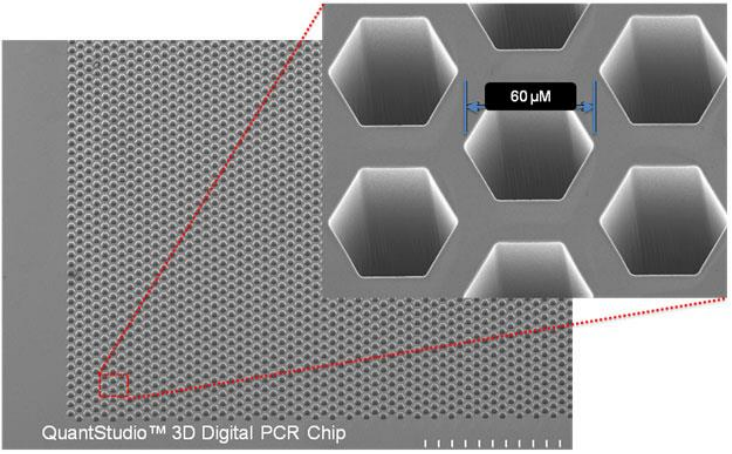
Hastanede Moleküler Testler ile Tanısal Yönetim

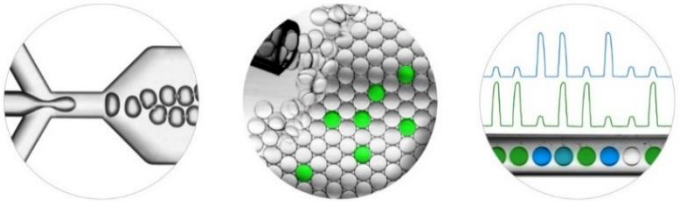
Mert Ahmet Kuşkucu PhD

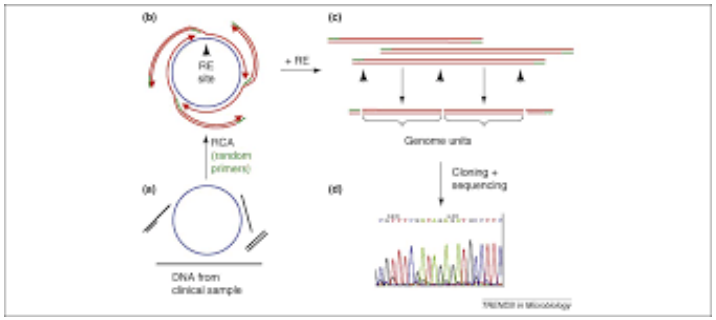
İstanbul Üniversitesi, Cerrahpaşa Tıp Fakültesi, Tıbbi Mikrobiyoloji Anabilim Dalı

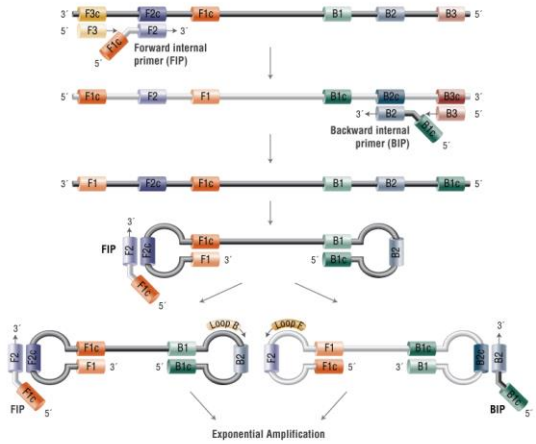
Mutfakta Neler Oluyor?

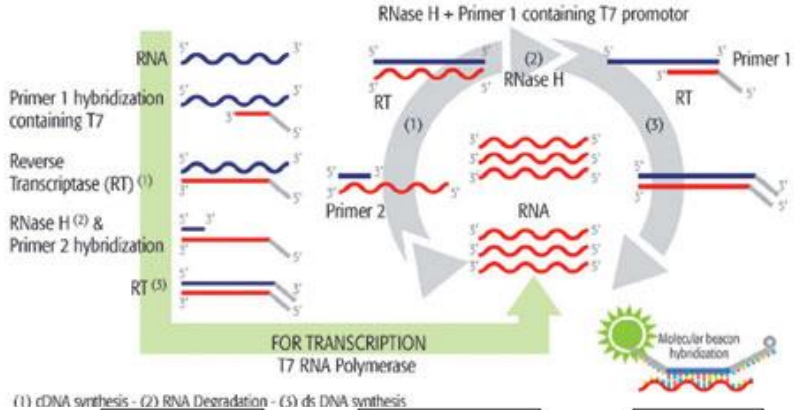


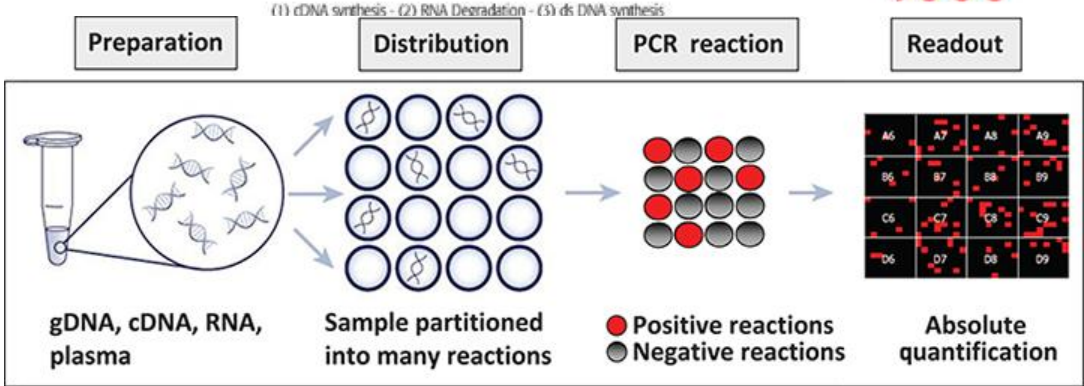
- PCR
- Real Time PCR
- Multiplex Testler
- LAMP
- TMA
- RPA
- RCA
- LCR



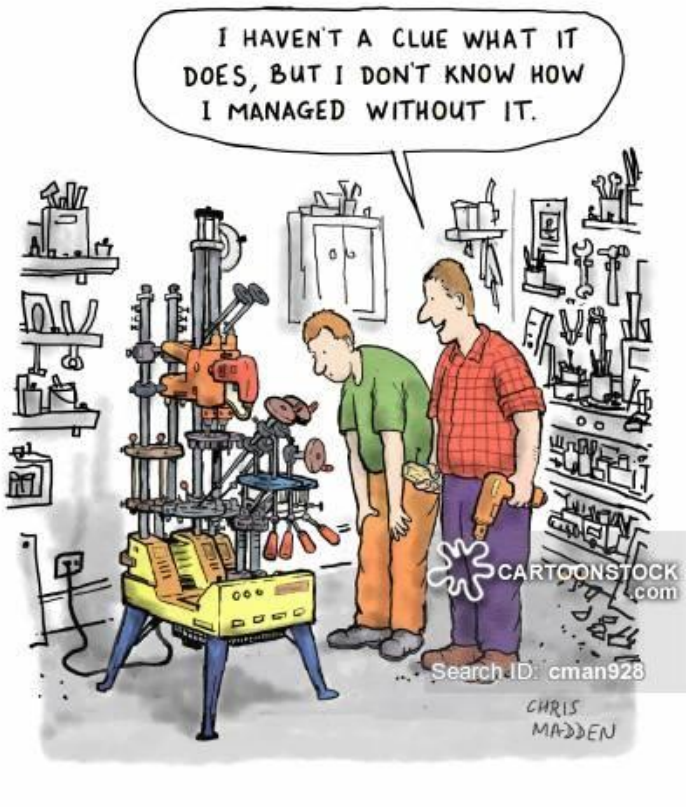


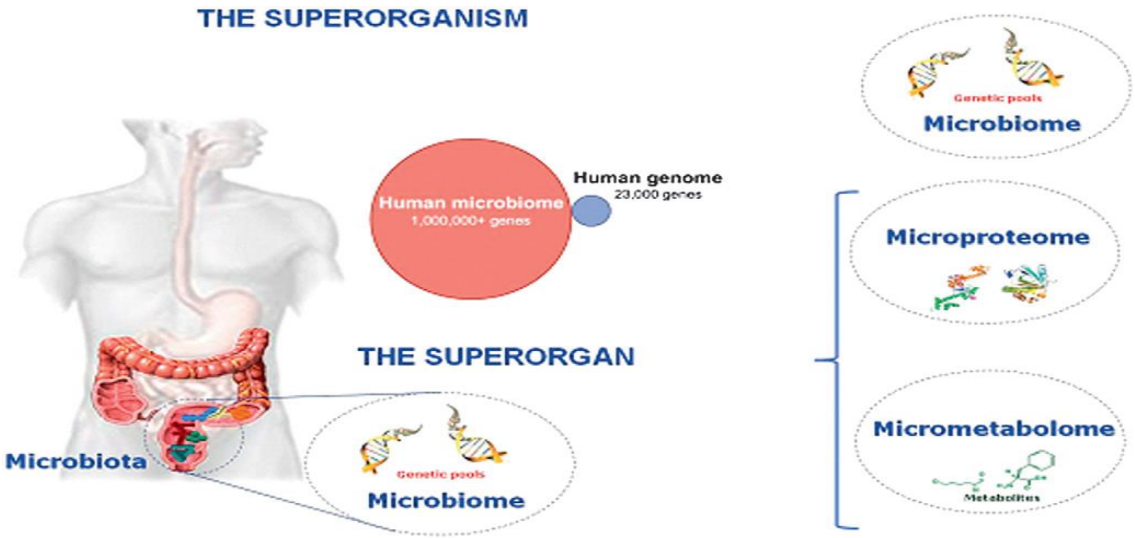


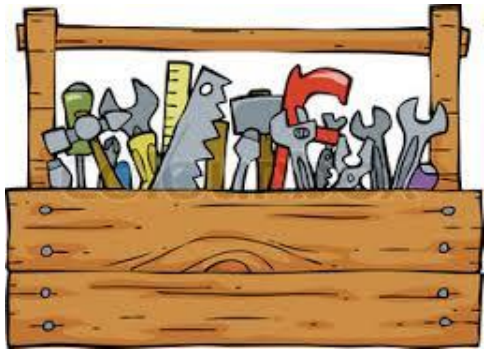




Alet Çantasındaki Pek Çok Alet;
ve Yeni Kavramlar;







