Infection control, counselling, antibiotic stewardship and auditing. Who should be in charge: ID or CM specialists or someone else?

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Farcus

by David Waisglass
Gordon Coulthart

www.farcus.com

"What conflict of interest?!
I work here in my spare time."

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Antimicrobial Stewardship: definition

Good antimicrobial stewardship is a practice that ensures the optimal selection, dose, and duration of an antimicrobial therapy that leads to the best clinical outcome for the treatment or prevention of infection while producing the fewest toxic effects and the lowest risk for subsequent resistance.

Owens RC Jr. Diagn Microbiol Infect Dis 2008: 61: 110–128.
Gerding DN. Jt Comm J Qual Improv 2001: 27:403−404.
McGowan JE Jr, Gerding DL. New Horiz 1996;4:370-6.

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Antimicrobial Stewardship: definition

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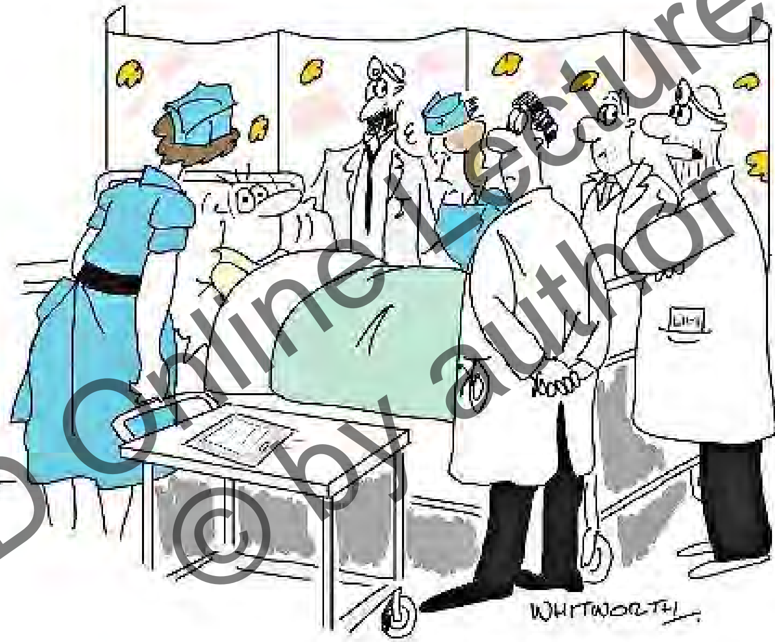

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WHO?

Core members of Multidisciplinary Antibiotic Stewardship Team

- **Infectious disease physician**
- **Clinical pharmacist trained in infectious diseases**
- **Clinical microbiologist**
- **Information system specialist**
- **Infection control physician**
- **Hospital epidemiologist**

Dellit TH, et al. SHEA&IDSA ASP guidelines

Clinical Infectious Diseases 2007;44:159–77

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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.,[3] Dale N. Gerding,[4] Robert A. Weinstein,[5] John P. Burke,[6] W. Charles Huskins,[7] David L. Paterson,[8] Neil O. Fishman,[9] Christopher F. Carpenter,[10] P. J. Brennan,[9] Marianne Billeter,[11] and Thomas M. Hooton[12]

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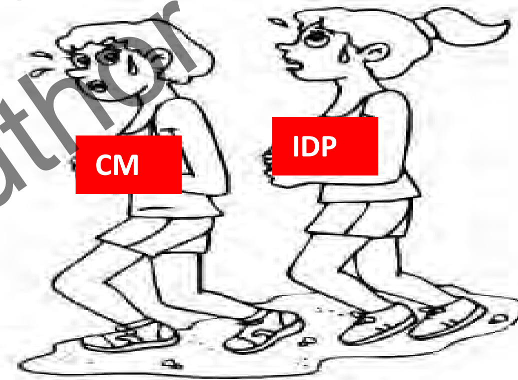
- **…Because antimicrobial stewardship, an important component of patient safety, is considered to be a medical staff function, the program is usually directed by an infectious diseases physician or codirected by an infectious diseases physician and a clinical pharmacist with infectious diseases training.**

Clinical Infectious Diseases 2007; 44:159–77

Clinical microbiologists and infectious diseases physicians: all the same or all different?

