THE HERETICAL HISTORY OF MEDICINE

2000 BC *Here, eat this root*

1000 AD *That root is heathen. Here, say this prayer*

1850 AD *That prayer is superstition. Here, drink this potion*

1920 AD *That potion is snake oil. Here, swallow this pill*

1945 AD *That pill is ineffective. Here, take this penicillin*

1955 AD *Oops, bugs mutated. Here take this tetracycline*

1960-99 AD *39 more "oops"-*

Here take this more powerful antibiotic

2000s AD *We ran out of antibiotics! Here, eat this root*

THE ANTIMICROBIAL STEWARDSHIP OPPORTUNITY

WE ARE LIVING THE ANTIBIOTIC CRISIS
WHICH ANSWERS?

New drugs

Alternative therapies

Improved microbiological diagnosis

Infection Control strategies

Anti-Microbial Stewardship

Vaccine

AMS refers to coordinated interventions designed to improve and measure the appropriate use of antimicrobial agents by promoting the selection of the optimal antimicrobial drug regimen including dosing, duration of therapy and route of administration, with the aim to improve outcome and save exposures

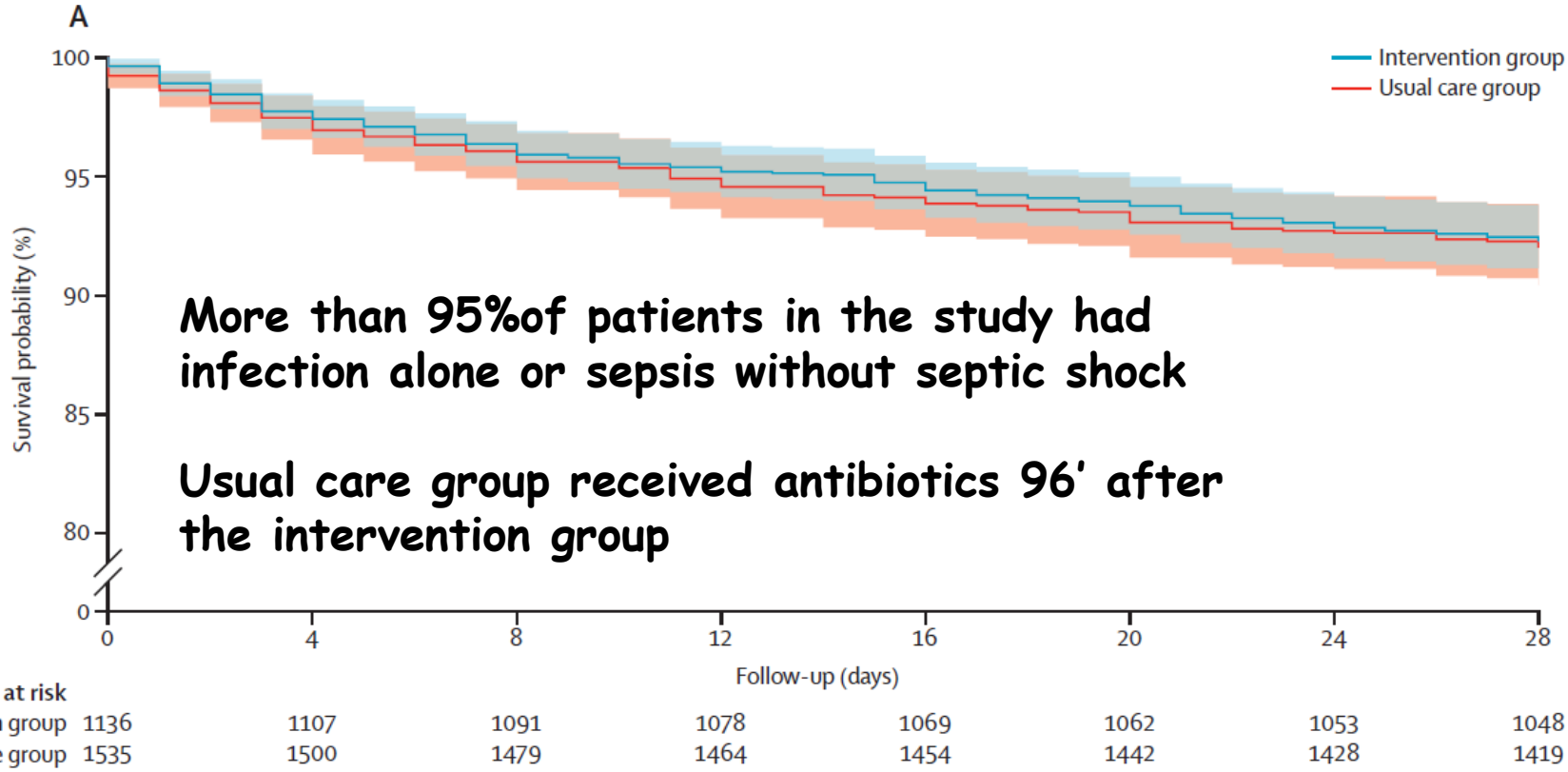
Policy Statement on Antimicrobial Stewardship by the Society for Healthcare Epidemiology of America, the Infectious Diseases Society of America, and the Pediatric Infectious Diseases Society . *Fishman N. Infect Control Hosp Epidemiol 2012;33:322–7.*