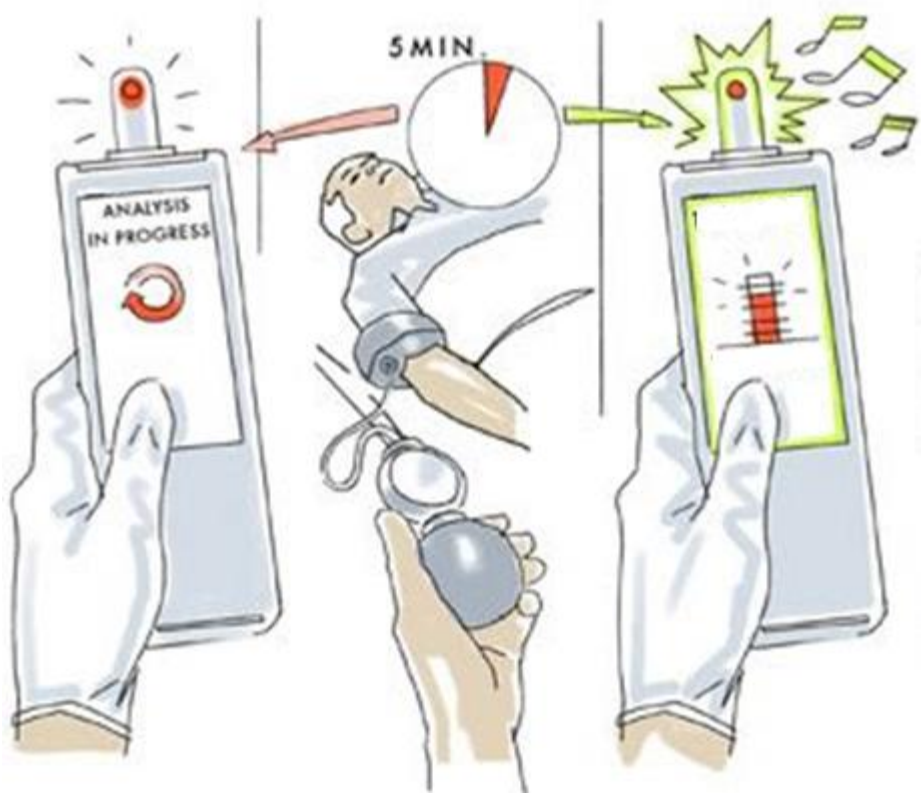
JOURNAL OF CLINICAL MICROBIOLOGY, Nov. 2002, p. 3889–3893 Vol. 40, No. 11
0095-1137/02/$04.00+0 DOI: 10.1128/JCM.40.11.3889–3893.2002

GUEST COMMENTARY

Clinical Microbiology in the Year 2025

W. Michael Dunne, Jr.,[1]* J. Keith Pinckard,[1] and Lora V. Hooper[2]

Departments of Pathology and Immunology[1] and Molecular Biology and Pharmacology,[2] Washington University School of Medicine, St. Louis, Missouri 63110



Broad Assay Menu and Sample Types

Future Clinical Assay Menu Design Goals

NOW CE MARKED

ASSAY	INTENDED COVERAGE	INTENDED SAMPLE TYPE
BAC BSI	**780+ Bacteria**, Candida and 4 Antibiotic Resistance Markers: mecA, vanA, vanB and kpc	5ml EDTA whole blood
BAC Sterile Fluids & Tissues		Sterile fluid and tissues
BAC LRT	Identical coverage with **semi-quantitative threshold**	BAL and ETA
Fungal	**200+** fungi and yeast	BAL and Isolates
Viral IC	**13** distinct groups of viruses 130+ Viral species	Plasma

Clinical Infectious Diseases

Volume 66, Issue 3
1 February 2018

Comments (0)

< Previous Next >

Demise of Polymerase Chain Reaction/Electrospray Ionization–Mass Spectrometry as an Infectious Diseases Diagnostic Tool

Volkan Özenci, Robin Patel ✉, Måns Ullberg, Kristoffer Strålin

Clinical Infectious Diseases, Volume 66, Issue 3, 18 January 2018, Pages 452–455,
https://doi.org/10.1093/cid/cix743
Published: 21 August 2017 **Article history** ▾

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Abstract

Although there are several US Food and Drug Administration (FDA)–approved/cleared molecular microbiology diagnostics for direct analysis of patient samples, all are single target or panel-based tests. There is no FDA-approved/cleared diagnostic for broad microbial detection. Polymerase chain reaction (PCR)/electrospray ionization–mass spectrometry (PCR/ESI-MS), commercialized as the IRIDICA system (Abbott) and formerly PLEX-ID, had been under development for over a decade and had become CE-marked and commercially available in Europe in 2014. Capable of detecting a large number of microorganisms, it was under review at the FDA when, in April 2017, Abbott discontinued it. This turn of events represents not only the loss of a potential diagnostic tool for infectious diseases but may be a harbinger of similar situations with other emerging and expensive microbial diagnostics, especially genomic tests.

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Implementation of Rapid Molecular Infectious Disease Diagnostics: the Role of Diagnostic and Antimicrobial Stewardship

Kevin Messacar,[a,b] Sarah K. Parker,[b] James K. Todd,[b] Samuel R. Dominguez[b]

the microbiology laboratory today is exceedingly "faced with a superabundance of academic information and pressure to perform exhaustive, expensive, clinically irrelevant [testing]", which, when misguided "misleads physicians into erroneous diagnosis and inappropriate therapy".

"more practical, economical, clinically meaningful approach"

The clinical microbiology laboratory is in the midst of a diagnostic revolution.

Messacar K. J. Clin. Microbiol. doi:10.1128/JCM.02264-16

ÇÖZÜM

Hastanede Moleküler Testler ile Tanısal Yönetim

Kan Kültürü

Genel Olarak;

Organizma tanımlama sürelerinde azalma,
Sonuç olarak uygun antimikrobiyal tedaviye geçiş süresinde kısalma

Maliyetler de ciddi azalmalar

Mortalite oranlarında ve hastanede yatış süresinde çelişkili sonuçlar;

Hasta popülasyonu;
Lokal direnç oranları

TABLE 1 FDA-approved/cleared panel-based molecular assays for detection of select microorganisms and select resistance genes in positive blood culture bottles

Parameter	FilmArray BCID	Verigene Gram-positive blood culture	Verigene Gram-negative blood culture
Total no. of targets	27	15	14
Ability to detect pathogen			
Gram-positive bacteria			
Staphylococcus species	✓	✓	
Staphylococcus aureus	✓	✓	
Staphylococcus epidermidis		✓	
Staphylococcus lugdunensis		✓	
Streptococcus species	✓	✓	
Streptococcus agalactiae	✓	✓	
Streptococcus pyogenes	✓	✓	
Streptococcus pneumoniae	✓	✓	
Streptococcus anginosus group		✓	
Enterococcus species	✓		
Enterococcus faecalis		✓	
Enterococcus faecium		✓	
Listeria species		✓	
Listeria monocytogenes	✓		
Gram-negative bacteria			
Klebsiella oxytoca	✓		✓
Klebsiella pneumoniae	✓		✓
Serratia marcescens	✓		
Proteus species	✓		✓
Acinetobacter species			✓
Acinetobacter baumannii	✓		
Haemophilus influenzae	✓		
Neisseria meningitis	✓		
Pseudomonas aeruginosa	✓		✓
Enterobacteriaceae	✓		
Escherichia coli	✓		✓
Enterobacter species			✓
Enterobacter cloacae complex	✓		
Citrobacter species			✓
Yeasts			
Candida albicans	✓		
Candida glabrata	✓		
Candida krusei	✓		
Candida parapsilosis	✓		
Candida tropicalis	✓		
Ability to detect presence of resistance gene			
mecA	✓	✓	
vanA	✓	✓	
vanB	✓	✓	
bla_{KPC}	✓		✓
bla_{NDM}			✓
bla_{OXA}			✓
bla_{VIM}			✓
bla_{IMP}			✓
bla_{CTX-M}			✓
Time to result (h)	~1	~2.5	~2

Clinical Infectious Diseases

MAJOR ARTICLE

The Effect of Molecular Rapid Diagnostic Testing on Clinical Outcomes in Bloodstream Infections: A Systematic Review and Meta-analysis

Tristan T. Timbrook,[1,4] Jacob B. Morton,[1,4] Kevin W. McConeghy,[2] Aisling R. Caffrey,[1,2,4] Eleftherios Mylonakis,[3] and Kerry L. LaPlante[1,2,4]

[1]Rhode Island Infectious Diseases Research Program, Providence Veterans Affairs Medical Center, [2]Center of Innovation in Long Term Services and Supports, Providence Veterans Affairs Medical Center, [3]Infectious Diseases Division, Warren Alpert Medical School of Brown University, Providence, and [4]College of Pharmacy, University of Rhode Island, Kingston

Background. Previous reports on molecular rapid diagnostic testing (mRDT) do not consistently demonstrate improved clinical outcomes in bloodstream infections (BSIs). This meta-analysis seeks to evaluate the impact of mRDT in improving clinical outcomes in BSIs.

