ESGAP

ESCMID STUDY GROUP FOR ANTIMICROBIAL STEWARDSHIP

European Society of Clinical Microbiology and Infectious Diseases

ANTIBIOTIC STEWARDSHIP IN THE EMERGENCY DEPARTMENT – JUST DO IT !

Céline PULCINI

Full Professor of Infectious Diseases, Nancy (France)

CHU NANCY

FACULTÉ de MÉDECINE NANCY

NANCY PARIS METZ 4360

UNIVERSITÉ DE LORRAINE

EUCIC EUROPEAN COMMITTEE ON INFECTION CONTROL

European Society of Clinical Microbiology and Infectious Diseases

EUCIC Local Module

Improving Antibiotic Prescription and Infection Control in the Emergency Room

Lisbon, Portugal
7 April 2018

WHAT IS ANTIMICROBIAL STEWARDSHIP?

Some suggestions

- Definition of **AMS**: a *strategy aiming at promoting responsible antibiotic use*

- Implemented as an **AMS programme** in hospitals = a *set of interventions*

- **WHAT** to achieve: responsible antibiotic use, defined by process measures (prescription compliant with guidelines, review of therapy…)

- **HOW** to achieve it: set of behavioural interventions
  - At the prescriber level: audit and feedback, education…
  - At the organisation/system level: AMS team, selective reporting…

Dyar OJ et al. And Hulscher M et al. CMI 2017

Adverse events of antibiotics

At the patient level

- **'Classical' adverse events** (allergy, hepatotoxicity...)

- Adverse events related to the **microbiota** impact:

1. Diarrhea
2. *Clostridium difficile* infection
3. Bacterial resistance:
   - Sometimes at the focus of infection
   - Always in the microbiota
4. More broadly: modification of the microbiota, and its consequences

At the population level

- **Transmission** of resistant bacteria and *C. difficile*

How can a prescriber do to reduce the risk of bacterial resistance?

Focus of infection

- Sometimes happens, in particular in ICU patients

- Avoid long durations
- Optimised PK/PD
- Control the source of infection / reduce bacterial load
- Combination therapy?
- Certain antibiotics carry a higher risk of selection (e.g. fluoroquinolones)

Microbiota

- Always happens

- Risk factors:
  - Long durations (beware of long half-lives, e.g. azithromycin)
  - Broad spectrum
  - Good diffusion in the microbiota

Use antibiotics only when needed !

WHY THE ED?

- At the interface of the outpatient and inpatient settings, with patients from both worlds
- + ED antibiotic prescriptions are usually continued
- + junior doctors usually rotate on ED departments

⇒ Big influence

- Misuse and overuse are frequent

=> All AMS programmes should target the ED

PARTICULAR CHALLENGES IN THE ED

- ED doctors don’t see the level and consequences of their prescribing

- Diagnostic uncertainty
- High patient and clinician turnover
- Concerns with patient satisfaction and other existing incentives/certification system

=> Overprescribing is perceived as less risky

WHICH INTERVENTIONS?

Menu of options

- Usual AMS strategies, but mixing outpatient and inpatient settings
- Adapted to the specificities of the ED setting
- And the local context (culture, barriers and facilitators)

The HOW

Clinical Infectious Diseases
Clinical Infectious Diseases Advance Access published April 13, 2016
IDSA FEATURES

Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America

Tamar F. Barlam,[1] Sara E. Cosgrove,[2] Lilian M. Abbo,[3] Conan MacDougall,[4] Audrey N. Schuetz,[5] Edward J. Septimus,[6] Arjun Srinivasan,[7] Timothy H. Dellit,[8] Yngve T. Falck-Ytter,[9] Neil O. Fishman,[10] Cindy W. Hamilton,[11] Timothy C. Jenkins,[12] Pamela A. Lipsett,[13] Preeti N. Malani,[14] Larissa S. May,[15] Gregory J. Moran,[16] Melinda M. Neuhauser,[17] Jason G. Newland,[18] Christopher A. Ohl,[19] Matthew H. Samore,[20] Susan K. Seo,[21] and Kavita K. Trivedi[22]

