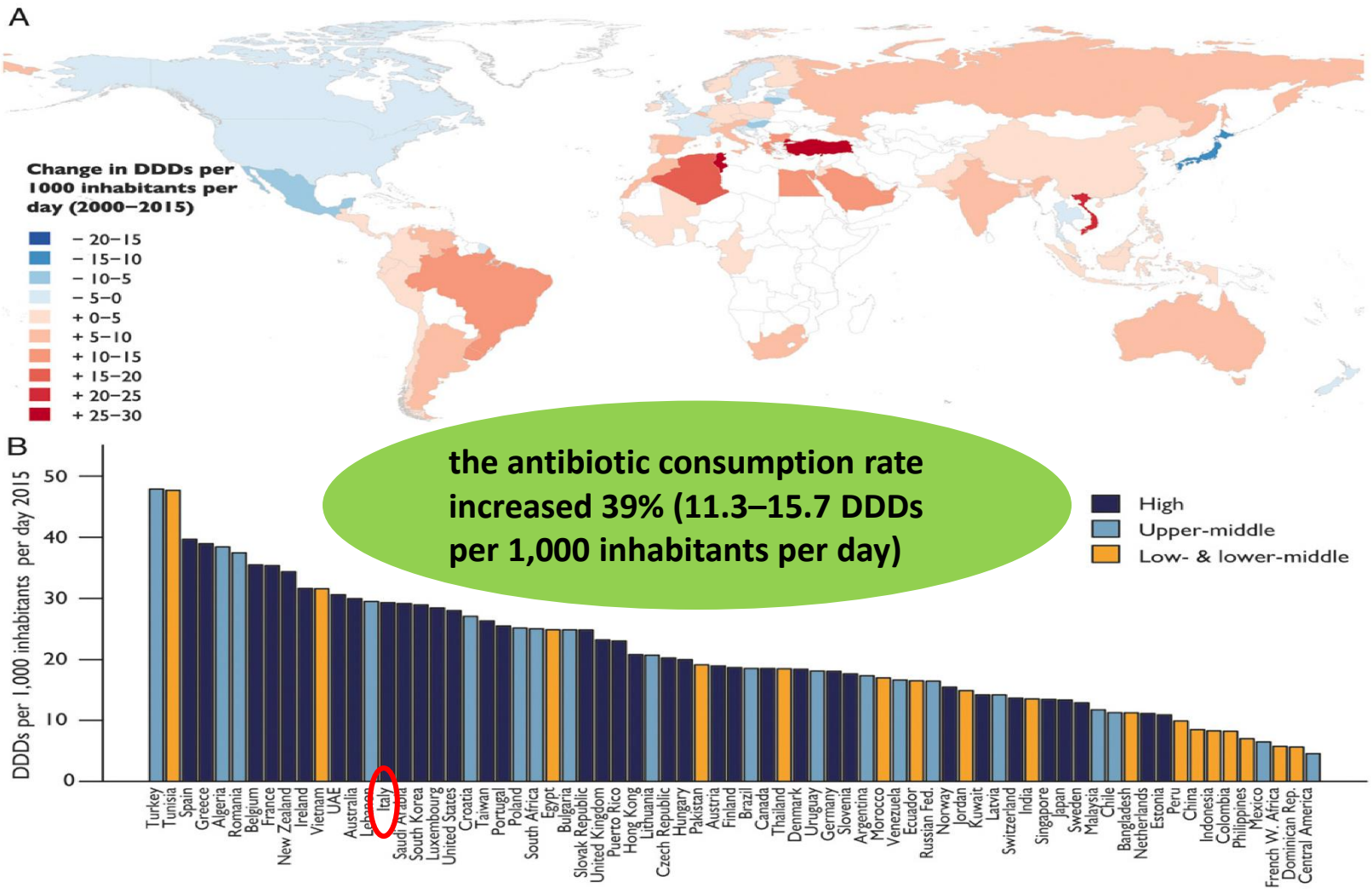
La stewardship antimicrobica. Esperienze in atto.

M. Tinelli

Senior Consultant, LTCF «Pio Albergo Trivulzio», Milan
Executive Board of SIMIT and ESGIE , EUCIC
ESCMID-European Society of Microbiology and Infectious Diseases

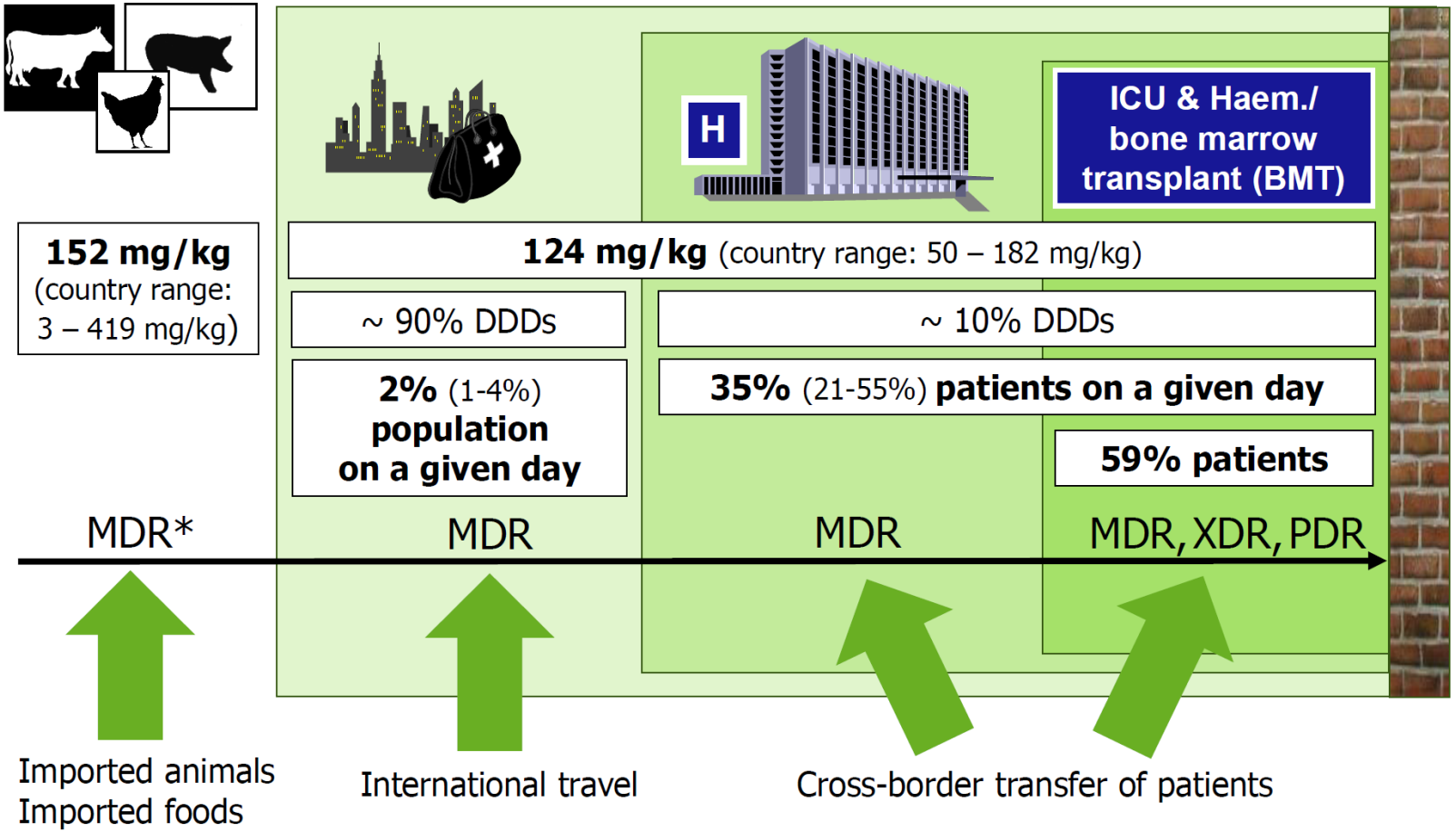
Global antibiotic consumption by country: 2000–2015



the antibiotic consumption rate increased 39% (11.3–15.7 DDDs per 1,000 inhabitants per day)

