

# Guidance for discharge and ending isolation in the context of widespread community transmission of COVID-19 – first update

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## Scope of this document

This document provides guidance for planning discharge and ending isolation for COVID-19 patients in the context of the phase of ongoing widespread community transmission.

## Target audience

Public health institutes in the EU/EEA countries and the UK

## Background

Since the publication of the first version of ECDC advice on discharge criteria for COVID-19 cases [1] and as of the end of March 2020, all EU/EEA Member States and the UK report numerous cases and are experiencing varying degrees of widespread community transmission of SARS-CoV-2.

In the context of widespread community transmission, with ongoing shortages of laboratory consumables and reagents that affect diagnostic capacity, and with significant pressure on the health systems as a whole, the former discharge criteria developed for the early stages of SARS-CoV-2 spread with no apparent sustained community transmission, no pressure on healthcare facilities and optimal laboratory testing capacity are no longer applicable at a large scale. In addition, almost all Member States have in place a stay-at-home strategy for mild cases. Nonetheless, there is an increasing need to discharge patients from hospitals early after clinical symptom improvement in order to maintain healthcare capacity for severe and critically ill patients.

Therefore, there is an urgent need for updated discharge criteria. The current update reflects the information available at the time of publication and may change if more information on the incubation period of SARS-CoV-2 infection and viral shedding becomes available.

# Scientific evidence on SARS-CoV-2 shedding

**Incubation period:** The median incubation period is considered to be five to six days for COVID-19, with a range from one to 14 days. According to modelling data it remains prudent to consider a period of at least 14 days as an upper limit of the incubation period [2,3].

**Viral shedding:** Over the course of the infection, viral RNA has been identified in respiratory tract specimens up to 1–2 days before the onset of symptoms. Viral load persists up to eight days after the onset of symptoms in mild cases and peaks in day 11 in more severe cases[4-5]. The current update reflects these findings. However, more research is needed on the level and duration of viral shedding in the various patient groups and in the context of asymptomatic and pre-symptomatic infections. There is no evidence on the duration of viral shedding after resolution of fever.

In terms of viral load profile, SARS-CoV-2 is similar to that of influenza, which peaks at around the time of symptom onset, but contrasts with that of SARS-CoV-1 and MERS-CoV, which peak in the second week after symptom onset. Older age and more severe infections have been associated with higher viral loads [5,6]. Viral RNA has been detected in faeces from day five after symptom onset and up to four to five weeks in moderate cases, as well as in whole blood [7], serum [8,9], saliva [3,6] and urine [6,10].

Prolonged viral RNA shedding has been reported from nasopharyngeal swabs (up to 37 days after onset of symptoms among adult patients) [11] and in faeces (more than one month after infection in paediatric patients) [12]. The viral load can be a potentially useful marker for assessing disease severity and prognosis: a recent study indicated that viral loads in severe cases were up to 60 times higher than in mild cases [5]. Although there is no specific evidence for COVID-19, immunocompromised patients may shed SARS-CoV-2 virus for prolonged periods similar to other respiratory viruses.

Viral RNA shedding of SARS-CoV-2 does not equate with infectivity, unless there is proof that the virus can be isolated and cultured from the particular samples. On the other hand, the infectious dose has not been determined; therefore, it is unclear how much virus is needed to infect humans.

**Infection in asymptomatic individuals:** Asymptomatic infection at time of laboratory confirmation has been reported from many settings, with a large proportion of these cases experiencing some symptoms at a later stage of infection [6]. There are, however, also reports of cases remaining asymptomatic throughout the whole duration of laboratory and clinical monitoring. Viral RNA, as well as infectious virus has been detected in asymptomatic patients [13-15].

**Transmission in pre-symptomatic stage of infection:** In symptomatic patients, the high viral load close to symptom onset suggests that SARS-CoV-2 can be easily transmissible at an early stage of infection [6,15-18]. Uncertainties remain with regards to the influence of pre-symptomatic transmission on the overall transmission dynamics of the pandemic because of the suboptimal level of evidence on transmission from asymptomatic cases mostly originating from case reports. Comparable viral loads in asymptomatic and symptomatic patients also indicate the potential of virus transmission from asymptomatic patients.

