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Background. Commercially available enzyme immunoassays (EIAs) for detection of norovirus antigen have poor sensitivity and are limited to use in investigations of a gastroenteritis outbreak. Hence, there remains a need for a standalone high-sensitivity assay that enables rapid and accurate detection of norovirus antigen.

Methods. The Singulex Clarity norovirus assay is currently in development for use on the Singulex Clarity® system (Singulex Inc., Alameda, CA, USA), a fully-automated platform powered by Single Molecule Counting technology (registered with the FDA and CE marked). The assay uses paramagnetic microparticles bound to capture antibody and a fluorescently labeled reporter antibody to detect virion capsid protein of norovirus genogroups I (GI) and II (GII) in the stool. For the development of Clarity Norovirus assay, diagnostic performance of 4 antibody pairs (as Capture and Detection reagent) were evaluated by testing 137 stool samples from patients with suspected norovirus infection. Samples were sourced from three providers: (1) 90 genotyped samples of which 75 were positive (19 different genotypes) and 15 were negative by the CDC assay, (2) 3 samples positive and 5 samples negative by the BioFire® FilmArray® Gastrointestinal Panel, and (3) 39 samples negative by a lab-developed test using Cepheid reagents (SmartCycler®).

Results. From all the antibody pairs tested, one of the pairs had best performance with the area under the receiver operating characteristic (AuROC) curve demonstrating a C-Statistic of 0.959 (95% CI 0.921–0.997), compared with AuROC C-statistic of 0.943 (95% CI 0.896–0.990), 0.871 (95% CI 0.807–0.936), and 0.914 (95% CI 0.863–0.964) for the three other pairs. The Clarity assay detected all 19 different genotypes tested (figures).

Conclusion. The ultrasensitive and rapid Clarity norovirus assay (in development) for detection of GI and GII demonstrated excellent performance with one of the antibody pairs tested and detected all 19 tested genotypes. The Clarity assay may offer a standalone solution for norovirus diagnostics.

Figure 1. Diagnostic performance of antibody pairs tested.

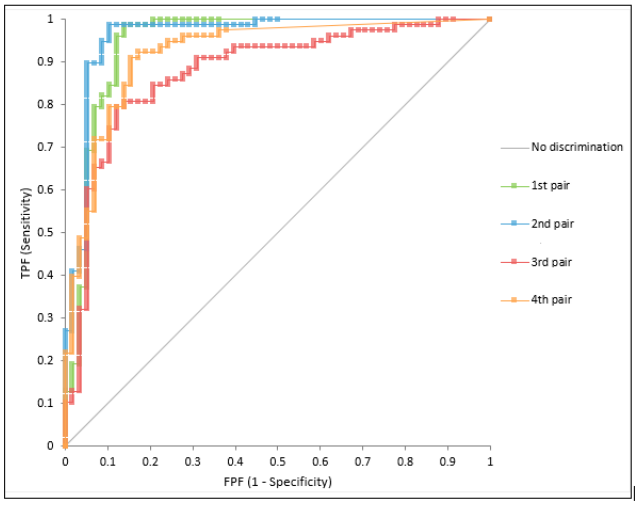
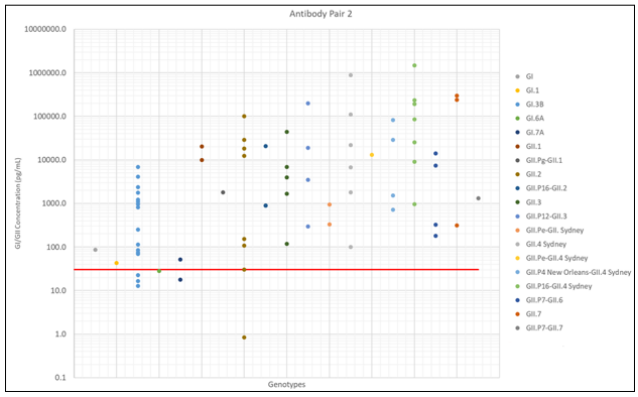


Figure 1: Dot-plot distribution of interpolated concentrations of norovirus-positive and genotyped samples. Antibody pair 2 detected all the tested genotypes with a preliminary cutoff at 30.4 pg/mL.