Klein EY et al *Proc Natl Acad Sci U S A.* 2018 Mar 26. pii: 201717295. doi: 10.1073/pnas.1717295115

Antimicrobial consumption and AMR: a continuum of risks in our societies

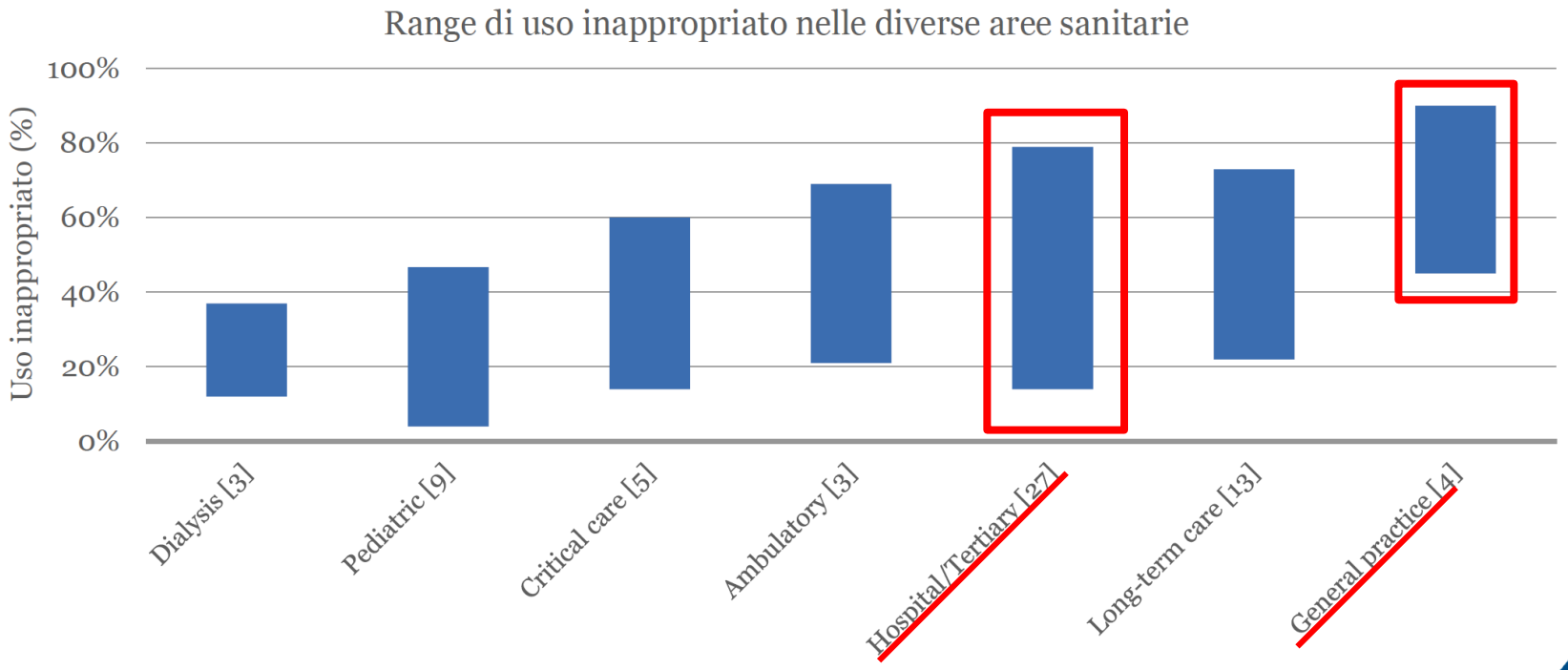


*MDR, multidrug-resistant; XDR, extensively drug-resistant; PDR, pandrug-resistant

Source: ECDC/EFSA/EMA JIACRA report, 2017; ECDC ESAC-Net 2016; ECDC PPS, 2013.

Dominique L. Monnet, ECDC Meeting ISS Marzo 2019

Troppo spesso gli antibiotici vengono usati in maniera inappropriata



Nota: [#] numero di studi

Source: Cecchini & Lee. "Low-value care with high stokes: promoting rational use of antimicrobials". OECD Publishing, 2017

Stewardship definitions

Scientific Societies

IDSA definition - 2007
A marriage of infection control (Epidemiologist), and antimicrobial management (Infectious Diseases specialist) finalized to share the principles of the optimized treatment between the bench to bed side point of view and the hospital-wide vision. Dellit TH, et al. Clin Infect Dis 2007; 44:159–177

ESCMID Definition - 2017
Antimicrobial stewardship is about using antimicrobials responsibly, which involves promoting actions that balance both the individual's need for appropriate treatment and the longer-term societal need for sustained access to effective therapy.
CMI, November 2017Volume 23, Issue 11, 793–798

Some Italian Stakeholders

P. Viale definition- 2016
An activity that optimizes antimicrobial management and includes microbiological work out, drugs selection, dosing, route and duration of antimicrobial therapy.

F. Menichetti definition - 2018
Il termine antimicrobial stewardship si riferisce ad una serie di interventi coordinati, che hanno lo scopo di promuovere l'uso appropriato degli antimicrobici e che indirizzano nella scelta ottimale del farmaco, della dose, della durata della terapia e della via di somministrazione.

E. Tacconelli definition - 2019
Define leadership, budget, personnel, your targets, settings. Choose your indicators (including side effects). Revise careful national or regional guidelines and stay update new studies on stewardship. Go multidisciplinary.

AMS – Shared key words

- multidisciplinary
- marriage of infection control (Epidemiologist), and antimicrobial management (ID specialist)
- antimicrobials responsibly
- optimized treatment
- optimizes antimicrobial management
- appropriate treatment
- dosing, route and duration
- choose your indicators

L’impatto
dell’Antimicrobial Stewardship
a livello scientifico e mediatico è
«gigantesco»

2.300.000
risultati sul Web alla voce:
«Antimicrobial Stewardship»

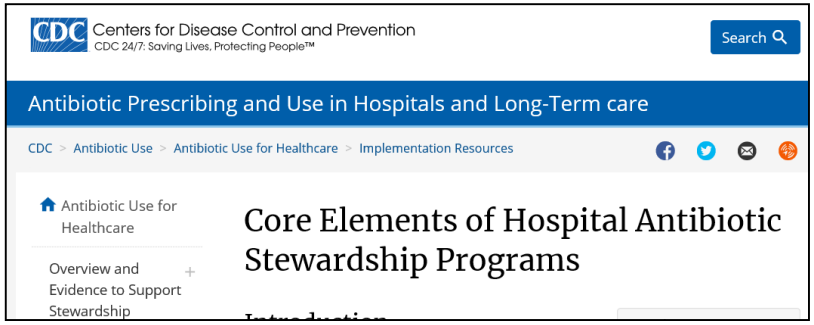
Available guidelines on antimicrobial stewardship programmes

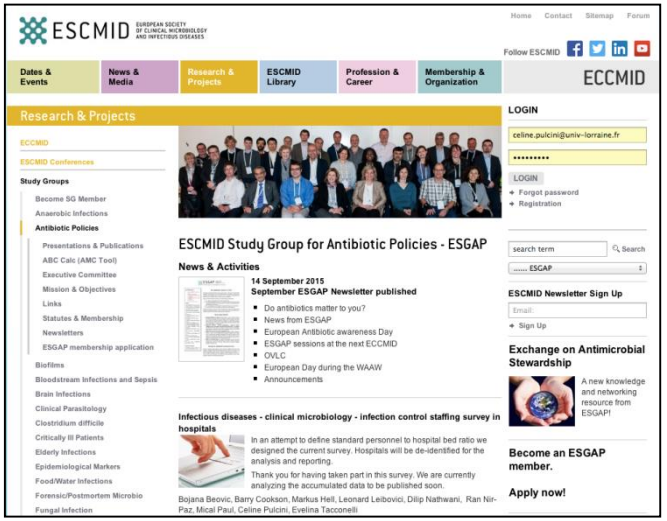

Clinical Infectious Diseases Advance Access published April 13, 2016

IDSA FEATURES

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

EXECUTIVE SUMMARY


CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™
Search
Antibiotic Prescribing and Use in Hospitals and Long-Term care
CDC > Antibiotic Use > Antibiotic Use for Healthcare > Implementation Resources
Antibiotic Use for Healthcare
Overview and Evidence to Support Stewardship
Core Elements of Hospital Antibiotic Stewardship Programs


ESCMID
Dates & Events | News & Media | Research & Projects | ESCMID Library | Profession & Career | Membership & Organization
ECCMID
Research & Projects
ESCMID Study Group for Antibiotic Policies - ESGAP
News & Activities
14 September 2015
September ESGAP Newsletter published
Infectious diseases - clinical microbiology - infection control staffing survey in hospitals
LOGIN
ESCMID Newsletter Sign Up
Exchange on Antimicrobial Stewardship
Become an ESGAP member.
Apply now!