Pre-symptomatic transmission has been inferred through modelling, and the proportion of pre-symptomatic transmission was estimated between 48% and 62% [19]. Pre-symptomatic transmission was deemed likely based on a shorter serial interval of COVID-19 (4.0 to 4.6 days) than the mean incubation period (five days). The authors indicated that many secondary transmissions would have already occurred at the time when symptomatic cases are detected and isolated [18,20,21].

**Immunity:** Based on the currently available data, the IgM and IgG antibodies to SARS-CoV-2 develop between 6-15 days post-disease onset [4,22-26]. However, clinically validated laboratory assays for detection of antibodies are still lacking and therefore these results need to be considered cautiously. In addition, correlates of protection are still to be defined which is necessary to be able to comment on the possibility of re-infection and the duration of immunity.

In summary, and based on limited evidence from one study indicating that viral load persists up to eight days after the onset of symptoms in mild cases and longer in more severe cases (peaking in the second week), patients should continue self-isolation at home or in a safe place if they are discharged from hospital before this period. Immunocompromised and patients with severe illness, as well as healthcare workers, should be prioritised for testing to exclude the possibility of prolonged shedding.

# Overview of current practice

An overview of recommendations for discharge and ending isolation of COVID-19 patients from national bodies in several EU/EEA Member States, other countries that experienced large numbers of COVID-19 cases and WHO is presented in Annex 1.

## Discharge and ending isolation criteria

When deciding on criteria for hospital discharge of COVID-19 patients, guidance for ending home isolation of mild cases and guidance for critical infrastructure responders (e.g. healthcare workers, law enforcement etc.) returning to work after COVID-19 illness, health authorities should take into account several factors such as the existing capacity of the healthcare system, laboratory diagnostic resources, and the current epidemiological situation.

COVID-19 patients may be discharged based on: a) clinical resolution of symptoms, and b) evidence for viral RNA clearance from the upper respiratory tract, where testing capacity permits. In order to protect the healthcare system capacity, in the context of widespread community transmission and limited testing capacity, clinical criteria will gain priority (Table 1).

Discharge and ending isolation criteria may be adapted for specific groups of patients.

**Table 1. Guidance on discharge and ending isolation in the context of widespread community transmission**

COVID-19 case status	Description	Guidance
<b>Hospitalised suspected or confirmed COVID-19 cases</b>	This category refers to: <ul style="list-style-type: none"> <li>Patients who are hospitalised with suspected or laboratory confirmed COVID-19 (mild, severe and critically ill) [27]</li> <li>Confirmed COVID-19 patients discharged early, due to clinical improvement</li> </ul>	<p><b>If testing and hospitalisation capacity allows,</b></p> <ul style="list-style-type: none"> <li>For a clinically recovered patient, two negative RT-PCR tests from respiratory specimens at 24 hours interval at least eight days after onset of symptoms [4]</li> </ul> <p><b>If limited/no testing capacity,</b></p> <ul style="list-style-type: none"> <li>Patient can be discharged based on clinical criteria, per evaluation of the treating physician, AND</li> <li>the discharged patient should self-isolate at home or in a safe place until resolution of fever for at least three days and clinical improvement of other symptoms AND</li> <li>until eight days after the onset of symptoms for mild cases or for 14 days (severe cases) if these criteria have not been fulfilled in hospital.</li> <li>Follow-up visits, or monitoring via phone or other electronic device can be considered.</li> <li>These patients should be prioritised for testing.</li> </ul>
	<b>Discharged to closed population environment</b> (long-term care facility, prison, children with special needs etc.)	The patient should be placed in a single room until eight days after the onset of symptoms have passed AND resolution of fever for at least for three days AND clinical improvement of other symptoms.
	<b>Immunocompromised patients</b>	Self-isolation should last until all of the following criteria are fulfilled: at least 14 days after symptom onset AND resolution of fever for at least three days AND clinical improvement of symptoms other than fever.
<b>Mild suspected or confirmed COVID-19 cases</b>	This category refers to: <ul style="list-style-type: none"> <li>Confirmed COVID-19 patients never hospitalised due to mild symptoms or asymptomatic presentation</li> <li>Suspected or probable COVID-19 patients in the community, who adhered to the stay-at-home advice by the national authorities</li> </ul>	<ul style="list-style-type: none"> <li>These patients can end self-isolation eight days after the onset of symptoms AND resolution of fever AND clinical improvement of other symptoms for at least for three days.</li> </ul>

