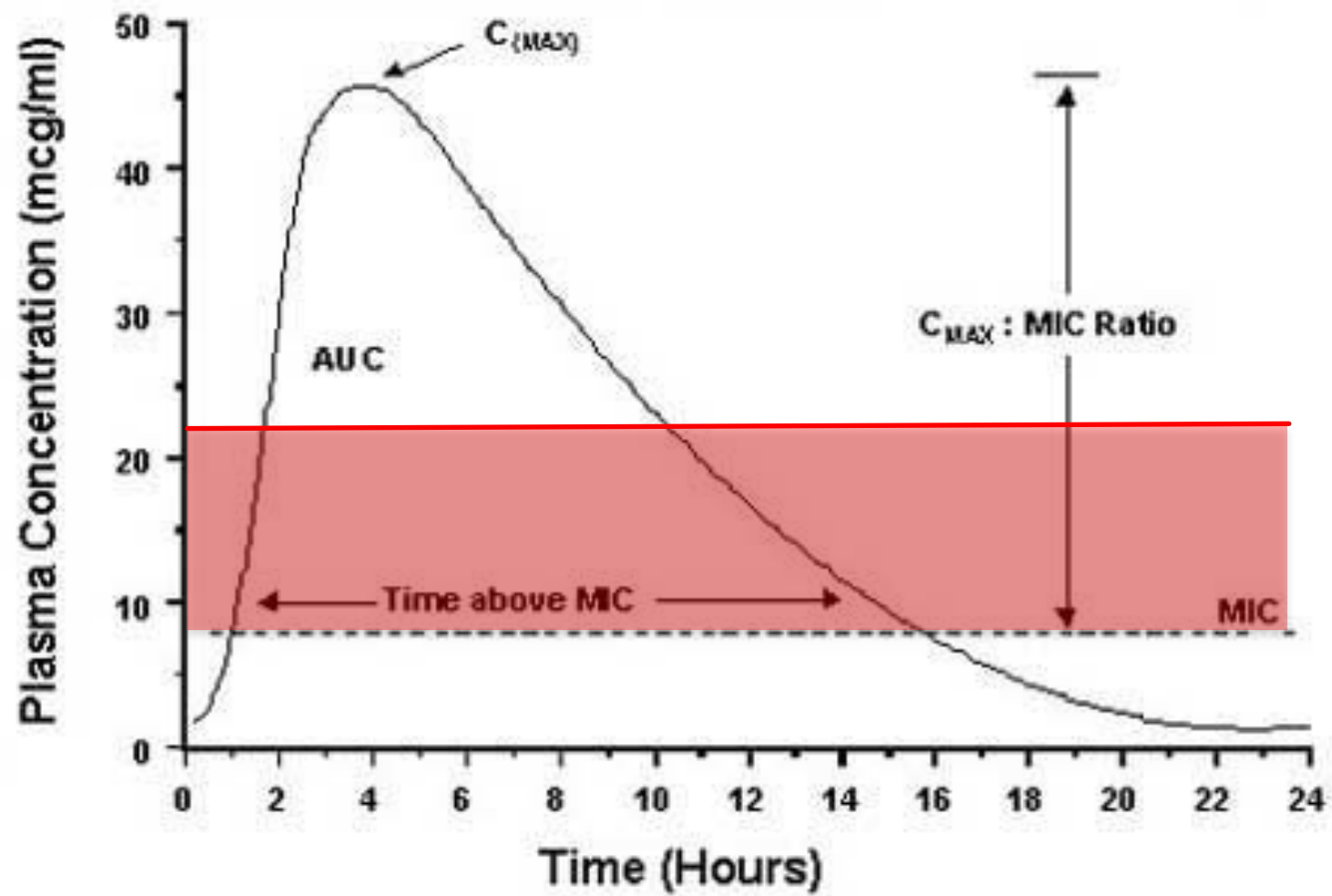
3 days of fever, LLQ pain

Appears unwell on exam with LLQ palpation tenderness, rebound, and guarding

Rx amoxicillin clavulanic acid 500mg PO tid

DO CONSIDER PATIENT'S BMI, IBW, ABW, AND MUSCLE MASS

- ▶ Under dosing risks treatment failure and selection of resistant mutant micro-organisms
- ▶ Pitfall of start and stop therapies
- ▶ Pitfall of prophylactic therapies



case – tissue penetration

25F

No PMH

bonafide allergies to penicillin, and ciprofloxacin

4 days of dysuria and frequency

UA +nit +LE

Rx clindamycin 300mg PO tid x7 days

DO CONSIDER TISSUE PENETRATION OF THE ANTIMICROBIAL, LOCAL TISSUE PHYSIOLOGY AND CHEMISTRY

- ▶ does it penetrate/concentrate into the urine?
- ▶ Can it penetrate all zones of the prostate?
- ▶ Can it cross the blood brain barrier?
- ▶ Can it penetrate bone / joints / lungs?
- ▶ Does surfactant interact with the antibiotics?
- ▶ Does this medication concentrate intracellularly?

case – oral bioavailability

46M

smoker, dyslipidemia, HTN

1-week cough, rusty sputum, left chest pain with pleuritic component.