- 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

- **Few address the primary care setting**
- **None for LTCFs in Europe**

Solo alcuni esempi di protocolli di AMS in Italia.....

VERONA

- Obiettivi della stewardship come **obiettivi aziendali**
- Evento educazionale obbligatorio per i referenti di reparto
- **Certificazione di stewardship**
- Stretta connessione con **CIO /GIO**

- Definizione degli **outcomes misurabili** fondamentale (DDD e point prevalence non sufficienti): CDI, giorni di terapia antibiotica prevenuti, durata ospedalizzazione, nuovi ricoveri ospedalieri, infezioni post chirurgiche

UNIVERSITÀ di VERONA

United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Training and Empowering Human Resources for Health Development in Resource-Limited Countries University of Brescia

BRESCIA

Stewardship antibiotica a Brescia: il progetto SCIMMIA

(Saper Come Impostare al Meglio il MIglior Antimicrobico)

BOLOGNA

The S. Orsola-Malpighi Stewardship program

THE PAST …

- Formulary restrictions
- Preauthorization requirements
- Retrospective Audits
- Diffusion of local guidelines

Run for the appropriateness

FROM 2013 …

- Shared definitions of appropriateness
- No pre defined restrictions but …
- "Real time" evaluation of any prescription by the ID consultant team

MILANO S. PAOLO

Progetto PASCIA'

Programma Antimicrobial Stewardship

Controllo Infezioni Antibioticoresistenti

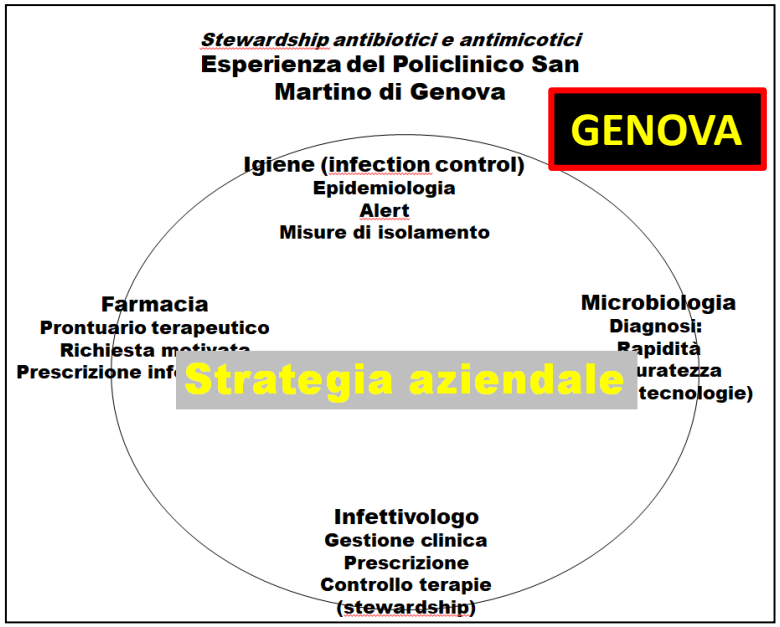
- ***AMS e servizio di consulenza attiva:***
  - Revisione bisettimanale delle terapie antibiotiche in corso nel reparto. Discussione dei casi con il medico referente (facilitatore) delle UU.OO interessate.
  - Rivalutazione alla visita successiva alla luce degli isolati microbiologici e dell'andamento clinico.
- ***Sorveglianza attiva universale ed Infection Control:***
  - Esecuzione di tampone rettale per indentificare pazienti colonizzati da CRE da eseguire a tutti i pazienti con FR per MDR e a tutti i pazienti provenienti dalla UO di Rianimazione. Da ripetere settimanalmente per i positivi e per i contatti.
  - Valutazione di tutti i casi positivi per MDR da qualsiasi campione microbiologico con discussione sul tipo di isolamento da eseguire.

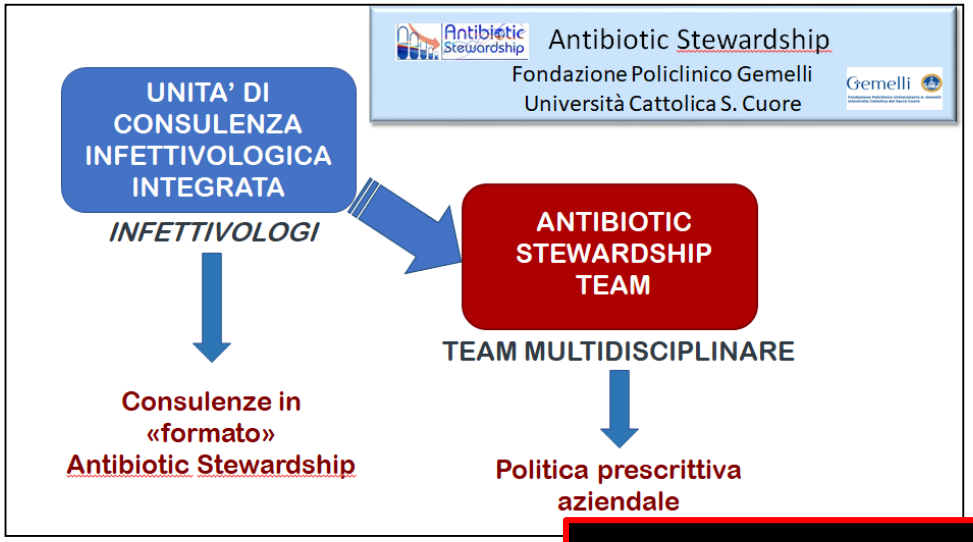
- I fase→ Adozione delle UO Anestesia e Rianimazione (secondo trimestre 2016)
- II fase→ Adozioni di due UO di Medicina Interna (primo semestre 2017)
- III fase → Adozione di due UO Chirurgiche (primo semestre 2018)

Presidi ospedalieri interessati:

- ✓ Azienda Ospedaliera San Paolo
- ✓ Azienda Ospedaliera San Carlo Borromeo

Solo alcuni esempi di protocolli di AMS in Italia…..





AMS in Italia ed il riscontro mediatico

Scienza e Farmaci

Antimicrobial Stewardship. La ricetta dell'Emilia-Romagna: "Condivisione con i professionisti"

Scienza e Farmaci

Antimicrobial Stewardship. Dalla Toscana un nuovo modello per la prevenzione e il controllo delle infezioni

Scienza e Farmaci

Antimicrobial Stewardship. Parte dalla Campania la controffensiva contro l'antibiotico resistenza

Regioni e Asl

Basilicata. Approccio multidisciplinare e costituzione di un gruppo tecnico per contrastare l'antimicrobico resistenza

Considerations about AMS in Italy

- **Encouraging results** obtained to optimize antibiotic treatment and increase appropriateness
- Local models with **different interventions** and indicators **not always transferables** to other settings
- **Different personel and resources** employed in each model

How to adapt national antibiotic prescription guidelines to your setting?

