

Diagnostic & Testing Strategies for COVID-19

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Diagnosis of COVID-19

Clinical Picture

- **Symptoms**
 - Fever
 - Cough
 - Myalgias
 - Dyspnea
 - Headache
 - Sore throat
 - GI illness
- **Risk factors**
 - Exposure
 - Travel
- **HIGH Risk**
 - Older age (>65yo)
 - Cardiac illness
 - Respiratory illness

Clinical Picture

- **Signs**
 - Fever
 - Majority have a normal exam
 - Hypotension
 - Hypoxia
 - Respiratory failure
 - Rapid decompensation at day 10+/-



Photo from phil.cdc.gov

Diagnostic Tests for COVID-19

- RT-PCR test using nasopharyngeal swab
 - Oropharyngeal swabs
- Point of care (POC) molecular testing
- Results

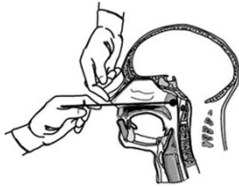
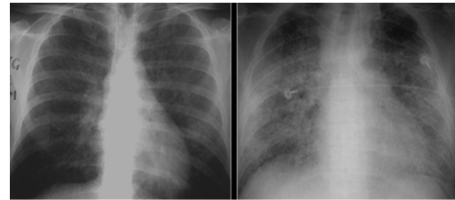


Photo from phil.cdc.gov

Other Diagnostic Tests

- Rapid influenza testing
 - Other viral panels
- Chest x-ray or chest CT scan
- Labs
 - CBC: lymphopenia
 - Elevated C-reactive protein
 - Liver function tests



Carolyn M. Allen, Hamdan H. AL-Jahdali, Klaus L. Irion, Sarah Al Ghanem, Alaa Gouda, and Ali Nawaz Khan - (CC BY 4.0)

Testing Concepts

- Tiered testing
- Offload the Emergency Departments & clinics
- Outpatient testing preferred
- Rapid collection
- Minimize interaction
- Isolation/quarantine until results

Testing Strategies

Call Center

- Allows rapid uniform screening
- Scripting for FAQs
- Portal for test orders in electronic medical record (EMR)
- Off-site function
- Follow-up



External Testing

- Re-purposed existing space
 - Clinical
 - Non-clinical
- Rapidly deployable site
 - Tents or shelters



External Site Considerations

- Hours of operations
- Volume
 - Ability to scale up
- Staffing
 - RNs, patient care associates, other affiliated medical
 - Information Technology (IT), facilities, traffic control, supply chain, lab



External Site Considerations

- Isolation: contact, droplet, airborne
 - Patients stay in vehicle
- Personal Protective Equipment (PPE)
- “hot” versus “cold” zone
 - Decon & cleaning process
- Marketing

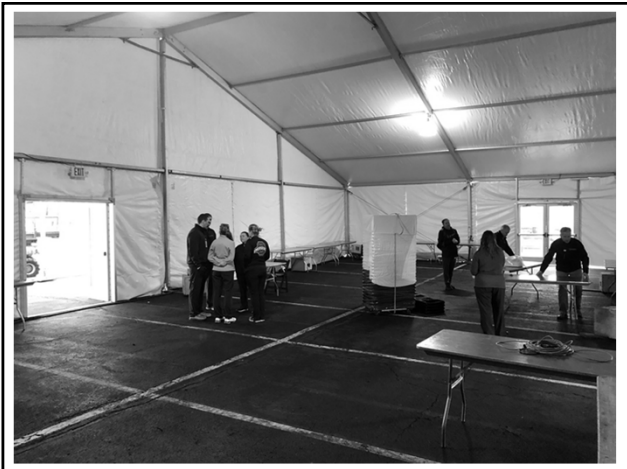


Re-purposed Space



Rapidly Deployable Site





Challenges & Contingencies

- Non-referred patients
- High acuity patients
- Security
- Weather



Internal Testing

- Emergency Department
 - EMTALA
- Inpatient units
- PPE
- Prioritize for most rapid testing

TEAM

Home Isolation Tips Covid-19

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Content Overview

Practical home isolation recommendations for outpatients with COVID-19 Human Coronavirus

- Social contact
- Hand hygiene
- Cleaning and disinfection within the home
- Meal preparation