PubNo. 300430

Prehospital antibiotics in the ambulance for sepsis:a multicentre, open label, randomised trial

Alam N et al, Lancet Respir Med 2018;6: 40–50

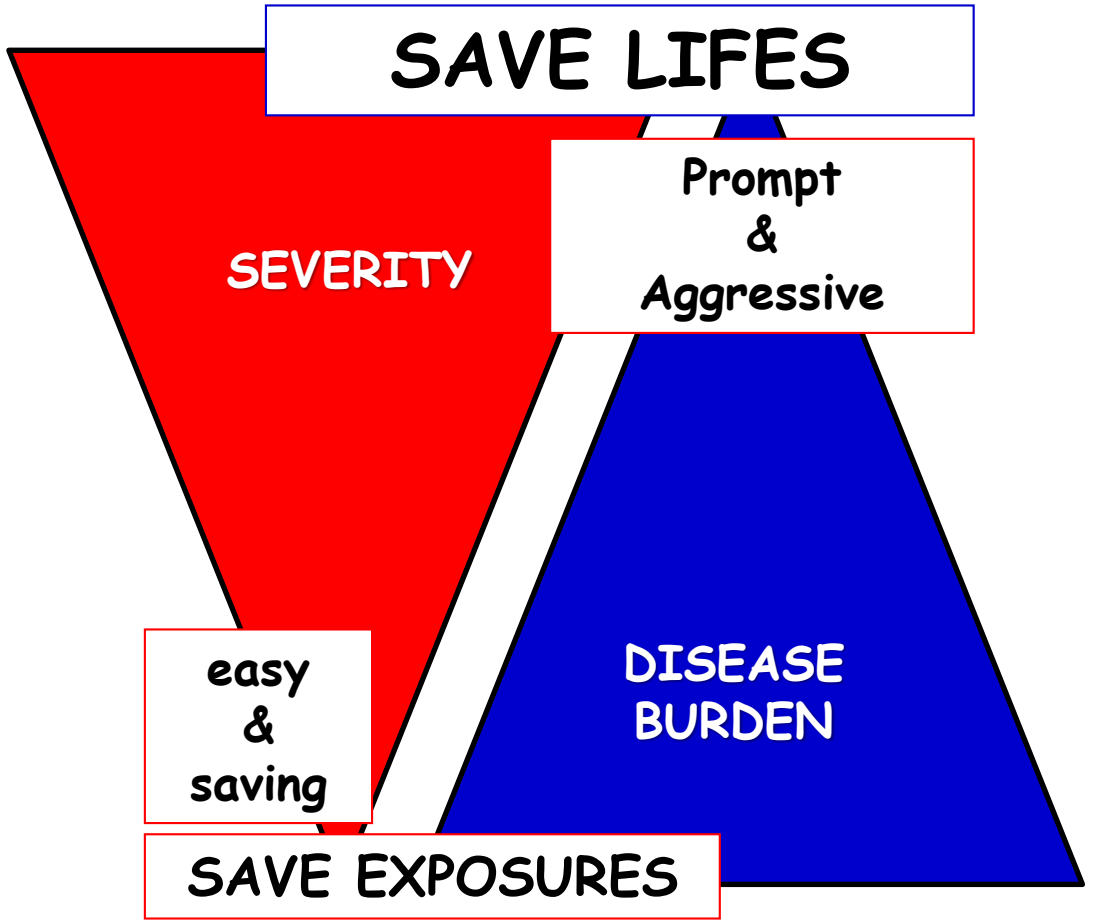
Eligible patients were randomly assigned (1:1) using block-randomisation with blocks of size 4 to the intervention (open-label intravenous ceftriaxone 2 g in addition to usual care) or usual care (fluid resuscitation and supplementary oxygen). The primary outcome was all-cause mortality at 28 days. **2698 patients were enrolled**