- education
- references
- communication with the team
- responsibility



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Postgraduate training curricula (UEMS)

- **Medical microbiology: min 5 years**
- **Scientific basis of medical microbiology, laboratory safety, sterilisation/desinfection, handling specimens, microscopy, culture metohods, further processing of cultures, antimicrobial investigations, emerging technologies, data handling, clinical experience, infection control in hospitals and in the community, antimicrobial usage, virology, mycology, parasitology, quality control, audit, accreditation, management**

http://www.uems-smm.org/wp-content/uploads/microbiology_traning_programme_june_2007.pdf

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http://www.uems-smm.org/wp-content/uploads/microbiology_traning_programme_june_2007.pdf

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Postgraduate training curricula (UEMS)

- **Infectious diseases: min 6 years**
- **General internal medicine (common trunk) 2 years**
- **HIV/AIDS, TBC, viral hepatitis, compromised patients, travel medicine and migrant health, intensive care, medical microbiology, control of infections, epidemiology and public health medicine, research, tropical infectious diseases, bioterrorism, STD, antimicrobial therapy**

http://uems-id.eu/index.php/training

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Postgraduate training curricula (UEMS)

- Infectious diseases: min 6 years
- Genera
  years
- HIV/AI
  patient
  intensi
  infectio
  medici
  bioterr

Skills:

Appropriate management of an emergency admission suffering from severe infection.
Competence in acute assessment of patients suffering from infections and the day-to-day care of patients suffering from severe infections and its sequelae.
Management of severe infection in an ICU setting.
Management of patients with imported infections - e.g. malaria.
Care of compromised patients - including neutropenic and those with HIV infection/AIDS. It is essential that the trainee must develop the skill to effectively use and monitor combination antiviral regimes.
Management of nosocomial infections, with knowledge of infection control, and appropriate liaison with laboratory services.
Practical knowledge of common clinical diagnostic procedures

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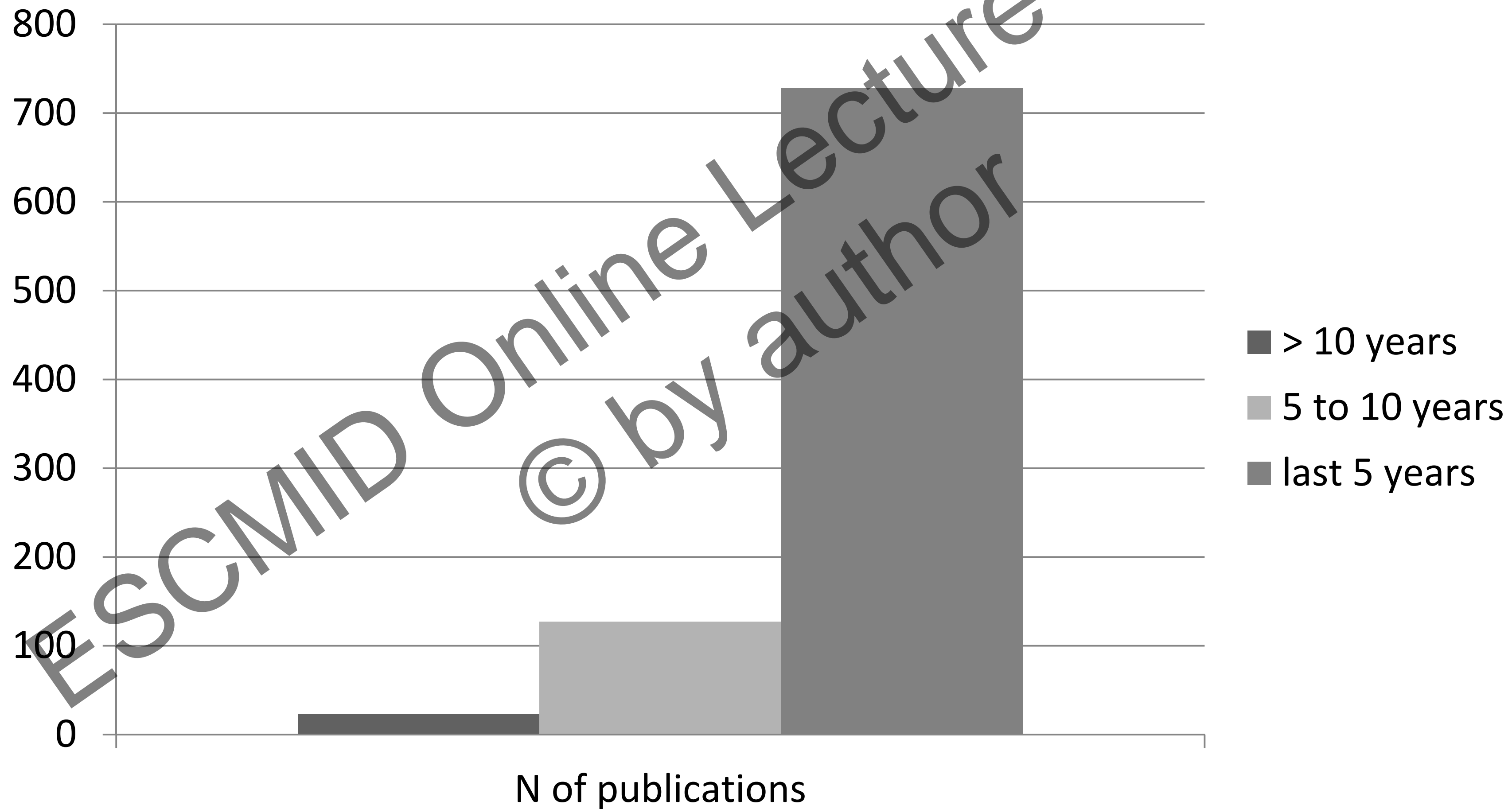
„(antimicrobial) AND stewardship" in PubMed



