Rapid respiratory panel testing: Impact of active antimicrobial stewardship

To the Editor:

Polymerase chain reaction (PCR)-based tests are approximately 94% as accurate as viral cultures.[1] The rapid direct respiratory panel (DRP) is a PCR-based diagnostic test that can identify pathogens within hours, compared with standard techniques requiring up to 48-72 hours.[1] This rapid detection can minimize the use of unnecessary antibiotics through timely deescalation when test results do not indicate the presence of a bacterial infection.[1-3] Rapid diagnostic tests are of little value without subsequent antibiotic deescalation when indicated.[4] Antimicrobial stewardship programs (ASPs) can help achieve these outcomes by acting as active messengers and educators for medical teams.[4,5] The purpose of this study was to assess the impact of real-time pharmacy intervention on antibiotic deescalation based on DRP results.

This study was conducted at the Virginia Commonwealth University Health System, an 860-bed tertiary care hospital in Richmond, Virginia. All patients hospitalized between October 2014 and March 2015 were eligible for inclusion in the study. During the study period, an ASP pharmacist reviewed the results of PCR-based DRPs using a computer decision support system (TheraDoc, Charlotte, NC) between 10 AM and 3 PM Monday through Friday, excluding holidays, and paged medical teams with recommendations during these hours. ASP pharmacist recommendations included deescalating antibiotics to complete a course appropriate for community-acquired pneumonia for a subset of these patients when the medical team opted to continue antibiotics.

A total of 68 patients were included in the study. Of these, 55 (80.9%) were receiving antibiotic therapy before the test. Influenza A H3 was the most frequently identified virus (n = 21; 30.9%), followed by rhinovirus, enterovirus (n =16; 23.5%), respiratory syncytial virus (n = 15; 22.10%), influenza A (n = 5; 7.4%), coronavirus OC43 (n = 5; 7.4%), parainfluenza 3 virus (n = 2; 2.9%), parainfluenza 2 virus (n = 1; 1.5%), parainfluenza 4 virus (n = 1; 1.5%), influenza B virus (n = 1; 1.5%), and coronavirus 229E (n = 1; 1.5%). Overall, 66% of the ASP recommendations were accepted. Our ASP pharmacist recommended deescalation or discontinuation of antibiotics in 32% of the cases based on DRP results; however, teams complied with these recommendations in only 19% of cases. The mean interval from the reporting of DRP results to changing antibiotics was 13.5 hours (Table 1).

Table 1
ASP recommendations and team actions

ASP recommendation, n (%)	No change: 28 (41.2) Discontinue antibiotics: 16 (23.5) Decrease duration of antibiotics: 14 (20.6) Infectious Diseases consult: 5 (7.4) Deescalate therapy: 6 (8.8) Escalate therapy: 0 (0.0)
Accepted recommendation, n (%)	Yes: 45 (66.2) No: 23 (33.8)
Action following ASP recommendation, n (%)	No change: 40 (58.8) Discontinue antibiotics: 6 (8.8) Decrease duration of antibiotics: 9 (13.2) Infectious Diseases consult: 2 (2.9) Deescalate therapy: 7 (10.3) Escalate therapy: 4 (5.9)
Time from test result to antibiotic change, h, mean (range)	13.5 (0.5-40)

ASP, antimicrobial stewardship program.

Our study contributes to the growing literature on the impact of real-time ASP interventions based on DRP results. Similar studies have been conducted in the setting of coagulase-negative *Staphylococcus* and *Staphylococcus aureus* bacteremia with promising results.[6,7] The results of our study suggest that DRP results tied to direct ASP review and intervention may lead to more prompt antibiotic deescalation, discontinuation, and reduced duration of therapy. Low antibiotic deescalation rates of 10%-20% have been reported in previous studies despite positive DRP results.[4,8] Although 66% of ASP recommendations were accepted overall in our study, only 19% of recommendations to deescalate or discontinue antibiotics were accepted, consistent with these previously published studies.

On the whole, teams were more likely to accept recommendations supporting their current management than those recommending antibiotic deescalation, discontinuation, or Infectious Diseases consultation. The mean time from test resulting in an antibiotic change was 13.5 hours. This highlights a potential opportunity for ASPs to facilitate action sooner based on these data. Further studies are needed to explore the reasons behind failure to deescalate antibiotics despite the availability of DRP results with ASP interpretation. Although rapid diagnostic testing with real-time ASP interpretation and intervention is very promising, the best use of ASP personnel in the reporting and interpretation of these tests remains to be determined.

