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**Discontinuation of Isolation Precautions for COVID-19 Patients**

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Early in the coronavirus disease-19 (COVID-19) pandemic, research showed that hospital-related transmission may be contributing to the spread of the virus.<sup>1</sup> Appropriate implementation of transmission-based precautions is critical to preventing SARS-CoV-2 transmission between patients and healthcare workers. Healthcare workers caring for patients with confirmed or suspect COVID-19 should wear an NIOSH-approved N95 or equivalent or higher-level respirator, gown, gloves, and eye protection. Given uncertainty regarding how long patients with COVID-19 remain infectious, it remains unclear when the discontinuation of transmission-based precautions is appropriate.

The Centers for Disease Control and Prevention (CDC) outlines three strategies for discontinuing transmission-based precautions for patients with confirmed COVID-19.<sup>2</sup> CDC initially recommended a symptom- or test-based strategy for symptomatic patients, and a time- or test-based strategy for asymptomatic patients. On July 17, 2020, CDC updated these strategies.<sup>3</sup> The test-based strategy is no longer recommended as many individuals will have a positive PCR test without being infectious. The symptoms-based approach now recommends at least 24-hours since the last fever, without use of fever reducing medications. Finally, CDC recommends that patients with severe disease or who are immunocompromised continue precautions until 20 days since first symptoms, compared to 10 days for less severe illness.

We undertook a survey to assess variation in and approach to discontinuing transmission-based COVID-19 precautions.

## **Methods**

The Infectious Disease Society of America (IDSA) Emerging Infections Network (EIN) is a sentinel network of infectious disease physicians which assists the CDC and public health agencies with surveillance of emerging infectious diseases.<sup>4</sup> During July-August 2020, EIN sent an online 11-question survey (Appendix A) to 696 physicians with infection prevention and/or hospital epidemiology responsibilities or interests to understand practices regarding the discontinuation of transmission-based precautions for COVID-19 patients. Two reminder emails were sent approximately 10 days apart. No incentive for participation was provided. Data were analyzed using descriptive statistics (Excel). As an EIN query, this survey was exempt from IRB review.

## Results

The timing of the survey coincided with release of CDC updated guidance. Three hundred and twenty (46%) physicians responded. Forty-four (14%) respondents were not aware of precautions used for COVID-19 patients and opted out of remaining questions. Among 276 responding physicians, 208 (75%) worked in adult infectious diseases and 109 (39%) practiced in a university hospital. Considerable variability was reported for the length of time inpatients remain in COVID-19-level precautions; 14-20 days was the most common response. Respondents most frequently reported using a combination of all 3 strategies (symptom, test and time-based) to determine when COVID-19-level precautions could be discontinued in inpatients. In the outpatient setting, a combination of symptom and time-based strategies was the most common (44%). Two hundred and seven (75%) respondents reported clearance of COVID-19-level precautions in inpatients was authorized by infection control personnel with Infectious Disease physician input.

Respondents whose facilities used the symptoms-based approach to discontinuing precautions reported that once symptoms improved, discontinuation occurred at 10 days (38%), 11-30 days (20%), >30 days (1%), and “it depends on the population” (21%). The most common applications of the test-based approach were among immunocompromised patients (50%) and patients with a planned discharge to nursing home (48%). Respondents whose facilities used the time-based strategy discontinued precautions at: 10 days (27%), 11-30 days (22%), >30 days (4%), and “it depends on the population (21%). The most common factors influencing the decision to discontinue COVID-19-level precautions were length of time from initial positive test (80%), improvement in symptoms (74%), and patient characteristics (66%).

## Discussion

Our survey found that most healthcare facilities discontinue COVID-19-level precautions on inpatients with COVID-19 prior to discharge using a combination of the symptom, test and time-based strategies. Length of time from initial positive test, improvement in symptoms, and patient characteristics influenced respondents' decisions to discontinue precautions. While CDC no longer recommends using the test-based strategy in most cases, 68% respondents reported using this strategy (e.g., for immunocompromised patients and patients planning discharge to a nursing home). The symptoms-based approach was popular but there was considerable variability in when precautions were discontinued following symptom improvement.

These findings highlight the need for more specific research and guidance regarding how to discontinue transmission-based precautions for inpatients with COVID-19 who are transferring to congregate living facilities. Because the spread of COVID-19 in these settings has shown devastating consequences, it is understandable that facilities would desire reassurance that patients are no longer infectious. Increasing PPE availability and Infection Prevention resources at these locations could decrease test-based strategy usage. Another issue requiring clarity is how to discontinue isolation precautions for patients who are recovering but remain critically ill or those who require ongoing aerosol-generating procedures. While there is evidence about the period of infectivity based on RT-PCR testing of the upper airways, less is known about whether this accurately represents the lower airways.

One limitation of our study was that CDC updated their guidance around the time of survey deployment. Some respondents commented their approach has changed in response to CDC guidance or due to seeing patients consistently test positive. Another limitation is the complexity of case-by-case decisions (e.g., requiring negative tracheal aspirate specimens for intubated patients) not captured by our survey questions. Third, this survey did not address healthcare worker return to work practices. Finally, it is possible to have multiple EIN respondents at one center. However, there were no more than five respondents from one city, suggesting center and geographic diversity among respondents.