Methods. We searched PubMed, CINAHL, Web of Science, and EMBASE through May 2016 for BSI studies comparing clinical outcomes between mRDT and conventional microbiology methods.

Results. Thirty-one studies were included with 5920 patients. The mortality risk was significantly lower with mRDT than with conventional microbiology methods (odds ratio [OR], 0.66; 95% confidence interval [CI], .54–.80), yielding a number needed to treat of 20. The mortality risk was slightly lower with mRDT in studies with antimicrobial stewardship programs (ASPs) (OR, 0.64; 95% CI, .51–.79), and non-ASP studies failed to demonstrate a significant decrease in mortality risk (0.72; .46–1.12). Significant decreases in mortality risk were observed with both gram-positive (OR, 0.73; 95% CI, .55–.97) and gram-negative organisms (0.51; .33–.78) but not yeast (0.90; .49–1.67). Time to effective therapy decreased by a weighted mean difference of −5.03 hours (95% CI, −8.60 to −1.45 hours), and length of stay decreased by −2.48 days (−3.90 to −1.06 days).

Conclusions. For BSIs, mRDT was associated with significant decreases in mortality risk in the presence of a ASP, but not in its absence. mRDT also decreased the time to effective therapy and the length of stay. mRDT should be considered as part of the standard of care in patients with BSIs.

Keywords. rapid diagnostic tests; bloodstream infections; meta-analysis; antimicrobial stewardship.

Hastanede Moleküler Testler ile Tanısal Yönetim

Olgu

- 75 yaşında Vietnamlı erkek hasta, 40 yıl önce Kaliforniya'ya göç etmiş.
- 10 ay önce foliküler lenfoma tanısı var, 6 kür kemoterapi sonucu tam remisyon.
- Acil servise 2 hafta önce başlayan hafif bilinç bulanıklığı ve konuşma güçlüğü nedeni ile baş vuruyor.

Olgu

- Acilde konfüze, dezoryante fokal nörolojik bulgu yok,
- Nonkontrast MR'da önemli bulgu yok
- Bos Bulguları, pleositoz, 210 hücre/µL, glukoz 67 mg/dL, protein 587 mg/dL.
- Gram, kalkoflor beyazı, EZN negatif, Kültürlerde üreme yok.
- Çoklu test sonucu **HSV-1 POZİTİF**
- IV Asiklovir tedavisi başlandı

Olgu

- 7 Gün sonra durumunda iyileşme yok,
- MR hidrosefali. ➔ Yoğun bakım
- BOS tekrarı artmış basınç 35 cm H2O pleositoz 99 hücre/uL glikoz 39 mg/dl

Open Forum Infect Dis. 2017 Winter; 4(1): ofw245. PMCID: PMC5437853
Published online 2016 Dec 7. doi: 10.1093/ofid/ofw245

Delayed Diagnosis of Tuberculous Meningitis Misdiagnosed as Herpes Simplex Virus-1 Encephalitis With the FilmArray Syndromic Polymerase Chain Reaction Panel

Carlos A. Gomez,[1,2] Benjamin A. Pinsky,[1,2] Anne Liu,[1,3] and Niaz Banaei[1,2,4]

- Agresif klinik yönetime karşın trekeostomi, gastirik tüp
- ➔At the time of writing this report, he continued on tuberculosis therapy with severe neurological deficit.

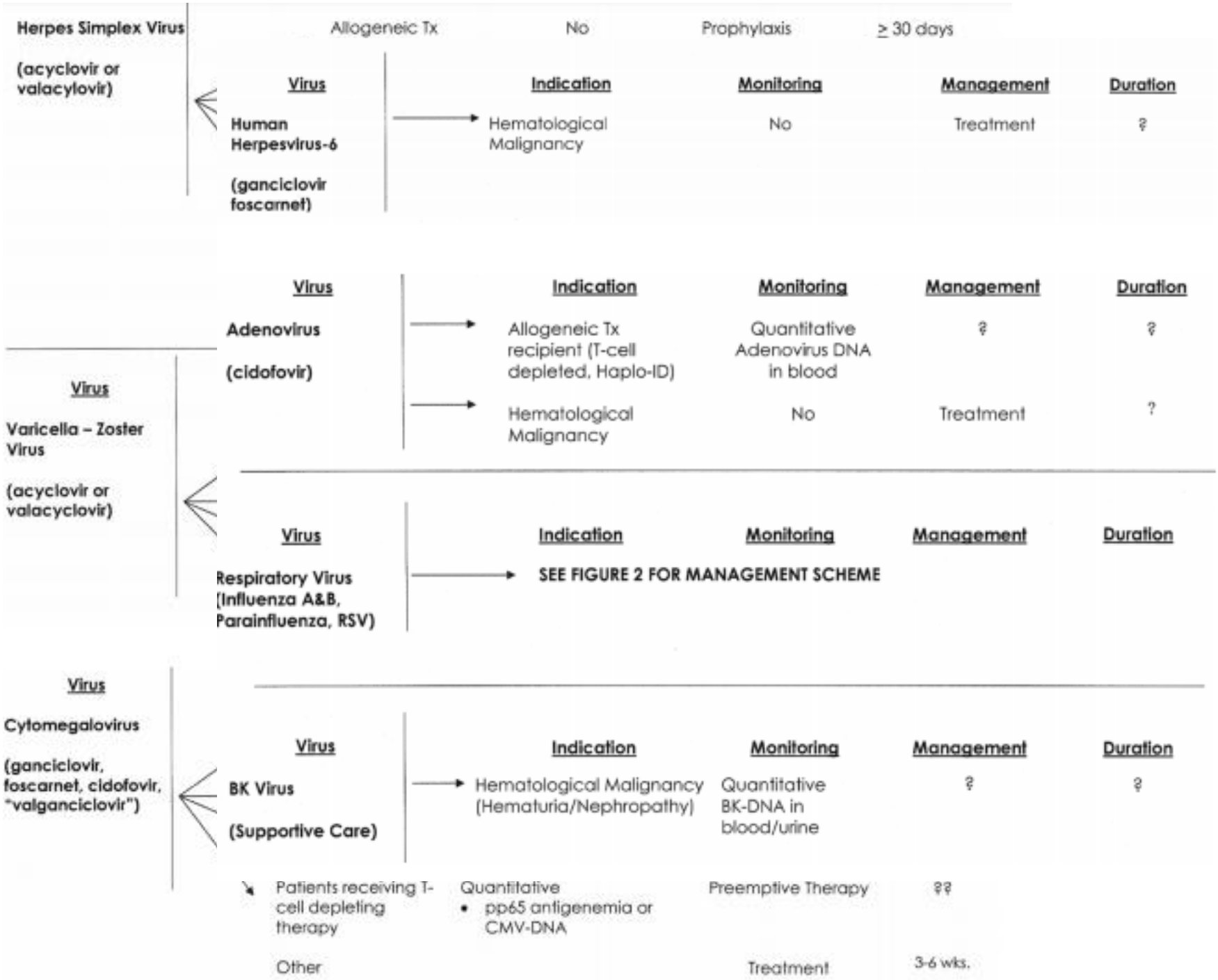
Table 1. Positive Predicted Value of the FilmArray ME Panel*

Analyte	Confirmed Positives/Total Positives (%)
Streptococcus pneumoniae	9 of 16 (56)
Haemophilus influenzae	2 of 2 (100)
Streptococcus agalactiae†	No positives
Escherichia coli K1	2 of 3 (66)
Listeria monocytogenes†	No positives
Neisseria meningitidis†	No positives
HSV-1	2 of 4 (50)
HSV-2	11 of 12 (92)
CMV	4 of 6 (66)
VZV	6 of 7 (86)
HPeV	12 of 12 (100)
HHV-6	19 of 22 (79)
EV	49 of 51 (96)
Cryptococcus spp	3 of 5 (60)

Önlemler !!!