[1]Section of Infectious Diseases, Boston University School of Medicine, Boston, Massachusetts; [2]Division of Infectious Diseases, Johns Hopkins University School of Medicine, Baltimore, Maryland; [3]Division of Infectious Diseases, University of Miami Miller School of Medicine, Miami, Florida; [4]Department of Clinical Pharmacy, School of Pharmacy, University of California, San Francisco; [5]Department of Medicine, Weill Cornell Medical Center/New York–Presbyterian Hospital, New York, New York; [6]Department of Internal Medicine, Texas A&M Health Science Center College of Medicine, Houston; [7]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia; [8]Division of Allergy and Infectious Diseases, University of Washington School of Medicine, Seattle; [9]Department of Medicine, Case Western Reserve University and Veterans Affairs Medical Center, Cleveland, Ohio; [10]Department of Medicine, University of Pennsylvania Health System, Philadelphia; [11]Hamilton House, Virginia Beach, Virginia; [12]Division of Infectious Diseases, Denver Health, Denver, Colorado; [13]Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University Schools of Medicine and Nursing, Baltimore, Maryland; [14]Division of Infectious Diseases, University of Michigan Health System, Ann Arbor; [15]Department of Emergency Medicine, University of California, Davis; [16]Department of Emergency Medicine, David Geffen School of Medicine, University of California, Los Angeles Medical Center, Sylmar; [17]Department of Veterans Affairs, Hines, Illinois; [18]Department of Pediatrics, Washington University School of Medicine in St. Louis, Missouri; [19]Section on Infectious Diseases, Wake Forest University School of Medicine, Winston-Salem, North Carolina; [20]Department of Veterans Affairs and University of Utah, Salt Lake City; [21]Infectious Diseases, Memorial Sloan Kettering Cancer Center, New York, New York; and [22]Trivedi Consults, LLC, Berkeley, California

Evidence-based guidelines for implementation and measurement of antibiotic stewardship interventions in inpatient populations including long-term care were prepared by a multidisciplinary expert panel of the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. The panel included clinicians and investigators representing internal medicine, emergency medicine, microbiology, critical care, surgery, epidemiology, pharmacy, and adult and pediatric infectious diseases specialties. These recommendations address the best approaches for antibiotic stewardship programs to influence the optimal use of antibiotics.

Keywords. antibiotic stewardship; antibiotic stewardship programs; antibiotics; implementation.

EXECUTIVE SUMMARY

Antibiotic stewardship has been defined in a consensus statement from the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS) as "coordinated interventions designed to improve and measure the appropriate use of [antibiotic] agents by promoting the selection of the optimal [antibiotic] drug regimen including dosing, duration of therapy, and route of administration" [1]. The benefits of antibiotic stewardship include improved patient outcomes, reduced adverse events including *Clostridium difficile* infection (CDI), improvement in rates of antibiotic susceptibilities to targeted antibiotics, and optimization of resource utilization across the continuum of care. IDSA and SHEA strongly believe that antibiotic stewardship programs (ASPs) are best led by infectious disease physicians with additional stewardship training.

Summarized below are the IDSA/SHEA recommendations for implementing an ASP. The expert panel followed a process used in the development of other IDSA guidelines, which included a systematic weighting of the strength of recommendation and quality of evidence using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system (Figure 1) [2–5]. A detailed description of the methods, background, and evidence summaries that support each of the recommendations can be found online in the full text of the guidelines. For the purposes of this guideline, the term antibiotic will be used instead of antimicrobial and should be considered synonymous.

RECOMMENDATIONS FOR IMPLEMENTING AN ANTIBIOTIC STEWARDSHIP PROGRAM

Interventions

I. Does the Use of Preauthorization and/or Prospective Audit and Feedback Interventions by ASPs Improve Antibiotic Utilization and Patient Outcomes?

Recommendation

1. We recommend preauthorization and/or prospective audit and feedback over no such interventions *(strong recommendation, moderate-quality evidence)*.

Received 22 February 2016; accepted 23 February 2016.