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646. Evaluation of the Utility of a New Comprehensive Molecular Assay to Test for the Common Pathogens that Cause Lower Respiratory Tract Infections and its Potential Impact on Antibiotic Therapy

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Background. Lower respiratory tract infection (LRTI) has high mortality among critically ill patients. The current standard of care for diagnosing bacterial causes of LRTI is respiratory culture, which is time consuming and insensitive. The FilmArray Pneumonia Panel (FA-Pneumo) (Biofire Diagnostics, Salt Lake City, UT) is FDA-cleared for the detection of lower respiratory tract pathogens (bacteria, atypical bacteria, and viruses) directly from lower respiratory tract specimens. Here, we evaluated the performance of the FA-Pneumo assay in bronchoalveolar lavage (BAL) samples and assessed its potential impact on antibiotic therapy.

Methods. A total of 61 BAL samples collected for respiratory culture from intensive care unit patients aged 18 years and older who had symptoms consistent with LRTI were included in the study. Remnant BAL samples were tested using the FA-Pneumo and results were compared with standard of care respiratory culture results. We then conducted a chart review to determine the potential impact of FA-Pneumo results on antibiotic therapy.

Results. The results of 48 out of 61 BAL samples (78.7%) were the same when comparing FA-Pneumo with a standard of care respiratory culture. Two patients grew *Stenotrophomonas maltophilia* and 1 patient grew *Achromobacter*. Importantly, neither of these organisms is targeted by the FA-Pneumo assay. Three patients (4.9%) had viral LRTI, with 9 patients (14.8%) having bacterial/viral co-infection. A total of six patients with methicillin-susceptible *Staphylococcus aureus* (MSSA) remained on vancomycin therapy for a median of 1.5 days (range 0–7 days) and all three patients with viral LRTI remained on broad-spectrum antibiotic therapy for a median of 4 days (range 3–13 days). All three patients with ESBL-positive *Enterobacteriaceae*detected by FA-Pneumo and culture were not started on appropriate antibiotic therapy until >48 hours after the FA-Pneumo would have been resulted.

Conclusion. The FA-Pneumo assay has the potential to lead to earlier discontinuation of vancomycin for patients with MSSA LRTI and earlier broadening of therapy for ESBL LRTI. Providers should be aware of the inability of the FA-Pneumo to detect *S. maltophilia* and *Achromobacter* species.

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647. Diagnoses Associated with Temperature ≥104°F in Adults

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Background. Temperature ≥104°F ($T \geq 104$) is uncommon in adults. The diagnoses and clinical characteristics were reviewed for patients with $T \geq 104$.

Methods. Infectious disease physicians reviewed charts of patients with $T \geq 104$ seen at the Washington DC Veterans Affairs Medical Center from 2009 to 2018. The following was collected: demographics, past medical history, medications, WBC, maximum temperature, time to defervescence, etiology of $T \geq 104$, and death.

Results. Less than 0.01% of all patient encounters were associated with $T \geq 104$. Of the 60 most recent patients with $T \geq 104$ (from 2014 to 2018), the median age was 63.5 years (range 23–97), 65% were African American, 88% were male. 82% of those with $T \geq 104$ were hospitalized; 76% of those had the $T \geq 104$ on or within 72 hours of admission. 25% of the 60 patients had underlying cancer, 10% HIV, 30% DM, 13% CKD, and 13% were on steroids/immunosuppressants/biologics. The median peak temperature was 104.3°F (interquartile range 104.0 – 104.7); maximum was 106.8°F. 82% had $T \geq 104$ for only 1 day and the median time to defervescence was 2 days. There were 55 diagnoses amongst 48 patients; 12 had no identifiable etiology of $T \geq 104$. Of the identifiable diagnoses, there were 45 (81.8%) infections, 4 (7.3%) metastatic malignancies (1 Hodgkin's lymphoma, 1 small cell carcinoma, 1 squamous cell carcinoma, 1 unknown primary), 2 (3.6%) intracranial bleeds, 2 (3.6%) GI bleeds, 1 (1.8%) mixed collagen vascular disease, and 1 (1.8%) neuroleptic malignant syndrome. The most common infections were 15 cases of pneumonia including 2 Legionella, 8 complicated UTI/pyelonephritis, 3 primary bacteremia, 2 West Nile virus, 2 influenza, and 2 cholangitis with bacteremia. The median WBC of infectious diagnoses (9.8) was significantly higher than noninfectious diagnoses (5.8, $P = 0.006$, T-test). Of the 60 patients, 20% died within 30 days of $T \geq 104$ including 2 patients who died of sepsis. 67% of those who died were receiving hospice care.

Conclusion. $T \geq 104$ is rare in adults and is usually associated with bacterial infections such as pneumonia (including Legionella), complicated UTIs/pyelonephritis, and primary bacteremia but may also be seen with viral infections such as West Nile virus and influenza. Mortality is high.

Disclosures. **All authors:** No reported disclosures.