- Preanalitik
  - Klinisyeni elektronik istem formunu doldururken popülasyon hakkında, kullanılan test performansı, limitleri ve pozitif sonuç sonrası uygulanacak refleks testler hakkında bilgilendir.
  - LP sırasında koruyucu maske takılması gerektiği hakkında bilgilendir.
  - Test kriterilerini anormal BOS bulguları doğrultusunda olabildiğince yönlendir.
  - Cerrahi sonrası hastaları dışla.
- Analitik
  - Biyogüvenlik kabininde çalış
  - Çalışma yüzeylerini temizle
  - Her örnek çalışmasından önce eldiven değiştir.
  - Her seferde bir BOS çalış.
- Postanalitik
  - Pozitif sonuçları, Gram boyama ve diğer BOS bulguları ile tekrar değerlendir.
  - Laboratuvarlar ek bulgular ile sonuçları daha ileri konfirmasyon/araştırmalar için saklamalı
  - Pozitif testleri refleks testler ile (kültür, hedefe yönelik viraltestler gibi) konfirme et.
  - Sonucu isteyen doktor ile tartış
  - Klinisyeni sonucu görüntüleme sırasında popülasyon hakkında, kullanılan test performansı, limitleri ve pozitif sonuç sonrası uygulanacak refleks testler hakkında bilgilendir.


Dalya
SELMA GÖKAHMETOĞLU
2. Ulusal Viroloji Günleri
22-24 MART 2018
KLIMUD


Herpes Simplex Virus
(acyclovir or valacylovir)
Allogeneic Tx
No
Prophylaxis
≥ 30 days
Virus
Indication
Monitoring
Management
Duration
Human Herpesvirus-6
(ganciclovir foscarnet)
Hematological Malignancy
No
Treatment
?
Virus
Indication
Monitoring
Management
Duration
Adenovirus
(cidofovir)
Allogeneic Tx recipient (T-cell depleted, Haplo-ID)
Quantitative Adenovirus DNA in blood
?
?
Hematological Malignancy
No
Treatment
?
Virus
Varicella – Zoster Virus
(acyclovir or valacyclovir)
Virus
Indication
Monitoring
Management
Duration
Respiratory Virus (Influenza A&B, Parainfluenza, RSV)
SEE FIGURE 2 FOR MANAGEMENT SCHEME
Virus
Cytomegalovirus
(ganciclovir, foscarnet, cidofovir, "valganciclovir")
Virus
Indication
Monitoring
Management
Duration
BK Virus
(Supportive Care)
Hematological Malignancy (Hematuria/Nephropathy)
Quantitative BK-DNA in blood/urine
?
?
Patients receiving T-cell depleting therapy
Quantitative
• pp65 antigenemia or CMV-DNA
Preemptive Therapy
??
Other
Treatment
3-6 wks.

Eur J Clin Microbiol Infect Dis
DOI 10.1007/s10096-014-2252-2

ARTICLE

Performance evaluation of the Verigene® (Nanosphere) and FilmArray® (BioFire®) molecular assays for identification of causative organisms in bacterial bloodstream infections

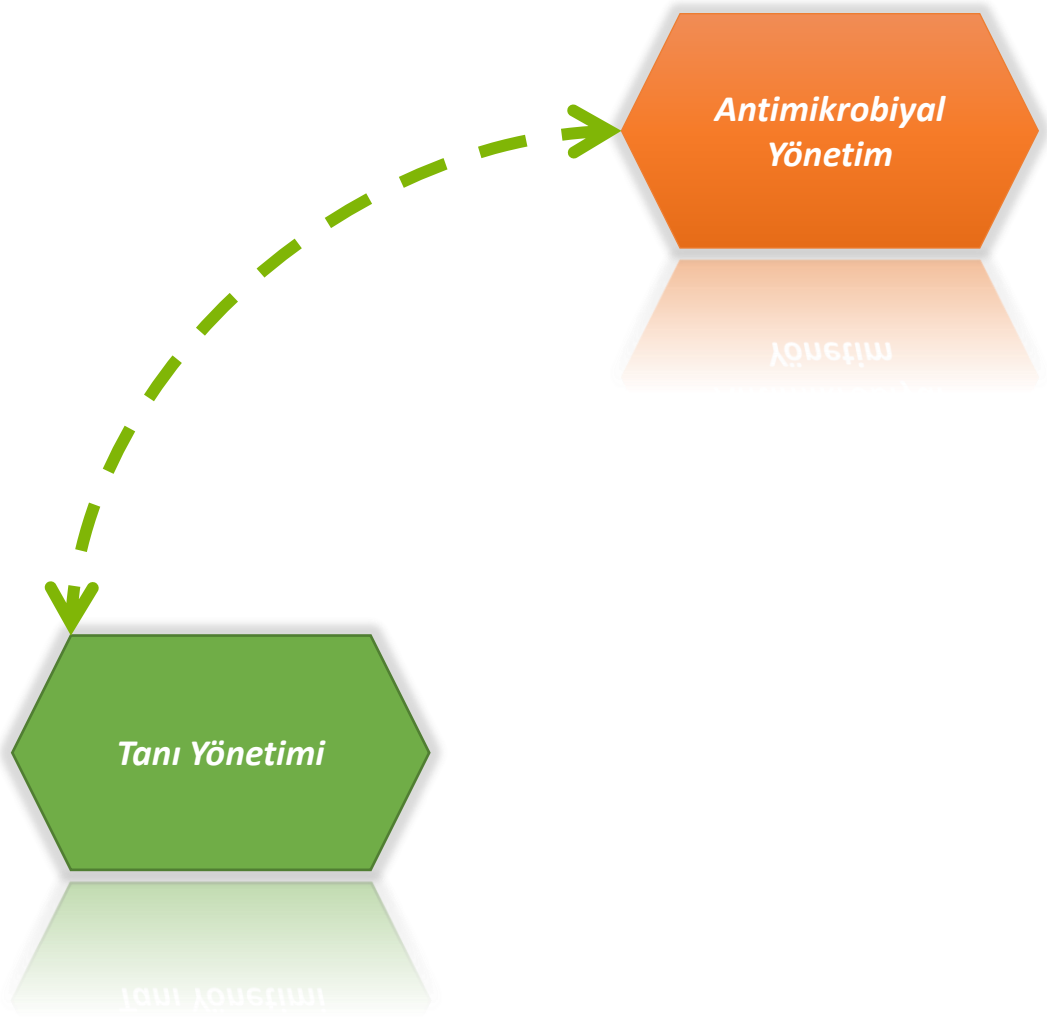
C. Ward · K. Stocker · J. Begum · P. Wade · U. Ebrahimsa · S. D. Goldenberg

Table 5 Details of all discrepant samples

Conventional methods identification	Verigene® identification	FIlmArray® identification	Number of occurrences
Staphylococcus epidermidis	*Staphylococcus epidermidis*	*Staphylococcus epidermidis* and *Pseudomonas aeruginosa* ✸	9
E. coli	*E. coli*	*E. coli* and *Pseudomonas aeruginosa* ✸	4
Staphylococcus hominis	*Staphylococcus* spp.	*Staphylococcus* spp. and *Pseudomonas aeruginosa* ✸	2
Klebsiella pneumoniae	*Klebsiella pneumoniae*	*Klebsiella pneumoniae* and *Pseudomonas aeruginosa* ✸	
Klebsiella oxytoca	*Klebsiella oxytoca*	*Klebsiella oxytoca* and *Pseudomonas aeruginosa* ✸	
Streptococcus bovis	*Streptococcus* spp.	*Streptococcus* spp. and *Pseudomonas aeruginosa* ✸	
Citrobacter braakii and *Klebsiella oxytoca*	*Citrobacter* spp. and *Klebsiella oxytoca*	*Enterobacter* spp. and *Pseudomonas aeruginosa* ✸	
Group C/G *Streptococcus*	*Streptococcus* spp.	*Streptococcus* spp. and *Pseudomonas aeruginosa* ✸	
Enterobacter cloacae	*Enterobacter* spp.	*Enterobacter cloacae* and *Pseudomonas aeruginosa* ✸	
Enterococcus faecium	*Enterococcus faecium*	*Enterococcus* spp. and *Pseudomonas aeruginosa* ✸	
Propionibacterium acnes	ND	*Pseudomonas aeruginosa* ✸	
Micrococcus luteus	*Micrococcus* spp.	ND	6
Corynebacterium spp.	ND	ND	4
Propionibacterium acnes	ND	ND	3
Haemophilus parainfluenzae	ND	ND	2
Brevibacterium casei	ND	ND	
Unidentified Gram-positive rod	ND	ND	
Aeromonas hydrophila	ND	ND	
Bacteroids fragilis	ND	ND	
Paenibacillus macerans	ND	ND	
Acinetobacter lwofii	ND	ND	
Prevotella denticola	ND	ND	
Morganella morganii	ND	ND	
Acinetobacter ursingii	*Acinetobacter* spp.	ND	
Staphylococcus hominis	*Staphylococcus* spp.	*Staphylococcus* spp. and *Klebsiella pneumoniae*	
Staphylococcus aureus and Group C/G *Streptococcus*	*Staphylococcus aureus*	*Staphylococcus aureus* and *Streptococcus* spp.	
Streptococcus viridans	*Streptococcus pneumoniae*	*Streptococcus* spp.	
Fusobacterium necrophorum	ND	*Pseudomonas aeruginosa* ✸	
Streptococcus viridans	*Streptococcus pneumoniae*	*Streptococcus* spp.	
Enterococcus avium	*Enterococcus faecium*	*Enterococcus* spp.	
Enterococcus faecalis	*Enterococcus faecalis* and *Staphylococcus* spp.	*Staphylococcus* spp. and *Enterococcus* spp.	
Enterococcus faecalis and *Citrobacter freundii*	*Citrobacter* spp.	*Enterococcus* spp. and *Enterobacter* spp.	

