Reply to Roady

To the Editor—We welcome the engagement and comments of Ms. Roady in response to our research article.[1] We agree that the use of rapid ATP testing has a growing body of published support. However, the lack of common acceptance for rapid ATP testing at this point in time is well expressed in the EPIC 3 Guidelines (2014) from an expert committee in the United Kingdom.[2]

Unfortunately, Ms Roady somewhat misses the point of our paper. In our study, we did not attempt to equate rapid ATP testing with detection of bacterial contamination. We showed that the variability that occurs when measuring responses to controlled quantitated microbial cultures is the same variability that occurs when controlled concentrations of pure ATP solutions are measured. The issue is therefore not correlation with detection but data variability.

This variability is undetectable to ATP device users and applies to all sources of detected ATP. The ATP variability problem (ie, imprecision in results) that we have outlined in our most recent paper is common to each of the ATP device brands we tested. This finding does have implications for sampling methodology and analysis.[3]

We set out to validate several branded ATP devices using a standardized approach and focusing on precision and accuracy.[4] The first issue we encountered was uncontrolled variability and the lack of precision at any testing point. The issue of accuracy is problematic because the scale of relative light units (RLU) is neither universally standardized nor standardized among ATP device suppliers.

We welcome the engagement with the industry. We would like to see better quality of results for ATP testing devices, including testing for precision and the development of a common measurement scale. There remains a tremendous upside for ATP use once these issues are resolved.

ACKNOWLEDGMENTS

Potential conflicts of interest. None of the authors has any conflict of interest to declare.

Greg S. Whiteley, M Safety Sc;[1,2]
Chris Derry, PhD;[1,3]
Trevor Glasbey, PhD;[2]
Paul Fahey, MMedStat[4]

Affiliation: 1. University of Western Sydney, School of Science and Health; 2. Whiteley Corporation; 3. WHO Collaborating Centre for Environmental Health Development; 4. University of Western Sydney

Infect. Control Hosp. Epidemiol. 2015;36(11):1368–1368
 0899-823X/2015/3611-0024. DOI: 10.1017/ice.2015.210

REFERENCES

1. Whiteley GS, Derry C, Glasbey T, Fahey P. The perennial problem of variability in adenosine triphosphate (ATP) tests for hygiene monitoring within healthcare settings. *Infect Control Hosp Epidemiol* 2015;36:658–663.
2. Loveday H, Wilson JA, Pratt RJ, Golsorkhi M, Tingle A, Bak A, Browne J, Prieto J, Wilcox M. *EPIC 3 National Evidence Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. J Hosp Infect* 2014;86:Supplement 1.
3. Whiteley GS, Derry C, Glasbey T. Sampling plans for use of rapid adenosine triphosphate (ATP) monitoring must overcome variability or suffer statistical invalidity. *Infect Control Hosp Epidemiol* 2015;36:236–237.
4. International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use. *ICH Harmonised Tripartite Guideline for Validation of Analytical Procedures: Text and Methodology* Q2(R1). ICH Guidelines 2008.

Infection Control Implications of Protracted Lengths of Stay With Noninfluenza Viral Influenza-Like Illnesses in Hospitalized Adults During the 2015 Influenza A (H_3N_2) Epidemic

To the Editor—Infection control (IC) precautions for hospitalized adults with influenza consist of standard, contact, and droplet precautions with single rooms recommended or with patients cohorted, but guidelines for viral influenza-like illnesses (ILIs) are not standardized.[1] During the January 2015 influenza A (H_3N_2) epidemic in our location, the high volume of patients with ILIs became problematic, creating a major strain on bed availability.

In January 2015, a total of 54 adults were admitted with influenza A (H_3N_2) and 37 adults were admitted with viral ILIs diagnosed by multiplex polymerase chain reaction (PCR) assay of nasopharyngeal swab samples. Of the 54 influenza case patients, 53 (98%) had influenza A (H_3N_2) and 1 (2%) had influenza B. One patient had a dual-positive rapid influenza diagnostic test for influenza A and influenza B, but PCR testing was positive for influenza A (H_3N_2).[2–6]

Of the 37 adults with viral ILIs, 16 (43%) had respiratory syncytial virus (RSV), 10 (27%) had rhinovirus/enterovirus (R/E), 5 (14%) had human parainfluenza virus type 3 (HPIV-3), 4 (11%) had human metapneumovirus (hMPV), and 2 (5%) had coronavirus (Table 1). Elderly patients, more commonly admitted for viral ILIs, had longer LOS for viral ILIs than for influenza. RSV patients were older (mean age, 83 years), with LOS similar to that of influenza patients. Importantly, HPIV-3 patients had the longest LOS of any viral ILI (mean, 19 days) and were more seriously ill, with 1 death due to HPIV-3 pneumonia. Two patients had co-colonization