- **<u>Share national tools that can be customised</u>**

  (e.g. electronic formats ++)

- **Make life simple for prescribers**

- Adapt **according to local epidemiology**, availability of antibiotics, local preferences and culture

- **Integrate feedback and stewardship tools**, if possible

- **Assess compliance / adapt your implementation strategy** based on existing barriers

M. Tinelli, ECCMID 2018, Madrid

“Classic” AMS interventions

- **Restrictive:**

  selective reporting of laboratory susceptibilities, **formulary restriction, requiring prior authorization of prescriptions** by infectious diseases physicians, microbiologists, pharmacists etc, therapeutic substitutions, automatic stop orders and antibiotic policy change strategies including cycling, rotation and cross-over studies.

- **Persuasive:**

  distribution of educational materials; educational meetings; **local consensus processes**; educational outreach visits; local opinion leaders; reminders provided verbally, on paper or on computer; audit and feedback**.**

Cochrane Database of Systematic Reviews 30 APR 2013 DOI: 10.1002/14651858.CD003543.pub3

AMS rationale

- Use vs no use?
- Which drug or combination?
- De-escalation?
- Dose?
- Route?
- Duration?
- Empirical/definitive/prophylaxis

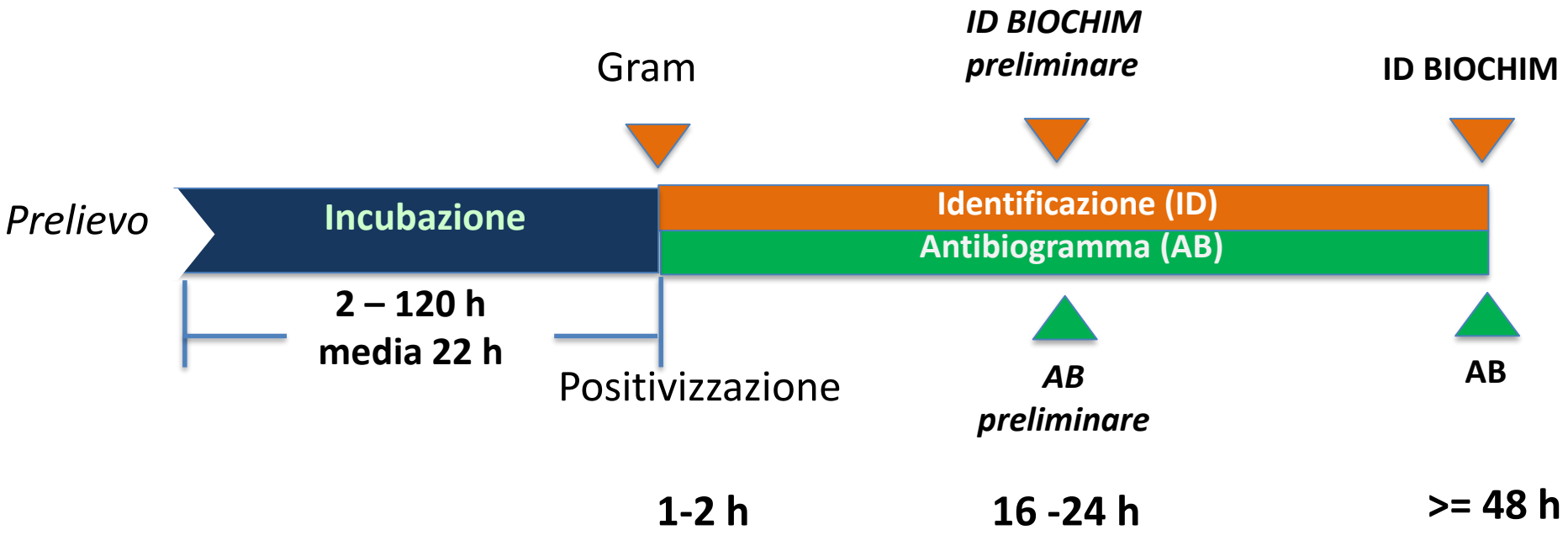
Jesús Rodríguez Baño, AMIT 2013

Primary AMS metrics

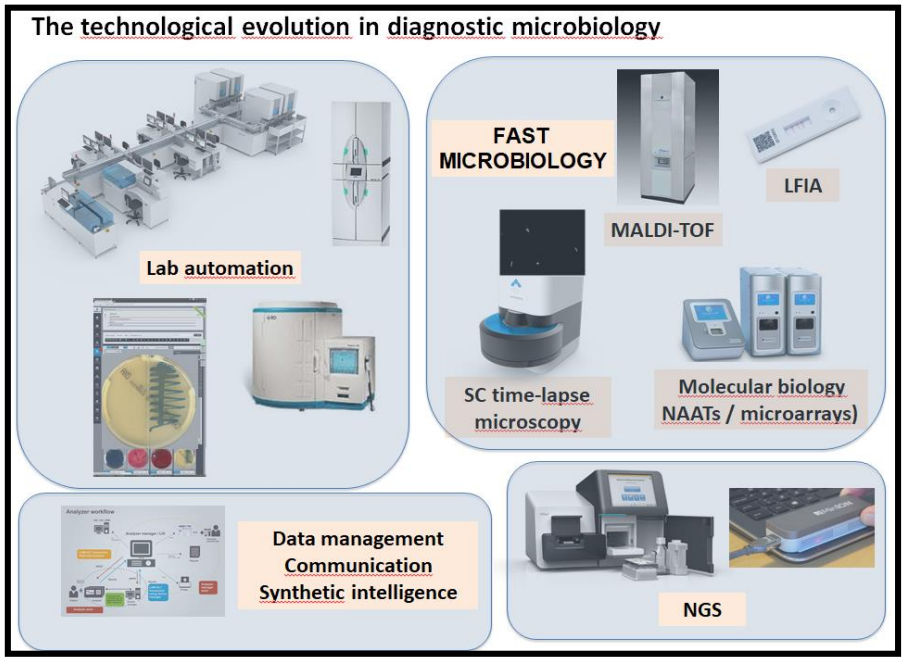
- **Microbiological diagnosis**
- **Microbiological resistance**
- **Antimicrobial use**
- **Clinical outcomes**

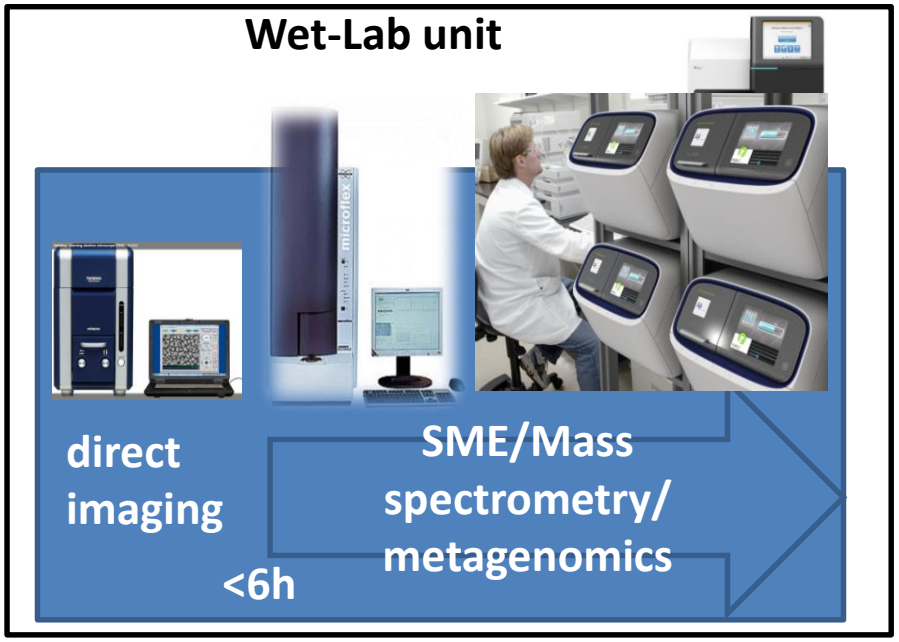
F. Menichetti, AMIT 2019

I tempi "tradizionali" delle analisi batteriologiche (emocoltura)