Aerop kan kültür şişelerinde Pseudomonas aeruginosa DNA Kontaminasyonu

Hastanede Moleküler Testler ile Tanısal Yönetim



The rapid diagnosis of viral respiratory tract infections and its impact on antimicrobial stewardship programs

Şiran Keske[1] · Önder Ergönül[1,2] · Faik Tutucu[2] · Doruk Karaaslan[2] · Erhan Palaoğlu[3] · Füsun Can[4]

Received: 1 November 2017 / Accepted: 21 December 2017

Abstract

We aimed to describe the potential benefit of new rapid molecular respiratory tests (MRT) in decreasing inappropriate antibiotic use among the inpatients presenting with influenza-like illness (ILI). We included patients from inpatient and outpatient departments who had ILI and performed MRT between 1 January 2015 and 31 December 2016 in a 265-bed private hospital in Istanbul. At the end of 2015, we implemented antimicrobial stewardship including systematic use of MRT. Then, we compared our observations between the year 2015 and the year 2016. We designed the study according to the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) tool. A U.S. Food and Drug Administration (FDA)-cleared multiplexed polymerase chain reaction (PCR) system (BioFire FilmArray, Idaho Technology, Salt Lake City, UT) which detects 17 viruses and three bacteria was used for diagnosis. In total, 1317 patients were included; 630 (48%) were inpatients and 569 (43%) were older than 16 years of age. At least one virus was detected in 747 (57%) patients. Rhinovirus/enterovirus, influenza virus, and adenovirus were the most commonly detected. Among hospitalized patients, in children, a significant decrease in antibiotic use (44.5% in 2015 and 28.8% in 2016, $p = 0.009$) was observed, but in adults, the decrease was not statistically significant (72% in 2015 and 63% in 2016, $p = 0.36$). The duration of antibiotic use after the detection of virus was significantly decreased in both children and adults ($p < 0.001$ and $p = 0.007$, respectively). By using MRT, inappropriate antibiotic use and, also, duration of inappropriate antibiotic use after the detection of virus was significantly decreased. It is time to increase the awareness about the viral etiology in respiratory tract infections (RTIs) and implement MRT in clinical practice.

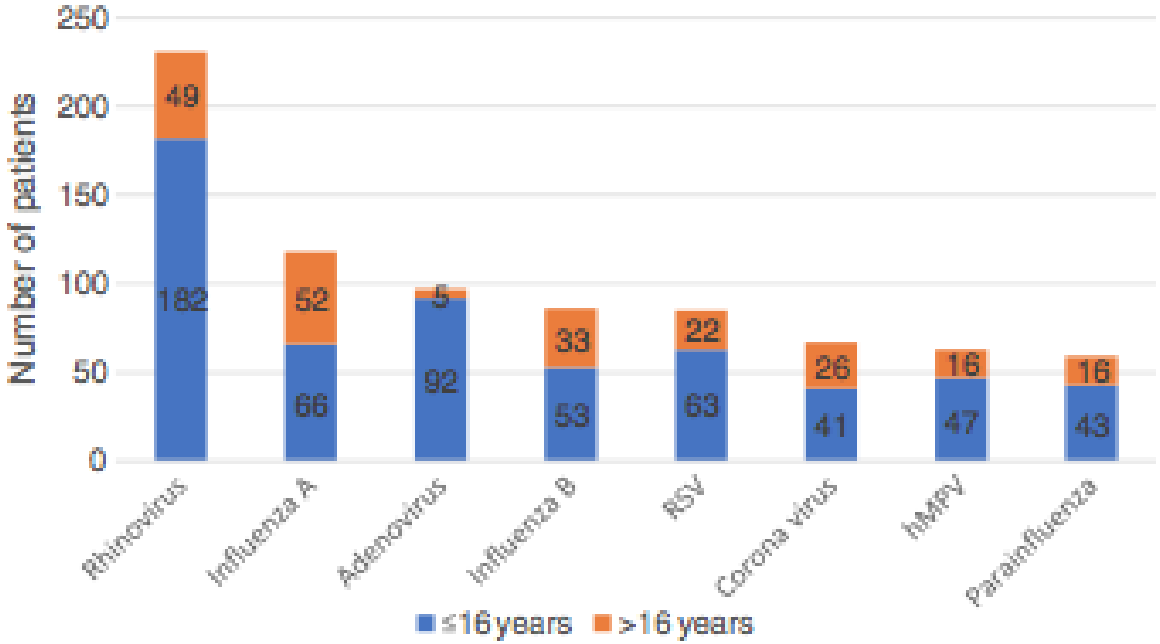


Fig. 2 The most commonly detected viruses among all patients in whom at least one virus was detected. RSV: respiratory syncytial virus; hMPV: human metapneumovirus

Best Practices in Diagnosing Respiratory Viral Disease

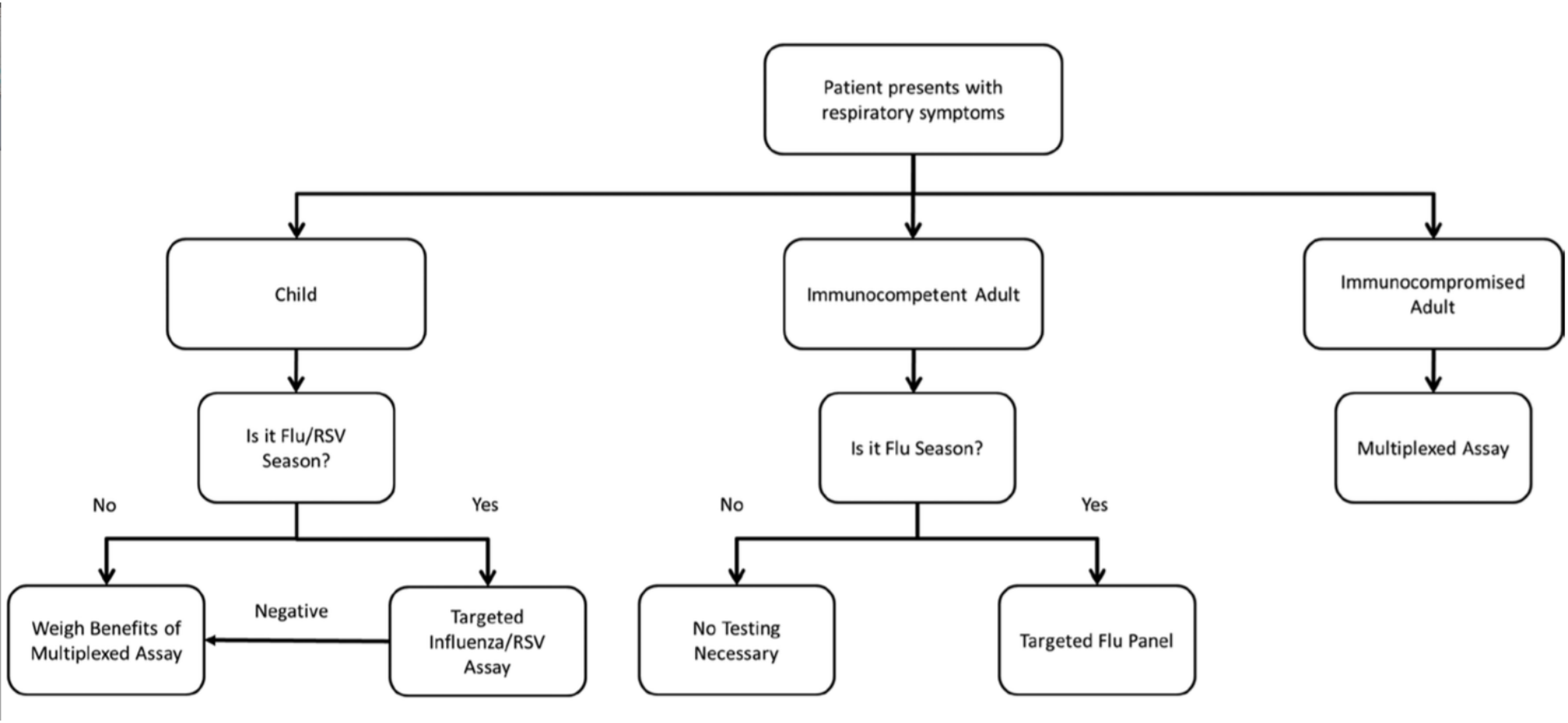
Abraham J. Qavi, M.D., Ph.D.[1] and Neil W. Anderson, M.D.,[1] Assistant Professor of Pathology and Immunology, [1]Washington University School of Medicine, St. Louis, Missouri

Table 1. Broadly multiplexed respiratory virus tests available for syndromic testing

Name	Manufacturer	Technology	No. of targets	Workflow	Turnaround time (h)	Reference(s)
FilmArray Respiratory Virus Panel	Biofire Diagnostics, Salt Lake City, UT	Real-time PCR	20	Single assay per instrument or random access (FilmArray Torch), sample to answer	1	6-10
FilmArray Respiratory Panel EZ	Biofire Diagnostics, Salt Lake City, UT	Real-time PCR	14	Single assay per instrument, sample to answer	1	
Luminex xTAG RVP	Luminex Molecular Diagnostics, Austin, TX	PCR followed by bead-based/flow cytometry detection	12	Batched; separate amplification and detection instruments	7	6
Luminex xTAG RVP FAST	Luminex Molecular Diagnostics, Austin, TX	PCR followed by bead-based/flow cytometry detection	9	Batched; separate amplification and detection instruments	5-6	6, 8
Luminex NxTAG	Luminex Molecular Diagnostics, Austin, TX	PCR followed by bead-based/flow cytometry detection	20	Batched; separate amplification and detection instruments	4	9, 10
Verigene Respiratory Pathogens Flex Test	Luminex Molecular Diagnostics, Austin, TX	PCR followed by microarray hybridization	16	Single assay per instrument, sample to answer; ability to selectively test targets	2	
Genmark XT-8	GenMark Dx, Carlsbad, CA	PCR followed by electrochemical detection	14	Batched; separate amplification and detection instruments	6	6, 7
Genmark ePlex	GenMark Dx, Carlsbad, CA	PCR followed by electrochemical detection	21	Random access, sample to answer	1.5	