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Interventions to improve antibiotic prescribing practices for hospital inpatients (review)

Davey P, Brown E, Fenelon L, et al.

Cochrane Database of Systematic Reviews 2005; Issue 4. Art.No CD003543.

- Publications 1966 to Nov 2003

Interventions to improve antibiotic prescribing practices for hospital inpatients (Review)

Cochrane Database of Systematic Reviews 2013, Issue 4. Art. No.: CD003543.

Davey P, Brown E, Charani E, Fenelon L, Gould IM, Holmes A, Ramsay CR, Wiffen PJ, Wilcox M

- Publications from 1980 to the end of 2006

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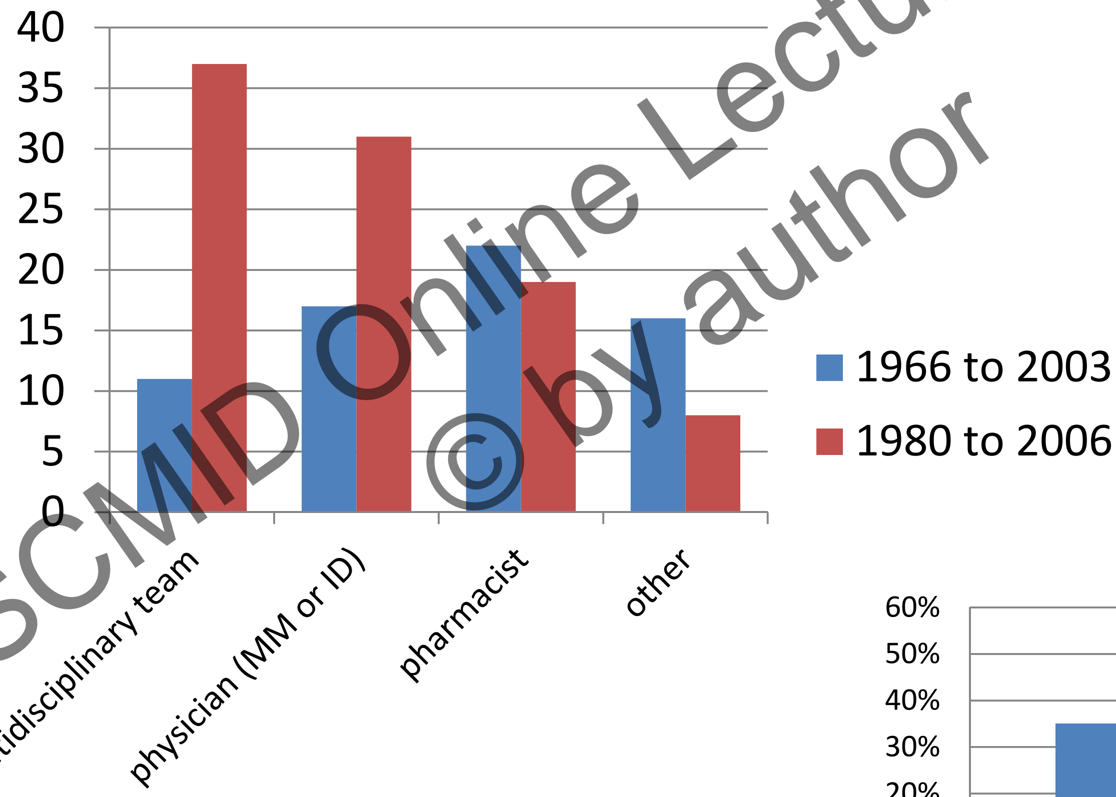
Deliverer of the Intervention