Courtesy, G. Rossolini





I tempi "rapidi" delle analisi batteriologiche (emocoltura)

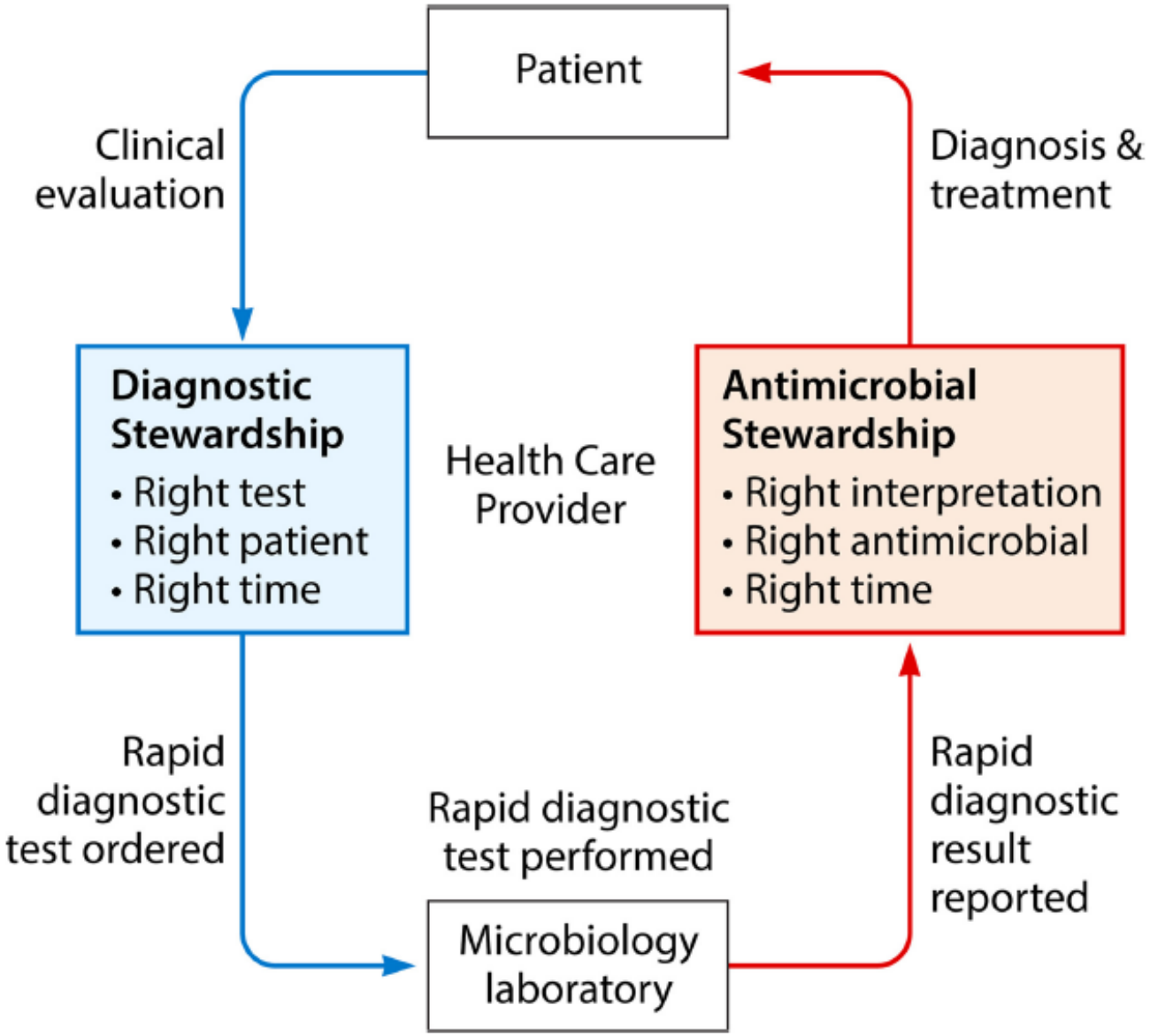
NAAT + microarray
Verigene® GN

Results in 1.5 hrs

Lateral flow immunochromatography assays (LFIA)

Results in 10-15 min

Diagnostic stewardship + Antimicrobial stewardship



Messacar *et al* – JCM 2017

Durata terapia antibiotica

- LG spesso indicano durate estese e “fisse” (ad es.: per endocarditi, infezioni osteo-articolari, etc)
- Prevale giudizio clinico sul singolo paziente (defervescenza per 3-5 giorni, miglioramento clinico)
- **Terapie di più breve durata: meno impatto sulla flora intestinale (microbioma) e degenza più breve**

Duration of Antibiotic Treatment in Community-Acquired Pneumonia: A Multicenter Randomized Clinical Trial.

CLINICAL SUCCESS RATES AMONG DIFFERENT SEVERITY GROUPS

	No. (%) of Participants		
PSI Class	Control Group	Intervention Group	*P* Value
Clinical Success at Day 10			
PSI classes I-III			
Intent to treat	41/86 (47.7)	58/101 (57.4)	.18
Per protocol	39/80 (48.8)	58/94 (61.7)	.09
PSI classes IV-V			
Intent to treat	30/60 (50)	32/59 (54.2)	.64
Per protocol	28/53 (52.8)	28/50 (56)	.75
Clinical Success at Day 30			
PSI classes I-III			
Intent to treat	83/88 (94.3)	93/102 (91.2)	.41
Per protocol	80/82 (97.6)	89/95 (93.7)	.29
PSI classes IV-V			
Intent to treat	49/61 (80.3)	54/58 (93.1)	.04
Per protocol	46/54 (85.2)	47/49 (95.9)	.10

Time receiving antibiotic treatment was significantly longer in the control than the intervention group (median, 10 days [interquartile range, 10-11] vs 5 days [interquartile range, 5-6.5], respectively;*P* < .001).

Uranga A et al, JAMA Intern Med. 2016;176:1257-1265

Overview of systematic reviews assessing the evidence for shorter versus longer duration antibiotic treatment for bacterial infections in secondary care.

Four reviews were rated high quality, and two of moderate quality.

In adults

no difference between shorter versus longer duration in clinical resolution rates for

Peritonitis (RR 1.03, 95% CI 0.98 to 1.09, I_2 = 0%), v
Ventilator-associated pneumonia (RR 0.93; 95% CI 0.81 to 1.08, I_2 = 24%),
Acute pyelonephritis/bacteremic UTI (RR 1.00, 95% CI 0.46 to 2.18).

In children

there was **no difference in clinical resolution rates** for

Pneumonia (RR 0.98, 95% CI 0.91 to 1.04, I_2 = 48%),
Pyelonephritis (RR 0.95, 95% CI 0.88 to 1.04)
confirmed Bacterial Meningitis (RR 1.02, 95% CI 0.93 to 1.11, I_2 = 0%).

Onakpoy IJ et al, PLoS ONE 2018 13(3): e0194858

Comparing the Outcomes of Adults With Enterobacteriaceae Bacteremia Receiving Short-Course Versus Prolonged-Course Antibiotic Therapy in a Multicenter, Propensity Score-Matched Cohort.

There were 5 (1.3%) and 9 (2.3%) episodes of recurrent bloodstream infections in the short- and prolonged-course treatment groups, respectively

CDI occurred in 7 (1.8%) and 6 (1.6%) patients within 30 days

There were 17 (4.4%) reports of incident MDRO in the short-course and 28 (7.3%) in the prolonged-course treatment groups

Secondary outcomes

Measure	Short	Prolonged	OR	95% CI
Recurrent BSI (%)	1.3%	2.3%	1.32	0.48-3.41
CDI (%)	1.81%	1.6%	1.16	0.39-3.51
Incident MDRO (%)	4.4%	7.3%	0.59	0.32-1.09

Chotiprasitsakul D et al Clin Infect Dis 2018;66:172-177.