Best Practices in Diagnosing Respiratory Viral Disease

Abraham J. Qavi, M.D., Ph.D.[1] and Neil W. Anderson, M.D.,[1] Assistant Professor of Pathology and Immunology, [1]Washington University School of Medicine, St. Louis, Missouri



Best Practices in Diagnosing Respiratory Viral Disease

Abraham J. Qavi, M.D., Ph.D.[1] and Neil W. Anderson, M.D.,[1] Assistant Professor of Pathology and Immunology, [1]Washington University School of Medicine, St. Louis, Missouri

Table 2. Characteristics of most commonly used respiratory virus tests

	Characteristic[a]				
Test	**Turnaround time**	**Targets covered**	**Affordable**	**Sensitivity**	**Specificity**
Antigen testing	++++	+	++++	+	+++
Narrow-spectrum PCR (1-4 targets)	++	++	++	++++	++++
Highly multiplexed PCR (>5 targets)	++	++++	+	+++	++++
POC molecular testing	+++	+	++	++++	++++

[a]++++, favorable; +, less favorable.

Hospital-Acquired Respiratory Viral Infections: Incidence, Morbidity, and Mortality in Pediatric and Adult Patients

Eric J. Chow[1,2,3] **and Leonard A. Mermel**[1,4]

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Background. Hospital-acquired respiratory viral infections can result in morbidity and mortality of hospitalized patients. This study was undertaken to better understand the magnitude of the problem of nosocomial respiratory viral infections in adult and pediatric patients.

Methods. This was a retrospective study at a tertiary care adult and pediatric teaching hospital. Study patients met a priori criteria for definite or possible nosocomial respiratory viral infection.

Results. From April 1, 2015 to April 1, 2016, we identified 40 nosocomial respiratory viral infections in 38 patients involving 14 definite and 3 possible cases in our adult hospital and 18 definite and 5 possible cases in our pediatric hospital. The incidence was 5 cases/10 000 admissions and 44 cases/10 000 admissions to our adult and pediatric hospitals, respectively. Only 6.8% of cases were due to influenza. Although 63% of cases occurred during the fall and winter, such infections were identified throughout the year. Five (13%) nosocomial respiratory viral infections occurred in 2 adult and 3 pediatric patients who died during the hospitalization.

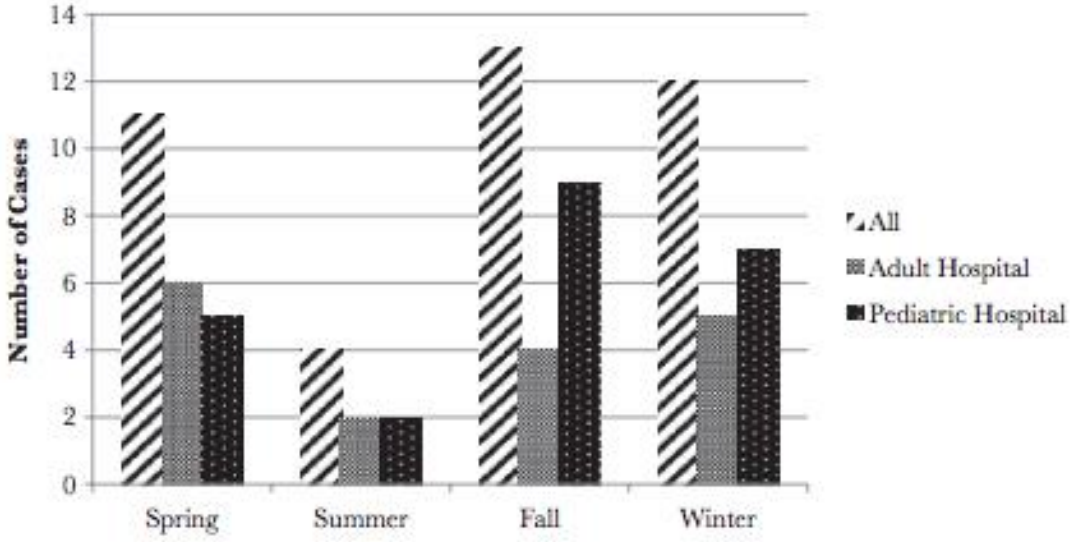
Conclusions. Nosocomial respiratory viral infections are an underappreciated cause of morbidity and mortality in hospitalized adult and pediatric patients. The incidence was nearly 10-fold higher in our pediatric hospital. We estimate there are approximately 18 955 pediatric and adult cases of nosocomial respiratory viral infections in US acute care hospitals each year.

Keywords. hospital-acquired; nosocomial; pneumonia; respiratory tract infection; viral.

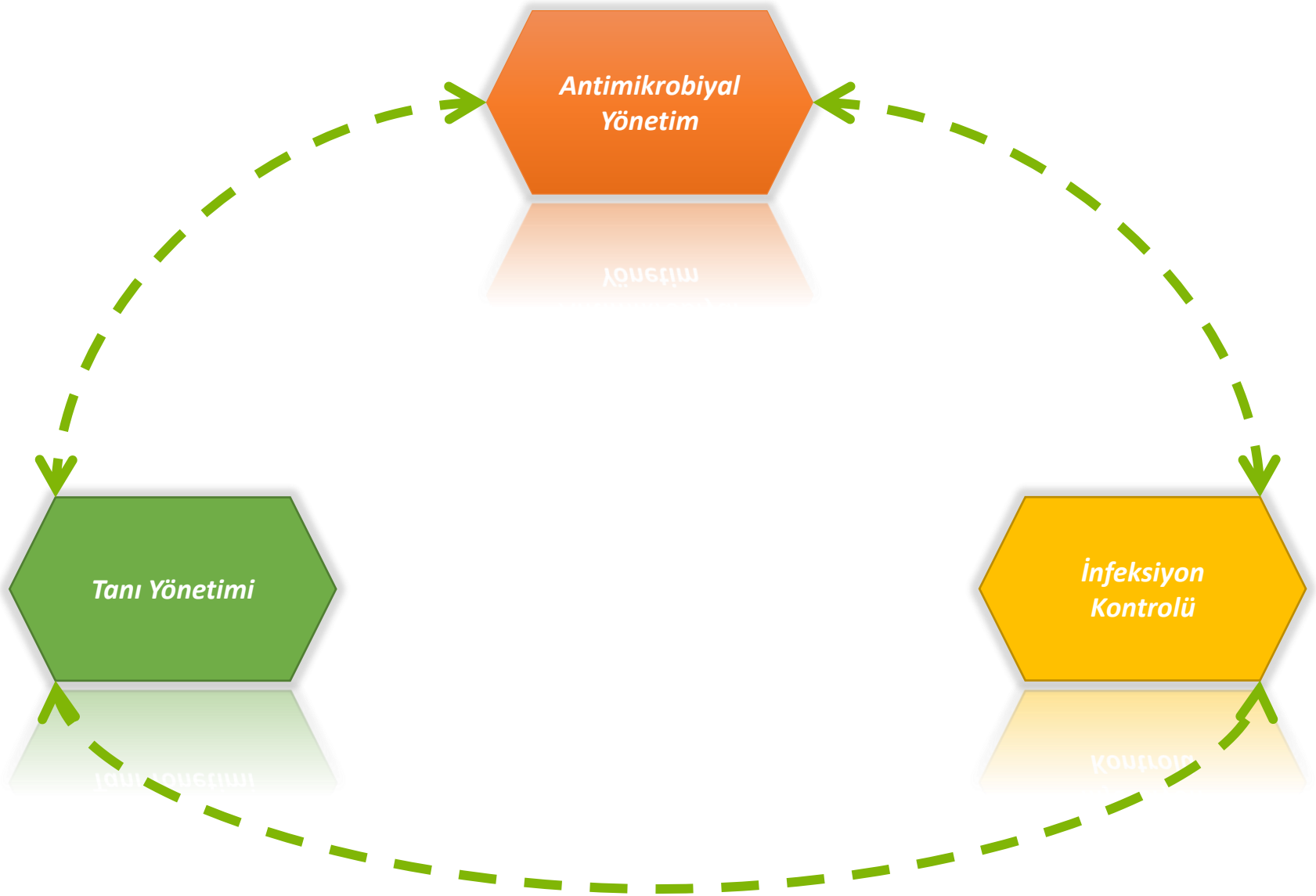
Hospital-Acquired Respiratory Viral Infections: Incidence, Morbidity, and Mortality in Pediatric and Adult Patients

Eric J. Chow[1,2,3] and Leonard A. Mermel[1,4]