COVID-19 case status	Description	Guidance
	<p><b>Critical infrastructure responders</b> (e.g. healthcare workers, law enforcement, firefighters etc.)</p>	<ul style="list-style-type: none"> <li>End isolation after resolution of fever for at least three days AND after eight days from the onset of symptoms have passed. Healthcare workers can return to work immediately after that, using a surgical mask during work hours until 14 days after the onset of symptoms have passed*.</li> <li>If testing capacity allows, for a clinically recovered patient, two negative RT-PCR tests from respiratory specimens at 24 hours interval, at least eight days after onset of symptoms. Critical infrastructure responders, especially HCWs, should be considered a priority group for testing during the pandemic.</li> </ul>
<p><b>Family members and other categories of contacts of COVID-19 patients</b></p>	<p>This category refers to:</p> <ul style="list-style-type: none"> <li>Partners and spouses</li> <li>Family members and other persons sharing housing or taking care of COVID-19 patients</li> </ul>	<p>For guidance on household care of a COVID-19 case, refer to the relevant ECDC guidance [28].</p> <p>Caretakers of COVID-19 patients should self-quarantine for 14 days after last contact with sick spouse/relative.</p> <p>Caretakers or family members that develop symptoms in the 14-day quarantine period, should stay in home isolation for eight days after onset of symptoms AND until resolution of fever for at least three days AND clinical improvement of other symptoms, or seek medical care, if symptoms worsen.</p>

*\*Healthcare workers and other critical infrastructure responders are advised to wear a facemask for 14 days after the onset of their symptoms, to cover the possibility of prolonged viral shedding in order to protect vulnerable patients in their care from being infected.*

Although the oral-faecal route does not appear to be a driver of transmission, its significance remains to be determined. Discharged patients should be advised to strictly follow personal hygiene precautions in order to protect household contacts. This applies to all convalescing patients, but particularly to convalescent children [28].

For persons in voluntary or mandatory quarantine as a traveller or contact of a confirmed case, they should follow the instructions of the national public health authorities. Usually the duration of quarantine in the context of the COVID-19 epidemic is 14 days.

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# Annex 1.

## Comparison of current guidelines on ending isolation of COVID-19 cases, a desk review of recommendations from national bodies in several EU/EEA Member States, other countries that experienced large numbers of COVID-19 cases and WHO.

Country	Discharge from hospital		Ending home isolation	
	Clinical	Lab (negative SARS-CoV-2 RNA test)	Clinical	Lab (negative SARS-CoV-2 RNA test)
<b>Estonia</b>	Case specific; ≥48 hours without fever AND ≥24 hours without acute respiratory symptoms		≥14 days after onset AND ≥48 hours with no fever AND ≥24 hours with no acute respiratory symptoms	
<b>Germany [29]</b>	After clinical improvement, based on medical assessment.	<i>Note: a COVID19 patient is considered 'fully discharged' if no symptoms related to acute COVID-19 for ≥48 hours AND two negative tests at 24-hour intervals from naso-, oropharyngeal swabs</i>	If previously hospitalised: ≥14 days after hospital discharge AND free of symptoms related to acute COVID-19- for ≥48 hours (as per medical consultation) If no prior hospitalisation: ≥14 days after onset AND no acute COVID-19- symptoms for ≥48 hours (as per medical consultation)	
<b>Greece [30]</b>	No fever ≥ three days without use of antipyretics	Two negative tests at 24 hours interval	At least three days without fever AND At least 14 days after symptom onset	
<b>Ireland</b>	14 days after onset, including five days without fever	For severe illness (prolonged virus shedding possible): 2 negative tests at 24 hours interval	No fever for five days AND at least 14 days since symptom onset	
<b>Italy [31]</b>	Resolution of symptoms	Two negative tests at 24 hours interval		At 14 days after first test
<b>Netherlands</b>	NA	NA	For discharged hospitalised patients: home isolation until all symptoms have resolved for at least 24 hours. For persons with mild symptoms (no fever): home-isolation ends when symptom free ≥ 24 hours. <i>Note: If one of the persons in a household develops fever (&gt; 38 C), all have to stay at home. This isolation is lifted 24 hours after all persons in the household are free of any symptoms for at least 24 hours.</i>	
<b>Spain [32]</b>	Probable and confirmed cases: if their clinical situation allows it, although their PCR remains positive	If negative laboratory result at discharge from hospital: go home without isolation	People discharged from hospital: ≥14 days of home isolation with clinical monitoring	
<b>UK [33,34]</b>	Patients to be discharged when clinically safe and with health and social care support packages as needed.		Symptomatic people: 7 days after onset. <i>Note: They can return to normal routine if they feel better, have no fever.</i> Family members: after 14 days of isolation, if have not become unwell. Family member that becomes unwell during the 14-day household-isolation: same advice like the first person, seven days from symptoms onset; may return to normal routine if feeling better, no fever. If household member develops COVID-19 symptoms late in the 14-day isolation period (e.g., on day 13 or day 14): stay at home for 7 days. <i>Note: the isolation period does not need to be extended (see footnote *)</i>	

