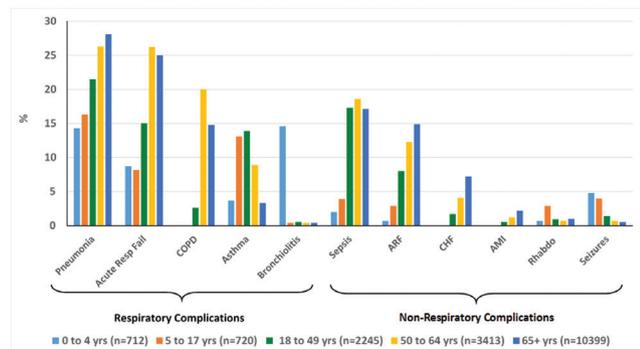


influenza during 2016–2017. We abstracted data on underlying conditions and discharge diagnoses from medical charts. We calculated the frequency of respiratory and nonrespiratory complications in all age groups and used univariate and multivariable logistic regression to examine factors associated with select complications among adults.

**Results.** Among 17,489 patients, the most common respiratory complications were pneumonia (26%) and acute respiratory failure (23%) and the most common nonrespiratory complications were sepsis (16%) and acute renal failure (ARF) (12%). Complications varied by age group (figure). Pneumonia was the most common respiratory complication in all age groups except 0–4 years; among children aged 0–4 years bronchiolitis was most common (104/712; 15%). Among 97 children aged 0–4 years with bronchiolitis who underwent testing for respiratory syncytial virus (RSV), 37% had RSV. The most common nonrespiratory complication was seizures in children aged 0–17 years (17% had a history of prior seizures) and sepsis in adults. Among adults ( $n = 16,057$ ), factors most strongly associated with ARF included chronic renal disease (adjusted odds ratio (AOR) 2.5; 95% confidence interval (95% CI) 2.2–2.8), male sex (AOR 1.5 95% CI 1.4–1.7) and age  $\geq 65$  years (AOR 1.4 95% CI 1.2–1.7); the factor most strongly associated with sepsis was chronic neuromuscular disease (AOR 1.5 95% CI 1.3–1.8).

**Conclusion.** Influenza hospitalizations are associated with a broad spectrum of complications including pneumonia, respiratory failure, sepsis, ARF and seizures. During the influenza season, astute clinicians should keep influenza in the differential diagnosis for patients with a wide range of presentations.

Figure. Respiratory and Non-Respiratory Complications by Age Group, FluSurv-Net, 2016–17



\*Acute Resp Fail = Acute Respiratory Failure; COPD = Exacerbation of Chronic Obstructive Pulmonary Disease; ARF= Acute Renal Failure; CHF= Exacerbation of Congestive Heart Failure; AMI= Acute Myocardial Infarction; Rhinobdo= Rhabdomyolysis

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### 721. Clinical Respiratory Syndromes and Association with Influenza Clinical Diagnostic Testing and Antiviral Treatment among Children Hospitalized with Acute Respiratory Illness, 2015–2016

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**Background.** We investigated clinical influenza testing and treatment in children hospitalized with acute respiratory illness (ARI) who had distinct respiratory syndromes.

**Methods.** Children <18 years old with ARI were enrolled at seven hospitals in the New Vaccine Surveillance Network (NVSN) between November 1, 2015–June 30, 2016. ICD10 admission diagnosis codes were grouped to define syndromes of bronchiolitis, asthma, pneumonia, and croup. At clinician discretion, influenza testing with a rapid influenza diagnostic test or molecular assay was performed on respiratory

samples. As part of the study, each site performed influenza testing using molecular assays on mid-turbinate nasal and throat swabs from all enrolled children. Analysis was restricted to influenza season; children who received antivirals before hospitalization were excluded.

**Results.** Among 2,134 children with available ICD10 codes, on preliminary analysis 1,119 (52%) had influenza testing ordered by a clinician: 111 (10%) were positive, and 57 (51%) of 111 received antiviral treatment. Of the 2,134, 858 (40%) had one of the four mutually exclusive syndromes (table). Hospital clinical testing per clinician discretion was influenza positive in 16 of the 858 children (percent positivity per syndrome ranged from <1% to 38%; table). Research study testing of children not undergoing clinical influenza testing identified 11 additional positives. Antiviral treatment was highest for pneumonia patients.

**Conclusion.** Understanding testing and treatment practices by clinical syndrome may help to identify missed opportunities for influenza diagnosis and treatment.

Table:

	Bronchiolitis		Asthma		Pneumonia		Croup
	n = 392		n = 320		n = 117		n = 29
	n	%	n	%	n	%	n %
<b>Age &lt;5 years</b>	391	>99	156	49	76	65	23 79
<b>&lt;2 days from illness onset to admission</b>	87	22	171	54	28	24	15 52
<b>&gt;1 known underlying condition</b>	84	21	277	87	62	53	6 21
<b>Hospital clinical testing performed</b>	209	53	90	28	68	58	8 28
Positive influenza	1	<1	4	4	8	12	3 38
Antiviral treatment	0		1		6		0
<b>Research study result in children without hospital clinical testing</b>							
Additional positive influenza	1		3		5		2
Antiviral treatment	0		0		3		0

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### 722. Normal Clinical Signs and Duration of Antibiotics in Hospitalized Patients with Pneumonia

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**Background.** The most common reason for antibiotic prescribing in hospitalized patients is suspected respiratory tract infection. In many cases, however, antibiotics may be started when the diagnosis is unclear and continued for a fixed course regardless of patients' clinical trajectories. We sought to characterize the distribution of clinical signs in patients started on antibiotics for possible pneumonia, number of days to normalization of clinical signs, and duration of antibiotics beyond when signs normalized.

**Methods.** We performed a retrospective analysis on 43,820 consecutive adults admitted to Brigham and Women's Hospital from May 2017 to January 2018. We identified all nonventilated patients started on antibiotics for pneumonia using clinicians' stated indications in their medication orders. We analyzed the distribution of clinical signs indicative of pneumonia (maximum temperature, maximum white blood cell count, median respiratory rate, and supplemental oxygen need) on the first day of antibiotics. We then calculated median days to normalization for each sign, total days of antibiotics for pneumonia, and duration of antibiotics beyond when all signs normalized.

**Results.** We identified 2,754 nonventilated patients started on antibiotics for pneumonia. On the first day of antibiotics, 38% had oxygen saturations  $\geq 95\%$  without supplemental oxygen, 78% had normal temperatures, 63% had normal white blood cell counts, and 79% had median respiratory rates <22 breaths/minute. All signs were normal in 25% of patients. Amongst those with at least one abnormal clinical sign on the first day of antibiotics, all signs returned to normal within a median of 3 days (IQR 2–7 days). Antibiotics were nonetheless continued for  $\geq 3$  more days in 33% of these patients.

**Conclusion.** Pneumonia is a major driver of antibiotic utilization in hospitalized patients but we found 25% of cases lacked the cardinal clinical signs of pneumonia and antibiotics were continued for  $\geq 3$  days after all clinical signs normalized in a third of the 75% of patients who did have signs of pneumonia. These findings suggest substantial opportunities to improve antibiotic prescribing for suspected respiratory tract infections in hospitalized patients.

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