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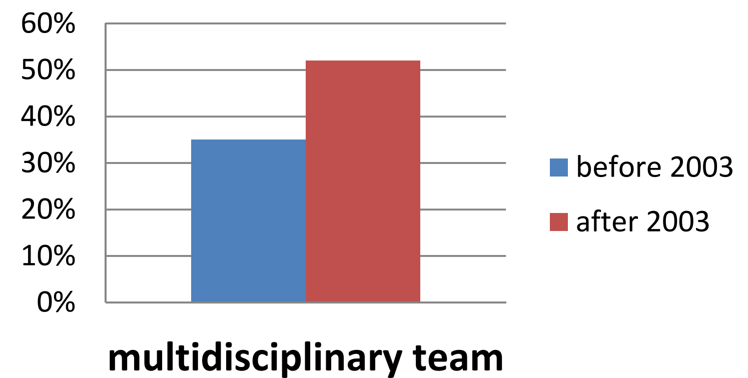

Other: primary team, policy change, computers....

Davey P, et al. 2005 and 2013

Bed-side consultations are more effective than telephone in patients with *S. aureus* bacteremia

- 342 episodes of *S. aureus* bacteremia, 72% bed-side consultations

- **Less ICU admissions (OR 0.35)**
- **More deep foci of infection identified (OR 3.11)**
- **Lower mortality rate (7-days: OR 0.09, 28-days: OR 0.27, 90-days: OR 0.25)**
- **Deleterious effect of telephone consultation on 90-days mortality (OR 2.31 in comparison with bed-side consultation) in multivariate analysis**

Forsblom E, et al. Clin Infect Dis 2013;56:527–35.

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Barriers…

- Funding/compensation
- Lack of leadership support
- Shortage of adequately trained specialists
- Antibiotic stewardship is not understood as a problem of patients safety and quality of care (but a cost-cutting activity)
- Communicating with antagonizing colleagues

Owens RC Jr, et al. Am J Health Syst Pharm 2009; 66: 12 Suppl 4: S15-22.
Tama PD, Cosgrove SE. Infect Dis Clin N Am 2011; 25: 245–60.

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The Leading Role of ID Physician in MAST

- increased acceptance and compliance of the program by other physicians
- reduced perception that a stewardship program is a pharmacy-driven cost-saving scheme

Tamma PD, Cosgrove SE. Infect Dis Clin N Am 2011; 25: 245–260.

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	Clinical microbiologist	Infectious disease physician
Strength	Profound knowledge on microbiology diagnostics	Clinical skills: clinical diagnosis, severity assessment, empirical treatment, evaluation of efficacy… Communication: „speaking the same language“ with the primary team, credibility, responsibility
Weakness	Modest clinical skills	Less knowledge on microbiology diagnostics – possibilities and limitations No direct information on microbiology results
Opportunity	Analysis of outbreaks, help in designing and evaluating the interventions (ASP and IC), cummulative antibiograms (empirical treatment, trends, predictions…)…	Patient-oriented AS interventions (present and future patients) Development of ASP as a medical activity (compensation!)
Threat	Poor compliance by the primary team, ASP and patient care includind IDP consultation run parallel to each other	Too much general internal medicine work may limit or completely abolish the time spent for antimicrobial stewardship Better compensation for other activities

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Antibiotic Stewardship: The "Real World" When Resources Are Limited
Author(s): Daniel Curcio , MD
Source: *Infection Control and Hospital Epidemiology*, Vol. 31, No. 6 (June 2010), pp. 666-668

"I propose a practical approach to implementing antibiotic stewardship programs in which strategies are adapted on the basis of the resources of the institution, prioritizing the bedside evaluation of the patient and interaction between colleagues".