Country	Discharge from hospital		Ending home isolation	
	Clinical	Lab (negative SARS-CoV-2 RNA test)	Clinical	Lab (negative SARS-CoV-2 RNA test)
<b>China [35]</b>		Afebrile for >3 days, improved respiratory symptoms, pulmonary imaging shows obvious absorption of inflammation, AND PCR negative for respiratory tract twice consecutively, at ≥ 24 hours interval.		Discharged patients in home isolation: 14 days isolation with health monitoring (follow-up visits after two and four weeks).
<b>Singapore [36]</b>	≥ 24 hours with no fever and ≥6 days from illness onset	Two respiratory samples negative for SARS-CoV-2 by PCR in ≥24 hours	After 14 days of place of residence isolation	
<b>South Korea [37]</b>	NA	NA	People with symptoms can be released from quarantine if: no fever, clinical symptoms have improved,  Asymptomatic persons (non-test-based): after three weeks from the date of confirmation	AND 2 PCR negative tests at 24-hour interval  Asymptomatic persons (test-based): two tests at 24 hours interval, seven days after first positive test. If they test positive, two more tests at 24 hour intervals at dates to be determined by physicians (e.g. day 10, day 14 after testing positive)
<b>USA [38,39]</b>	Non-test-based strategy: ≥ three days (72 hours) since recovery (no fever and improvement in respiratory symptoms) AND, ≥ seven days since symptoms onset	Test-based strategy: resolution of fever, improvement in respiratory symptoms AND two negative nasopharyngeal swabs, ≥24 hours apart <i>Note: this strategy preferred for patients who are: hospitalised OR severely immunocompromised OR being transferred to long-term care or assisted living facility</i>	Non-test-based strategy: ≥ three days (72 hours) since recovery (no fever and improvement in respiratory symptoms) AND, ≥ seven days since symptoms onset  Asymptomatic individuals: ≥ seven days since the date of their first COVID-19 positive test AND have had no subsequent illness.	Test-based strategy: resolution of fever, improvement in respiratory symptoms AND two negative nasopharyngeal swabs, ≥24 hours apart (see footnote **)
<b>WHO [27]</b>		If clinically recovered AND two negative tests, at least 24 hours apart. (see footnote ***)		

*Note: Green boxes indicate the policy in use (e.g. Estonia, clinical criteria for both hospital discharge and end of home-isolation). NA: not reported/not identified through the desk review.*

*\*UK: The 14-day household-isolation period will have greatly reduced the overall amount of infection the rest of the household could pass on, and it is not necessary to restart 14 days of isolation for the whole household. This will have provided a high level of community protection. Further isolation of members of this household will provide very little additional community protection.*

*\*\*USA: Still valid (contingent on the availability of ample testing supplies and laboratory capacity as well as convenient access to testing): at least two consecutive sets of nasopharyngeal and throat swabs collected ≥ 24 hours apart from a patient with COVID-19 (a total of four negative specimens); and resolution of fever, without use of antipyretic medication, improvement in illness signs and symptoms.*

*\*\*\*WHO: In hospitalised patients with confirmed COVID-19, repeat URT and LRT samples can be collected to demonstrate viral clearance. The frequency of specimen collection will depend on local epidemic characteristics and resources.*