TABLE 1. Adults Admitted to Winthrop-University Hospital in January 2015 With a Noninfluenza Viral ILI and a Positive Respiratory Viral PCR

hMPV		RSV		Coronavirus		R/E		HPIV-3	
Age	LOS	Age	LOS	Age	LOS	Age	LOS	Age	LOS
33	2	48	4	63	7	47	10	67	21
65	2	60	9	89	2	55	3	74	8
79	7	69	6			56	4	74	27
93	5	82	7			75	3	83	11[a]
		82	6			75	19	83	28
		82	8			80	2		
		86	7			81	10		
		88	3			82	18		
		88	7			84	4		
		88	12			91	7[a]		
		90	4						
		90	9						
		91	7						
		93	7						
		94	7						
		97	27						
Mean	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
67.5	4	83	8.1	76	4.5	72.6	8	76.2	19

NOTE. hMPV: human metapneumovirus; HPIV-3: human parainfluenza virus type 3; ILI, influenza-like illness; LOS: length of stay in days; PCR, polymerase chain reaction; R/E: rhinovirus/enterovirus; RSV: respiratory syncytial virus.
[a]Deceased during hospitalization.

with influenza A (H_3N_2) and another respiratory virus, but not a worse prognosis.[4–6] None of the 37 adults with viral ILIs had bacterial coinfection at admission or during hospitalization.

Hand hygiene and respiratory hygiene (ie, cough etiquette) should be maintained for viral ILIs. The Centers for Disease Control and Prevention's Guideline for Isolation Precautions recommends contact precautions for adults with hMPV, RSV, or HPIV-3 only if they are immunosuppressed. Droplet precautions and single rooms are recommended during hospitalization.[7] Our viral PCR (FilmArray Respiratory Panel; BioFire Diagnostics) does not distinguish between rhinoviruses and enteroviruses (eg, EV-D86). R/E patients were placed on droplet and contact precautions. Since hMPV, RSV, and HPIV-3 have been implicated in serious nosocomial outbreaks in adults, we placed patients with hMPV, RSV, or HPIV-3 on standard, contact, and droplet precautions for cough duration and used single rooms when available.[8–10]

Early in the influenza epidemic here, influenza and ILI patients were given single rooms. Influenza patients had single room priority and cohorting was performed whenever possible. The bed situation was maximally stressed by adult admissions for influenza and ILIs. For patients with viral ILIs, cohorting was of limited value since patients with the same virus were usually not in the hospital at the same time.

During an influenza season or epidemic, influenza cocirculates with ILI viruses.[3–5] In our view, because of potential nosocomial transmission, patients with hMPV, RSV, or HPIV-3 should be placed on the same IC precautions as those with influenza.

We experienced several unexpected findings during the January 2015 influenza A (H_3N_2) epidemic here. First, the number of adults with viral ILIs approached that of influenza. Second, relatively few ILIs were due to hMPV and coronavirus, which were associated with relatively short LOS (4 and 4.5 days, respectively). RSV (n = 16) was the most common viral ILI with a mean patient age of 83 years and long LOS (8.1 days). Third, there was a relatively high incidence of R/E (n = 10), but our PCR does not differentiate rhinoviruses from enteroviruses. Like RSV, R/E was most common in elderly patients (mean age, 72.6 years), and more importantly from an IC perspective, had a prolonged LOS (8 days) like RSV, impacting our bed utilization. Fourth, the most surprising finding was the relatively high number (5) of HPIV-3 patients in nonimmunosuppressed adults (mean age, 76.2 years). From an IC perspective HPIV-3 had an effect on bed utilization greater than what would be expected from the number of patients. The HPIV-3 LOS (19 days) exceeded that of all other ILIs. There was 1 death due to HPIV-3 pneumonia.

Influenza and viral ILIs cocirculate during the winter months (ie, influenza season). The number of ILIs (37 patients) during the 2015 influenza epidemic at our hospital approached that of influenza (54 patients). Admitted adults with influenza diagnosed by PCR were placed on standard, contact, and droplet precautions and were given single room priority. Influenza patients were cohorted whenever possible, but owing to high volume, single room availability quickly became extremely limited. Because some viral ILIs (eg, hMPV, RSV, HPIV-3) have potential for nosocomial spread and serious hospital outbreaks,

https://doi.org/10.1017/ice.2015.204 Published online by Cambridge University Press

we thought it prudent to put these ILI patients in single rooms.[9,10] Since the viral etiology of ILIs was known by PCR, it was thought that cohorting would decrease the bed burden, but cohorting was of limited value because ILIs of the same type were not in hospital at the same time. Single room availability was further limited by the prolonged LOS of some ILI viruses—for example, RSV (8.1 days) and R/E (8 days). Although there were relatively few HPIV-3 cases, HPIV-3 LOS was the most protracted (19 days), with a disproportionate effect on bed availability. The five HPIV-3 patients were also the most ill, with 1 death due to HPIV-3 pneumonia.