More than 95%of patients in the study had infection alone or sepsis without septic shock

Usual care group received antibiotics 96' after the intervention group

A dichotomist vision of antimicrobial stewardship mission



Antimicrobial Stewardship – BASIC ACTIVITIES

right protocols of surgical prophylaxis

shared and honest place in therapy of new drugs

hierarchical pattern of prescriptions

right sampling for culture

right approach to colonization / contamination

improvement in diagnostic algorithms

avoidance of redundant prescriptions

therapeutic drug monitoring

PK/PD driven therapy

feasible de-escalation

shortened duration of antibiotic therapy when possible

early discharge from hospitals

assessment of patient adherence

Increased relative abundance of carbapenemase-producing Klebsiella pneumoniae within the gut microbiota is associated with risk of bloodstream infection in long-term acute care hospital patients. *Shimasaki T et al Clin Infect Dis. 2018 Sep 18.*

A total of 2,319 samples from 562 admissions (506 patients) were collected, of which 255 (45.4%) were colonized with KPC-Kp and 11 (4.3%) had KPC-Kp BSI

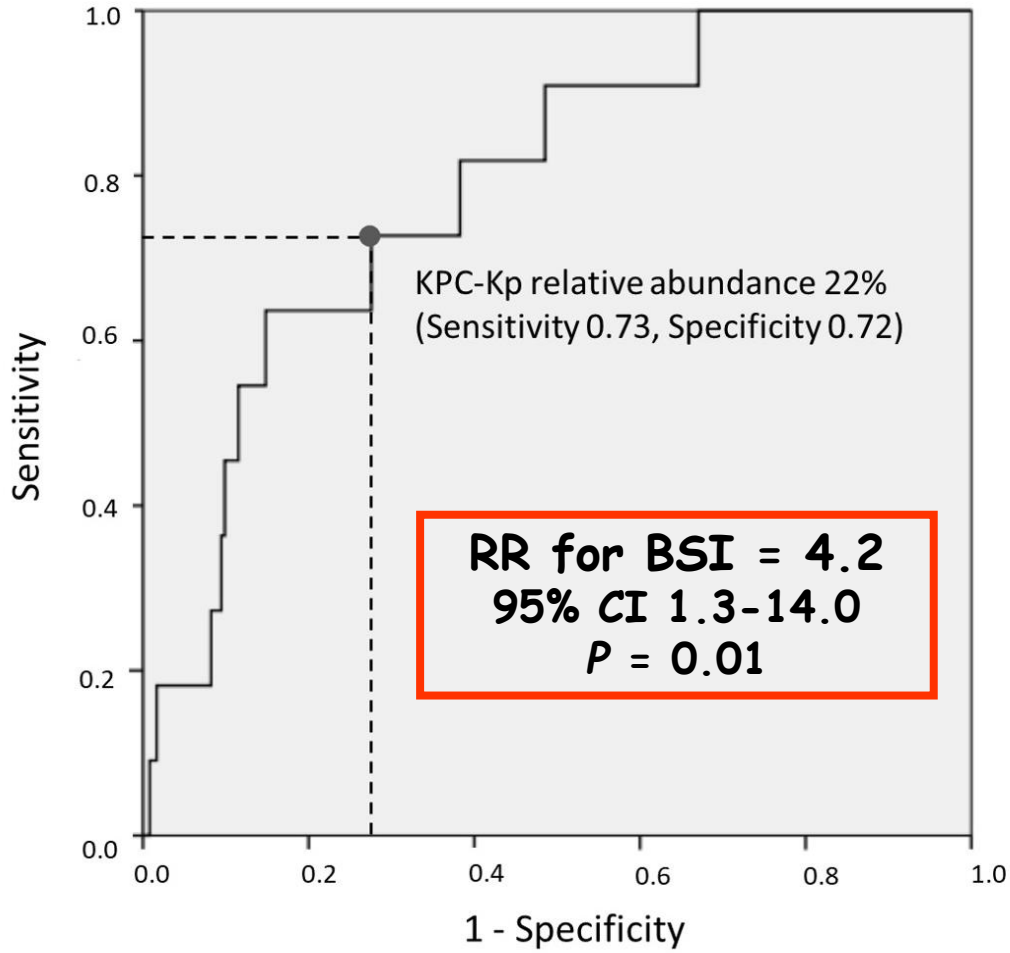
Demographic and Clinical Characteristics of KPC-Kp colonized patients (N=255)

Age (Years), mean ± SD	63.2 ± 15.9
LOS in days, median (IQR)	40 (27-65)
Mechanical ventilation	98 (38.4)
