Dirençli Bakteri Yayılımının Önlenmesinde Laboratuvarın Rolü

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Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji AD

Antonie Philips van Leeuwenhoek
(Hollanda, 1632 - 1723)

AMERICAN SOCIETY FOR MICROBIOLOGY | Clinical Microbiology Reviews®

Antimicrobial Stewardship: How the Microbiology Laboratory Can Right the Ship

Philippe Morency-Potvin,[a,b,c] David N. Schwartz,[a,b] Robert A. Weinstein[a,b]

Clinical microbiology is a relatively new science. Van Leeuwenhoek, considered "the father of microbiology," wrote his first letters on microscopy studies in the 17th century (1), but the work by Pasteur and Koch (2), among others, that led to clinical advances in the prevention and management of infectious diseases (ID) and associated improvements of the human condition (3), was not performed until the late 19th century. Once incurable and lethal infections have since become readily diagnosed and easily treatable, contributing to today's lofty expectations of modern medicine in which unsuccessful treatment of infections is considered a major failure.

Clin Microbiol Rev 2017; 30: 381-407

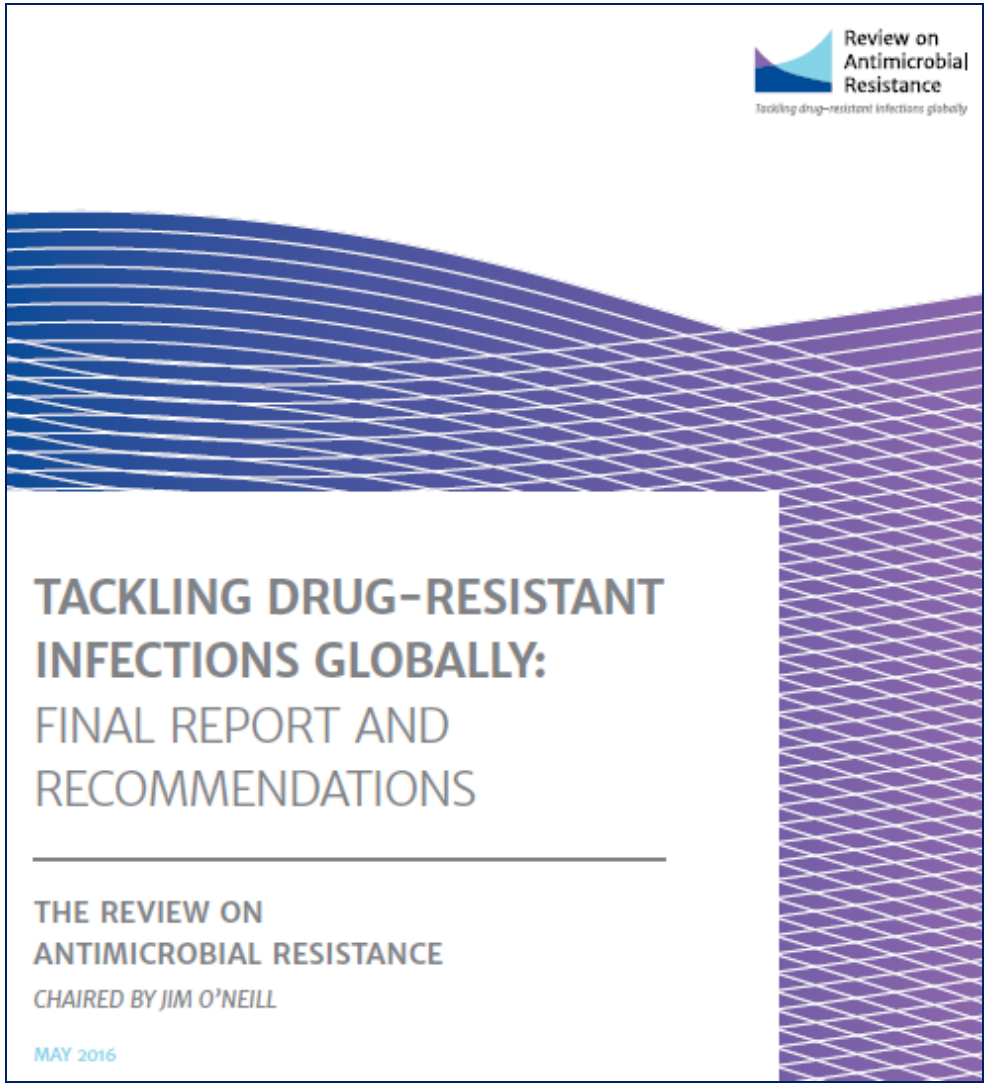
Hans Christian Joachim Gram
Danimarka, 1853 -1938

"Makaleyi paylaşmama rağmen yöntem pek mükkemmel değil ve kusurları var ama sizin belki yöntemi geliştirip kullanabilmenizi umut ettiğim için makaleyi paylaştım.” (Yıl: 1884)

Sunum Planı

- Direnç oranlarında son durum
- Direncin önlenmesine yönelik stratejiler: AMY prg...vb
- **Laboratuvarın Rolü**
  - Hızlı tanı, direnç belirleme yöntemleri
  - Aktif sürveyans
  - Antimikrobiyal direnç verilerinin paylaşılması: Kümülatif/Tabakalı antibiyogram..vb
  - Salgın analizi
  - Eğitim