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Salma Abbas, MBBS, MPH
Division of Infectious Diseases

Shaina Bernard, PharmD, BCPS
Department of Pharmacology

Kimberly B. Lee, PharmD
Department of Pharmacology

Amy Pakyz, PharmD, MS, PhD
Department of Pharmacotherapy and Outcomes Science, School of Pharmacy

Christopher Doern, PhD
Departments of Pathology and Pediatrics

Michelle Doll, MD, MPH
Division of Infectious Diseases and Department of Hospital Epidemiology and Infection Control

Gonzalo Bearman, MD, MPH
Division of Infectious Diseases and Department of Hospital Epidemiology and Infection Control

Michael P. Stevens, MD, MPH*
Division of Infectious Diseases and Department of Hospital Epidemiology and Infection Control, Virginia Commonwealth University, Richmond, VA

*Address correspondence to Michael P. Stevens, MD, Department of Hospital Epidemiology and Infection Control, Virginia Commonwealth University, North Hospital, 2nd Floor, Room 2-073, 1300 E Marshall St, Richmond, VA, 23298.
E-mail address: michael.stevens@vcuhealth.org (M.P. Stevens).

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Exploring patient perceptions of contact precautions

To the Editor:

Contact precautions (CPs) help to reduce the spread of health care–associated infections (HAIs).[1] Our institution begins CP by implementing provider personal protective equipment (PPE) and signs detailing level of CP on room doors. However, CPs may be adversely perceived by patients with higher levels of depression and anxiety.[2-4] One strategy to address these negative perceptions is the PPE Free Zone, a taped-off box measuring 3×3 feet placed in the threshold of a patient's doorway.[5] However, patient perceptions of CPs, in general, remain underexplored.

From November 2017 to January 2018, at a large university hospital, we interviewed 10 patients whose rooms did not have the PPE Free Zone as a control group and 10 patients whose rooms did have this feature as an experimental group. Most patients were under CPs owing to *Clostridium difficile* infection. Data were collected using in-person, semi-structured interviews with a mix of open-ended and 5-point Likert scale questions. We interviewed patients in their private hospital rooms with 2 trained study team members present—1 to conduct the interview and 1 to take notes. Before the interview, patients received a brief overview of the study and verbally confirmed their willingness to participate. We did not have access to medical records.

The interview guide was based on the domains identified by Abad et al[6]: psychological well-being, provider contact with patients, patient satisfaction, and patient safety. Questions were test piloted before the study began. All patients were asked demographic questions, including living arrangement, race, and education status. All were asked to rate the hospital from 1-10 based on their current stay. Each interview lasted approximately 10 minutes. Using an inductive approach to analysis, a research staff member manually generated a list of common themes. Both study team members discussed and agreed on the themes identified.

Commonalities included the 60% who rated their health as poor or fair, the 70% who were able to move about on their own, and the 75% who lived with their spouse and/or family. Education ranged from high school (35%) to a master's degree (10%) (Table 1). The most common length of stay was 3 days, and the average hospital rating was 8.75 of 10.

Of those interviewed, 70% identified the protective role gowns play in infection control. Patients also felt responsible for protecting others from acquiring their infection. As 1 patient explained, "I know it's necessary. I don't want to put others at risk." Of those interviewed, 30% expressed negative attitudes toward gowns and/or signs. Patients with unfavorable viewpoints described gowns as a waste of time and resources: "It's dumb, there's no proof, it's a waste of money to wash them, a waste of time, and they fall off anyway." Two patients thought gowns made interactions with health care staff impersonal, because gowns concealed name tags or made everyone look the same. One patient expressed concerns about signs and privacy invasion: "The signs are kind of impersonal, and they put your information out there. You feel kind of like 'what's wrong?' Wish I'd known about it before they put the sign up." Most patients, however, viewed gowns and signs neutrally or did not notice signs or have concerns about their presence. Some patients expressed negative feelings, such as stigmatization, distress, and confusion related to CPs. Emotions included feeling self-conscious, dirty, diseased, alienated, or like a burden to health care staff: "[Gowns make me feel] different, like 'He's got something,' not bad but self-conscious." Four patients did not grasp the importance of PPE. When we asked 1 patient why gowns are used, he responded, "I don't quite remember because I was talked to about this months ago. I don't remember quite what the reason is. I think the gowns are kinda weird. Are they for your protection or mine? Cuz I pass people all the time when I walk down the hall, so why use them in some places and not others? It's a waste of money."

Level of education about CPs varied among patients interviewed. Almost half of the patients revealed they had received little to no education on CPs or were not educated until they asked health care staff about the gowns or signs. Several patients reported feeling uneasy prior to education. As 1 patient stated, "It was scary. I did not know what to think. But my doctor explained to me it's not uncommon and that he's seen it before, so it inspired confidence." Two patients recalled receiving education about the posted signs. In general, interviewed patients com-

Table 1
Demographics of patients interviewed

Characteristics	No. of patients
Gender	
Female	12
Male	8
Race	
White	16
Hispanic	2
African American	1
Refused to answer	1
Education	
High school	7
Some college	7
College degree	4
Advanced degree	2
Are you able to move on your own?	
Yes	14
Yes, with some help	2
No	4
How would you describe your health in general?	
Poor	4
Fair	6
Good	3
Very good	3
Excellent	2