

Supplementary File 1. Search Algorithms

MEDLINE (via PubMed)

Search Number	Search Algorithm	Hits
#1	"multidrug resistant" OR "multidrug resistance" OR "multi-drug resistant" OR "multi-drug resistance" OR "multi drug resistant" OR "multi drug resistance" OR MDR OR "Carbapenem-resistant Enterobacteriaceae" OR "extreme drug resistance" OR pan-resistance OR "pan resistance" OR pan-resistant OR "pan resistant" OR "Klebsiella pneumonia carbapenemase" OR KPC OR "New Delhi Metallo-beta-lactamase" OR non-susceptibility OR non-susceptible OR intermediate-susceptibility OR intermediate-resistant OR carbapenemase-producing	46,804
#2	"Gram-Negative Bacteria"[Mesh] OR ("gram negative" AND (bacteria OR bacterium OR infection OR isolate OR culture OR pathogen)) OR "Gram-Negative Bacterial Infections"[Mesh] OR klebsiella OR enterobacteriaceae OR enterobacter OR serratia OR escherichia OR citrobacter	866,366
#3	#1 AND #2	10,144
#4	"blood stream infections" OR "Bacteremia"[Mesh] OR bacteremia OR "Intraabdominal Infections"[Mesh] OR "complicated intra-abdominal infection" OR "intraabdominal infection" OR "complicated intraabdominal infection" OR "Urinary Tract Infections"[Mesh] OR "complicated urinary tract infection" OR "urinary tract infection" OR UTI OR "Pneumonia, Bacterial" [Mesh] OR "bacterial pneumonia" OR "hospital-acquired bacterial pneumonia" OR "healthcare-associated bacterial pneumonia" OR "ventilator-associated bacterial pneumonia"	138,374
#5	#3 AND #4	1084
#6	#5 limited to humans, English	858
#7	#6 published since January 1, 1994	839
#8	Guideline [pt] OR "practice guideline"[pt] OR Letter[pt] OR editorial[pt] OR review[pt] OR news[pt] OR comment[pt] OR "case reports"[pt] OR "in vitro" [pt]	5,096,041
#9	#7 NOT #8	585

Embase

Search Number	Search Algorithm	Hits
#1	'multidrug resistant' OR 'multidrug resistance'/exp OR 'multidrug resistance' OR 'multi-drug resistant' OR 'multi-drug resistance' OR 'multi drug resistant' OR 'multi drug resistance' OR mdr OR 'carbapenem-resistant enterobacteriaceae'/exp OR 'carbapenem-resistant enterobacteriaceae' OR 'extreme drug resistance' OR 'pan resistance' OR 'pan resistant' OR 'klebsiella pneumonia carbapenemase' OR kpc OR 'new delhi metallo-beta-lactamase' OR non-susceptible OR intermediate-susceptibility OR intermediate-resistant OR carbapenemase-producing	78,093
#2	'gram negative' OR ('gram negative' AND (bacteria OR bacterium OR infection OR isolate OR culture OR pathogen)) OR 'gram negative bacterium'/exp OR 'gram negative sepsis'/exp OR 'gram negative infection'/exp OR pseudomonas OR klebsiella OR enterobacteriaceae OR enterobacter OR serratia OR escherichia OR citrobacter	778,405
#3	#1 AND #2	16,136
#4	'blood stream infections' OR 'bacteremia'/exp OR bacteremia OR 'abdominal infection'/exp OR 'intraabdominal infection' OR 'complicated intraabdominal infection' OR 'urinary tract infection'/exp OR 'complicated urinary tract infection' OR 'urinary tract infection' OR UTI OR 'bacterial pneumonia'/exp OR 'bacterial pneumonia' OR 'hospital-acquired bacterial pneumonia' OR 'healthcare-associated bacterial pneumonia' OR 'ventilator-associated bacterial pneumonia'	154,058
#5	#3 AND #4	2390
#6	#5 limited to humans, English, articles and articles in-press	1032
#7	#6 published since January 1, 1994	1025
#8	[editorial]/lim OR [erratum]/lim OR [letter]/lim OR [note]/lim OR [review]/lim OR 'case report'/de OR 'clinical protocol'/de OR 'letter':it OR 'editorial':it OR 'review':it OR 'practice guidelines' OR 'in vitro study'	6,883,23 2
#9	#7 NOT #8	851

