Influenza continues to flex its viral muscles this season, and University of Colorado Hospital is absorbing blows on multiple fronts.

The number of people hospitalized with confirmed cases of flu – nearly all of them the H1N1 strain that caused havoc in 2009 – continues to run well ahead of last year’s relatively mild season. There were 127 influenza admissions at UCH from Nov. 1, 2013 to Jan. 29, 2014, compared with just 45 for the same period last year, said Michelle Barron, MD, infectious disease medical director for UCH. There were more than 70 flu admissions in December 2013 alone.

The average length per flu admission was eight days, with three deaths at UCH attributed to influenza, Barron said. The patients were relatively young (average age 51) and nearly two-thirds (65 percent) were female.

Nearly all hospital employees, providers, volunteers and contractors received flu vaccinations, and those granted exemptions are required to wear protective masks when they have direct contact or are in areas where patients and visitors congregate. But as a further guard against transmitting the virus, the hospital instituted a requirement Jan. 14 that all visitors must don masks before entering high-risk areas, including intensive care and progressive care units, the Oncology inpatient unit, and the Transplant and Blood and Marrow Transplant inpatient units and ambulatory clinics. All children under the age of 12 are prohibited from visiting these areas.

Meanwhile, patients exhibiting flu-like symptoms have streamed into UCH’s Emergency Department. Associate Medical Director Kelly Bookman, MD, said it’s difficult to pin down the number of flu cases, as opposed to people who have other viral illnesses. But based on a review of discharge diagnoses, she estimated the total number of flu cases from September through December 2013 is double the number the ED saw for the same period last year.

**Lab alert.** The higher number of confirmed and suspected cases of influenza also increased demand for tests in the Clinical Laboratory. Through the last week of January 2014, the lab had run a total of 2,813 respiratory PCR (polymerase chain reaction) and antigen flu tests for the hospital’s inpatient units and ambulatory clinics and lab clients, 74 percent more than the 1,618 tests for the same period last year, said Lori Brewster, MB(ASCP) SV, chief medical laboratory scientist for molecular diagnostics and virology.

The lab has a rapid antigen test that yields results in about 15 minutes. But there is a catch, Brewster said.

“You pay for that with a loss of sensitivity and specificity,” she said. During flu season, that means more false negatives than the hospital would like. The rapid test claims 87 percent accuracy,
Brewster said, but experience shows it’s lower than that, depending on the sample type and the strain of influenza. This year, she said, the accuracy is “probably far lower than 70 percent” because rapid antigen tests seem to have trouble identifying the H1N1 strain.

**Quicker, more accurate.** Help has arrived in the form of molecular tests with accuracy rates well above 90 percent both in detecting the virus and correctly identifying the specific strain – and the tests can be run much faster than before.

“In the past, the rapid test was the best we could do,” Brewster said. “We’ve watched as these new tests have developed, and they have now drastically reduced the amount of time it takes to run them.”

The workhorse now is the GeneXpert Flu test from Cepheid, which can detect either A or B viruses and identify some specific A strains. The mostly automated test requires only about five minutes of hands-on time, Brewster said, down from the 90 minutes that had made the use of previous tests impractical on a large scale. Best of all, she added, the test’s accuracy has lived up to its billing.

“We’ve discontinued use of the rapid antigen test completely,” Brewster said.

**More hands on deck.** Still, the huge influx of flu tests has required the lab to ramp up to meet demand. As of Jan. 22, the Molecular Lab launched 24/7 testing, enlisting help from other departments, such as Specials, which includes Toxicology, Coagulation and Special Chemistry. So far six techs have received two weeks of training to run the flu tests and document the results, Brewster said. Because of the cross-training and cooperation between teams, the lab has handled the heavier volumes without having to add staff, she added.

“It would have been hard to have handled the volumes we’ve been seeing with previous versions of the molecular test,” Brewster said.

The mini-revolution in the lab is likely to continue beyond flu season, she added. A second test, the FilmArray Respiratory Panel from Biofire Diagnostics, detects a total of 18 viruses, including influenza strains, and three types of bacteria. It takes about the same amount of time as the GeneXpert Flu test, Brewster said, but it is more expensive.

“The physicians decide which one to use,” she said, adding that the FilmArray panel has been a great help in targeting respiratory viruses that often mimic one another.

Brewster, who has been with the hospital 13 years, said the current flu season is the most challenging since 2009, although it hasn’t yet proven to be terribly unusual in terms of the number of influenza tests ordered.

“The surprise was how early it started,” she said. “We have reduced the test requirements, and we’re making sure the target is correct. Now we’re shifting resources to treating the flu rather than verifying it.”

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*The FilmArray Respiratory Panel tests for 18 viruses and three types of bacteria.*