Home Isolation

- **STAY AT HOME** except for emergencies
- Avoid public transportation.
- Avoid visitors
- Stay in separate room: avoid being within 6 feet of other people unless wearing a mask
- Limit contact with pets and animals

Social Contact for Ill Person

- Wear mask when around other people
- Limit contact with pets and animals
- Stay in separate room from other people
- Do not share bedding or other linens
- Dedicated, lined trash can for the ill person. Use gloves when removing garbage bags and handling trash. Wash hands afterwards.
- spread from person-to-person happens most frequently among close contacts (within about 6 feet). This type of transmission occurs via respiratory droplets,

Hand Hygiene

- All household members should avoid touching eyes, nose, or mouth
- Key times to clean hands include:
 - After blowing one's nose, coughing, or sneezing
 - After using the restroom
 - Before and after eating or preparing food
 - After contact with animals or pets
 - Before and after providing routine care for another person who needs assistance (e.g. a child)
 - Immediately after removing gloves
 - After contact with an ill person
- Wash hands with soap and water for 20 seconds
- Alcohol-based hand sanitizer with 60% or more alcohol concentration is fine if hands are not visibly dirty

Sanitation of Surfaces

Cleaning VS. Disinfecting

- Soap and water
 - Removes of germs, dirt, and impurities from surfaces
 - Does not kill germs
- Uses chemicals (EPA-registered disinfectants)
 - Kills germs on surfaces
 - Does not clean dirty surfaces or remove germs



Sanitation of Surfaces

- Cleaning of visibly dirty surfaces with soap and water followed by disinfection is a best practice measure for prevention of COVID-19 and other viral respiratory illnesses in households and community settings
- Wear gloves when using disinfectants.
- If using reusable gloves, those gloves should be dedicated for cleaning and disinfection of surfaces for COVID-19 and should not be used for other household purposes.

Sanitation of Surfaces

Wipe down all 'high-touch' surfaces daily with a disinfectant household cleaner.

- High touch surfaces include:

Tables	Handles
Doorknobs	Sinks
Toilets	Keyboards
Faucets	Phones
Light switches	Handrails
Countertops	

- <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

Disinfectants for Human Coronavirus

- Ammonia: 4-10 minutes
- Hydrogen peroxide: 5 minutes
- Sodium hypochlorite (bleach): 5 minutes
- L-Lactic acid: 5-10 minutes
- Phenolic: 5-10 minutes
- Peroxy-acetic acid: 10 minutes
- Sodium chlorite: 10 minutes
- Glycolic acid: 10 minutes

Contact Time:

The amount of time (in minutes) required for the disinfectant to kill the virus.

The surface should be visibly wet for the duration of the contact time.

Meal Preparation

- Disinfect inside and out for reusable shopping bags with each use
- Wash hands and disinfect surfaces after putting groceries away.
- Use cold water to clean fresh fruits/vegetables. Do NOT use soaps or disinfectants.
- Do not share utensils, dishes, towels
- Eat separately, in another room
- Wash dishes and utensils in hot water with gloves or dishwasher
- Wash hands before and after handling food
- <https://www.youtube.com/watch?v=taOUVUp1Pqw>



Bathroom Hygiene

- Sick person should use separate bathroom if possible

If sharing bathroom:

- use separate oral hygiene products, towels, and soap dispenser
- Keep toothbrush, toothpaste, and mouthwash of ill person separately from other family members
- Disinfect sink and toilet handles after each use

Electronics

- Cell phones, tablets, touch screens, remote controls, and keyboards, remove visible contamination if present.
 - Follow the manufacturer's instructions for all cleaning and disinfection products.
 - Consider wipeable covers
 - disinfect touch screens with alcohol-based wipes or sprays containing at least 70% alcohol. Then dry surface thoroughly to avoid pooling of liquids



Laundry

- Linens, clothing, and other items that go in the laundry
 - If no gloves are used when handling dirty laundry, be sure to wash hands afterwards.
 - Do not shake dirty laundry. This will minimize the possibility of dispersing virus through the air.
 - Launder items on warmest heat setting possible according to product label. Dry items completely.
 - Dirty laundry from an ill person can be washed with other people's items.
 - Clean and disinfect clothes hampers or use a bag liner that is disposable or can be laundered.