	All Viruses No. (%)	Adult Hospital No. (%)	Pediatric Hospital No. (%)	Seasons No.
	44	18	26	44
Adenovirus	3 (6.8)	2 (11)	1 (3.8)	Sp 1; Su 0; F 1; W 1
Coronavirus	2 (4.5)	0 (0)	2 (7.7)	Sp 0; Su 0; F 1; W 1
Influenza A	3 (6.8)	1 (5.6)	2 (7.7)	Sp 0; Su 0; F 0; W 3
Influenza B	0 (0)	0 (0)	0 (0)	N/A
Parainfluenza	1 (2.3)	0 (0)	1 (3.8)	Sp 1; Su 0; F 0; W 0
Respiratory syncytial virus A and B	6 (14)	2 (11)	4 (15)	Sp 3; Su 0; F 0; W 3
Rhino/enterovirus	25 (57)	11 (61)	14 (54)	Sp 6; Su 5; F 9; W 5
Metapneumovirus	4 (9)	2 (11)	2 (7.7)	Sp 2; Su 0; F 0; W 2



Hastanede Moleküler Testler ile Tanısal Yönetim



Clinical decision making in the emergency department setting using rapid PCR: Results of the CLADE study group

Glen T. Hansen, Johanna Moore, Emily Herding, Tami Gooch, Diane Hirigoyen, Kevan Hanson, Marcia Deike

PlumX Metrics

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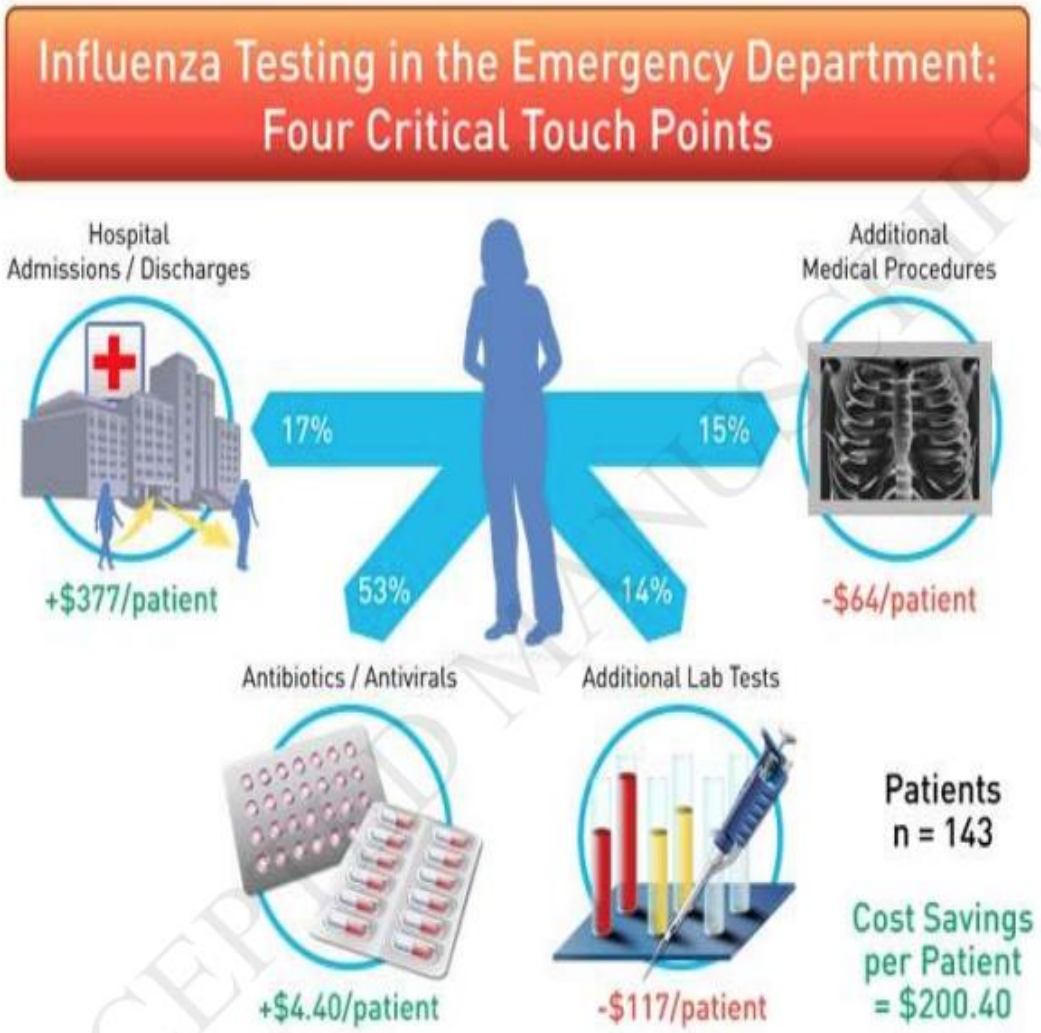

Right-Sizing Technology in the Era of Consumer-Driven Health Care

Eszter Deak, Ph.D.[1] and Elizabeth M. Marlowe, Ph.D.,[2] [1]The Permanente Medical Group, Regional Laboratories, Berkeley, California, and [2]Roche Molecular Solutions, Inc., Pleasanton, California

Table 1. Cost of mPOC implementation across 14 emergency departments

Expenditure	Cost[a]	No. needed	Estimated cost of implementation
Instrument	$15,000	14	$210,000
Tests	$35	6,000[b]	$210,000
Total			$420,000

[a]Hypothetical costs; not reflective of a specific platform.
[b]6,000 tests = 4.76 tests/day/ED over the 3-month flu season; does not include cost of controls, validation, or training materials.

Table 2. Cost of implementation and estimated cost avoidance to break even

Reagent costs	Instrument costs	Total cost of implementation	Estimated cost of avoidance of admission[a]	No. of admissions avoided required to break even
$210,000	$210,000	$420,000	$14,143	30 (2.12/ED)

[a]Average published cost per stay with a diagnosis of pneumonia. Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS), HCUP, 2007, 2008, 2009. Agency for Healthcare Research and Quality, Rockville, MD (www.hcup-us.ahrq.gov/nedsoverview.jsp). The actual budget impact, depending on the payment schedule, is a saving of $6,715 due to $7,428 reimbursement if admitted, based on a blended rate of top diagnosis related group (DRG) associated with an influenza diagnosis.

Table 3. Estimated ROI based on hospital cost avoidance

Estimated no. of admissions avoided required to break even (0.5% over 3-month flu season)	Total estimated hospital cost avoidance	ROI[a]
30	$424,290	<3 months

[a]ROI, return on investment.

Maliyet Etkinlik

			SUT
4008	900.200	Alanin aminotransferaz (ALT)	1,09 ₺
4009	900.210	Albümin	0,99 ₺
4021	900.340	Alkalen fosfataz	1,09 ₺
4025	900.370	Amilaz	1,39 ₺
4047	900.580	Aspartat transaminaz (AST)	0,99 ₺
4059	900.690	Bilirubin Direkt	0,99 ₺
4059	900.690	Bilirubin Total	0,99 ₺
4081	900.901	CRP, nefelometrik	4,48 ₺
4089	901.020	Demir (Serum)	1,09 ₺
4091	901.040	Demir bağlama kapasitesi	1,09 ₺
4114	901.220	Ferritin	4,97 ₺
4119	901.260	Fosfor (P)	0,99 ₺
4141	901.500	Glukoz	0,99 ₺
4164	901.730	İdrar mikroskobisi	1,79 ₺
4168	901.780	TİT	4,97 ₺
4182	901.910	Kalsiyum (Ca)	1,09 ₺
4199	902.090	Klor (Cl)	0,99 ₺
4208	902.180	Kreatin	1,09 ₺
4209	902.190	Kreatin kinaz (CK)	1,39 ₺
4212	902.220	Kreatinin klerens testi	3,38 ₺
4217	902.260	Laktik Dehidrogenaz (LDH)	0,99 ₺
4296	903.130	Potasyum	1,09 ₺
4300	903.170	Procalcitonin	25,37 ₺
4323	903.400	Sedimentasyon	1,69 ₺
4330	903.470	Serbest T3	4,48 ₺
4331	903.480	Serbest T4	4,48 ₺
4153	901.620	Tam Kan (Hemogram)	2,98 ₺
		Toplam	77,01

4871	**908.732**	**ReverseTranscriptase PCR Multiplex**	**218,89**

Impact of a Healthcare Provider Educational Intervention on Frequency of *Clostridium difficile* Polymerase Chain Reaction Testing in Children: A Segmented Regression Analysis

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[1]Pediatric Infectious Diseases, [2]Infection Prevention and Control, [3]Pathology and Laboratory Medicine, [4]Department of Pharmacy, Ann & Robert H. Lurie Children's Hospital of Chicago, [5]Departments of Pediatrics, [6]Preventive Medicine-Biostatistics, and [7]Pathology, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Results. Hospital-wide, absolute TR reduction was 0.71 (P[level] = .0067; P[trend] = .0042) and absolute PR reduction was 0.14 (P[level] = .22; P[trend] = .018). In the outpatient setting, absolute TR reduction was 0.30 (P[level] = .0015; P[trend] < .001) and absolute PR reduction was 0.09 (P[level] = .0069; P[trend] = .046). The incidence density of healthcare facility-associated CDI did not significantly change after the EI. The EI was associated with avoidance of 574 tests and 113 positive tests (and subsequent antibiotic courses) during the postintervention period, which saved approximately $250 000 in patient charges related to CDI testing and treatment.