We continued to provide single rooms for ILI patients for the first 3 weeks of January, but by week 4, bed availability became critical and we were forced to cohort ILIs of different viral etiologies as the influenza epidemic self-terminated. From an IC perspective we prefer diagnostic precision by PCR testing with ILIs. However, during influenza epidemics, knowing the specific viral ILI type may not be helpful when bed availability becomes severely limited.

ACKNOWLEDGMENTS

Financial support. None reported.

Potential conflicts of interest. All authors report no conflicts of interest relevant to this article.

Burke A. Cunha, MD;
James J. Connolly, MD;
Adina C. Musta, MD;
Eileen Abruzzo, RN, CIC

Affiliation: Infectious Disease Division, Infection Control Department, Winthrop-University Hospital, Mineola, New York; State University of New York School of Medicine, Stony Brook, New York.

Address correspondence to Burke A. Cunha, MD, Infectious Disease Division, Winthrop-University Hospital, 222 Station Plaza North (Ste 432), Mineola, NY 11501 (bacunha@winthrop.org).

Infect. Control Hosp. Epidemiol. 2015;36(11):1368–1370

 0899-823X/2015/3611-0025. DOI: 10.1017/ice.2015.204

REFERENCES

1. Centers for Disease Control and Prevention. Prevention strategies for seasonal influenza in healthcare settings: guidelines and recommendations. CDC website. http://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm. Accessed April 2, 2015.
2. D'Mello T, Brammer L, Blanton L, et al. Update: influenza activity–United States, September 28, 2014–February 21, 2015. *MMWR Morb Mortal Wkly Rep* 2015;64:206–212.
3. Cunha BA, Connolly JJ, Abruzzo E. Clinical implications of dual-positive rapid influenza diagnostic tests during influenza season: co-colonization, coinfection, or false positive test? *Am J Infect Control* 2014;42:1139–1140.
4. Goka E, Vallely P, Mutton K, et al. Influenza A viruses dual and multiple infections with other respiratory viruses and risk of hospitalisation and mortality. *Influenza Other Respir Viruses* 2013;7:1079–1087.
5. Goka EA, Vallely PJ, Mutton KJ, Klapper PE. Single, dual and multiple respiratory virus infections and risk of hospitalization and mortality. *Epidemiol Infect* 2015;143:37–47.
6. Gilca R, Amini R, Douville-Fradet M, et al. Other respiratory viruses are important contributors to adult respiratory hospitalizations and mortality even during peak weeks of the influenza season. *Open Forum Infect Dis* 2014;1: ofu086.
7. Siegel JD, Rhinehart E, Jackson M, et al. 2007 Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings. Centers for Disease Control and Prevention website. http://www.cdc.gov/ncidod/dhqp/pdf/isolation. Accessed April 2, 2015.
8. Martinelli PE, Canuti M, Farsani J, et al. Influenza and other respiratory viruses involved in severe acute respiratory disease in northern Italy during the pandemic and postpandemic period (2009–2011). *Biomed Res Int* 2014;2014:241298.
9. Falsey AR, McElhaney JE, Beran J, et al. Respiratory syncytial virus and other respiratory viral infections in older adults with moderate to severe influenza-like illness. *J Infect Dis* 2014;209: 1873–1881.
10. Widmer K, Griffin MR, Zhu Y, Williams JV, Talbot HK. Respiratory syncytial virus and human metapneumovirus-associated emergency department and hospital burden in adults. *Influenza Other Respir Viruses* 2014;8:347–352.

The Economics of a Chickenpox Outbreak in an Oncology Center in Eastern India

To the Editor—There is a lack of robust data on the health, infection control, and economic consequences of chickenpox (varicella) among healthcare workers. Chickenpox is potentially fatal, and adults contribute to most cases of chickenpox-related mortality.[1] From 1985 to 1997 there was an average of 9.22 case fatalities per 100,000 population in England and Wales due to chickenpox.[1] Many individuals in the tropics, especially those coming from rural areas, may be nonimmune to varicella. For instance, only 5 (3.3%) of 153 urban adults were seronegative for varicella zoster virus (VZV) immunoglobulin G (IgG) in India compared with 74 (30.1%) of 246 rural adults. Ninety-six percent of urban adults were immune by the age of 25, compared with 42% in the rural group.[2] In our center, of the 956 VZV IgG tests performed for immunity, 593 (62%) were found to be reactive (immune to varicella) from May 2011 to June 2015; also, 26 samples had indeterminate VZV IgG reactivity. The live attenuated varicella vaccine (contraindicated in immunosuppressed or pregnant patients as well as those with previous anaphylaxis) is relatively safe with few adverse effects (injection site pain, redness, or mild rash in 10% of adults).[3] Although many developed countries offer the varicella vaccine (eg, National Health Service, United Kingdom) to nonimmune healthcare workers,