References

- YouTube PSA Grocery Shopping in COVID-19
- https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/disinfecting-your-home.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fprepare%2Fdisinfecting-your-home.html
- <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>
- <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/disinfecting-your-home.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

Discharge Instructions for the Inpatient with COVID-19

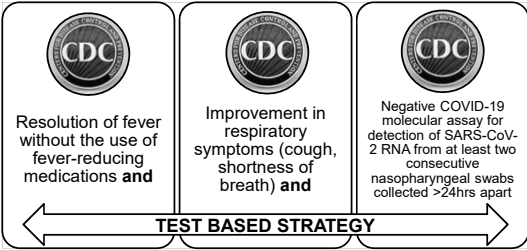
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Key Points with Discharge

- When to Discontinue Self-Isolation
- What Setting is the Patient Being Discharged
- Ensuring Patients Have Key Resources at Discharge to Support a Period of Quarantine
- Appropriate Education and Follow Up

When to Discontinue Isolation?

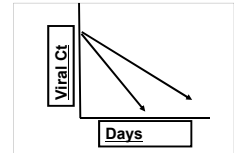
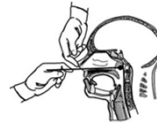
CDC Recommending a Test-Based and Non-Test-Based Strategy



<https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html>

Testing-Based Strategy

Hospitalized patients may have longer periods of SARS-CoV Viral detection.



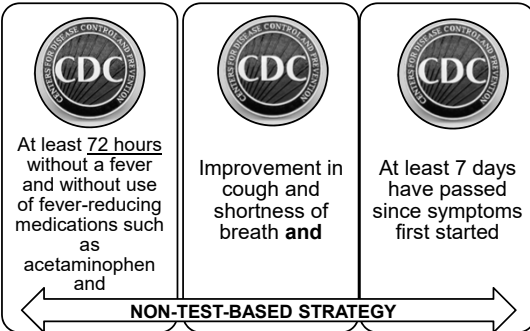
Further Consideration of Testing Warranted in

- Hospitalized
- Severely Immunocompromised
- Transfer to a LTC, SNF or Assisted Living Facility

Photo from phil.cdc.gov

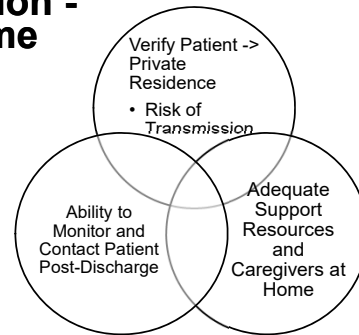
When to Discontinue Isolation?

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<https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html>

Discharge Location - Home



Mobility Considerations

Able to Manage ADLs at Home

Resources or Support to support 1-2 weeks of food in quarantine

Address DME needs – ability to obtain

Medications/Supplies

Provide at least 14 day supply of medications

Reconsideration of the use of NSAIDs

Restarting ACE/ARBs post-discharge

Oxygen necessity post-discharge



Discharge Instructions – Home Isolation



Wear a mask and gloves when you have contact with the person's saliva or other body fluids.

After providing care, **take off the gloves and mask right away and dispose of them**, removing the gloves first and washing your hands with soap and water, then removing the mask.



Clean hands again after disposing of the mask and before touching anything else.



Limit visitors whenever possible. Keep high-risk individuals away from the infected person (*this includes seniors and those with chronic illnesses, such as heart disease, diabetes or immune deficiencies*).



Avoid sharing household items such as dishes, cups, silverware, towels or bedding. Clean these items with regular soap or detergent.



Wash laundry thoroughly, using gloves when handling laundry from the infected person. There's no need to separate your laundry from that of the infected person, though.



Be careful when touching waste, and ensure that wastebaskets/trash cans are lined with plastic bags to make it easier to avoid touching when disposing of the waste. All waste can go into regular garbage bins, but take care to **wash your hands after handling any waste**.

Follow Up Visits

COVID-19 can manifest worsening lower respiratory tract disease in the second week of illness

Transition of Care Phone Call (24-48hrs) Post Discharge

Consideration of TeleHealth or Video Visits within 72-96 hrs.