It is important to realize that guidelines cannot always account for individual variation among patients. They are not intended to supplant clinician judgment with respect to particular patients or special clinical situations. IDSA considers adherence to these guidelines to be voluntary, with the ultimate determination regarding their application to be made by the clinician in the light of each patient's individual circumstances.

Correspondence: T. F. Barlam, Boston Medical Center, One Boston Medical Center Place, Boston, MA 02118 (tamar.barlam@bmc.org).

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Infection
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GUIDELINE

Strategies to enhance rational use of antibiotics in hospital: a guideline by the German Society for Infectious Diseases

K. de With[1] · F. Allerberger[2] · S. Amann[3] · P. Apfalter[4] · H.-R. Brodt[5] · T. Eckmanns[6] · M. Fellhauer[7] · H. K. Geiss[8] · O. Janata[9] · R. Krause[10] · S. Lemmen[11] · E. Meyer[12] · H. Mittermayer[4] · U. Porsche[13] · E. Presterl[14] · S. Reuter[15] · B. Sinha[16] · R. Strauß[17] · A. Wechsler-Fördös[18] · C. Wenisch[19] · W. V. Kern[20]

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Abstract

Introduction In the time of increasing resistance and paucity of new drug development there is a growing need for strategies to enhance rational use of antibiotics in German and Austrian hospitals. An evidence-based guideline on recommendations for implementation of antibiotic stewardship (ABS) programmes was developed by the German Society for Infectious Diseases in association with the following societies, associations and institutions: German Society of Hospital Pharmacists, German Society for Hygiene and Microbiology, Paul Ehrlich Society for Chemotherapy, The Austrian Association of Hospital Pharmacists, Austrian Society for Infectious Diseases and Tropical Medicine, Austrian Society for Antimicrobial Chemotherapy, Robert Koch Institute.

Materials and methods A structured literature research was performed in the databases EMBASE, BIOSIS, MEDLINE and *The Cochrane Library* from January 2006 to November 2010 with an update to April 2012 (MEDLINE and *The Cochrane Library*). The grading of recommendations in relation to their evidence is according to the AWMF Guidance Manual and Rules for Guideline Development.

Conclusion The guideline provides the grounds for rational use of antibiotics in hospital to counteract antimicrobial resistance and to improve the quality of care of patients with infections by maximising clinical outcomes while minimising toxicity. Requirements for a successful implementation of ABS programmes as well as core and supplemental ABS strategies are outlined. The German version of the guideline was published by the German Association of the Scientific Medical Societies (AWMF) in December 2013.

Keywords Antibiotic stewardship · ABS · Guideline · Antimicrobial resistance · Quality of care · Rational use

AWMF (Association of the Scientific Medical Societies in Germany) Registry No. 092/001.
S3-Guideline of the German Society for Infectious diseases
Reg.Soc. (Deutsche Gesellschaft für Infektiologie e.V., DGI) in association with the following professional societies/associations/institutions:
German Society of Hospital Pharmacists (ADKA).
German Society for Hygiene and Microbiology (DGHM).
Paul Ehrlich Society for Chemotherapy (PEG).
The Austrian Association of Hospital Pharmacists (AAHP).
Austrian Society for Infectious Diseases and Tropical Medicine (ÖGIT).
Austrian Society for Antimicrobial Chemotherapy (ÖGACH).
Robert Koch Institute (RKI), Berlin.
External reviewer: Prof. Dr. Stephan Harbarth, Genf.
Patient representative: Viktoria Mühlbauer, Düsseldorf.
Editor of the English version: Sina Helbig, Dresden.

H. Mittermayer: Diseased.

✉ K. de With
Katja.deWith@uniklinikum-dresden.de

1 Division of Infectious Diseases, University Hospital Carl Gustav Carus at the TU Dresden, Fetscherstr. 74, 01307 Dresden, Germany

2 Division Public Health, Austrian Agency for Health and Food Safety (AGES), Vienna, Austria

3 Hospital Pharmacy, Munich Municipal Hospital, Munich, Germany

4 Institute for Hygiene, Microbiology and Tropical Medicine (IHMT), National Reference Centre for Nosocomial Infections and Antimicrobial Resistance, Elisabethinen Hospital Linz, Linz, Austria

5 Department of Infectious Disease Medical Clinic II, Goethe-University Frankfurt, Frankfurt, Germany

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Taylor & Francis
Taylor & Francis Group

REVIEW

How can we improve antibiotic prescribing in primary care?