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Infectious diseases physicians

Strength	Weakness
Clinical skills: clinical diagnosis, severity assessment, empirical treatment, evaluation of efficacy… Communication: „speaking the same language“ with the primary team, credibility, responsibility	Less knowledge on microbiology diagnostics – possibilities and limitations No direct information on microbiology results
Opportunities	**Threats**
Patient-oriented AS interventions Development of ASP medical activity (compensation!)	Too much general internal medicine work may limit or completely abolish the time spent for antimicrobial stewardship Better compensation for other activities

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Strength **Profound knowledge on microbiology diagnostics.**	**Weakness** **Modest clinical skills**
Opportunity Analysis of outbreaks, help in designing and evaluating the interventions, cummulative antibiograms	Threat Poor compliance by the primary team, ASP and patient care includind IDP consultation run parallel to each other

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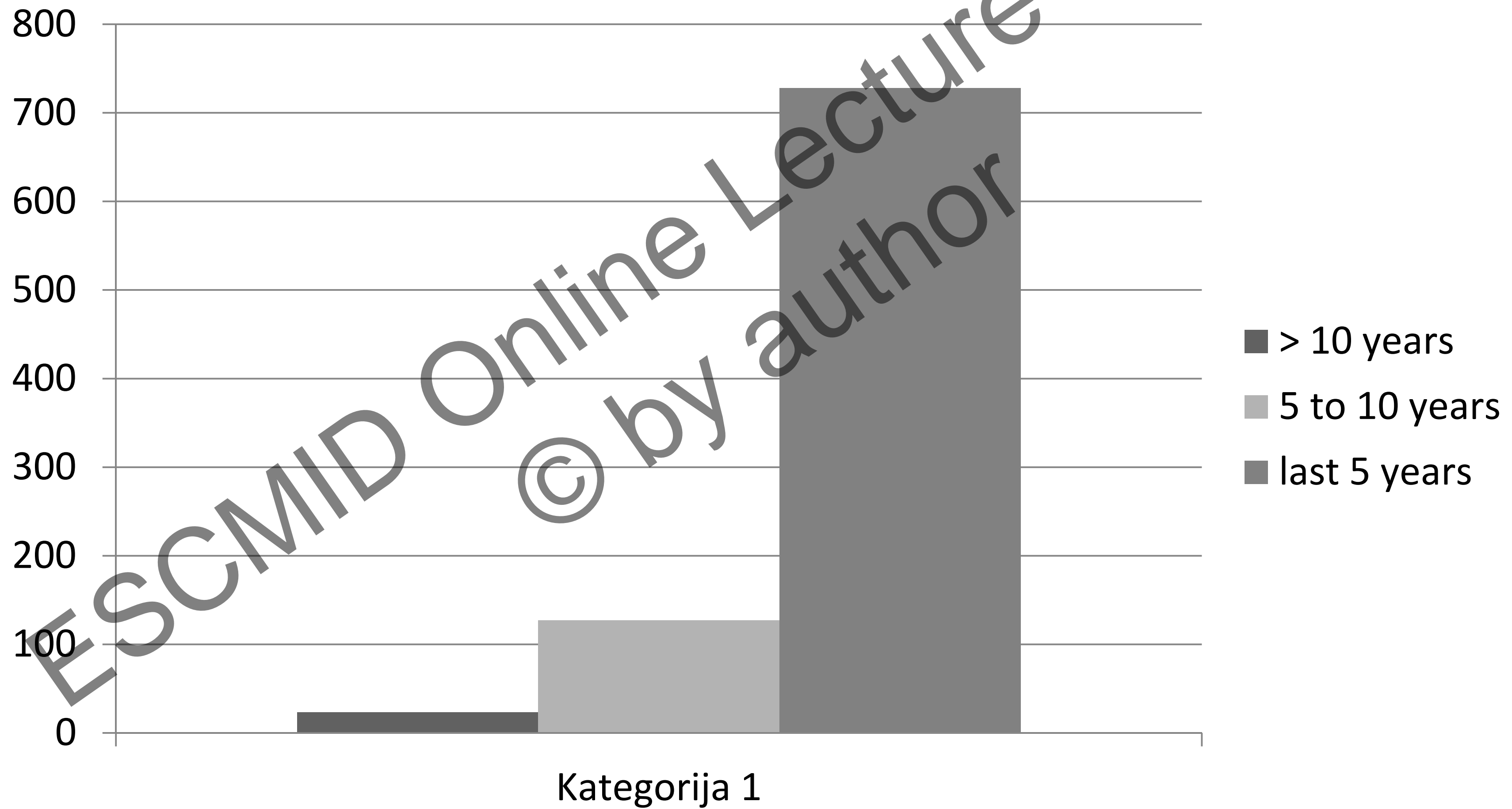
„Antimicrobial stewardship“ in PUBMed



