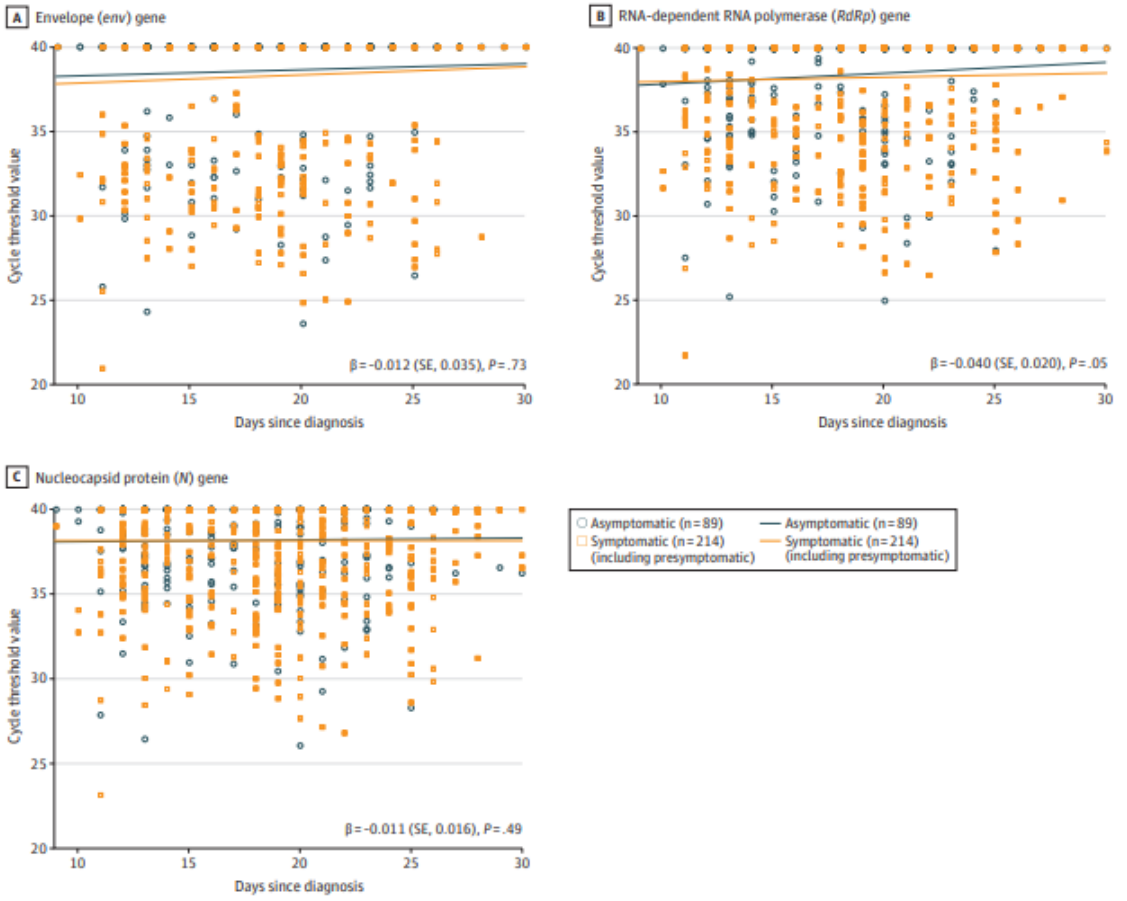
**Clinical Course and Molecular Viral Shedding Among Asymptomatic and Symptomatic Patients With SARS-CoV-2 Infection in a Community Treatment Center in the Republic of Korea**

JAMA Intern Med published online August 6, 2020

This article is a retrospective evaluation conducted for a cohort of 303 symptomatic and asymptomatic patients with SARS-CoV-2 infection between March 6 and March 26, 2020. Participants were isolated in a community treatment center. Reverse transcription-polymerase chain reaction (RT-PCR) assay from upper respiratory tract specimens (nasopharynx and oropharynx swab) and lower respiratory tract specimens (sputum) were tested on various time-points from days 8 to 19.