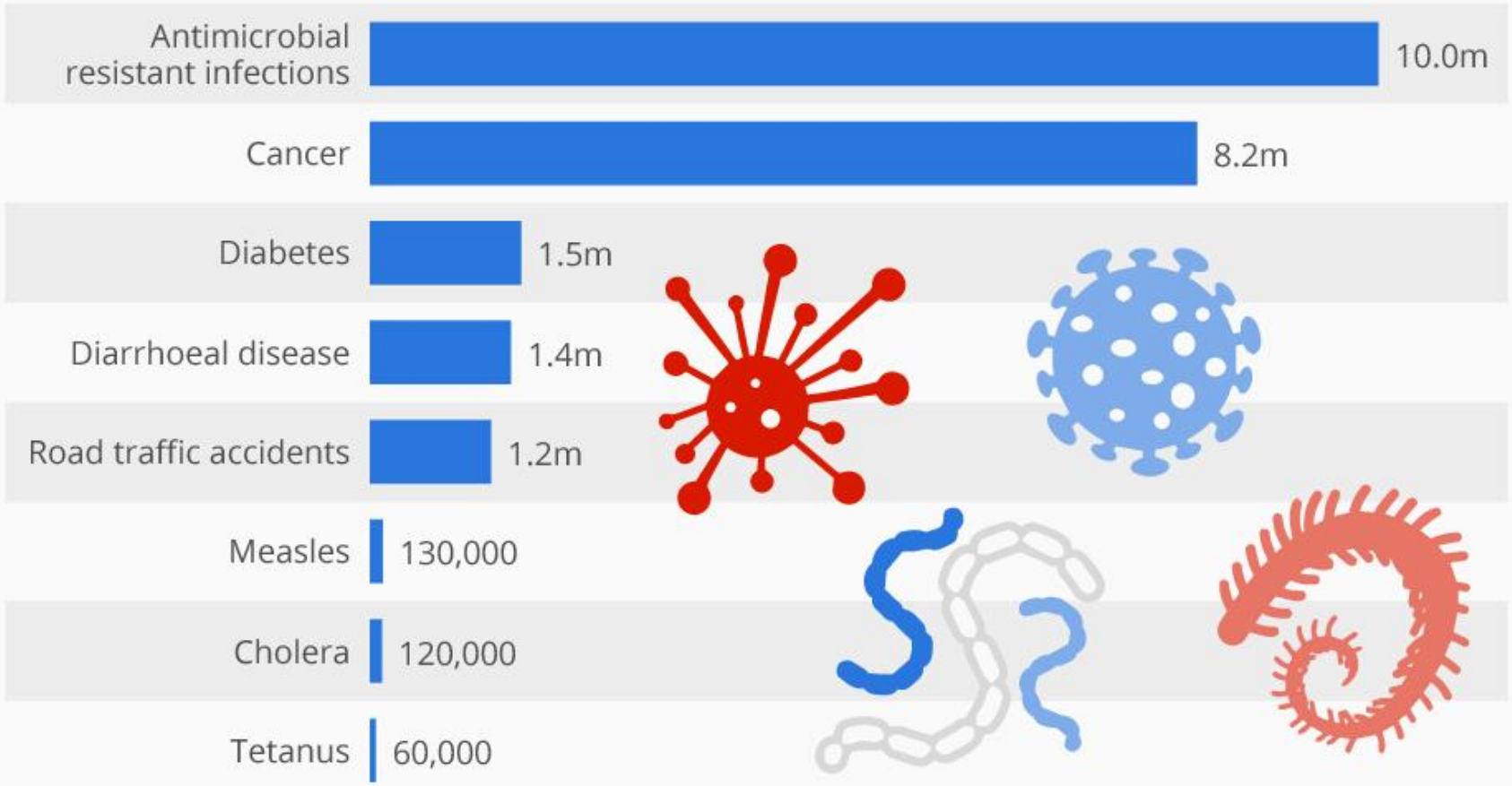
Direnç oranlarında son durum


Review on Antimicrobial Resistance
Tackling drug-resistant infections globally
TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY:
FINAL REPORT AND RECOMMENDATIONS
THE REVIEW ON ANTIMICROBIAL RESISTANCE
CHAIRED BY JIM O'NEILL
MAY 2016


IF NOT TACKLED, RISING AMR COULD HAVE A DEVASTATING IMPACT
00:00:03
By 2050, the death toll could be a staggering
one person every three seconds
if AMR is not tackled now.
Source: Review's own analysis.
Review on Antimicrobial Resistance

Deaths From Drug-Resistant Infections Set To Skyrocket

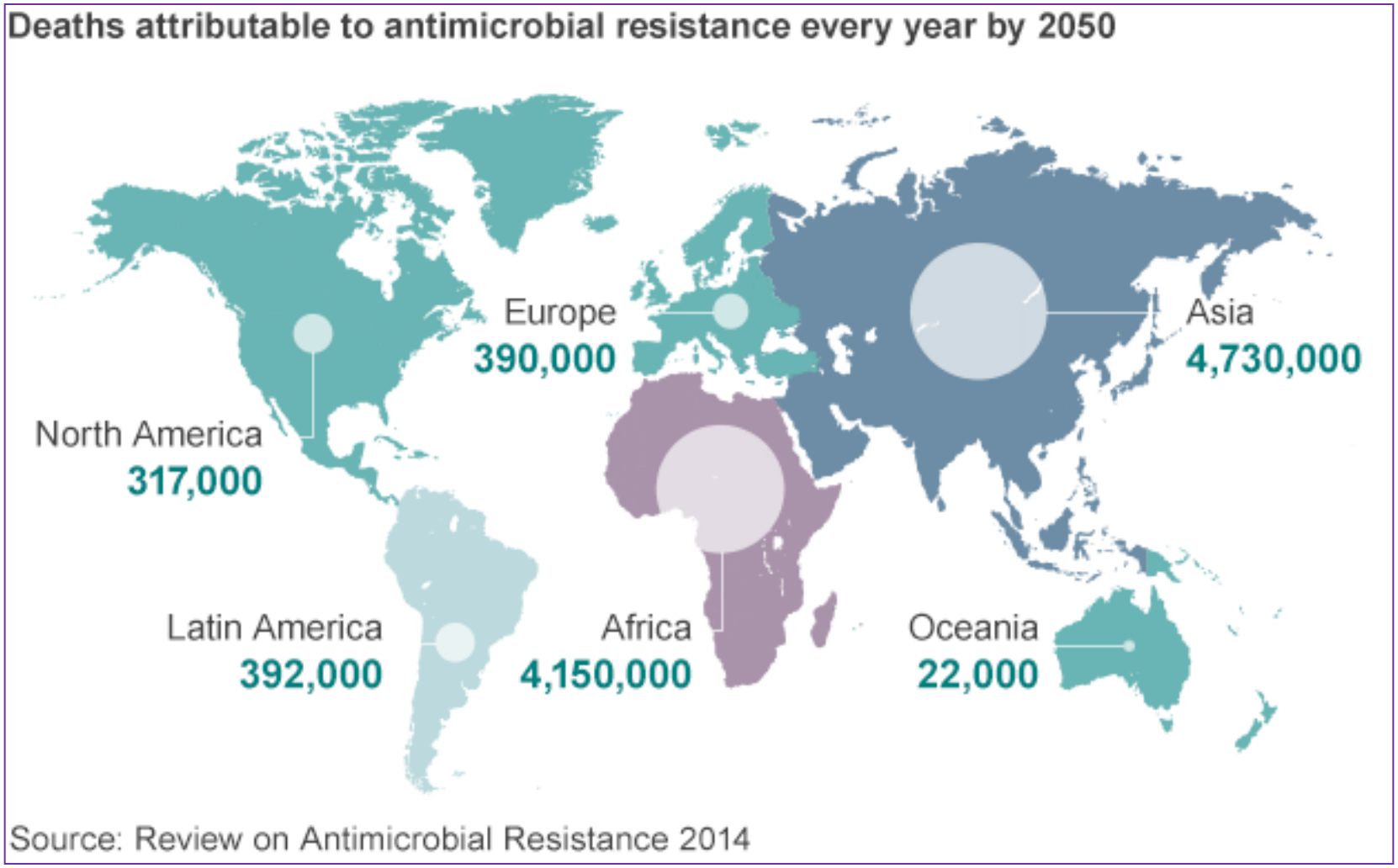
Deaths from antimicrobial resistant infections and other causes in 2050

