

**Conclusion.** Vaccinated individuals were more likely than unvaccinated individuals to benefit from antiviral treatment. This finding warrants confirmation in other populations.

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#### 1044. Active Surveillance to Quantify the Burden of Norovirus in a U.S. Veterans Affairs (VA) Patient Population, Houston, 2015–2016

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**Background.** Norovirus is the leading cause of acute gastroenteritis (AGE) outbreaks in the United States; however, little data exist on the burden of endemic norovirus disease among adults. Robust estimates of the norovirus disease burden among US adults are needed to inform assessment of potential norovirus vaccines, which are currently in development.

**Methods.** We conducted active surveillance for AGE at the Michael E. DeBakey Veterans Affairs (VA) Medical Center, where approximately 104,000 unique patients were served in 2016. Cases were defined as veterans with symptoms of AGE ( $\geq 3$  loose stools,  $\geq 2$  vomiting episodes, or  $\geq 1$  episodes of both loose stool and vomiting, within 24 hours) occurring in the previous 10 days, who presented to the emergency department or outpatient clinics (outpatients), or were admitted to the hospital (inpatients). Patients without AGE symptoms in the prior 14 days were enrolled as controls. Demographic data and illness characteristics were collected from enrolled subjects, and stool samples were collected and tested using the FilmArray gastrointestinal panel. Norovirus positives were confirmed by real-time RT-PCR and genotyped after sequencing of conventional PCR products.

**Results.** From November 1, 2015–November 30, 2016, 130 inpatient and 85 outpatient AGE cases, along with 20 inpatient and 37 outpatient controls, were enrolled and provided a stool specimen. Among cases, 201 (93%) were male, and 94 (44%) were  $\geq 65$  years; median duration of illness was 3 days (range, 1–10 days). Norovirus was detected in 12 (9%) inpatient and 15 (18%) outpatient cases; norovirus was not detected in any controls. Incidence of norovirus-associated hospitalization was 15/100,000 population, and was similar in hospitalized cases aged  $<65$  years (14/100,000) and  $\geq 65$  years (15/100,000). Of 22 norovirus positive specimens genotyped, 13 (59%) were GII.4 Sydney.

**Conclusion.** This robust, active surveillance platform employed screening and enrollment of patients in a VA population meeting a standardized AGE case definition, as well as asymptomatic controls. Data from this study highlight the burden of norovirus in adults and importance of a norovirus vaccine.

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#### 1045. Norovirus, Astrovirus, and Sapovirus in a Tertiary Care Research Hospital

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**Background.** Norovirus, astrovirus, and sapovirus are known to cause acute gastroenteritis and are associated with chronic viral excretion in stool among immunocompromised patients. Because molecular tools for their detection only recently became widely available, the prevalence and chronic excretion of these viruses has not been well defined. We describe features of these viral infections among patients receiving care at the Clinical Center of the National Institutes of Health.

**Methods.** We identified patients with a positive BioFire FilmArray<sup>®</sup> gastrointestinal panel result for norovirus, astrovirus, or sapovirus from September 15, 2015 through November 30, 2016. We reviewed patient medical records to abstract clinical and microbiologic information. Chronic excretion was defined as more than one positive test for a given virus with more than 30 days between tests.

**Results.** Of 932 samples tested, 102 (11%) samples from 48 patients tested positive for norovirus, 15 (2%) samples from 11 patients tested positive for sapovirus, and 16 (2%) samples from 7 patients tested positive for astrovirus. One of these patients had a sample that tested positive for both sapovirus and norovirus, and one tested positive for astrovirus and sapovirus at separate points during the study period. Of the 48 patients with norovirus, 16 (33%) had evidence of chronic excretion, with a median duration of 189 days (range 72–372). Of these 16, 14 were known or suspected to be immunodeficient, and 4 had hematologic malignancies. Of 7 patients with astrovirus, 1 (14%) had evidence of chronic excretion (132 days). This patient had a hematologic malignancy and was taking immunosuppressive medication. No patients with sapovirus had evidence of chronic excretion. Overall, 20 (31%) patients additionally tested positive for another gastrointestinal pathogen, most commonly enteropathogenic *E. coli* and *C. difficile*.

**Conclusion.** Norovirus remains common in this immunocompromised patient population, and both sapovirus and astrovirus are present. Additional follow-up in this and other cohorts with new molecular tools will enable more complete description of the prevalence, excretion duration, and clinical features of infection with these enteric viruses.

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#### 1046. Incidence of Norovirus-Associated Acute Gastroenteritis in Four Veteran's Affairs Medical Center Populations in the United States, 2011–2015

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**Background.** In the USA, norovirus is an important cause of epidemic acute gastroenteritis (AGE) as well as a leading cause of pediatric AGE. However, the burden of sporadic norovirus disease in US adults has not been well-documented. Our objective was to estimate the incidence of outpatient visits and hospitalizations for community-acquired norovirus AGE at four Veterans Affairs Medical Centers (VAMCs) and their associated outpatient clinics in Atlanta, GA; Bronx, New York; Houston, TX; and Los Angeles, CA.

**Methods.** From November 2011 to September 2015, stool specimens collected for clinician-requested diagnostic testing within 7 days of AGE symptom onset and with reported vomiting or diarrhea were tested for norovirus by real-time RT-PCR and positive samples were genotyped by Sanger sequencing. Incidence of norovirus-associated outpatient visits and hospitalizations were calculated by multiplying the prevalence of norovirus among tested specimens by AGE-coded outpatient encounters and inpatient discharges, and dividing by the unique patients served at each VAMC.

**Results.** 1,620 stool specimens were tested from all 4 sites. Seven percent of outpatient ( $n = 795$ ) samples (annual range: 3%–10%; range by site: 3%–10%) and 6% of ( $n = 825$ ) samples from hospitalized patients tested positive for norovirus (annual range: 3%–8%; range by site: 3%–10%). Forty-four percent of norovirus-positive specimens were typed as GII.4 Sydney. Seventy-four percent of norovirus-positive specimens were collected between November and April. From 2011 to 2015, outpatient norovirus incidence was 250/100,000 population (annual range: 129 to 426/100,000; range by site: 87 to 428/100,000), and the incidence of norovirus hospitalizations was 28/100,000 population (annual range: 19 to 39/100,000; range by site: 14 to 57/100,000). By age group and setting, the highest incidence was observed among 45- to 64-year-old outpatients (370/100,000 population), and 85+-year-old inpatients (63/100,000 population).

**Conclusion.** This study provides estimates of the incidence of norovirus AGE outpatient visits and hospitalizations across multiple years among a geographically distributed VA population, highlighting the substantial burden of norovirus in US adults.

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#### 1047. WU Polyomavirus Associated with Severe Respiratory Failure in Children

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**Background.** WU polyomavirus (WUPyV) is a relatively new virus associated with respiratory infections. However, its role is unclear in children with severe