Of the 303 patients with SARS-CoV-2 infection, the median age was 25 (22-36) years, and 201 (66.3%) were women. Only 12 (3.9%) patients had comorbidities. Among the 303 patients with SARS-CoV-2 infection, 193 (63.7%) were symptomatic at the time of isolation. Of the 110 (36.3%) asymptomatic patients, 21 (19.1%) developed symptoms during isolation. The median interval of time from detection of SARS-CoV-2 to symptom onset in presymptomatic patients was 15 (13-20) days. The proportions of participants with a negative conversion at day 14 and day 21 from diagnosis were 33.7% and 75.2%, respectively, in asymptomatic patients and 29.6% and 69.9%, respectively, in symptomatic patients (including presymptomatic patients). The Ct values in asymptomatic patients were similar to those in symptomatic patients from the upper respiratory tract.

Figure 2. The Cycle Threshold Value Dynamics of *env*, *RdRp*, and *N* Genes From Upper Respiratory Tract Specimens



**Comment:** Knowledge about the infectiveness of asymptomatic patients is evolving. This report offers biological plausibility on transmission by asymptomatic people. It is important to note that detection of viral RNA does not equate infectious virus being present and transmissible. Obvious extent of close contact and duration are important variables. For a better understanding of the viral shedding and potential transmissibility of asymptomatic infection, large rigorous epidemiologic studies are still needed.

**High Incidence of Barotrauma in Patients with COVID-19 Infection on Invasive Mechanical Ventilation**

Radiology published online July 2, 2020

This is a retrospective review of clinical and imagine patients who tested positive for SARS-CoV-2 and experienced barotrauma (e.g. pneumothorax, pneumomediastinum) on mechanical ventilation and compared to patients without SARS-CoV-2 infection during same period of time. Historical comparison was made to barotrauma rates of patients with ARDS from 02/01/2016 to 02/01/2020 at their institution. Comparison of patient groups was performed using categorical or continuous statistical testing as appropriate with multivariable regression analysis. Patient survival was assessed using Kaplan-Meier curves analysis.

601 patients with COVID-19 infection underwent invasive mechanical ventilation (63 ± 15 years, 71% men). There were 89/601 (15%) patients with one or more barotrauma events, for a total of 145 barotrauma events (24% overall events). During the same period, 196 patients without COVID-19 infection (64 ± 19 years, 52% male) with invasive mechanical ventilation had 1 barotrauma event ($p<.001$ vs. the group with COVID-19 infection). Of 285 patients with ARDS over the prior 4 years on invasive mechanical ventilation (68 ± 17 years, 60% men), 28 patients (10%) had 31 barotrauma events, with overall barotrauma rate of 11% ( $p<.001$ vs. the group with COVID-19 infection). Barotrauma is an independent risk factor for death in COVID-19 (OR=2.2, p=.03), and is associated with longer hospital length of stay (OR=.92, $p<.001$).

**Comment:** The authors did not correlate the rate of barotrauma with specific ventilator settings. Rather, this was retrospective study reporting high barotrauma rates in patients with COVID-19 infection. Examination of potential associations with ventilator parameters requires further study. Nonetheless high barotrauma rates in patients with COVID-19 infection on mechanical ventilation is associated with longer hospital stay and is a risk factor for higher mortality.

**Imaging of COVID-19 pneumonia: Patterns, pathogenesis, and advances**

Br J Radiol 2020; 93 20200538 article provided by Dick Hamrick

The goal of this review is to highlight common imaging findings using illustrative examples, describe the evolution of disease over time, discuss differences in imaging appearance of adult and pediatric patients and review the available literature on quantitative CT for COVID-19. They address the known pathological findings of the COVID-19 lung disease that may help better understand the imaging appearance and provide a demonstration of novel display methodologies and artificial intelligence applications serving to support clinical observations.