Central venous catheter	130 (51.6)
Indwelling urinary catheter	159 (62.4)
Charlson Score, median (IQR)	3 (2-5)
Diabetes mellitus	123 (48.2%)
Congestive heart failure	82 (32.2)
Stroke	72 (28.2)
Decubitus ulcer	193 (75.7)
ESRD on hemodialysis	35 (13.8)
Antibiotic use, n (%)	235 (92.2)

Carbapenem	102 (40.0)
BI/BLI	69 (27.1)
Vancomycin iv	133 (52.2)
Metronidazole	49 (19.2)

Increased relative abundance of carbapenemase-producing Klebsiella pneumoniae within the gut microbiota is associated with risk of bloodstream infection in long-term acute care hospital patients. *Shimasaki T et al Clin Infect Dis. 2018 Sep 18.*

ROC curve analysis of the relation between relative abundance of KPC-Kp and subsequent KPC-Kp BSI



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Risk factors associated with ≥22% relative abundance of KPC-Kp in the gut microbiota

Clinical predictors	*HR (95% CI)*	*P value*
Age in years	0.99 (0.97-1.02)	0.549
Charlson comorbidity index	0.90 (0.74-1.09)	0.277
Any medical device use	1.05 (0.25-4.48)	0.943
Any antibiotic exposure	0.70 (0.24-2.07)	0.519
Carbapenem	2.19 (1.06-4.55)	0.036
BI/BLI	0.66 (0.23-1.90)	0.436
Vancomycin IV	0.79 (0.38-1.66)	0.537
Metronidazole	0.50 (0.12-2.12)	0.351

Antimicrobial Stewardship Mission

Contain antimicrobial exposures and resultant ecological damage without undermining the clinical outcome