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Infectious Diseases Specialty Intervention Is Associated With Decreased Mortality and Lower Healthcare Costs

Clinical Infectious Diseases 2014;58(1):22–8

Steven Schmitt,[1] Daniel P. McQuillen,[2] Ronald Nahass,[3] Lawrence Martinelli,[4] Michael Rubin,[5] Kay Schwebke,[6] Russell Petrak,[7] J. Trees Ritter,[8] David Chansolme,[9] Thomas Slama,[10] Edward M. Drozd,[11] Shamonda F. Braithwaite,[11] Michael Johnsrud,[12] and Eric Hammelman[11]

- 101,991 hospital stays with and 170,336 without ID consultation
- Adjustment analysis showed that ID interventions were done in more severely ill patients
- Significantly lower mortaliy and readmission rate with ID intervention
- If intervention was performed within 2 days of admission, the patients had significantly lower mortality, re-admission rate, hospital and ICU stay, and cost of treatment

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IDP and Antibiotic Stewardship Programmes: 1993

Infectious Diseases Consultation: Impact on Outcomes for Hospitalized Patients and Results of a Preliminary Study

David C. Classen, John P. Burke, and Richard P. Wenzel

From the Department of Clinical Epidemiology, LDS Hospital, Salt Lake City, Utah; and the Department of Internal Medicine, Medical College of Virginia, Richmond, and the Virginia Commonwealth University, Richmond, Virginia

Clin Infect Dis 1997; 24: 468-79.

- **Cases with IDP consultation had longer lengths of hospital stays, longer intensive care unit lengths of stays, and higher antibiotic costs than did matched controls.**

- **Consultation in the last one-third: shorter length of stay and lower cost**

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Compliance to Recommendations: does experience matter?

- Recommendations were followed less often when given by the 1st year trainees than older trainees (69.7 vs 78.5%, p=0.02, but non-significant with the logistic regression analysis)

  Sipahi OP, et al. Int J Infect Dis 2007; 11: 518-23.

- Compliance to the advice of board-certified IDP was higher than to the advice of a trainee (89 vs 74%, p=0.02)

  Gennai S, et al. Med Mal Infect 2009; 39: 798-805.

- Decrease in compliance to the advice and increase in broad-spectrum antibiotic prescribing after the replacement of senior doctors by trainees.

  Yeo CL, et al. Antimicrob Res Infect Control 2012, 1:36.

- Compliance to the advice is related to the year since the fellowhsip of the deliverer:

  < 6 years: 81%

  6-10 years: 89%

  > 10 years: 77%

  Lo E, et al. Clin Infect Dis 2004; 38: 1212-8.

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  Lo E, et al. Clin Infect Dis 2004; 38: 1212-8.

No special training in ABS?
Too much office work?