Are infection specialists recommending short antibiotic treatment durations? An ESCMID international cross-sectional survey

ID specialists were invited to participate in an online cross-sectional survey between Sep and Dec 2016. The questionnaire included 15 clinical vignettes corresponding to common clinical cases with favorable outcomes; part A asked about the antibiotic treatment duration they usually advise to prescribers and part B asked about the shortest duration they were willing to recommend. A total of 866 participants were included, both clinical microbiologists and ID specialists, of whom 73% (624/854) acting as members of an antibiotic stewardship team, coming from 58 countries on all continents.

- Meningococcal meningitis
- Uncomplicated C-R S.aureus BSI
- Uncomplicated CAP
- acute exacerbation of a severe COPD
- uncomplicated bacterial sinusitis
- Uncomplicated pyelonephritis In an adult woman
- Complicated pyelonephritis in an adult woman
- acute cholangitis, treated by biliary drainage
- Uncomplicated C-R K. pneumoniae BSI
- First episode of acute otitis media in a 2 years old kid
- diffuse peritonitis with an early source control
- uncomplicated erysipelas
- Escherichia coli vertebral osteomyelitis
- staphylococcal PJI 1-stage exchange
- diabetic foot infection, not eligible for surgery

36% of participants (271/749) already advised short durations of antibiotic therapy (compared with the literature) to prescribers for more than half of the vignettes and 47% (312/662) were ready to shorten durations of treatment

Macheda G et al, J Antimicrob Chemother 2018; 73: 1084–1090

AMS: IV-to PO Swith Therapy

Sze WT, Kong MC. Impact of printed antimicrobial stewardship recommendations on early intravenous to oral antibiotics switch practice in district hospitals. Pharmacy Practice 2018 Apr-Jun;16(2):855.
https://doi.org/10.18549/PharmPract.2018.02.855

Original Research

Impact of printed antimicrobial stewardship recommendations on early intravenous to oral antibiotics switch practice in district hospitals

Wei T. SZE, Mei C. KONG.
Received (first version): 9-Nov-2017 Accepted: 25-Apr-2018 Published online: 17-Jun-2018

Public Health Ontario — PARTNERS FOR HEALTH | Santé publique Ontario — PARTENAIRES POUR LA SANTÉ

Antimicrobial Stewardship Strategy:
Intravenous to oral conversion

Promoting the use of oral antimicrobial agents instead of intravenous administration when clinically indicated.

Description

This is an overview and not intended to be an all-inclusive summary. As a general principle, patients must be monitored by the health care team after changes to therapy resulting from recommendations made by the antimicrobial stewardship team.

Intravenous to oral conversion (IV to PO) involves a policy or

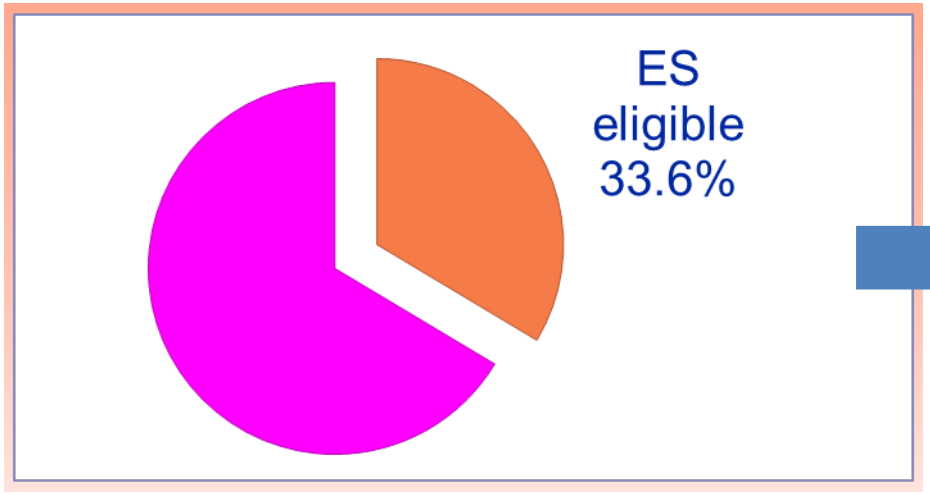
TERAPIA PARENTERALE vs. ORALE

INDICAZIONI TERAPIA ORALE

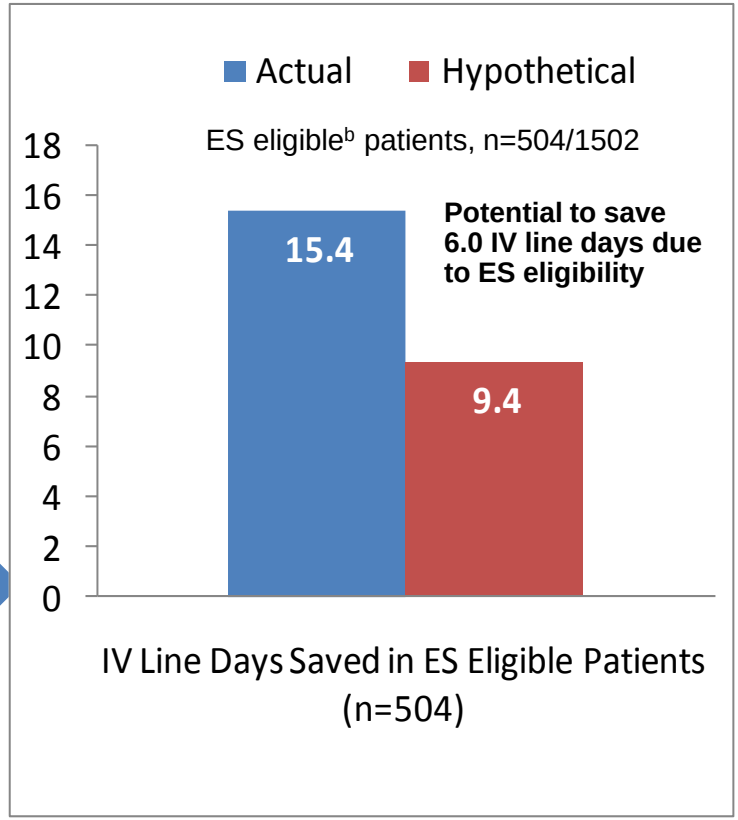
- DOCUMENTATE : Polmoniti, Celluliti, Pielonefriti , Osteomieliti , Artriti settiche…….Endocrditi
- DA VALUTARE: BSI
- DISCUTIBILI: Ascessi cerebrali

Possibility of Early Switch to Oral Antibiotics for Patients With MRSA cSSTI in a Pan-EU Study[a]

- **33.6% of MRSA cSSTI patients** treated with IV antibiotics met ES criteria and potentially could have discontinued IV therapy 6.0 ± 5.5 days sooner



1502 patients hospitalized with MRSA cSSTI



Nathwani D, et al. *Clin Microbiol Infect.* 2014 Mar 27. doi: 10.1111/1469-0691.12632.

Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis

Table 2. Distribution of the Four Components of the Primary Composite Outcome.*

Component	Intravenous Treatment (N=199)	Oral Treatment (N=201)	Difference	Hazard Ratio (95% CI)
	number (percent)		*percentage points (95% CI)*	
All-cause mortality	13 (6.5)	7 (3.5)	3.0 (–1.4 to 7.7)	0.53 (0.21 to 1.32)
Unplanned cardiac surgery	6 (3.0)	6 (3.0)	0 (–3.3 to 3.4)	0.99 (0.32 to 3.07)
Embolic event	3 (1.5)	3 (1.5)	0 (–2.4 to 2.4)	0.97 (0.20 to 4.82)
Relapse of the positive blood culture†	5 (2.5)	5 (2.5)	0 (–3.1 to 3.1)	0.97 (0.28 to 3.33)

CONCLUSIONS

In patients with endocarditis on the left side of the heart who were in stable condition, changing to oral antibiotic treatment was noninferior to continued intravenous antibiotic treatment. (Funded by the Danish Heart Foundation and others; POET ClinicalTrials.gov number, NCT01375257.)