Oliver J. Dyar[a], Bojana Beović[b], Vera Vlahović-Palčevski[c], Theo Verheij[d] and Céline Pulcini[e] on behalf of ESGAP (the ESCMID [European Society of Clinical Microbiology and Infectious Diseases] Study Group for Antibiotic Policies)

Use primary care tools for discharged patients with mild infections: communication skills, patient leaflets…

Interventions targeting healthcare professionals		Interventions aiming at modifying the healthcare system	
Description	Level of evidence [18]	Description	Level of evidence [18]
Education	Low	Limiting the over-the-counter use of antibiotics	N/A
Communication skills training	Medium		
Guidelines	Low	Unit dispensing of antibiotics	N/A
Clinical decision support systems	Low	Reducing the number of available antibiotics or increasing the price of antibiotics	N/A
Delayed prescribing	Low	Separating prescribing and dispensing of antibiotics	N/A
Education material for patients	Low	Prescribers' remuneration system	N/A
Public commitment	N/A	Pay-for-performance	Low
Point-of-care diagnostic tests	Medium	Public reporting	N/A
Selective susceptibility reporting	N/A	Sickness leave regulation	N/A
Quality indicators	N/A	Limiting advertising of antibiotics	N/A
Audit and feedback	Low		
Restrictive prescribing measures	Low		

Other guidelines/guidance

- ECDC proposal / guidance: http://ecdc.europa.eu/en/publications/Publications/draft-EU-guidelines-prudent-use-antimicrobials-human-medicine.pdf
- NICE (UK): https://www.nice.org.uk/guidance/qs121
- Australia : http://www.safetyandquality.gov.au/our-work/healthcare-associated-infection/antimicrobial-stewardship/
- Netherlands, Spain…
- Library on the ECDC website: http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/guidance-infection-prevention-control/Pages/guidance-antimicrobial-stewardship.aspx

Core elements and checklist items project

- Led by Ramanan Laxminarayan and Céline Pulcini
- Group of 15 international experts

- Goal: set of globally applicable essential core elements and checklist items for hospital AMS programmes

- Published in CMI on the 3rd April

One example

Box 1. Core element 1: Senior hospital management leadership towards antimicrobial stewardship

Accompanying comment: *This section relates to governance of the programme by hospital executives, and specifies how senior hospital management supports the antimicrobial stewardship programme.*
Checklist item 1.1: **Has your hospital management formally identified antimicrobial stewardship as a priority objective for the institution and included it in its key performance indicators?**
Checklist item 1.2: **Is there dedicated, sustainable and sufficient budgeted financial support for antimicrobial stewardship activities (e.g., support for salary, training, or IT (information technology) support)?**
Checklist item 1.3: **Does your hospital follow any (national or international) staffing standards for antimicrobial stewardship activities (e.g. number of full-time equivalent (FTE) per 100 beds for the different members of the antimicrobial stewardship team)?** Accompanying comment: *These staffing standards should ideally be set at national level.[56]*

Pulcini C et al. CMI 2018

General principles

- Be physically present as much as possible
- Train different ED leaders in AMS (champions); frontline ownership
- Simple, quick, easy-to-understand, integrated into the workflow
- Monitor outpatient (+ inpatient) antibiotic prescriptions

In the literature

- 2017 systematic review *(Losier M et al. Ann Pharmacother. 2017)*

- Patient or provider education and guideline or clinical pathway implementation were the most commonly reported interventions.
- Few studies reported on audit and feedback
- No study evaluated preauthorization

- Most reported improved outcomes, but the study design was often suboptimal

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Antimicrobial Stewardship in the Emergency Department and Guidelines for Development

Larissa May, MD, MSPH,
Department of Emergency Medicine, The George Washington University, Washington, D.C

Sara Cosgrove, MD,
Department of Infectious Diseases, The Johns Hopkins University, Baltimore, Maryland

Michelle L'Archeveque,
The George Washington University School of Public Health, Washington, D.C