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- HOW

- WHO

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How:

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.,[3] Dale N. Gerding,[4] Robert A. Weinstein,[5] John P. Burke,[6] W. Charles Huskins,[7] David L. Paterson,[8] Neil O. Fishman,[9] Christopher F. Carpenter,[10] P. J. Brennan,[9] Marianne Billeter,[11] and Thomas M. Hooton[12]

Clinical Infectious Diseases 2007; 44:159–77

Journal of Antimicrobial Chemotherapy (2006) 57, 1189–1196
doi:10.1093/jac/dkl137
Advance Access publication 19 April 2006

JAC

Antimicrobial prescribing policy and practice in Scotland: recommendations for good antimicrobial practice in acute hospitals

Dilip Nathwani* on behalf of Scottish Medicines Consortium (SMC) Short Life Working Group, The Scottish Executive Health Department Healthcare Associated Infection Task Force†

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Barriers…

- Funding/compensation
- Lack of leadership support
- Antibiotic stewardship is not understood as a problem of patients safety and quality of care
- Shortage of adequately trained specialists
- Communicating with antagonizing colleagues

In 1999: 45% of IDSA members judged that infectious diseases consultants' participation in the antibiotic approval process would antagonize colleagues in other specialties and would possibly lead to a loss of income from decreased requests for consultation

Owens RC Jr, et al. Am J Health Syst Pharm 2009; 66: 12 Suppl 4: S15-22.
Tama PD, Cosgrove SE. Infect Dis Clin N Am 2011; 25: 245–60.
Sunenshine RH, et al. Clin Infect Dis 2004; 38:934–8.

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- Antimicrobial prescribing practice and policy in Scotland:

➢ **The multidisciplinary antimicrobial team should include the Lead doctor for Antimicrobial prescribing practice and policy, and pharmacist, clinical microbiologist, and/or infectious disease physician, and senior management representative**

Nathwani D, et al. J Antimicrob Chemother 2006; 57:1189-96.

- Antimicrobial prescribing indicators: a consensus among German ABS networkers:

➢ **Multidisciplinary ABS team is appointed and authorized by the hospital management and is headed by an infectious disease physician (or physician trained in ABS) plus pharmacist**

Thern J, et al. Infection (2014) 42:351–62.

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Infectious diseases physicians

Country	Approximate population (million)	Infectious disease specialists per million population
England, Wales and Northern Ireland	53.6	< 5
Belgium	10	< 5
Greece	10.3	< 5
Germany	82	< 5
Republic of Ireland	3.6	< 5
Scotland	5.1	< 5
The Netherlands	15.8	5–10
Denmark	5.3	5–10
Portugal	10	5–10
Finland	5.2	10–20
Norway	4.5	10–20
Slovakia	5.4	10–20
Slovenia	2	10–20
Switzerland	7.3	10–20
Iceland	0.3	20–40
Croatia	4.8	20–40
Sweden	8.8	20–40
Turkey	68	20–40
Italy	58	40–60

- **the first half of the 20th century: „classical infectious diseses“**
- **„the quiet period“: false perception of human control of infectious diseases**
- **„new age“: emerging and re-emerging diseases, HCAI, AMR**

McKendrick. Clin Microbiol Infect 2005; 11: Suppl 1: 28–32.

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Responsibility

- **Advice on antimicrobial treatment is not a part of medical record**
- **Advice on antimicrobials is a part of the medical record, but the primary care team is responsible for the antimicrobial treatment**
- **Shared responsibility?**

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Responsibility

- **Advice on antimicrobial treatment is not a part of medical record**
- **Advice on antimicrobials is a part of the medical record, but the primary care team is responsible for the antimicrobial treatment**
- **Shared responsibility?**

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IDP in an ICU

- **ID consultations significantly improved adherence to guidelines, shortened antibiotic treatment, mechanical ventilation, ICU stay, and decreased in-hospital mortaliy in a befor and after study.** **(Raineri E, et al. Am J Infect Control 2008 May;36(4):283-90.)**

- **IDP discussions with the ICU team: decrease in broad-spectrum antibiotics, non-compliance with guidelines, length of stay, mechanical ventilation, mortality and cost.** **(Rimawi RH, et al. Crit Care Med 2013; 41:2099–2107.).**

- **Participation of IDP in multidisciplinary rounds in an ICU reduced significantly the days on antibiotic therapy and the cost.** **(Gilbert DN. Crit Care Res Pract 2014, Article ID 307817.)**

- **…**

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