Iversen K, Ihlemann N, Gill SU, et al. Partial oral versus intravenous antibiotic treatment of endocarditis. N Engl J Med 2019; 380: 415-24. POET trial

AMS ed interventi istituzionali

PNCAR- Contenuti del piano

- **Sorveglianza AMR** e consumo degli antibiotici in ambito umano e veterinario, ICA, Piano Nazionale Residui
- Prevenzione e controllo delle infezioni in tutti gli ambiti
- **Uso corretto degli antibiotici (compresa "*Antimicrobial Stewardship*")**
- Formazione
- Comunicazione e Informazione
- Ricerca e innovazione

In ogni sezione:

- premessa,
- stato dell'arte
- **azioni** previste a livello **centrale** e **regionale**
- **indicatori** a livello **centrale** e **regionale**

PNCAR: AZIONI REGIONALI

- Emanazione di un **documento regionale** sull'organizzazione per l'*antimicrobial stewardship* **(entro il 2018)** **??????????????**
- Inserimento formale del **core curriculum** per i medici ed il personale addetto al controllo delle infezioni e a programmi di *antimicrobial stewardship* **tra i criteri di assunzione** a livello regionale e aziendale (entro il 2018)

Regioni/PA che hanno attivato un sistema di popolazione di sorveglianza delle resistenze in ambito umano (con rapporti on-line)

Regione	Sito web
Bolzano	http://www.services.asbz.it/san/laboratorio_di_microbiologia/index.htm#
Campania	https://icaaroweb.regione.campania.it/
Emilia-Romagna	http://assr.regione.emilia-romagna.it/it/ricerca-innovazione/prevenzione-antibioticoresistenza-infezioni/sorveglianza-controllo/sorveglianza-rischio-infettivo/rapporti-sorveglianza
Friuli Venezia-Giulia	https://egas.sanita.fvg.it/it/aree-tematiche/rete-cure-sicure-fvg/programmi/uso-prudente-degli-antibiotici-antibiotic-stewardship/il-registro-regionale-delle-resistenze-batteriche/
Piemonte	www.seremi.it
Sicilia	https://www.qualitasiciliassr.it
Toscana	https://www.ars.toscana.it/images/pubblicazioni/Rapporti/2018/Report_ATB_SMART_Maggio_2018_web.pdf

Ricognizione 2018 Tavolo inter-regionale per l'implementazione del PNCAR

M-L. Moro, Kickoff meeting – 21 e 22 marzo 2019, ISS, Roma

Le azioni in corso

- Gruppo Tecnico di Coordinamento (GTC) della strategia nazionale di contrasto dell'AMR
  - 13 gruppi di Lavoro
  - 1-2 coordinatori per GdL
  - 1-3 referenti scientifici per GdL

Le azioni in corso

- Aggiornamento Protocollo AR-ISS e Individuazione requisiti dei laboratori appartenenti alla rete *(Circolare 18/01/2019)*
- Individuazione LG prioritarie su 'Uso appropriato AB' e 'Prevenzione ICA' e avvio collaborazione con SNLG
- Revisione Sorveglianza CPE *(in corso)*
- Predisposizione Piani specifici:
  - Comunicazione One Health *(approvato dal GTC)*
  - Formazione One Health *(in corso)*
  - Uso appropriato AB *(in corso)* → **Previsto per fine 2019**
  - Sorveglianza ICA *(in corso)*

"Sinergie e integrazione tra rischio clinico e rischio infettivo"

19 Maggio 2019

Documento di consenso

Le Regioni/PA adottino e attuino un programma per la prevenzione e il controllo delle ICA e delle AMR coerente con le evidenze internazionali e con quanto previsto dai piani nazionali (es. PNCAR [12]).

Piena attuazione dei programmi ministeriali come il PNCAR in tutte le sue aree di azione:

- sorveglianza dell'AMR e delle ICA;
- Piano Nazionale Residui;
- **sorveglianza dei consumi di antibiotici nel settore umano e veterinario;**
- prevenzione e controllo delle ICA e delle malattie infettive e zoonosi;
- **uso corretto di antibiotici;**
- comunicazione e informazione;
- formazione;
- ricerca e innovazione;

MAJOR ARTICLE

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

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

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Summary Statistics of Patient Condition

	No ID Intervention		ID Intervention	
Condition	Number	Percent	Number	Percent
Bacteremia	20 377	12.0	14 066	13.8
Clostridium difficile infection	31 853	18.7	13 681	13.4
Central line infections	3308	1.9	3980	3.9
Endocarditis	8585	5.0	5773	5.7
HIV/opportunistic infections	24 087	14.1	9648	9.5
Meningitis	279	0.2	644	0.6
Osteomyelitis	16 754	9.8	19 959	19.6
Prosthetic joint infections	30 608	18.0	21 957	21.5
Septic arthritis	3215	1.9	4809	4.7
Septic shock	35 659	20.9	19 975	19.6
Vascular device infections	8232	4.8	6885	6.8
Total unique stays	**170 366**		**101 991**	

Many patients had more than 1 condition during an index stay.

Abbreviations: HIV, human immunodeficiency virus; ID, infectious diseases.

The ID intervention cohort demonstrated **significantly lower mortality** (odds ratio [OR], 0.87; 95% confidence interval [CI], .83 to .91) **and readmissions** (OR, 0.96; 95% CI, .93 to .99) than the non-ID intervention cohort.; the ID intervention cohort ICU LOS was 3.7% shorter (95% CI, −5.5% to −1.9%).

Patients receiving ID intervention within 2 days of admission had significantly lower 30-day mortality and readmission, hospital and ICU length of stay, and Medicare charges and payments compared with patients receiving later ID interventions.

ID interventions are associated with <u>improved patient outcomes</u>. Early ID interventions are also associated with <u>reduced costs</u> for Medicare beneficiaries with select infections.

Risk-Adjusted Outcomes for Stays Receiving Early Versus Late Infectious Diseases Interventions

	No ID	ID	
30-day mortality (%)[b]	8.7	7.7	<.001
30-day readmission rate (%)[b]	22.7	22.1	.009

Impact of infectious diseases consultation as a part of an antifungal stewardship programme on candidemia outcome in an Italian tertiary-care, University hospital

Table 1. Clinical characteristics, therapy and outcomes of study population.

Variables	No IDC (*n* = 200)	IDC (*n* = 76)	*P*
Male gender	103/200 (51%)	33/76 (43%)	0.287
Age >65 years	146/200 (73%)	46/76 (61%)	0.062
Charlson score	7.30 ± 3.09	7.32 ± 2.65	0.961
Admitted in Internal Medicine wards	155/200 (78%)	31/76 (41%)	**<0.001**
Length of hospital stay (days)	16 [9–30]	36 [23–61]	**<0.001**
Late onset of candidemia	80/200 (40%)	41/76 (54%)	0.051
Non-albicans *Candida*	92/200 (46%)	37/76 (49%)	0.792
Antifungal therapy			
• Azoles	148/200 (74%)	32/76 (42%)	**<0.001**
• Echinocandins	0/200 (0%)	35/76 (46%)	**<0.001**
• Liposomal and lipidic complex amphotericin B	0/200 (0%)	9/76 (12%)	**<0.001**
No antifungal therapy	52/200 (26%)	0/76 (0%)	**<0.001**
In-hospital 30-day mortality	73/200 (37%)	15/76 (20%)	**0.011**

IDC – Infectious disease consultation.
Bold values are for variables with a *p* value ≤ 0.05.

Menichetti et al, Journal of Chemotherapy, 2018

REVIEW 10.1111/1469-0691.12751

The impact of infectious disease specialists on antibiotic prescribing in hospitals

Clin Microbiol Infect 2014; 20: 963–972

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A review of the impact of infectious disease specialists (IDSs) on the quality and quantity of antibiotic use in acute-care hospitals, and discuss the main factors that could limit the efficacy of IDS recommendations. A total of **31 studies were included in this review**, with a wide range of infections, hospital settings, and types of antibiotic prescription.

