

Children with chronic respiratory illness are vulnerable to critical H1N1

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As critical care professionals develop a better understanding of the progression of H1N1, they are becoming better prepared to treat children with severe cases, according to a new study that will be published in the March issue of *Pediatric Critical Care Medicine* (PCCM).

Additionally, with careful management, the pediatric critical care system is expected to be able to meet the increased demands of a [flu pandemic](#), according to a resource modeling study published in the same issue of PCCM. Both studies are available on www.pccmjournal.org.

The first H1N1 study focusing exclusively on critically ill children found that children with chronic illness, especially respiratory illness, are more likely to develop H1N1 influenza that requires critical care and that the virus is likely to change course as it attacks the lungs throughout the course of the illness.

"The good news is that all of our patients survived, even though some needed mechanical ventilators and heart medication," said senior author David G. Nichols, MD, professor of anesthesiology/critical care medicine and pediatrics at the Johns Hopkins University School of Medicine.

Compared to seasonal influenza, H1N1 influenza appears to have increased infection rates among children and young adults and varies in severity.

The researchers reviewed cases of 13 critically ill children with H1N1 admitted to the Johns Hopkins Hospital Children's Center pediatric intensive care unit during the spring and summer of 2009. They found that the vast majority (92%) of the children had an underlying chronic disease, usually a lung disease such as asthma, before contracting H1N1 infection.

"Critical H1N1 disease in children has different and rapidly changing manifestations in the patients' lungs," explained Dr. Nichols. "Some children behaved as though they were having an [asthma attack](#), while other children behaved as though they had severe pneumonia. Some children had both or switched from one to the other. These variable and changing manifestations of lung infection made life support with a mechanical ventilator challenging and required us to constantly reassess and readjust treatments."

The researchers also found that children with H1N1 lung disease are at increased risk for developing a second type of pneumonia.

Patients who received treatment with antiviral drugs such as Tamiflu within 48 hours of admission did not have significantly different outcomes than those who received antiviral treatment more than 48 hours following admission.

Study offers positive assessment of PICU surge capacity during pandemic flu

Even during the peak of a pandemic, adequate health care can be provided if patients are managed appropriately. "An influenza pandemic for children can be managed, even allowing emergency care for non-influenza-related acute care children, but only when firm decision-making rules for hospital health care are followed and anti-viral therapy is used to reduce the burden of the disease in the community," said lead

author Raoul E. Nap, PhD, directorate of medical affairs, quality, and safety at the University Medical Center Groningen, University of Groningen in the Netherlands.

The researchers modeled pediatric surge capacity of health care facility and pediatric [intensive care unit](#) (PICU) requirements over time to assess the adequacy of preparedness planning for an influenza pandemic.

They noted a lack of published and detailed analyses of PICU needs and demands, raising concern that PICU facilities will be a major limiting factor in the provision of care. "We show that PICU surge capacity is likely to be adequate assuming that 'older children' [age > 7-8 years] can be rerouted to an adult ICU environment preserving adequate bed space for 'younger children', that enough adult ICU resources are available and that safe provision of care to children can be guaranteed," said Dr. Nap.

The study's overall assessment that an influenza pandemic can be managed at the level of health care institutions clearly contrasts with other sobering and daunting global analyses presented for ICU capacity, according to Dr. Nap.

"We recommend that an adaptable planning model for pediatric surge capacity be an integral part of a preparedness plan for a pandemic flu," Dr. Nap concluded.

"H1N1 has greatly impacted every pediatric critical care medicine program world-wide," said PCCM editor Patrick M. Kochanek, MD, FCCM. "I view the dissemination of new information on this disease as the top priority for our journal. The reports from both Baltimore and the Netherlands in the March issue of Pediatric [Critical Care Medicine](#) present, respectively, valuable information on the impact of critical respiratory disease produced by H1N1 in children with underlying chronic conditions, and explores PICU surge capacity."

Provided by Society of Critical Care Medicine

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