Outpatient Management of COVID-19: Home Treatment

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Outpatient Primary Care Management of Patients with COVID19

- The outpatient care of patients during the COVID19 Pandemic includes:
 - Office Transformation
 - Pivot to Telehealth
 - Managing COVID19 patients not needing Hospitalization
 - Ending Isolation
 - Educating your Community

Office Transformation

- Educate staff about coronavirus disease 2019
- Train and educate staff with job-or task-specific information on preventing transmission of infectious agents
- Educate staff about alternative office management plans
- Review appropriate use of Personal Protective Equipment (PPE)
- Prepare office for COVID19 related absences
- Develop a Triage protocol incorporating recommended safe practices for managing patients with COVID19
<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/index.html>

TeleHealth

- Video visits
- Evisits
- Telephone visits
 - Coverage varies
 - Some States are waiving some requirements for the duration of the crisis
 - Some Payers are covering that which they did to during the duration of the crisis
 - Reimbursement varies by modality as does patient cost share

Management of Patients with COVID19 at Home

- Can the patient be safely managed at home?
 - Is the patient stable enough to receive care at home.
 - Are Appropriate caregivers available at home.
 - Is there a separate bedroom where the patient can recover without sharing immediate space with others.
 - Are there resources for access to food and other necessities available.
 - Does the patient and other household members have access to appropriate, recommended personal protective equipment (at a minimum, gloves and facemask) and are they capable of adhering to precautions recommended as part of home care or isolation (e.g., respiratory hygiene and cough etiquette, hand hygiene);
 - Are there household members who may be at increased risk of complications from COVID-19 infection (e.g., people >65 years old, young children, pregnant women, people who are immunocompromised or who have chronic heart, lung, or kidney conditions).
- <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html>

Management of Patients with COVID19 at Home

- Patient should monitor for:
 - increased work of breathing with ambulation, dyspnea
 - persistent chest pain or pressure
 - cyanosis (bluish lips or face)
 - confusion, somnolence
- If symptoms worsen, patients should seek care and **CALL FIRST** to inform about COVID-19 diagnosis prior to arrival
 - If the patient calls 911, they should inform them of COVID-19 diagnosis on phone
 - Patient should put on a facemask before entering a healthcare facility or emergency department

Management of Patients with COVID19 at Home

The patient should isolate from others, specifically:

- Stay home, not visit public areas, avoid public transportation, limit visitors
- Wear a mask if around other people
- Limit contact with pets and animals
- If the patient lives with others: stay in a separate room and use a separate bathroom if possible. Do not share bedding, towels, dishes, utensils (see caregiver instructions below)

Cleaning recommendations while on home isolation:

- Wipe down all "high-touch" surfaces every day with household cleaner³
- Wash laundry with the warmest temperatures recommended on label
- Place all gloves and masks in a lined container and dispose with other household waste
- Clean hands often with soap and water

Management of Patients with COVID19 at Home

- The caregiver should monitor for symptoms:
 - Call healthcare provider if caregiver develops fever, cough, SOB
 - Prevent exposure:
- Stay in another room from the patient, use separate bathroom if possible
 - Wash hands often or use alcohol-based hand sanitizer and avoid touching eyes, nose, mouth
 - If patient is unable to wear a mask, the caregiver should wear a mask when in the same room as the patient
 - Wear facemask and gloves when disposing of patient's body fluids (blood, saliva, sputum, mucus, urine, vomit, stool). Dispose of gloves and facemask. Do not reuse.
 - Do not share bedding, towels, utensils, dishes with the patient

Ending Isolation

- CDC provides two options for ending isolation
- **Time-since-illness-onset and time-since-recovery strategy (non-test-based strategy):** Persons with COVID-19 who have symptoms and were directed to care for themselves at home may discontinue home isolation under the following conditions:
 - At least 3 days (72 hours) have passed *since recovery* defined as resolution of fever without the use of fever-reducing medications and improvement in respiratory symptoms (e.g., cough, shortness of breath); and,
 - At least 7 days have passed *since symptoms first appeared*.
- **Test-based strategy (simplified from initial protocol)** Previous recommendations for a test-based strategy remain applicable; however, a test-based strategy is contingent on the availability of ample testing supplies and laboratory capacity as well as convenient access to testing. For jurisdictions that choose to use a test-based strategy, the recommended protocol has been simplified so that *only one swab is needed at every sampling*.
- <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-in-home-patients.html>

Educating your Community

- Handwashing
- Washing Clothes
- Clean high touch surfaces
- Minimize trips to Grocery Store
- Social Distancing
 - Not a snow day
 - Drop food on doorsteps
 - Pick up medication for elderly/vulnerable
 - Virtual gatherings
 - Quarantine vs Isolation

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-prevent-spread.html>