ID intervention was associated with a **significant improvement in the appropriateness of antibiotic prescribing as compared with prescriptions without any IDS** input, and with **decreased antibiotic consumption.**

Eur J Clin Microbiol Infect Dis
DOI 10.1007/s10096-016-2791-9

ORIGINAL ARTICLE

A large survey among European trainees in clinical microbiology and infectious disease on training systems and training adequacy: identifying the gaps and suggesting improvements

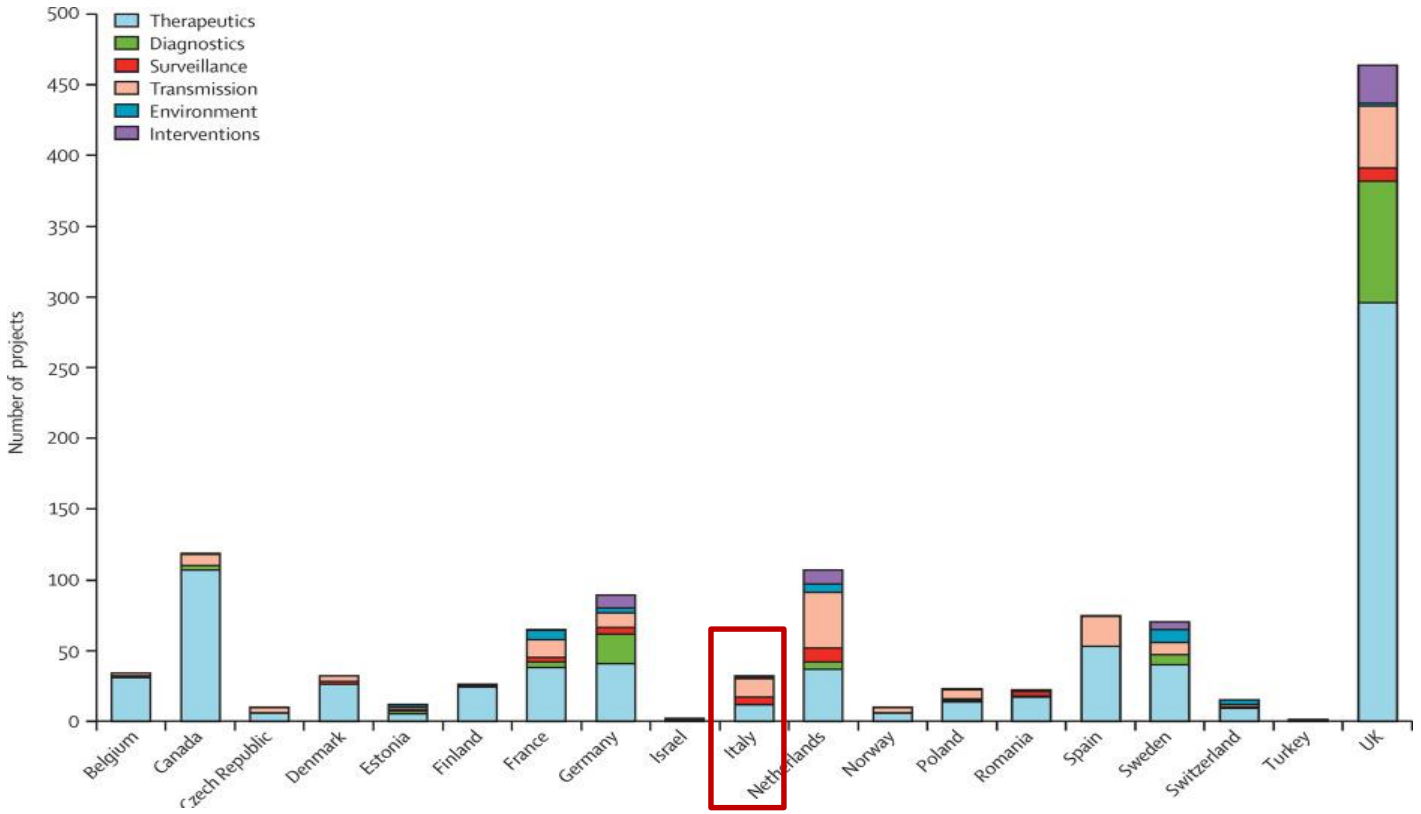
E. Yusuf[1,2] · D. S. Y. Ong[3] · A. Martin-Quiros[4] · C. Skevaki[5] · J. Cortez[6,7] · K. Dedić[8] · A. E. Maraolo[9] · D. Dušek[10] · P. J. Maver[11] · M. Sanguinetti[12] · E. Tacconelli[13] · The Trainee Association of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID)

Received: 4 September 2016 / Accepted: 4 September 2016

Abstract The purpose of this investigation was to perform a survey among European clinical microbiology (CM) and infectious disease (ID) trainees on training satisfaction, training tools, and competency assessment. An online, anonymous survey in the English language was carried out between April and July 2015. There were 25 questions: seven in a 5-point Likert scale (1: worst scenario, 5: best scenario) and the remainder as closed multiple-choice questions in five areas (satisfaction, adequacy, system, mentorship, and evaluation of training). Included were 419 respondents (215 CM, 159 ID, and 45 combined CM/ID) from 31 European countries [mean age (standard deviation) 32.4 (5.3) years, 65.9 % women]. Regarding satisfaction on the training scheme, CM and ID scored 3.6 (0.9) and 3.2 (1.0), respectively. These scores varied between countries, ranging from 2.5 (1.0) for Italian ID to 4.3 (0.8) for Danish CM trainees. The majority of respondents considered training in management and health economics inadequate and e-learning and continuing medical education programs insufficient. Many trainees (65.3 % of CM and 62.9 % of ID) would like to have more opportunities to spend a part of their training abroad and expected their mentor to be more involved in helping with future career plans (63.5 % of CM and 53.4 % of ID) and practical skills (53.0 % of CM and 61.2 % of ID). Two-thirds of the respondents

ATBS/AMR Funding in Europe 2018

Funding and research opportunities



OCSE, 2018

DOCUMENTO SIMIT 2019-2020.

Sviluppo di documenti di linee-guida o “buone pratiche cliniche”.

Stewardship antimicrobica.

Organizzazione, Budget, Pianificazione e Formazione.

→ **«Ongoing»**

Attività	mese 1	mese 2	mese 3	mese 4	mese 5	mese 6	mese 7	mese 8	mese 9	mese 10	mese 11	mese 12	mese 13	mese 14	mese 15	mese 16	mese 17	mese 18	mese 19	mese 20	mese 21	mese 22	mese 23	mese 24
Organizzazione, Budget, Pianificazione e Formazione	x																							
Definizione delle Priorità	x																							
Appartenenza al Gruppo della Linea Guida	x	x																						
Stabilire i Processi del Gruppo della Linea Guida		x																						
Identificare il Pubblico Target e Selezione degli Argomenti		x																						
Consumer and Stakeholder Involvement		x	x																					
Partecipazione degli Utenti e degli Stakeholders			x																					
PICO: Formulazione dei Quesiti				x																				
Considerazioni circa l'Importanza degli Outcomes e dell'Intervento, dei Valori, delle Preferenze e delle Utilità				x																				
Decidere quale Evidenza includere e ricerca dell'Evidenza				x																				
Riassumere l'Evidenza e Considerare le Informazioni Aggiuntive					x	x	x																	
Giudicare la Qualità, Forza o Certezza del Corpo dell'Evidenza							x	x	x	x	x	x												
Sviluppare le Raccomandazioni e Determinare la loro Forza												x	x	x										
Formulazione delle Raccomandazioni e Considerazioni sull'Implementazione, Fattibilità ed Equità														x	x	x								
Peer review																x	x	x						
Diffusione e Implementazione																		x	x	x				
Valutazione e Uso																					x	x	x	x
Aggiornamento																								x

AMS: our goal

An incomparable, unique opportunity to improve the approach to the infectious risk, by a more standardized approach