Overall, we found that discontinuation practices vary widely, and decision-making is complicated by many factors. Research is needed to understand how long different COVID-19 patient populations remain infectious to determine when to safely discontinue transmission-based precautions.

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**Table 1.** Summary results of survey on discontinuation of transmission-based precautions for COVID-19 patients among a network of infectious disease physicians, North America, July-August, 2020\*

Survey characteristic	No. (%)
Practice, n=276	
Adult infectious diseases	208 (75.4)
Pediatric infectious diseases	60 (21.7)
Both adult and pediatric	8 (2.9)
Years' experience since ID fellowship, n=276	
<5 years	47 (17.0)
5-14 years	73 (26.4)
15-24 years	57 (20.7)
≥25 years	99 (35.9)
Primary hospital type, n=276	
City/county	16 (5.8)
Community	57 (20.7)
Non-university teaching	78 (28.3)
University	109 (39.5)
VA hospital or DOD	16 (5.8)
Number of inpatients with lab-confirmed COVID-19 in past 6 months, n=276	
None	0 (0)
1-99	69 (25.0)
100-199	33 (12.0)
200-299	24 (8.7)
≥300	87 (31.5)
Not sure or not answered	63 (22.8)
Duration of precautions for inpatients with COVID-19, n=276	
Until discharge in all cases	38 (13.8)
<7 days	4 (1.4)
7-13 days	69 (25.0)

14-20 days	92 (33.3)
≥21 days	43 (15.6)
Not sure or not answered	30 (10.9)
Strategy used to discontinue precautions for inpatients with COVID-19, n=276	
Symptom-based	176 (63.8)
Test-based	187 (67.8)
Time-based	167 (60.5)
All 3 strategies	83 (30.1)
Not answered	5 (1.8)
Patient populations for which test-based strategy applied, n=276	
Adult	108 (39.1)
Pediatric	58 (21.0)
Immunocompromised	138 (50.0)
Planned discharge to nursing home	132 (47.8)
Other	21 (7.6)
Not sure or not answered	71 (25.7)
Factors that influenced decision to discontinue precautions for inpatients with COVID-19, n=276	
RNA test availability	73 (26.4)
Illness severity	125 (45.3)
Improvement in symptoms	205 (74.3)
Asymptomatic vs. symptomatic	140 (50.7)
Length of time from initial positive test	222 (80.4)
Patient characteristics	183 (66.3)
Discharge to home	95 (34.4)
Discharge to congregate living facility (LTCF, jail, shelter)	142 (51.4)
Other	11 (4.0)
Not answered	7 (2.5)

\*n values indicate number of participants who responded. LTCF = long term care facility

## Appendix

### Survey

#### **Inpatient**

1. Approximately how many inpatients with lab-confirmed COVID-19 has your facility admitted in the past 6 months?
  - a. None
  - b. 1-99
  - c. 100-199
  - d. 200-299
  - e.  $\geq 300$
2. For inpatients with COVID-19, what is the approximate length of time they remain in transmission-based precautions for COVID-19 in your facility?
  - a. <1 week
  - b. 1-2 weeks
  - c. 2-3 weeks
  - d. >3 weeks
  - e. Until discharge in all cases
3. What strategy does your facility use to determine when inpatients with COVID-19 can discontinue transmission-based precautions? (Check all that apply)
  - a. Symptom-based
  - b. Test-based
  - c. Time-based
4. Is clearance of transmission-based precautions in inpatients authorized by (Check all that apply):
  - a. Infection control personnel
  - b. Infection control personnel with Infectious Diseases physician input
  - c. Only Command center personnel

#### **Outpatient**

5. Approximately how many outpatients with lab-confirmed COVID-19 has your institution seen in the past 6 months?
  - a. None
  - b. 1-99
  - c. 100-199
  - d. 200-299

- e.  $\geq 300$
- 6. What strategy is being used to determine when outpatients with COVID-19 can discontinue transmission-based precautions? (Check all that apply)
  - a. Symptom-based
  - b. Test-based
  - c. Time-based

**All Settings**

- 7. If you selected your facility uses a test-based approach to discontinue transmission-based precautions, what populations is this done for?
  - a. Adult
  - b. Pediatric
  - c. Immunocompromised patients
  - d. Planned discharge to nursing home
- 8. If you selected your facility uses a time-based approach to discontinue transmission-based precautions, what time point is specified?
  - a. 10 days
  - b. 11-30 days
  - c. > 30 days
- 9. What factors influence the decision to remove patients with COVID-19 from transmission-based precautions?
  - a. RNA test availability
  - b. Illness severity
  - c. Improvement in symptoms
  - d. Asymptomatic vs symptomatic
  - e. Length of time from initial positive test
  - f. Patient characteristics (e.g. immunocompromised)
  - g. Discharge to home
  - h. Discharge to congregate living facility (e.g. nursing home, jail, shelter)
  - i. Other (specify): (free text)
- 10. Additional comments about discontinuation of transmission-based precautions for patients with COVID-19? (Free Text)