Table 1. COVID-19 imaging patterns on CT with confidence levels described by guidance document of the BSTI[15]

| Disease pattern | Imaging appearance |
|---|---|
| Typical or classical (near 100% confidence) * | Lower lobe and peripheral predominant, bilateral, multifocal, round, GGO<br>With or without:<br>• Reticular interstitial thickening (crazy paving)<br>• Reverse Halo (Organizing pneumonia)<br>• Peripheral Consolidation |
| Probable (71–99% confidence) * | Lower lobe predominant peripheral consolidation with:<br>• Bronchocentric disease<br>• Less GGO<br>• Reverse Halo (Organizing pneumonia) |
| Indeterminate (<70% confidence) | Typical or probable imaging pattern without clinical suspicion<br>Disease pattern that doesn't fit into typical or probable |
| Atypical (70% confidence for alternative diagnosis) | • Lobar consolidation<br>• Tree-in-bud or centrilobular nodules<br>• Cavitary lesions<br>• Lymphadenopathy or effusions |

GGO, ground-glass opacity.
[a]In a clinically suspected COVID-19 patient.

**Comment:** This is an excellent review with terrific images and illustrations.

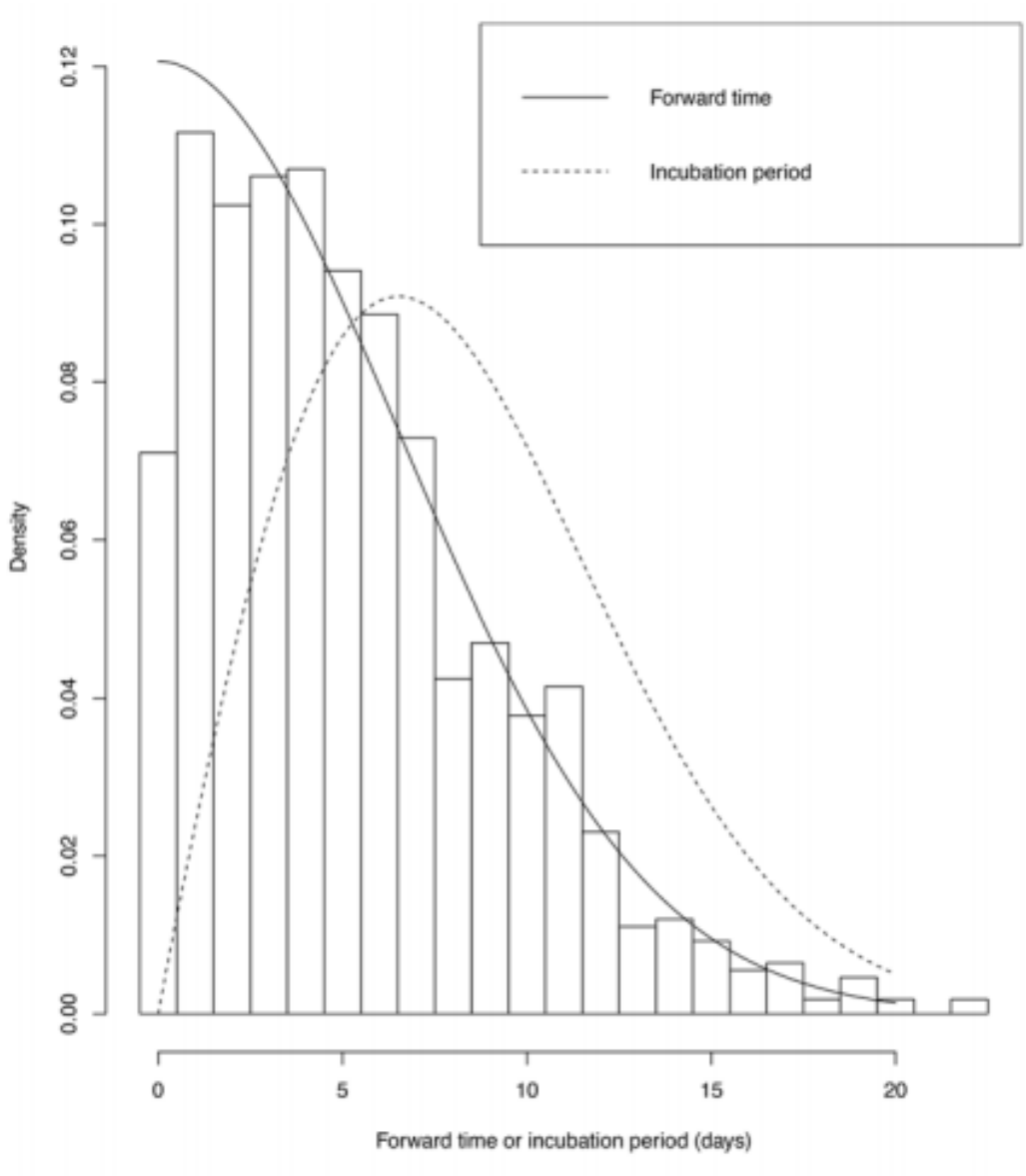
**Prevalence of SARS-CoV-2 Antibodies in Health Care Personnel in the New York City Area**
JAMA published online August 6, 2020
All Northwell HCW were provided with PPE from March 7, 2020, onward. SARS-CoV-2 testing by PCR began March 7, 2020 and was available for any HCW who had COVID-19-like symptoms or suspected exposure. From April 20, 2020, to June 23, 2020, all Northwell HCW were offered free, voluntary antibody testing, regardless of symptoms, at 52 sites in the greater NYC area. Testing was for qualitative IgG or total immunoreactivity to SARS-CoV-2. The main outcome was seroprevalence. HCW reported demographics, primary work location, job function, direct patient care, work on a COVID or non-COVID unit, and their level of suspicion of virus exposure.