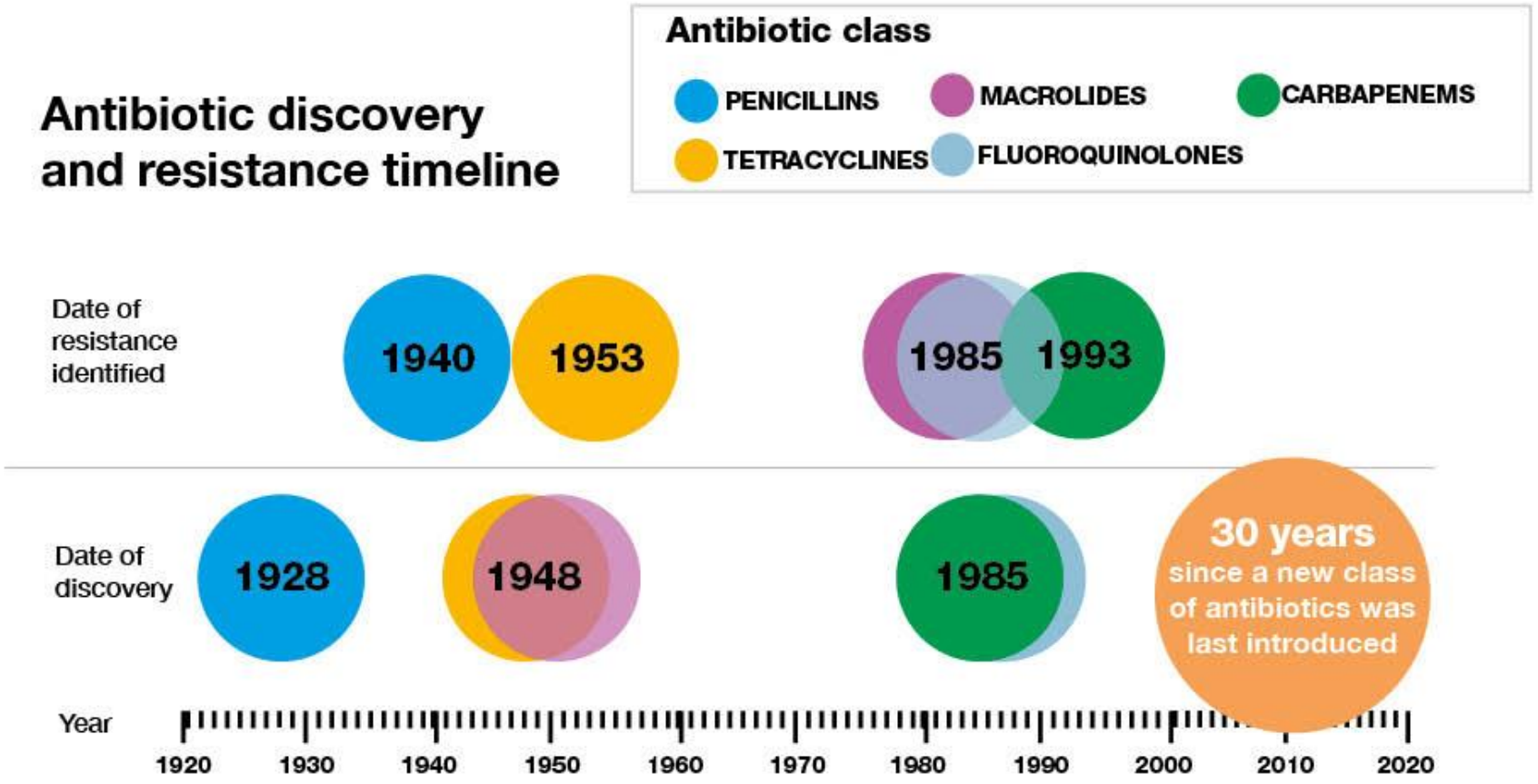


@StatistaCharts Source: Review on Antimicrobial Resistance

statista

Direnç nedeniyle yıllık ölen kişi sayısı: 10 milyon olacak!




Antibiotic discovery and resistance timeline
Antibiotic class
PENICILLINS
MACROLIDES
CARBAPENEMS
TETRACYCLINES
FLUOROQUINOLONES
Date of resistance identified
1940
1953
1985
1993
Date of discovery
1928
1948
1985
30 years
since a new class of antibiotics was last introduced
Year
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020

WHO PRIORITY PATHOGENS LIST FOR R&D OF NEW ANTIBIOTICS

Priority 1: CRITICAL#

Acinetobacter baumannii, carbapenem-resistant

Pseudomonas aeruginosa, carbapenem-resistant

Enterobacteriaceae*, carbapenem-resistant, 3rd generation cephalosporin-resistant

Priority 2: HIGH

Enterococcus faecium, vancomycin-resistant

Staphylococcus aureus, methicillin-resistant, vancomycin intermediate and resistant

Helicobacter pylori, clarithromycin-resistant

Campylobacter, fluoroquinolone-resistant

Salmonella spp., fluoroquinolone-resistant

Neisseria gonorrhoeae, 3rd generation cephalosporin-resistant, fluoroquinolone-resistant

Priority 3: MEDIUM

Streptococcus pneumoniae, penicillin-non-susceptible

Haemophilus influenzae, ampicillin-resistant

Shigella spp., fluoroquinolone-resistant

CAESAR'a gönderilen Türkiye verisi - Ulusal Antibiyotik Direnç Oranları (2013-2015)

	E. coli			*K. pneumoniae*		
Antibiyotik sınıfı	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
Aminopenisilinler (R)	%67	%76	%78	UD	UD	UD
3. kuşak sefalosporinler (R)	%44	%29	%28	%56	%45	%44
3. kuşak sefalosporinler (I+R)	%45	%47	%48	%59	%42	%48
Aminoglikozitler (R)	%22	%48	%49	%30	%48	%52
Florokinolonlar (R)	%41	%36	%51	%34	%52	%68
Florokinolonlar (I+R)	%42	%39	%53	%39	%61	%70
Karbapenemler (R)	%4	%1	%2	%11	%28	%30
Karbapenemler (I+R)	%5	%2	%5	%15	%31	%35
Çok ilaca direnç (R)	-	%14	%16	-	%20	%32

Türkiye'nin 3 Yıllık CAESAR Verisi

CAESAR'a gönderilen Türkiye verisi - Ulusal Antibiyotik Direnç Oranları (2013-2015)

	P. aeruginosa			*Acinetobacter* spp.		
Antibiyotik sınıfı	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
Aminoglikozitler (R)	%19	%18	%17	-	%74	%80
Florokinolonlar (R)	%22	%19	%24	-	%89	%89
Piperasilin-tazobaktam (R)	%27	%21	%30	UD	UD	UD
Seftazidim (R)	%26	%19	%24	UD	UD	UD
Karbapenemler (R)	%33	%24	%32	-	%89	%89
Karbapenemler (I+R)	%36	%30	%37	-	%90	%90
Çok ilaca direnç (R)	-	%17	%21	-	%66	%77

Türkiye'nin 3 Yıllık CAESAR Verisi

CAESAR'a gönderilen Türkiye verisi - Ulusal Antibiyotik Direnç Oranları (2013-2015)

	S. pneumoniae		
Antibiyotik sınıfı	**2013**	**2014**	**2015**
Penisilinler (R)	%54	%48	%55
Penisilinler (I+R)	%55	%48	%55
Makrolidler (R)	%42	%42	%36
Makrolidler (I+R)	%42	%43	%36
3. kuşak sefalosporinler (R)	%5	%8	%10
3. kuşak sefalosporinler (I+R)	%19	%25	%25
Florokinolonlar (R)	%0	%22	%8
Çok ilaca direnç (R)	-	%24	%11

Türkiye'nin 3 Yıllık CAESAR Verisi

Antimikrobiyal Yönetim (AMY) Programları

Antimikrobiyal Yönetim Rehberi Yayımlayan Ülkeler

- ABD
- Almanya
- Hollanda
- Fransa
- İrlanda
- İngiltere
- İspanya
- …

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,a] Sara E. Cosgrove,[2,a] 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]

Clinical Infectious Diseases 2016;62(10):e51–e77

Infection (2016) 44:395–439
DOI 10.1007/s15010-016-0885-z

dgi DEUTSCHE GESELLSCHAFT FÜR INFEKTIOLOGIE e.V.

CrossMark

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]

Infection (2016) 44:395–439

AMY Ekibi (Takımı)

- **Enfeksiyon hastalıkları uzmanı (EHU)**
- Klinik eczacı
- **Klinik mikrobiyoloji uzmanı**
- Bilgi işlem uzmanı
- **Enfeksiyon kontrol hekimi/hemşiresi**
- Hastane epidemiyoloğu

AMY Ekibi Kimlerden Oluşmalı?

1 Requirements

1.1 Availability of a team of ABS experts

The team should consist of at least one infectious diseases physician (or clinician with infectious diseases training) and an experienced clinical pharmacist/hospital pharmacist, as well as a specialist in microbiology, virology and infection epidemiology being responsible for laboratory diagnostic and microbiological consultation; furthermore, the physician

Various ABS programmes describe an FTE of 0.5 per 250 beds as being the minimum staff resources necessary to cost-effectively conduct an ABS programme.

- 250 yatak için 0.5 FTE
- FTE: Full time equivalent

- **Enf. Hast. uzmanı**
- **Klinik eczacı**
- Mirobiyoloji uzmanı
- Epidemiyolog
- Enf. Kontrol doktoru