David A. Talan, MD,
David Geffen School of Medicine at University of California Los Angeles, Los Angeles, CA

My selection

- Train all doctors (including communication skills) and nurses at induction
- Guidelines
  - Easy-to-use
  - Diagnostic + therapeutic algorithms
  - Microbiological samples: contamination; too many urine samples; samples taken before antibiotic administration
- Computerised decision support systems
- Use of biomarkers / rapid diagnostic tests: to be included into guidelines (how and when to use, how to interpret; +/- expert advice in some cases)

J Antimicrob Chemother 2014; **69**: 2857–2863
doi:10.1093/jac/dku191 Advance Access publication 4 June 2014

Journal of Antimicrobial Chemotherapy

Impact of a computerized decision support system on compliance with guidelines on antibiotics prescribed for urinary tract infections in emergency departments: a multicentre prospective before-and-after controlled interventional study

Elisa Demonchy[1,2], Jean-Charles Dufour[3,4], Jean Gaudart[3,4], Emmanuel Cervetti[5], Pierre Michelet[6], Nicolas Poussard[7], Jacques Levraut[1,8] and Céline Pulcini[1,2,4]*

- CDSS used in 59% of cases
- CDSS improved the compliance of antibiotic prescriptions with guidelines in only one ED (absolute increase +20%)
- CDSS also changed the initial diagnosis in 23% of cases, in all 3 EDs

My selection

- (Quick) audit and feedback
- Automated quality indicators, targeting common reasons for misuse

- Document indication and antibiotic plan / specific antibiotic form in the EMR
- Review system:
  - by admitting ward or the outpatient prescriber
  - or AMS team member assisted review for (all or some) prescriptions (including outpatient ones; *review of positive cultures => decreased return ED visits and hospital readmissions – Dumkov LE et al. Infect Dis Ther 2014*) + telephone patient follow-up in some cases of non-antibiotic prescription

How to choose the best interventions

- Guidelines / Literature

- No magic bullet
- Multifaceted strategy, usually both restrictive and persuasive
- Adapted to your specific context
- And taking into account local barriers

- Behaviour change strategy

Pieces of advice

- Start small, with low-hanging fruits
- With friendly colleagues
- Stepwise approach
- Build on successes
- Monitor your impact and adapt

The WHAT

- Most frequent infections: (upper and lower) respiratory, skin and urinary tract infections
- Sepsis bundle
- Communication tools with patients for benign infections

Infectious diseases team for the early management of severe sepsis and septic shock in the emergency department

Pierluigi Viale[1], Sara Tedeschi[1], Luigia Scudeller[2], Luciano Attard[1], Lorenzo Badia[1], Michele Bartoletti[1], Alessandra Cascavilla[1], Francesco Cristini[1], Nicola Dentale[1], Giovanni Fasulo[1], Giorgio Legnani[1], Filippo Trapani[1], Fabio Tumietto[1], Gabriella Verucchi[1], Giulio Virgili[1], Andrea Berlingeri[3], Simone Ambretti[3], Chiara De Molo[3], Mara Brizi[4], Mario Cavazza[4], Maddalena Giannella[1]

Other suggestions

- List of situations where antibiotics are not needed (e.g. viral infections, colonisation)
- Checklist to be documented when initiating an antibiotic (take cultures, check recent antibiotic use and past microbiological results…)
- Clear guidelines regarding timing of antibiotic administration (urgent / semi-urgent / can wait until admission) and (limited) indications for IV treatment
- For admitted patients, always take blood cultures (in complement to other specific cultures) before starting antibiotics
- Appropriate microbiological practice and interpretation (e.g. cytology in addition to urine culture, to differentiate between infection and colonization)

=> *include in guidelines/clinical algorithms/CDSS*

A checklist of reminders:

EUROPEAN ANTIBIOTIC AWARENESS DAY
A EUROPEAN HEALTH INITIATIVE

Insert logo of national institution

Insert logo of national institution

- ○ Is there a high probability of a bacterial infection, rather than colonization or a viral infection?
- ○ Does the patient have an infection that will respond to antibiotics?
- ○ Have you checked the patient's recent antibiotic use, drug allergies, hospitalisation or institutionalisation, use of immunosuppressive therapy and microbiology results for the previous 3 months?
- ○ Is the patient on the right antibiotics, dosage, and route of administration?
- ○ Can an antibiotic with a narrower spectrum be used to treat the infection?
- ○ Have you prescribed the shortest possible duration of treatment?
- ○ Have the appropriate cultures been taken?
- ○ Do the culture results necessitate starting antibiotic therapy or modifying ongoing the current antibiotic therapy?
- ○ Have you documented the indication of antibiotic treatment, drug choice, dosage, route of administration and duration of treatment in the patient chart?
- ○ Does the choice of antibiotic therapy comply with your hospital's guidelines?
- ○ Does the choice of antibiotic therapy comply with your hospital's antibiotic resistance patterns?

If you have doubts, consult [antibiotic stewardship programme, microbiologist, infectious disease specialist] in our hospital. Contact [email address] or call [phone number]. See more information at [hospital website/ EAAD website].

https://antibiotic.ecdc.europa.eu/en

Other suggestions

- Promote narrow-spectrum antibiotics as 1st line treatment, and for the shortest possible duration
  - Restrict use of quinolones and ceftriaxone
  - If ciprofloxacin is used it should be for UTI and levofloxacin for RTI
  - Restriction of broad spectrum beta-lactams (e.g. Pip-Tazo, carbapenems) and anti-MRSA agents (vancomycin, linezolid…) in community-acquired infections (except treatment failures and specific clinical situations)

Downloaded from http://emj.bmj.com/ on March 23, 2018 - Published by group.bmj.com

Original article

Editor's choice
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Implementation of an intensified antibiotic stewardship programme targeting third-generation cephalosporin and fluoroquinolone use in an emergency medicine department

Johannes P Borde,[1] Winfried V Kern,[1] Martin Hug,[2] Michaela Steib-Bauert,[1] Katja de With,[1,3] Hans-Jörg Busch,[1,4] Klaus Kaier[5]

Persuasive measures: guideline revision, information, education, intensified infectious disease consultations (academix detailing + audit/feedback) and standardised treatment protocols

68% reduction in cephalosporins use
No change in total antibiotic use or fluoroquinolone use

WHICH SYSTEM IN PLACE?

Essential starting point

- Institutional support
- Clear distribution of roles and responsibilities
- ED leader

HOW TO MONITOR?

Plan in advance

- List of indicators
- And monitoring system (ideally automated)
- Time to analyse the data
- Feedback to clinicians:
  - Involve them
  - Short report, easy to understand
  - Real time

How to choose the indicators?

- National/regional regulation
- Local context
- Feasibility

- Examples of indicators:
  - TATFAR: https://www.cdc.gov/drugresistance/pdf/tatfar_rec1-finalreport_2015.pdf
  - DRIVE-AB: http://drive-ab.eu/wp-content/uploads/2014/09/WP1A_Final-QMs-QIs_final.pdf

WHO SHOULD BE PART OF THE TEAM?

Two levels

- AMS operational ‘core’ team:
  - Daily work
- Antimicrobial committee:
  - Regular meetings to validate the strategy at an institutional level
  - Includes departments’ representatives

AMS guidelines

- All recommend a multidisciplinary team

- ID specialist
- Pharmacist
- Microbiologist
- + others (nurses ++)

CORE TEAM

- Depending on the context

- Differences between countries

WHICH RESOURCES?

Human resources

German guidelines

- 2 FTE / 1000 beds

= **minimum** staff resources for the whole team

French Task Force

- **Optimal** AMS team resources:
  - 3.6 FTE / 1000 beds ID specialist
  - 2.5 FTE / 1000 beds pharmacist
  - 0.6 FTE / 1000 beds microbiologist
  - Total of 6.7 FTE / 1000 beds

De With K *et al*. Infection 2016, PMID: 27066980 ; Le Coz P *et al*. Med Mal Infect 2016, PMID: 27021932

IT tools

- Shared form for the AMS team in the electronic medical record (EMR):
  - Activity report
  - Traceability for clinicians
  - Consistency within the team