O/E appears unwell T38.4C. Decreased air entry left lung field, with rales audible on inspiration.

CXR showing left lung lobar consolidation
CBC, chemistry, blood cultures drawn.

Rx amoxicillin 1g PO bid

DO CONSIDER BIOAVAILABILITY OF ORAL ANTIBACTERIAL AGENTS

- ▶ When the patient can take PO medication, and the gut is absorbing reliably, certain medications achieve levels that are equivalent to receiving intravenous doses.
 - ▶ Fluoroquinolones – i.e ciprofloxacin, levofloxacin, moxifloxacin
 - ▶ Macrolides – ie azithromycin
 - ▶ clindamycin
 - ▶ trimethoprim-sulfamethoxazole
 - ▶ doxycycline

case – duration of therapy

83F

T2DM, CAD, dyslipidemia

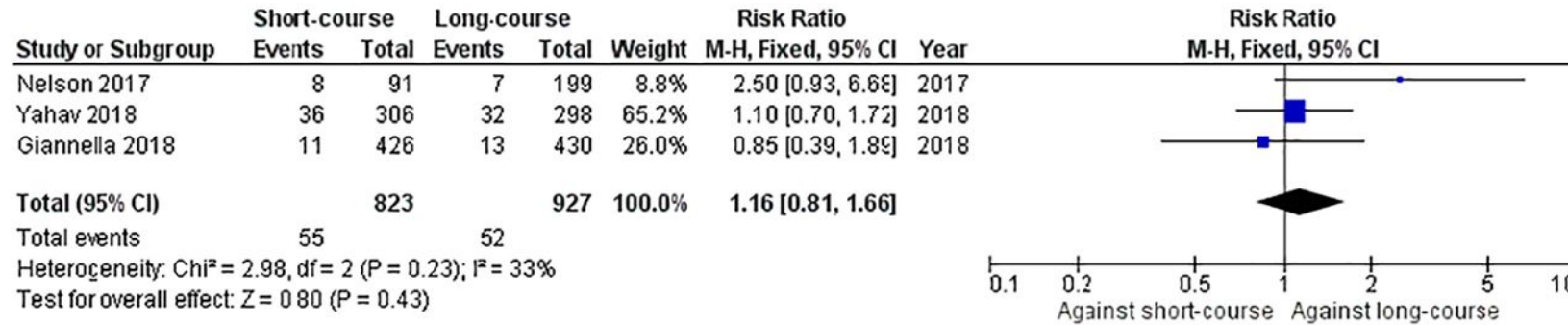
Presented in septic shock and jaundiced after acute abdominal pain. Started on broad spectrum antibiotics. ERCP demonstrated obstructing cholelithiasis, papillotomy and restoration of biliary patency. Blood cultures grow *Klebsiella pneumoniae*.

Rx Pip-Tazo 3.375g IV q6h x 14d ordered

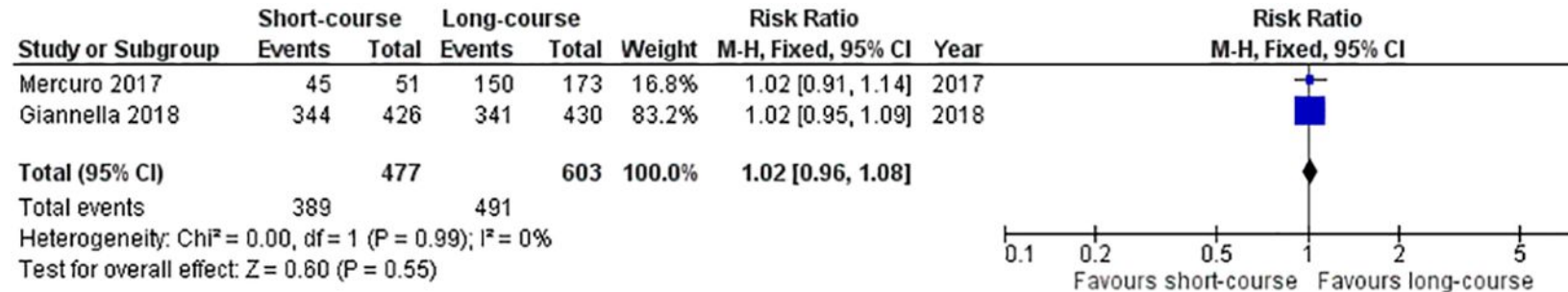
DO CONSIDER THE DURATION OF THERAPY

- ▶ Magic numbers are going out, especially for cellulitis and pneumonia
- ▶ Shorter and shorter therapies are in
 - ▶ 7-d vs 14-d for uncomplicated Gram negative bloodstream infection
- ▶ ?Earlier stepdown

Forest plot depicting the risk ratios of 90-day mortality among patients receiving antibiotic treatment for ≤10 days versus >10 days.