Infection (2016) 44:395–439

Sunum Planı

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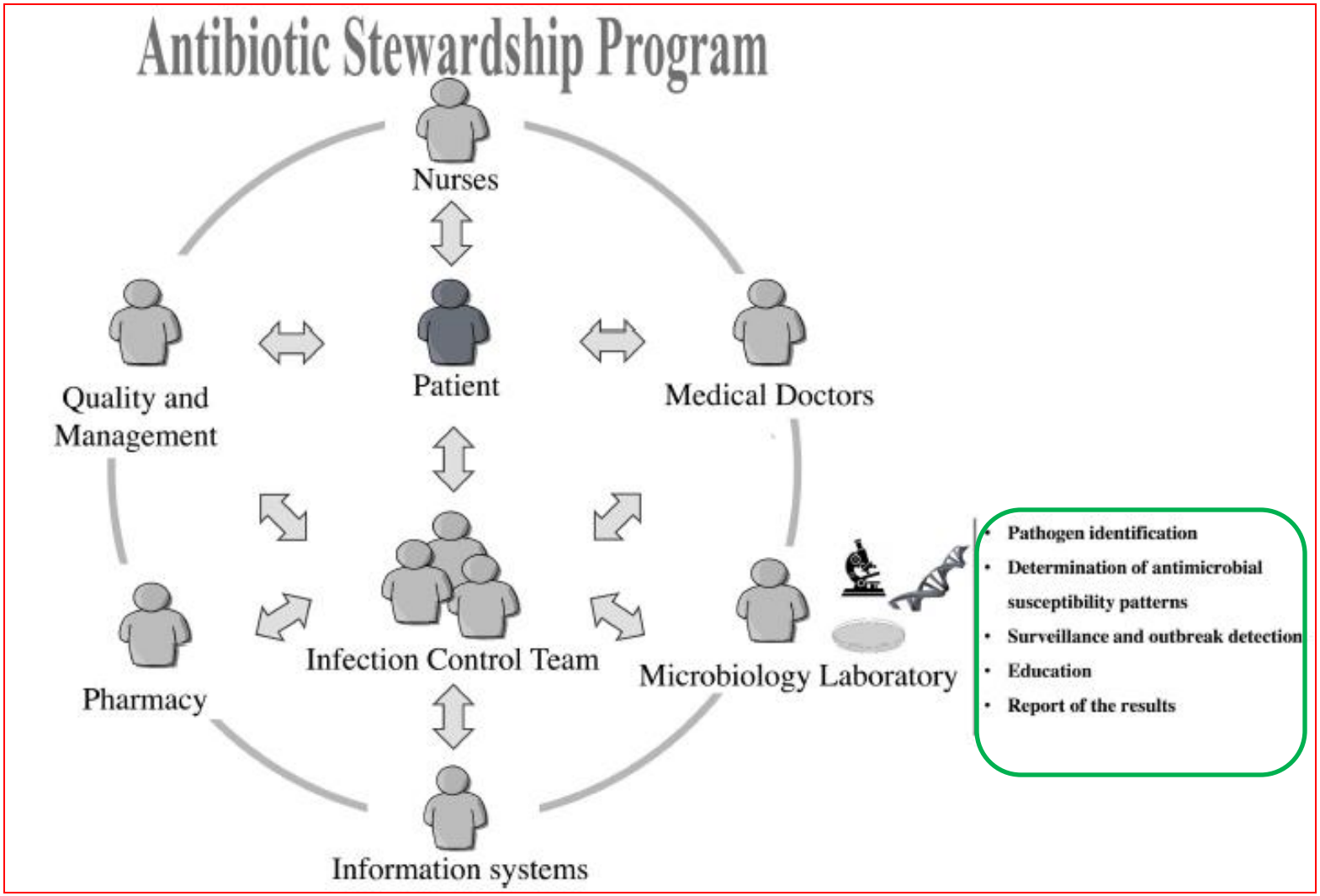
  - Hızlı tanı, direnç belirleme yöntemleri
  - Aktif sürveyans
  - Salgın analizi
  - Eğitim

frontiers in Microbiology

MINI REVIEW
published: 07 June 2016
doi: 10.3389/fmicb.2016.00855



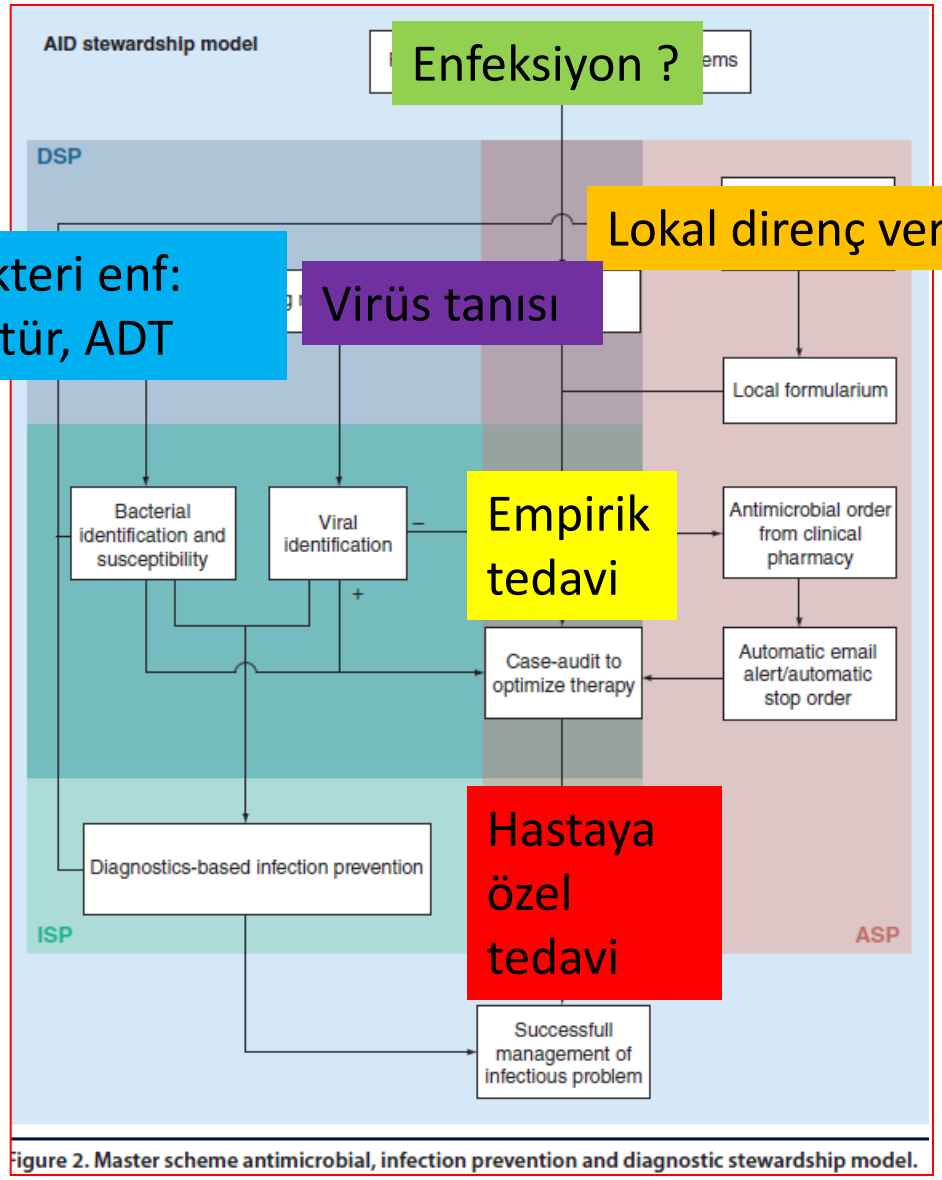


Figure 2. Master scheme antimicrobial, infection prevention and diagnostic stewardship model.