- Computerised decision support systems

Share ideas, tools, and network

- At local level in your hospital
- At regional level, including primary care and long-term care facilities
- At national level

Toolboxes: some examples

- UK / BSAC : http://www.bsac-arc.com
- France / SPILF : http://www.infectiologie.com/fr/toolbox.html
- Sweden / React : https://www.reactgroup.org/toolbox/

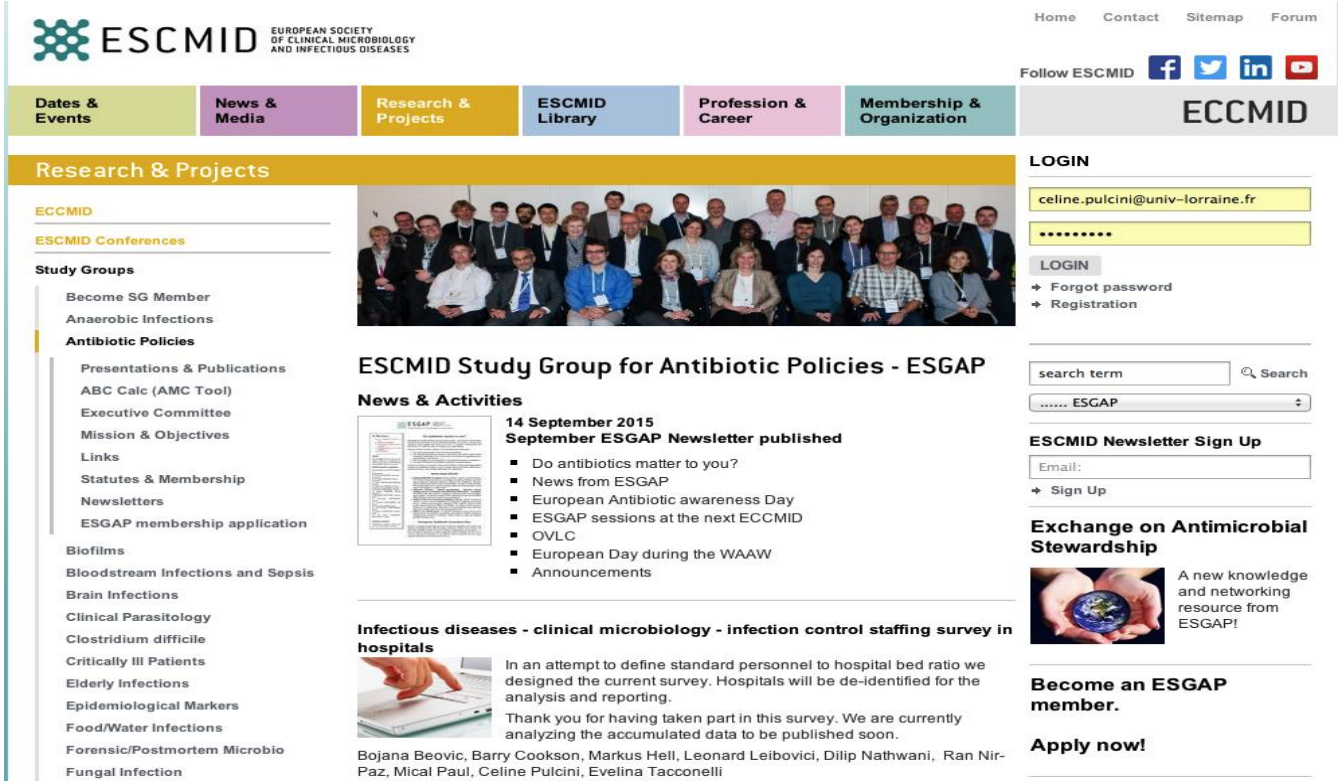
Folkhälsomyndigheten
PUBLIC HEALTH AGENCY OF SWEDEN