Cochrane Databases

Search Number	Search Algorithm	Hits
#1	"multidrug resistant" OR "multidrug resistance" OR "multi-drug resistant" OR "multi-drug resistance" OR "multi drug resistant" OR "multi drug resistance" OR MDR OR "Carbapenem-resistant Enterobacteriaceae" OR "extreme drug resistance" OR pan-resistance OR "pan resistance" OR pan-resistant OR "pan resistant" OR "Klebsiella pneumonia carbapenemase" OR KPC OR "New Delhi Metallo-beta-lactamase" OR non-susceptible OR intermediate-susceptibility OR intermediate-resistant OR carbapenemase-producing	942
#2	("gram negative" AND (bacteria OR bacterium OR infection OR isolate OR culture OR pathogen)) OR pseudomonas OR klebsiella OR enterobacteriaceae OR enterobacter OR serratia OR escherichia OR citrobacter	5121
#3	MeSH descriptor: [Gram-Negative Bacteria] explode all trees	5681
#4	MeSH descriptor: [Gram-Negative Bacterial Infections] explode all trees	5801
#5	#1 AND (#2 OR #3 OR #4)	111
#6	MeSH descriptor: [Bacteremia] explode all trees	757
#7	MeSH descriptor: [Intraabdominal Infections] explode all trees	949
#8	MeSH descriptor: [Urinary Tract Infections] explode all trees	2081
#9	MeSH descriptor: [Pneumonia, Bacterial] explode all trees	689
#10	"blood stream infections" OR bacteremia OR "complicated intraabdominal infection" OR "intraabdominal infection" OR "complicated intraabdominal infection" OR "complicated urinary tract infection" OR UTI OR "urinary tract infection" OR "bacterial pneumonia" OR "hospital-acquired bacterial pneumonia" OR "healthcare-associated bacterial pneumonia" OR "ventilator-associated bacterial pneumonia"	4579
#11	#6 OR #7 OR #8 OR #9 OR #10	7407
#12	#5 AND #11	20
#13	#12 NOT reviews	13
#14	#13 Limited to English Studies Published since 1994	12

Supplementary File 2. Data Elements for Extraction

Study Design Characteristics	Patient Characteristics	Treatment Characteristics	Outcomes
<ul style="list-style-type: none"> • Study design • Trial name or lead institution • Sponsor • Sponsor type • Sample size • Geographic location • Patient inclusion criteria • Patient exclusion criteria • Study duration • Reported study limitations 	<ul style="list-style-type: none"> • Number of patients enrolled/randomized • Patients evaluated at baseline • Proportion of males • Age: median, range • Type of infection • GN pathogen(s) • APACHE II score • Proportion of patients currently in the ICU • Proportion of patients with <ul style="list-style-type: none"> – Prior ICU stays – Prior surgery – Prior hospitalizations – CVC at isolate time – Mechanical ventilation – Prior antibiotics – Number of prior exposures – Exposure to specific drug classes, including but not limited to carbapenems and colistins – Compromised immune systems – Neutropenia – RA – ESRD/dialysis – Prior complex surgery 	<ul style="list-style-type: none"> • Methods for use of empirical antibiotics • Type of empirical antibiotics • Appropriateness of drug at culture (susceptibility reporting) • Time window for determining susceptibility • Treatments received after culture • Antibiotic type(s) • Dose • Route of administration • Treatment schedule • Total treatment duration • Mono- or combination therapy for the following treatments: <ul style="list-style-type: none"> – Tigecycline – Aminoglycosides – Carbapenems – Polymyxins • Time to appropriate therapy • Instances and timing of treatment switching 	<ul style="list-style-type: none"> • Number of patients evaluated at follow-up for endpoints • Number of patients reported with the following events <ul style="list-style-type: none"> • Time point • Overall mortality • Infection-related mortality • In-hospital mortality • Mortality within 14 days • Mortality within 30 days • Reinfection • Readmission • Clinical cure • Microbiologic cure • Improvement • Emergence of resistance • Length of hospital stay • Length of ICU stay • Economic outcomes • Cost of treatment • Total cost of hospitalization • Cost of readmission • Other costs

CVC=central venous catheter; ESRD=end-stage renal disease; GN=gram-negative;

ICU=intensive care unit; RA=rheumatoid arthritis.