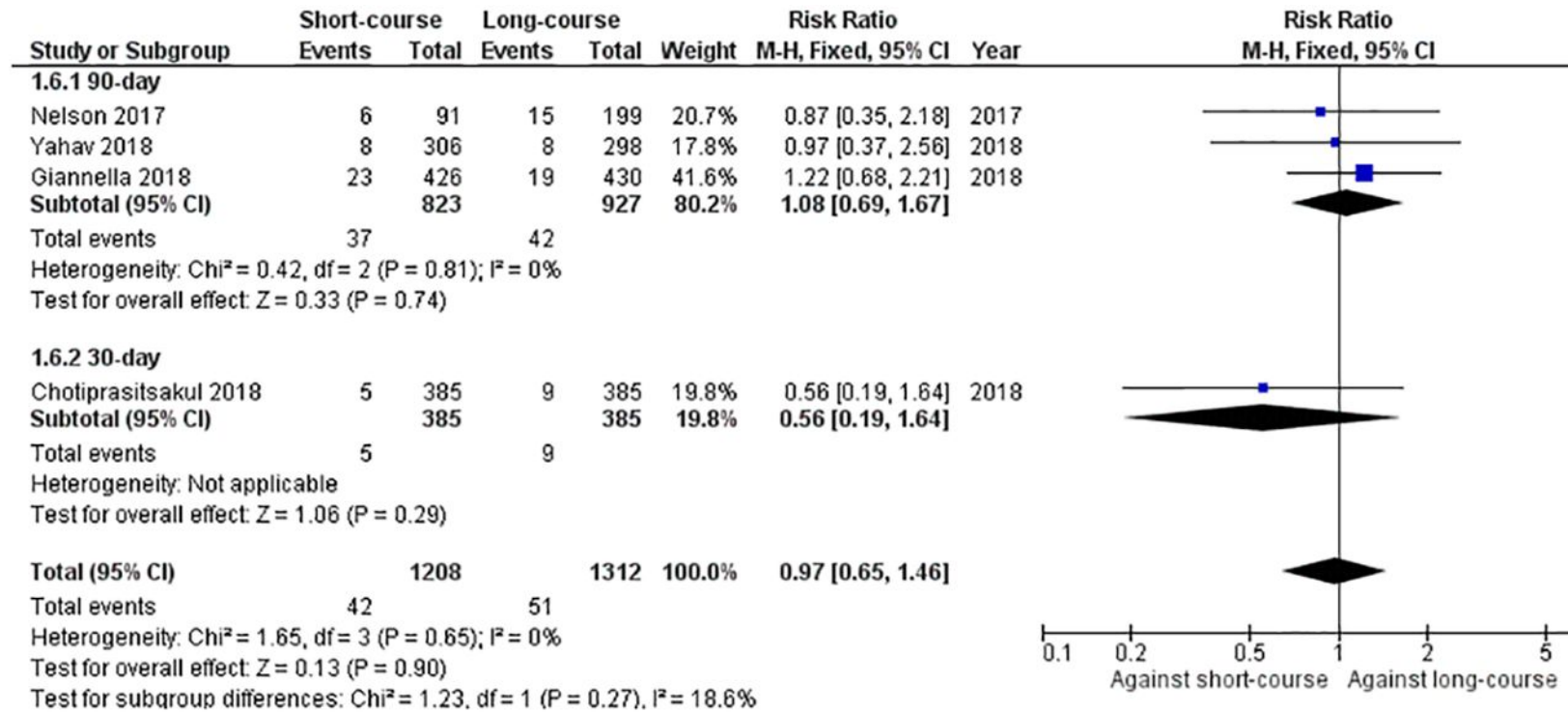


Forest plot depicting the risk ratios of clinical cure of patients receiving antibiotic treatment for ≤10 days versus >10 days.



Giannoula S. Tansarli et al. Antimicrob. Agents Chemother. 2019; doi:10.1128/AAC.02495-18

Forest plot depicting the risk ratios of relapse of patients receiving antibiotic treatment for ≤ 10 days versus >10 days.



Giannoula S. Tansarli et al. Antimicrob. Agents Chemother. 2019; doi:10.1128/AAC.02495-18

case – de-labeling beta-lactam allergies

52M

Hx of cellulitis left leg, eczema
Topical corticosteroid
Allergy to penicillin → rash.

2 day history of ascending erythema,
swelling, pain in right leg. Fever.

Rx clindamycin 450mg PO tid

DO HAVE A LOW THRESHOLD FOR CONSULTATION WITH A CLINICAL ALLERGIIST TO RESOLVE BETA-LACTAM ALLERGY

- ▶ Patients should be provided the most narrow spectrum and most appropriate antibiotic
- ▶ At a patient's first encounter with a physician, when a penicillin allergy is described, a referral should be offered
- ▶ Many beta lactams can still be used safely in the context of a penicillin allergy, dependent on the reaction and the setting

Call to Action

- ▶ The next time you prescribe and antimicrobial or assess the need for an antibiotic, ask yourself:
 1. What am I treating? Is the (working) diagnosis established?
 2. Am I initiating appropriate antibiotics as per (local) empiric guidelines? Or, treatment in response to a culture result?
 3. Is there an alternative, more appropriate/targeted antibiotic? ... Or, no antibiotic necessary at all.
 4. How long should I treat?