Future Microbiol. (2015) 11(1), 93–102

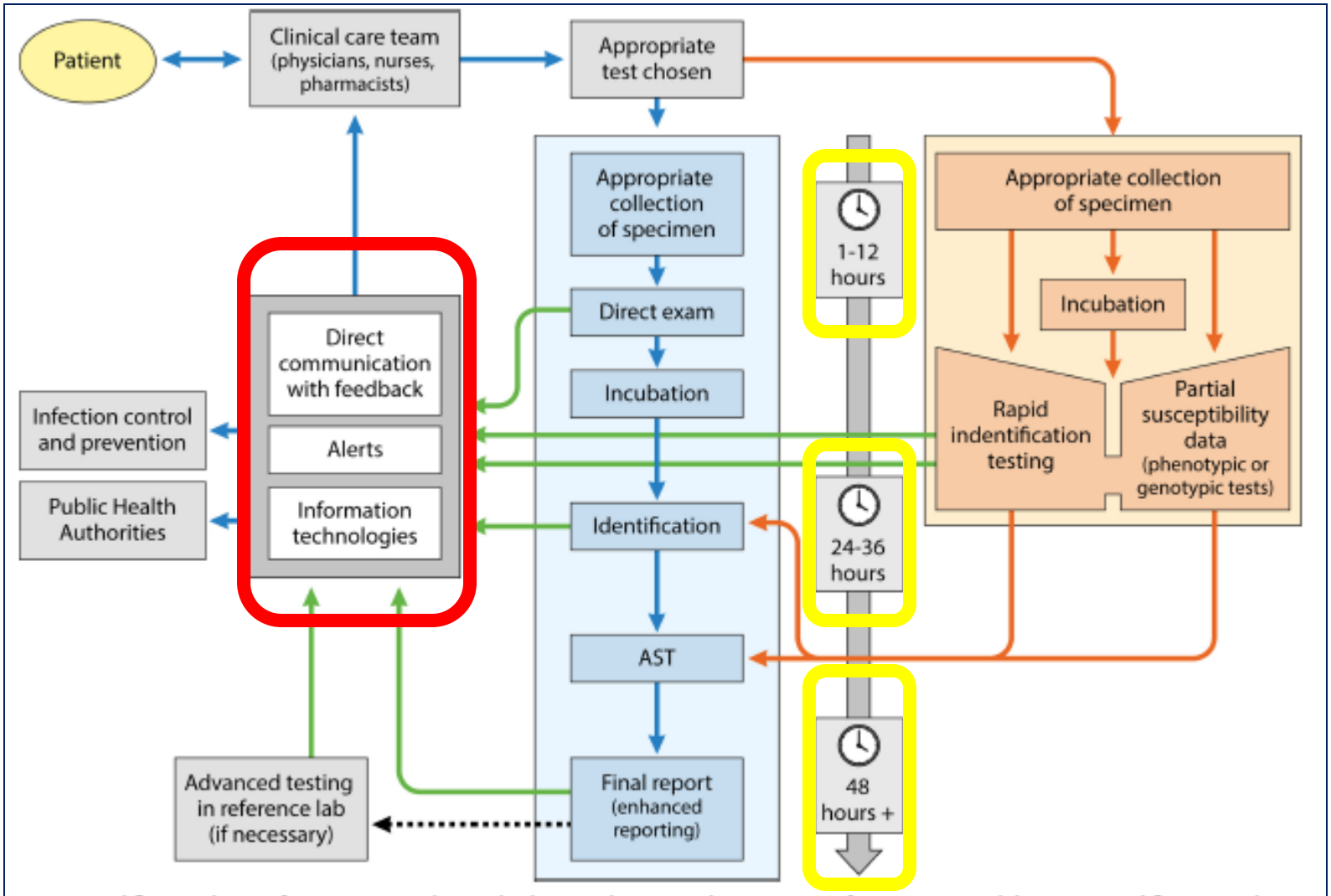


FIG 1 Workflow pathways for conventional microbiology and RDT. Implementation of RDT increases laboratory workflow complexity but can hasten the availability of results. Communication of results is a key factor. Blue arrows represent the conventional microbiology pathway, orange arrows represent the RDT pathway, and green arrows represent opportunities for the laboratory and antimicrobial stewardship teams to improve communication of results. AST, antimicrobial susceptibility testing.

AID Stewardship:'Theragnostic' yaklaşım

Figure 1. Multistakeholder platform of the antimicrobial, infection prevention and diagnostic stewardship model. Pyramid

ASP: Antimicrobial Stewardship Program;
DSP: Diagnostic Stewardship Program;
ISP: Infection Prevention Stewardship Program.

Future Microbiol. (2015) 11(1), 93–102

Clinical Infectious Diseases
IDSA GUIDELINE

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

Microbiology and Laboratory Diagnostics

Tabakalı/Kümülatif antibiyogram

15. We suggest development of stratified antibiograms over solely relying on nonstratified antibiograms to assist ASPs in developing guidelines for empiric therapy *(weak recommendation, low-quality evidence).*

XV. Should ASPs Work With the Microbiology Laboratory to Perform Sele… …eptibility Test Resu…

Kısıtlı antibiyogram

Recommendation

16. We suggest selective and cascade reporting of antibiotics over reporting of all tested antibiotics *(weak recommendation, low-quality evidence).*

Solunum yolu örnekleri için hızlı virüs testleri

17. We suggest the use of rapid viral testing for respiratory pathogens to reduce the use of inappropriate antibiotics *(weak recommendation, low-quality evidence).*

Kan örneklerinde kültürün yanısıra hızlı testlerin yapılması

18. We suggest rapid diagnostic testing in addition to conventional culture and routine reporting on blood specimens if combined with active ASP support and interpretation *(weak recommendation, moderate-quality evidence).*

YBÜ'de prokalsitonin kullanımı

Recommendation

19. In adults in ICUs with suspected infection, we suggest the use of serial PCT measurements as an ASP intervention to decrease antibiotic use *(weak recommendation, moderate-quality evidence).*

Hematolojik maligniteli hastalarda fungal testler

20. In patients with hematologic malignancy at risk of contracting invasive fungal disease (IFD), we suggest incorporating nonculture-based fungal markers in ASP interventions to optimize antifungal use *(weak recommendation, low-quality evidence).*

AMY'nin **6 D**'si ve Laboratuvarın Sorumluluğu

TABLE 1 The six D's of antimicrobial stewardship and associated key roles of microbiology laboratories

The 6 D's of antimicrobial stewardship	Description	Examples of the key roles of microbiology laboratories
Diagnosis	Make and document the right diagnosis	Provide guidance to clinicians in obtaining adequate and significant specimens (e.g., prefer tissues and fluids in adequate volume to swabs) Perform rapid testing for pathogens difficult to identify with standard microbiology (e.g., *Legionella* urine antigen) Perform rapid identification testing of critical specimens (e.g., rapid molecular testing of positive blood cultures) Perform timely biomarker testing (e.g., PCT) as indicated by institutional or professional organization recommendations Promptly send samples to reference laboratories for appropriate tests not performed on site (e.g., *Histoplasma* urine antigen) Advise clinicians about availability of advanced molecular diagnostic (e.g., 16S rRNA) testing for culture-negative critical access tissues (e.g., brain or bone biopsy specimens, cardiac valves) and provide timely access to reference lab testing as clinically appropriate Advise clinicians on the performance characteristics of conventional and emerging RDT methods Discard inadequate specimens (e.g., a urine specimen that has leaked from its transport container, external drains, etc.)
Debridement/ drainage	Drainage of abscesses and removal of necrotic tissue or foreign material when required	Provide guidance for obtaining adequate and significant specimens (e.g., fluids in adequate volume rather than just swabs) Prioritize cultures of specimens from operating rooms and interventional radiology (e.g., prepare slides and inoculate agar with specimens as soon as specimens arrive in the laboratory) Optimize routing and tracing of specimens to the laboratory (e.g., provide logs to trace specimens from the operating room)
Drug	Use the right drug empirically according to suspected or confirmed diagnosis, risk factors for resistant pathogens, allergy, or major side effects	Participate in creating local guidelines for common infectious syndromes Provide, revise, and publicize annual cumulative susceptibility reports to clinicians (e.g., provide tables with local susceptibility patterns) and work with ID physicians to interpret these data, e.g., to update recommended empirical regimens Provide supplementary testing for susceptibility to new drugs when appropriate Use cascade reporting (e.g., do not report carbapenem susceptibility when a pathogen is susceptible to narrower-spectrum drugs) Repeat testing and promptly send to reference laboratory unusual susceptibility profiles (e.g., *S. aureus* resistant to vancomycin) Contact clinicians directly and promptly in unusual cases and provide guidance for testing and therapy (e.g., when carbapenem resistance is suspected in a critical specimens and confirmation testing is pending) Perform surveillance for emerging pathogens and resistance patterns and inform clinicians and public health authorities as appropriate (e.g., reporting to public health and memo to clinicians when multiple multiresistant *Acinetobacter* spp. are identified at one institution)
Dose	Use right dose according to diagnosis, site of infection, or renal or hepatic dysfunction	Collaborate with pharmacists and ID physicians to improve reporting of MICs for dosing based on pharmacokinetic targets
Duration	Use drugs for an appropriate duration	Perform biomarker testing and develop protocols to optimize their use for informing therapy duration as indicated
De-escalation	Reevaluate diagnosis and therapy routinely and de-escalate therapy to narrow-spectrum and/or oral agents when appropriate	Do not report skin contaminants in noncritical specimens and specify when contamination of critical specimens is or is not suspected (e.g., report *S. epidermidis* and other skin commensals exclusively from clinically significant specimens such as blood or prosthetic joints) Leverage opportunities to append clinical guidance to microbiological reports, e.g., preferred drugs, likelihood of polymicrobial infection by specimen source (e.g., urine vs intra-abdominal wound), diagnostic follow-up (e.g., that repeat blood cultures are usually required in cases of candidemia, links to respiratory virus panel results in sputum culture reports)

- Diagnosis
- Debridement/drainage
- Drug
- Dose
- Duration
- De-escalation

Clin Microbiol Rev 2017; 30: 381-407

Kümülatif Antibiyogram

Kümülatif/Tabakalı Antibiyogramlar

XIV. Should ASPs Work With the Microbiology Laboratory to Develop Stratified Antibiograms, Compared With Nonstratified Antibiograms?