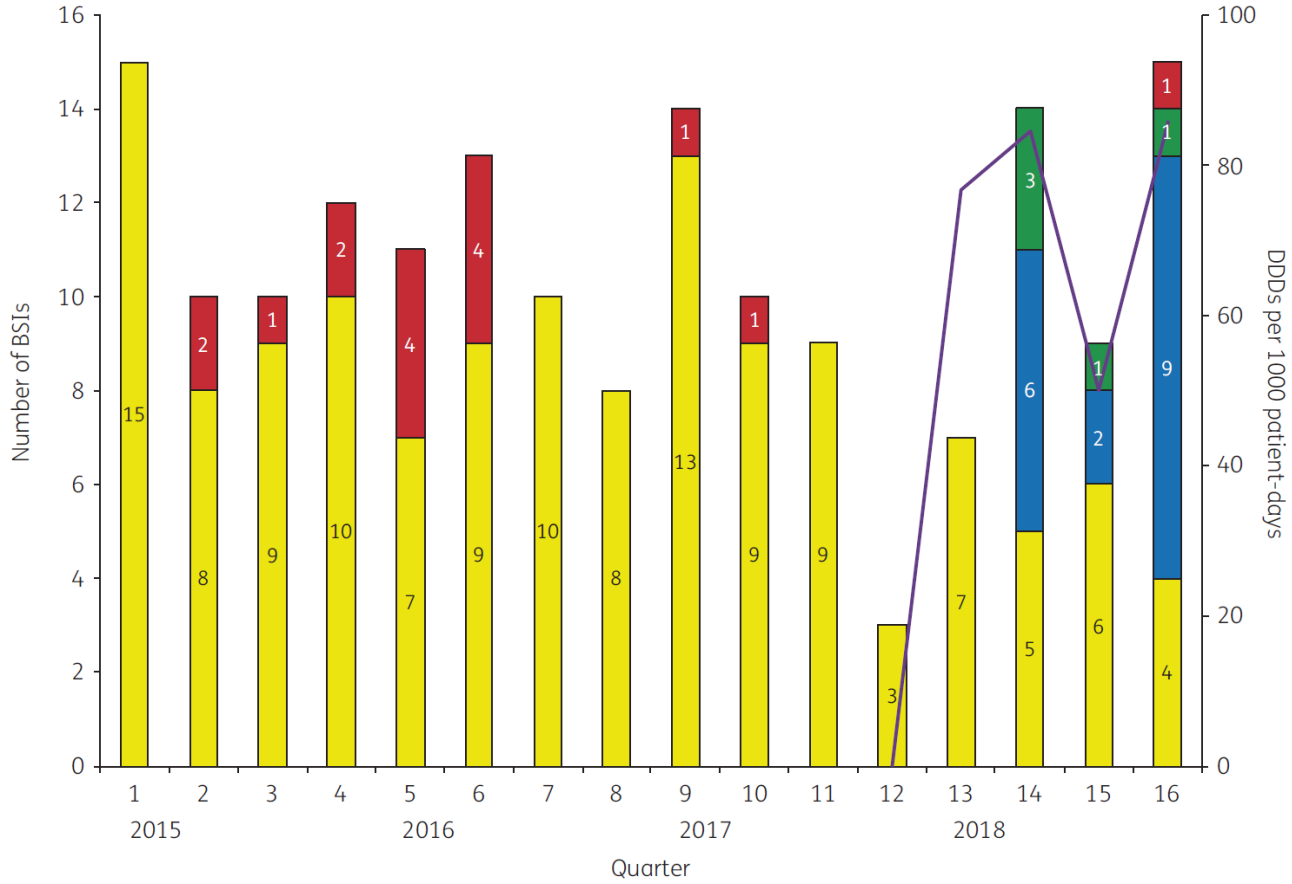
SHORTENING THE DURATION OF TREATMENT

"One patients exposed to antibiotics for 10 days is far worse than 5 patients exposed for 2 days each"

Reversal of carbapenemase-producing K.pneumoniae epidemiology from blaKPC- to blaVIM-harbouring isolates in a Greek ICU after introduction of ceftazidime /avibactam.

Papadimitiou-Olivgeris M et al. J Antimicrobial Chemother 2019;74;2051-4

Quarterly distribution of carbapenemase genes in clinical isolates



A LESSON NEVER TO BE FORGOTTEN