Overall, 5523 of 40 329 (13.7% [95% CI, 13.4%-14.0%]) HCW were seropositive. Of these PCR-positive HCW, 2044 (93.5%) were also seropositive. Of the 3892 PCR-negative HCW, 3490 (89.7%) were also seronegative. Of 34 251 with no PCR testing, 3077 (9.0%) were seropositive. Working in COVID-19 units or in intensive care units were each associated with seroprevalence in bivariate analyses but not in multivariable analyses. In a fully adjusted model, a previous positive PCR test result (relative risk, 1.52 [95% CI, 1.44-1.60]; $P < .001$) and reported high suspicion of virus exposure (relative risk, 1.23 [95% CI, 1.18-1.28]; $P < .001$) were associated with seroprevalence.

**Comment:** A 13.7% prevalence of SARS-CoV-2 antibodies in this large cohort study of HCW in the greater NYC area was similar to that among adults randomly tested in New York State, 14.0%. (Ann Epidemiol June 13, 2020} Only 56% of HCP participated and 7 different assays with variable sensitivity and specificity were used, only HCW-reported suspicion of overall exposure was recorded, so distinguishing among community-, home-, and health care–acquired exposures was unfortunately was not possible. However, based on other studies elsewhere, if HCW wear appropriate PPE, transmission in healthcare settings appears low. Given seropositivity of HCW is similar to randomly tested adults in NY it suggests community exposure may account for the majority of cases.

**Estimation of incubation period distribution of COVID-19 using disease onset forward time: a novel cross-sectional and forward follow-up study**
Science Adv published online August 7, 2020

Researchers studied nearly 1100 people who developed COVID-19 outside Hubei province but had a history of travel or residency in Wuhan; all had a known departure date from Wuhan and a known date of symptom onset. They used a novel method to estimate the incubation period of COVID-19 by using the well-known renewal theory in probability. Such a method enhances the accuracy of estimation by reducing recall bias and utilizing abundance of the readily available forward time with a large sample size of 1084. The median incubation period was estimated at 7.8 days — whereas the generally accepted incubation period is close to 5 days. The 90th percentile was 14.3 days. The researchers note that, according to their estimates, some 10% of COVID-19 patients may develop symptoms more than 14 days after infection.




**Comment:** They assumed that the individuals included in their cohort were either infected in Wuhan or on the way to their destination from Wuhan, however, the chance for an individual in the Wuhan

departure cohort getting infected outside Wuhan would lead to an overestimation of incubation period. The investigators believe this would be relatively small. Nonetheless, they acknowledge this possibility exists, that a family member could be uninfected by the time of departing Wuhan but got infected by other family members or outside contacts after leaving Wuhan. They did do a sensitivity analysis by removing all cases who left Wuhan with their families in the Wuhan departure cohort, and found it only resulted in a small change of the estimated distribution of the incubation period. This was early in the pandemic and does not take into account possible mutation of the virus which we know has occurred from D614 to G614 which may have a fitness advantage. Based on this analysis the incubation period for SARS-CoV-2 may be longer than previously assumed. If true, this may have a major public health concern in regard to the current recommended 14-day quarantine.