Recommendation

15. We suggest development of stratified antibiograms over solely relying on nonstratified antibiograms to assist ASPs in developing guidelines for empiric therapy *(weak recommendation, low-quality evidence).*

Yaşa, hastalığa, birime, örnek türüne... göre antibiyogramlar geliştirilebilir

Clinical Infectious Diseases℠ 2016;62(10):e51–e77

Kümülatif antibiyogram nasıl yapılabilir?
CLSI önerisi

Box 1
The Clinical and Laborato
development

Data should be stratified

- Patient population (inp
- Location (ICU, wards)
- Specimen types (all, blo

Data should include:

- Only species with at lea
- Diagnostic isolates only
- First isolate per patient
- Results only for drugs t

Antibiograms should be generated at least annually

Data from Hindler JF, Stelling J. Analysis and presentation of cumulative antibiograms: a new consensus guideline from the Clinical and Laboratory Standards Institute. Clin Infect Dis 2007;44:867–73.

- Hasta grubu, birim, örnek..vb bazında olabilir
- En az **30 izolat** olan türler alınmalı
- **Hastalık etkeni** olmalı
  Sürveyans örneği OLMAMALI!
- Her bir hastadan izole edilen **ilk** etken olmalı
- Sadece **rutin**de kullanılan ilaçlar için duyarlılık sonucu verilecek
- En az yıllık olmalı

Örnek

Yoğun Bakımlar, İdrar dışı örnek, Gram-negatif bakteri, % duyarlılık

		Penisilin		Sefalosporin		Karbapenem			Aminoglikozid			Florokinolon	Diğer	
Organizma	Sayı	Ampisilin (AMP)	Piperasilin tazobaktam (TZP)	Seftazidim (CAZ)	Sefotaksim (CTX)	Ertapenem (ETP)	İmipenem (IPM)	Meropenem (MEM)	Amikasin (AK)	Gentamisin (GN)	Tobramisin (TOB)	Siprofloksasin (CIP)	Trimetoprim-sülfametaksazol (SXT)	Sefaperazon-sulbaktam (SCF)
A.baumannii	183	R*	3	4		R*	4	6	19	19	61	5	14	8
K.pneumoniae	130	R*		28	25	37	39	40	42	34	32	32	23	
P.aeruginosa	101	R*	68	77		R*	52	58	77	76	56	62	R*	69
E.coli	39	15		54	51	92	92	92	92	54	49	49	44	

R*: doğal direnç

Hızlı Tanı Testleri

Hızlı tanı:

Prokalsitonin, viral antijen testleri, mantarlar için biyobelirteçler, moleküler yöntemler

XVI. Should ASPs Advocate for Use of Rapid Viral Testing for Respiratory Pathogens to Reduce the Use of Inappropriate Antibiotics?

Recommendation

17. We suggest the use of rapid viral testing for respiratory pathogens to reduce the use of inappropriate antibiotics *(weak recommendation, low-quality evidence).*

Comment: Although rapid viral testing has the potential to reduce inappropriate use of antibiotics, results have been inconsistent. Few studies have been performed to assess whether active ASP intervention would improve those results.

XVII. Should ASPs Advocate for Rapid Diagnostic Testing on Blood Specimens to Optimize Antibiotic Therapy and Improve Clinical Outcomes?

Recommendation

18. We suggest rapid diagnostic testing in addition to conventional culture and routine reporting on blood specimens if combined with active ASP support and interpretation *(weak recommendation, moderate-quality evidence).*

XVIII. In Adults in Intensive Care Units (ICUs) With Suspected Infection, Should ASPs Advocate Procalcitonin (PCT) Testing as an Intervention to Decrease Antibiotic Use?

Recommendation

19. In adults in ICUs with suspected infection, we suggest the use of serial PCT measurements as an ASP intervention to decrease antibiotic use *(weak recommendation, moderate-quality evidence).*

XIX. In Patients With Hematologic Malignancy, Should ASPs Advocate for Incorporation of Nonculture-Based Fungal Markers in Interventions to Optimize Antifungal Use?

Recommendation

20. In patients with hematologic malignancy at risk of contracting invasive fungal disease (IFD), we suggest incorporating nonculture-based fungal markers in ASP interventions to optimize antifungal use *(weak recommendation, low-quality evidence).*

Clinical Infectious Diseases™ 2016;62(10):e51–e77

- ABD'de yılda **40** milyon kişi solunum yolu enfeksiyonu nedeniyle antibiyotik alıyor;
  27 milyonu gereksiz!

Review of Rapid Diagnostic Tests Used by Antimicrobial Stewardship Programs

Karri A. Bauer,[1] Katherine K. Perez,[2,3,4] Graeme N. Forrest,[5] and Debra A. Goff[1]

[1]Department of Pharmacy, The Ohio State University Wexner Medical Center, Columbus; Departments of [2]Pharmacy, and [3]Pathology and Genomic Medicine, Houston Methodist Hospital, and [4]Center for Outcomes Research, Houston Methodist Research Institute, Texas; and [5]Division of Infectious Diseases, Portland Veterans Affairs Medical Center, Oregon

Table 1. Rapid Molecular Assays for Detection of Various Organisms

Organism	Detection Time, h	Technology	Manufacturer	Batching	Need for Pure Colony	Automated	CLIA Designation	Trade Name
Gram-positive								
Staphylococcus aureus, CoNS	0.3	PNA QuickFISH	AdvanDx	No	No	No	High complexity	*S. aureus*/CoNS PNA QuickFISH
MRSA	0.1	Immunochromatography	Alere Scarborough, Inc	No	Yes	No	Moderate complexity	Alere PBP2a Culture Colony Test
S. aureus	0.2	Immunochromatography	Alere Scarborough, Inc	No	No	No	Not rated	BinaxNOW *S. aureus*
MSSA, MRSA	20–26	Chromogenic medium	BD	No	Yes	No	High complexity	BBL CHROMagar MRSA II
MRSA	2	PCR	Roche Diagnostics USA	Yes	No	Yes	High complexity	LightCycler MRSA
MSSA, MRSA, CoNS	2	Multiplex PCR	BD GeneOhm	Yes	No	Yes	High complexity	BD GeneOhm Staph SR
MSSA, MRSA, CoNS	1	Multiplex PCR	Cepheid	No	No	Yes	Moderate complexity	Xpert MRSA/SA BC
MSSA, MRSA	1	Multiplex PCR	Cepheid	No	No	Yes	Moderate complexity	Xpert MRSA/SA SSTI
S. aureus, *Staphylococcus epidermidis*	2.5	Multiplex PCR	Nanosphere	No	No	Yes	Moderate complexity	Verigene: BC-GP
Enterococcus faecalis, *Enterococcus faecium*	0.5	PNA QuickFISH	AdvanDx	No	No	No	High complexity	*Enterococcus faecalis*/OE PNA QuickFISH
Clostridium difficile	1	LAMP	Meridian Bioscience	Yes	No	Yes	Moderate complexity	Illumigene *C. difficile*
C. difficile	2	PCR	BD GeneOhm	Yes	No	Yes	Not rated	BD GeneOhm Cdiff Assay
C. difficile	0.5	Multiplex PCR	Cepheid	No	No	Yes	Moderate complexity	Xpert *C. difficile*
C. difficile	0.75	Multiplex PCR	Cepheid	No	No	Yes	Moderate complexity	Xpert *C. difficile*/Epi
C. difficile	3	PCR	Gen-Probe Prodesse	Yes	No	Yes	Not rated	ProGastro Cd Assay
Staphylococcus spp, *Streptococcus* spp, *E. faecalis*, *E. faecium*, *Micrococcus* spp, *Listeria* spp	2.5	Multiplex PCR	Nanosphere	No	No	Yes	Moderate complexity	Verigene: BC-GP

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Table 1 continued.