Swedish work on containment of antibiotic resistance

Tools, methods and experiences

CONCLUSIONS

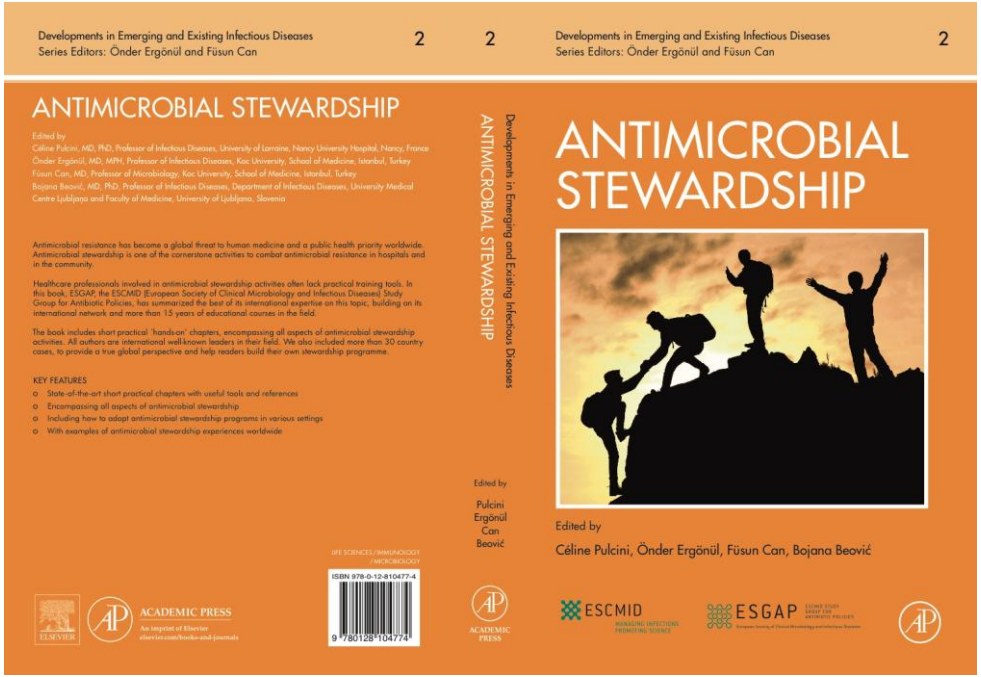
Interested in AMS… Join ESGAP !

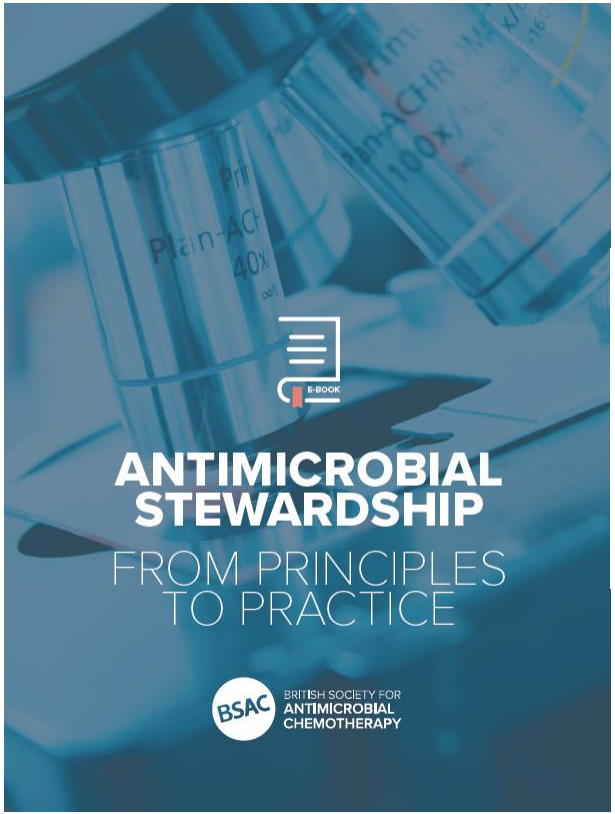


ESGAP meeting tomorrow at 18.15

Hall N

Some useful resources





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IN COLLABORATION WITH ESGAP/ESCMID

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INTRODUCTION

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Any question?

celine.pulcini@univ-lorraine.fr

Lorraine region

Nancy