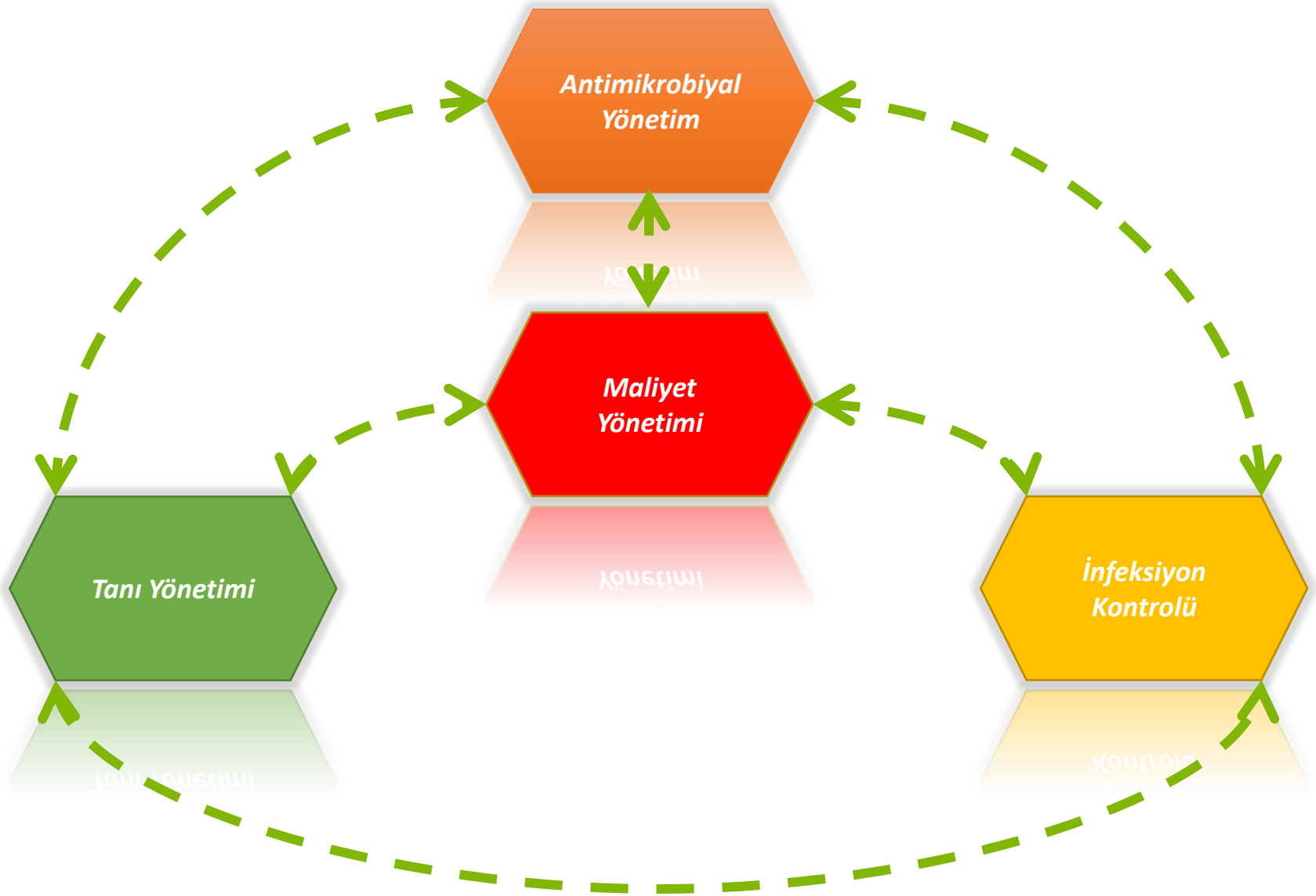
Table 1. Topics Included in the Healthcare Provider Didactic Education

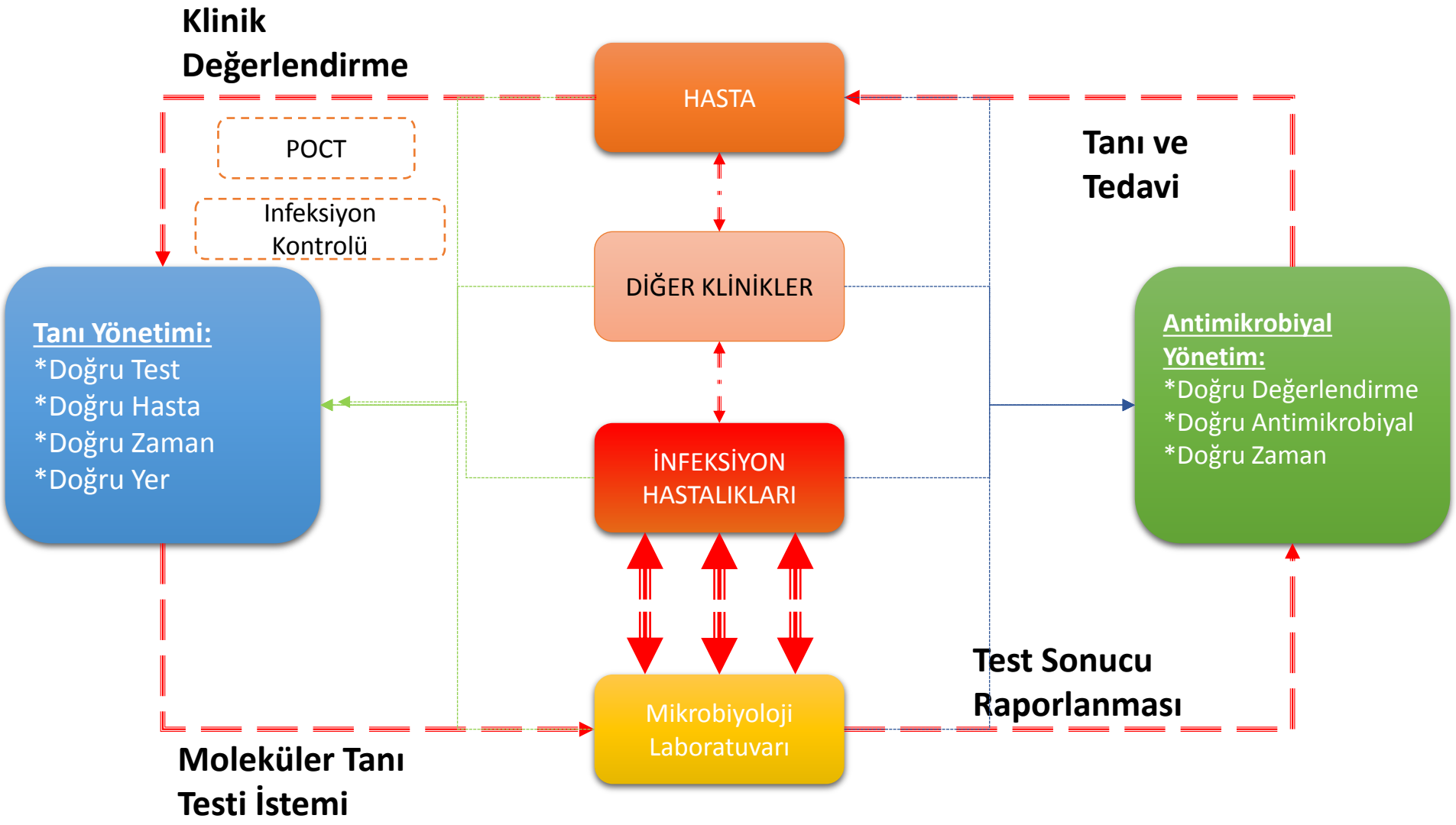
Topics Included in 15-Minute Clinician Didactic Education
• Epidemiology of *Clostridium difficile* infection (CDI) and asymptomatic carriage
• *C difficile* polymerase chain reaction test interpretation
• American Academy of Pediatrics recommendations for CDI testing [19]
• Hospital CDI surveillance and *C difficile* testing data
• Impact of CDI misdiagnosis on patient care and hospital CDI surveillance
• Suggestions for improving CDI testing behaviors
• Questions and answers
Additional Topics Included in 30-Minute Microbiology Technologist Didactic Education
• Review of criteria for rejecting specimens for CDI testing
• Guidance for responding to healthcare provider inquiries after specimen rejection

Table 2. Electronic Medical Record Prompt When Ordering *Clostridium difficile* Polymerase Chain Reaction (PCR) Testing

Because *C difficile* PCR is highly sensitive and frequently identifies colonized patients, testing should NOT be ordered for patients with low probability of infection, such as the following:
• A patient without risk factors who has vomiting as a significant complaint.
• The stool is soft or formed.
• A patient has diarrhea and is prescribed stool softeners or laxatives.
• The test is ordered as a "test of cure" after treatment.
• A negative *C difficile* PCR result was reported within the last 7 days.

Hastanede Moleküler Testler ile Tanısal Yönetim (Genişletilmiş Spektrumlu Yönetim)

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POCT
Infeksiyon Kontrolü
Tanı ve Tedavi
DİĞER KLİNİKLER
Tanı Yönetimi:
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*Doğru Hasta
*Doğru Zaman
*Doğru Yer
İNFEKSİYON HASTALIKLARI
Antimikrobiyal Yönetim:
*Doğru Değerlendirme
*Doğru Antimikrobiyal
*Doğru Zaman
Test Sonucu Raporlanması
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