Organism	Detection Time, h	Technology	Manufacturer	Batching	Need for Pure Colony	Automated	CLIA Designation	Trade Name
Gram-negative								
Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae,	0.5	PNA QuickFISH	AdvanDx	No	No	No	High complexity	GNR Traffic Light PNA QuickFISH
E. coli, K. pneumoniae, Klebsiella oxytoca, P. aeruginosa, Serratia marcescens, Acinetobacter spp, *Proteus* spp, *Citrobacter* spp, *Enterobacter* spp	<2.0	Multiplex PCR	Nanosphere	No	No	Yes	Not rated	Verigene: gram-negative blood culture
Fungal pathogens								
Candida albicans, Candida parapsilosis, Candida tropicalis, Candida glabrata, Candida krusei	1.5	PNA FISH	AdvanDx	Yes	No	No	High complexity	Yeast Traffic Light PNA Fish
Other								
Multiple bacterial, fungal, and viral pathogens	1	Multiplex PCR	BioFire Diagnostics	Yes	No	Yes	Moderate complexity	FilmArray System and panels
Multiple bacterial and fungal pathogens	6 (direct from blood prior to culture)	PCR	Roche Molecular Systems*	Yes	No	Yes	Not rated	LightCycler SeptiFast Test MGRADE
Multiple bacterial and fungal pathogens	0.2	MALDI-TOF MS	Bruker Corporation	No	Yes	Yes	High complexity	MALDI Biotyper CA
Multiple bacterial and fungal pathogens	0.25–1	MALDI-TOF MS	bioMérieux	No	Yes	Yes	High complexity	VITEK MS
Multiple bacterial and fungal pathogens	6–24	Optical	bioMérieux	No	Yes	No	High complexity	VITEK 2

Aktif Sürveyans

ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

Enfeksiyon Kontrol Önlemleri

- El hijyeni
- Aktif sürveyans kültürleri
- Temas önlemleri
- Çevre temizliği
- Antimikrobiyal kullanım yönetimi

Recommendations

Epidemic setting

Strong recommendation: Implement a programme of active screening culture at hospital admission followed by contact precautions to reduce the spread of extended-spectrum β-lactamase-producing Enterobacteriaceae, multidrug-resistant (MDR)-*Klebsiella pneumoniae*, MDR-*Acinetobacter baumannii* (moderate level of evidence); and MDR-*Pseudomonas aeruginosa* (very low level of evidence)

Clin Microbiol Infect 2014; **20 (Suppl. 1)**: 1–55

Kolonizasyonu bilmenin “yararları”

- Enfeksiyon kontrol önlemleri ile bulaşı azaltmak; kolonizasyon enfeksiyondan 1-6 gün önce belirlenebiliyor
- Empirik antibiyotik tedavisinin belirlenmesine katkı sağlar
- Enfeksiyon kontrol önlemlerinin etkinliğini değerlendirmeye yardımcı olur

Aktif sürveyans

Hangi bakteriler? Hangi vücut bölgeleri?

Hangi sıklıkta? Nasıl?

Hangi bakteriler? - I

- **Karbapeneme dirençli *Acinetobacter* spp.**
- Karbapeneme dirençli *Pseudomonas aeruginosa*
- **Karbapeneme dirençli enterik bakteriler**

Hangi bakteriler? - II

- *Stenotrophomonas maltophilia*
- *Burkholderia cepacia*

Salgın durumu dışında gerek yok gibi görünüyor!

ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

Clin Microbiol Infect 2014; **20 (Suppl. 1)**: 1–55

Niçin *Acinetobacter*?

contamination with MDR-*A. baumannii* has been observed in 11–12% of HCWs when caring for colonized patients [93,103]. In the same studies, MDR-*P. aeruginosa* contaminated HCWs gowns less frequently, i.e. 4–5% [93,103]. Since not all

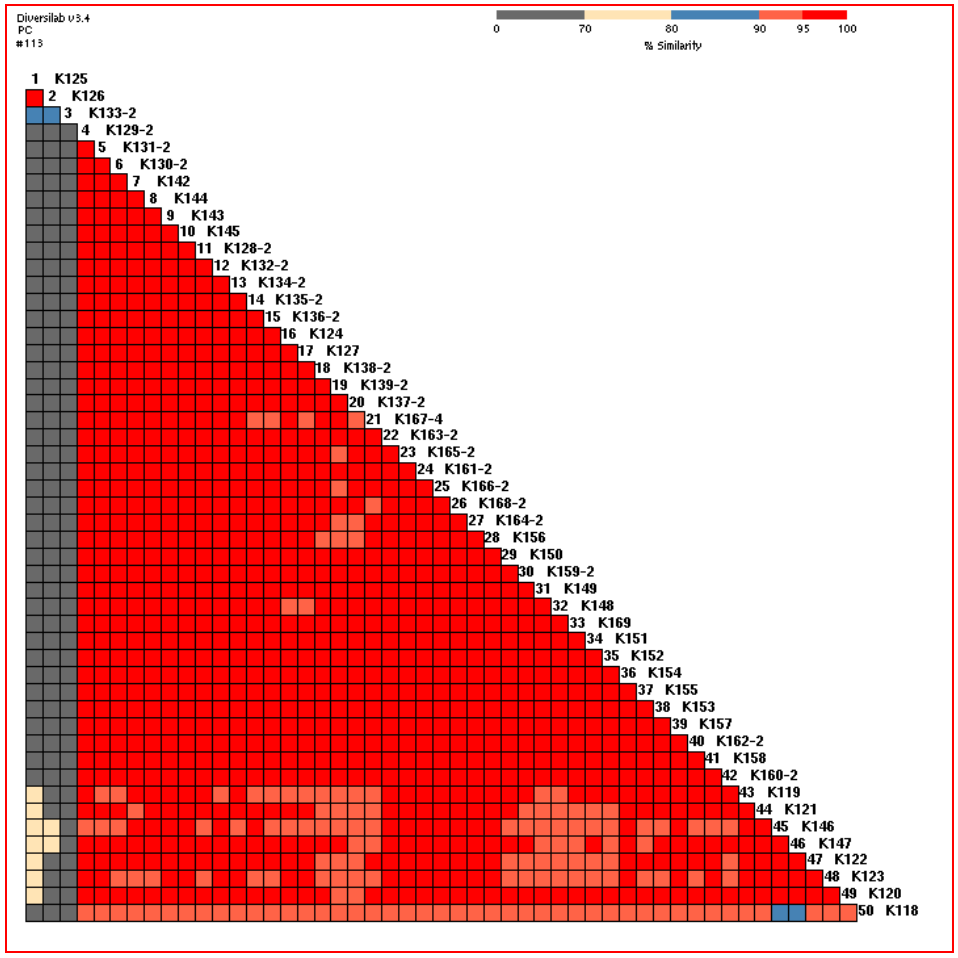
varied depending on the microbe. Morgan *et al.* evaluated about 200 opportunities of staff providing assistance to patients colonized or infected with MDR-*A. baumannii* and MDR-*P. aeruginosa*. They observed hand contamination in 4.5% of HCWs assisting patients with MDR-*A. baumannii*, compared with 0.7% of those caring for patients with MDR-*P. aeruginosa*. Risk factors for HCWs' hand contam-

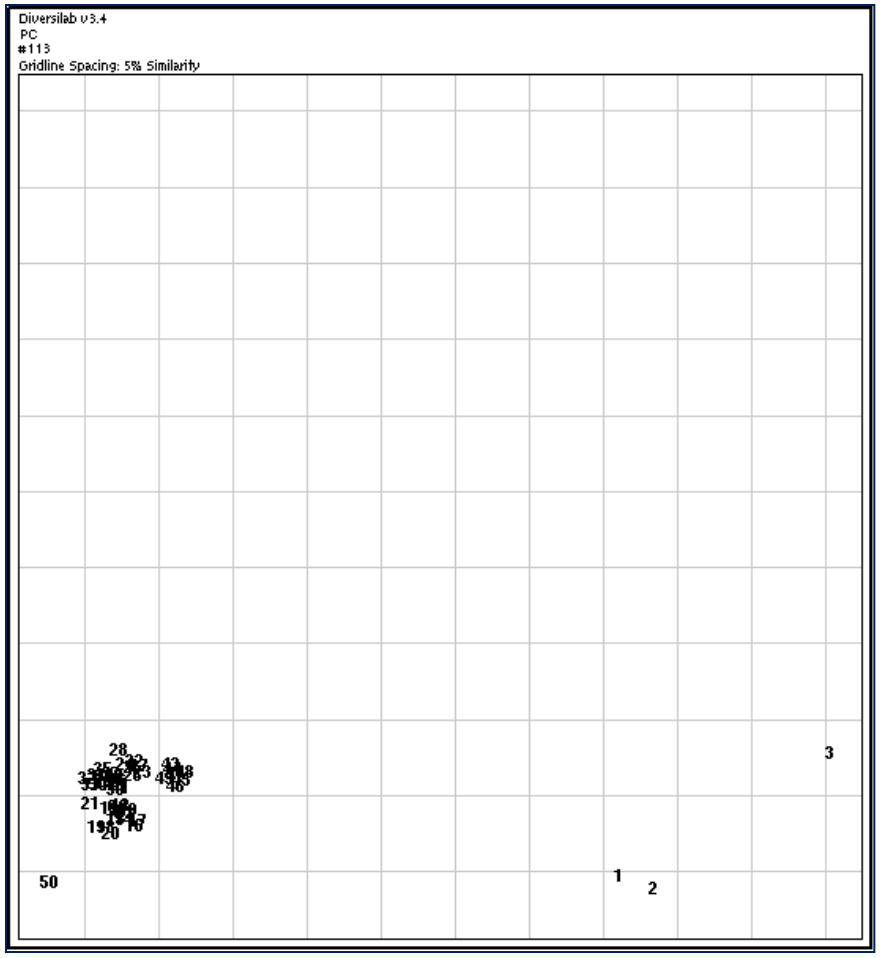
Acinetobacter daha kolay bulaşıyor!

Clin Microbiol Infect 2014; **20 (Suppl. 1)**: 1–55

BAŞKENT HASTANESİ- ANESTEZİ YBÜ- 2013

ÇİD-Acinetobacter baumannii (N=50)





Ne zaman örnek alalım?

- Hastaneye yattığı zaman
- Haftada bir kez ?
- Haftada iki kez ?

Net bir öneri YOK!

Nerelerden örnek alalım?

- Burun sürüntüsü
- Boğaz sürüntüsü
- Balgam
- Aksiller
- İnguinal
- Umblikal
- Alın
- El tırnak yatağı
- Ayak tırnak yatağı
- Perianal sürüntü / dışkı kültürü
- Entübe ise derin trakeal aspirat
- Üriner sondası varsa idrar kültürü
- Yara / dren var ise örnek

Net bir öneri YOK!

Aktif Sürveyans

- ‘Birlikte’ çalışmak önemli
- Sürveyans günü belirlenmeli
- Hangi bakterilerin sürveyansının yapılacağı belirlenmeli
- Sonuçların kime, nasıl bildirileceği belirlenmeli
- Tetkik tahakkukunun ve raporlamanın nasıl yapılacağı belirlenmeli

Salgın Analizi

TABLE 1. Steps in nosocomial outbreak investigation and the role of the laboratory at each step[a]

Investigative step	
Recognize problem	Surveil… notif… possi…
Establish case definition	Assist …
Confirm cases	Perfor…
Complete case finding	Charac… impo…
Establish background rate of disease and compare to attack rate during suspected outbreak	Provide… units… basel…
Characterize outbreak (descriptive epidemiology)	Perfor… deter… path…
Generate hypotheses about causation: reservoir, mode of spread, vector	Perfor… epid…
Case-control study or cohort study	
Institute control measures	Adjust …
Ongoing surveillance to document efficacy of control measures	Maintain surveillance and early-warning function of the laboratory

- Salgının saptanması
- Etkenin belirlenmesi
- Kaynağın belirlenmesi
- Yaygınlığın belirlenmesi
- Salgının durduğunun belirlenmesi
- ……

JOURNAL OF CLINICAL MICROBIOLOGY, Sept. 2011, p. S57–S60

Mikrobiyoloji Laboratuvarı

TABLE 3 Essential, achievable, and aspirational antimicrobial stewardship activities for the microbiology laboratory

Stewardship activity level	Description[a]
Essential	Provide timely, reliable, and reproducible identification and antimicrobial susceptibility results
	Actively participate in antimicrobial stewardship committee or work group
	Collaborate in educating local health care workers on microbiology issues that impact treatment and microbial resistance
	Promptly report unusual patterns of resistance, test supplementary agents, and provide advice on therapy for patients awaiting results
	Optimize communication of critical test result values and alert systems
	Provide, revise, and publicize annual CASR consistent with CLSI standards
	Provide guidance for adequate collection of microbiology specimens
	Develop alert systems for specific multidrug-resistant organisms
	Use cascade or selective reporting
	Collaborate with ID physicians and pharmacists on updating methods for susceptibility testing
Achievable	Provide specific comments, drafted in collaboration with antimicrobial stewardship team, to guide therapy on microbiology reports
	Participate in establishing protocols on biomarker use
	Use rapid diagnostic and antimicrobial susceptibility technologies for targeted critical specimen types
	Use rapid-detection platform for respiratory pathogens
	Guide optimal use of diagnostic assays for *C. difficile*
	Develop direct communication pathways with prescribers to help interpret RDT results and discrepant results
	Provide guidelines for the interpretation of microbiology test results
	Collaborate in audit and feedback of antimicrobial therapies for specific pathogens or syndromes where the role of lab test values is critical (e.g., *C. difficile*, bloodstream infections)
Aspirational	Evaluate feasibility of and, where possible, perform testing for susceptibility to new drugs
	Broaden use of validated rapid diagnostic and rapid antimicrobial susceptibility testing
	Participate in education of patients and local population on antimicrobial resistance
	Participate in national and regional surveillance systems
	Promote appropriate use of point-of-care microbiological tests, when available

Temel

'Yapılabilir'

İsteğe bağlı


Türk Mikrobiyoloji Cemiyeti
Kelime Giriniz
Kullanıcı Adı
Giriş
şifremi unuttum
yeni üyelik
Ana Sayfa
Yeni Üyelik
Cemiyet
Yayınlar
Geçmiş Kongreler/Sunumlar
Çalışma Grupları
Burslar
EUCAST Dokümanları
Forum
Etkinlikler
Bilimsel Materyaller
Haber/Duyuru Arşivi
İlgili Linkler
Fotoğraf Galerisi
Mali Bilgiler
İletişim
Türk Mikrobiyoloji Cemiyeti Web Sitesi
BD
'nin koşulsuz katkılarıyla hazırlanmıştır.
http://www.bd.com/tr/
Kan Kültürü
EUCAST Dokümanları
Antimikrobiyal veriliş yolu, doz fiyat ve TR'de bulunma durumu
Antimikrobik Duyarlılık Testlerinin EUCAST Sınır Değerleri ile Uygulanmasına Geçişi Kolaylaştıracak Kontrol Listesi
EUCAST Disk Difüzyon Testi Değerlendirme Kılavuzu
EUCAST Disk Difüzyon Testi El Kitabı
EUCAST Disk Difüzyon Testi Slayt Gösterisi
EUCAST Disk Difüzyon Testi ve Sıvı Mikrodilüsyon Yöntemi ile MİK Değerlerinin Belirlenmesi için Besiyeri Hazırlanması
EUCAST Kalite Kontrol Tabloları
EUCAST Klinik Sınır Değer Tablosu (pdf dosyası)
EUCAST Klinik Sınır Değer Tablosu (excel dosyası)
EUCAST Özel Direnç Mekanizmaları
EUCAST Uzman Kuralları
EUCAST Edef 7.2
EUCAST Edef 9.2
CLSI ve EUCAST'ın Karşılaştırılması
Kısıtlı Antibiyogram Ön Yazı
TMC-ADTS Kısıtlı Bildirim Tablosu
Güncellemeler için:http://www.eucast.org/
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