

# Infection control challenges and management of hemodialysis patients during the COVID-19 pandemic

MICHELE H. MOKRZYCKI MD MS FASN  
PROFESSOR OF MEDICINE  
ALBERT EINSTEIN COLLEGE OF MEDICINE  
MONTEFIORE MEDICAL CENTER  
BRONX, NEW YORK

# Disclosures

CLINICAL EVENTS COMMITTEE MEMBER:

SPYRAL PIVOTAL HYPERTENSION ON/OFF-MEDICATIONS, AND GLOBAL SYMPATHETIC REGISTRY  
SPONSORED BY MEDTRONIC

RADIANCE II TRIAL SPONSORED BY RECOR MEDICAL

BOA GARNET TRIAL

# Learning Objectives

- To understand challenges in keeping hemodialysis patients safe during the COVID-19 pandemic
- To review evidence based guidelines for mitigating COVID-19 transmission in outpatient hemodialysis facilities

**The COVID-19 pandemic has resulted in extensive restrictions on in-person health care visits**

**However, patients receiving in-center maintenance hemodialysis must continue to attend treatment, usually 3 times per week**



HD patients have multiple risk factors for severe COVID illness

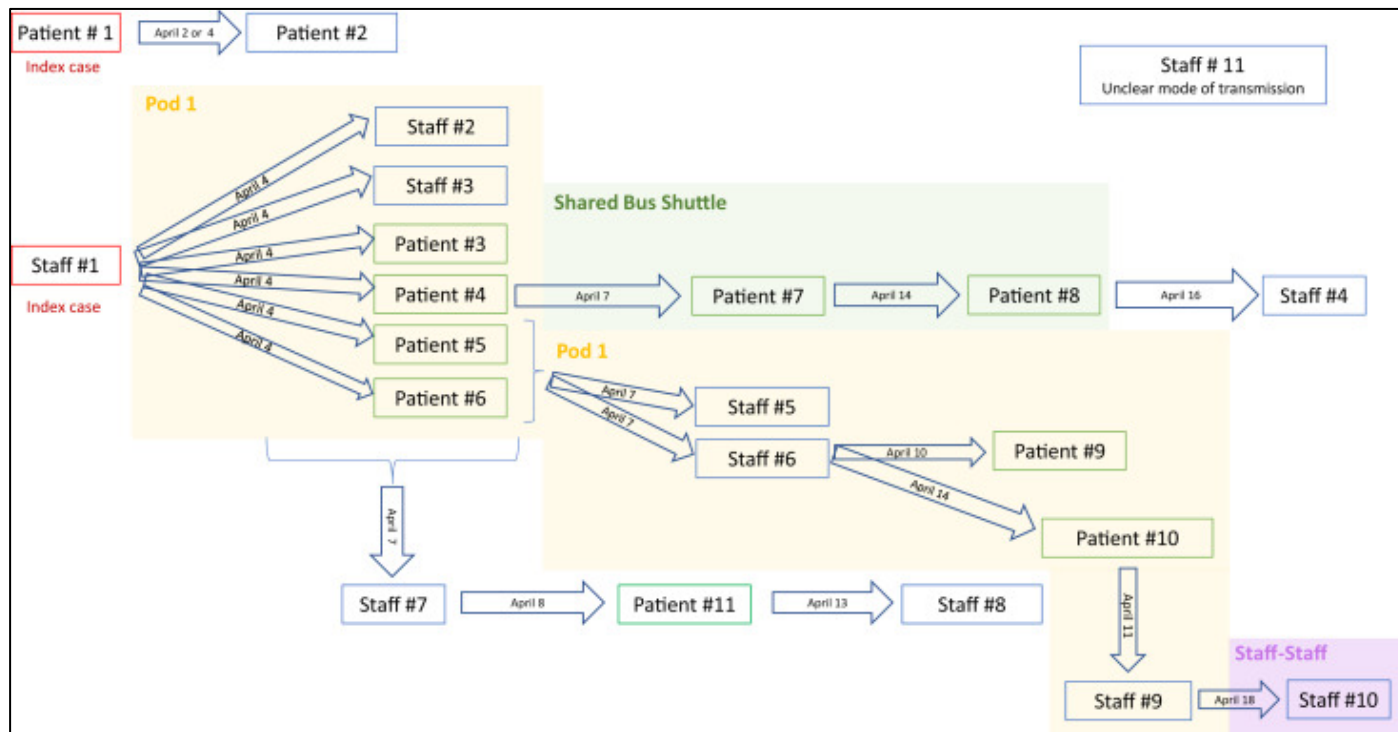
- Older age
- Diabetes mellitus
- Hypertension
- Heart disease
- Lung disease

Points of potential risk of COVID-19 exposure

- Travel to/from HD facility
- Waiting room exposure to other patients and their family, or home health aides
- Exposure to staff and other patients during treatment

# Reported COVID-19 Outbreak in an Urban HD Unit

At St. Michael's Hospital, Toronto, Canada



- Infection control authorities concluded that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission during an outbreak at the St. Michael's Hospital hemodialysis unit was likely to have originated from 2 index cases.
  - Patient #1 acquired the virus through an outbreak at a skilled nursing facility
  - Hemodialysis Staff #1 likely acquired the virus in the community.
- Subsequent transmission likely occurred from patient-to-patient interactions or indirectly through staff, many were asymptomatic.
- Later transmission likely occurred through a shared shuttle bus service to and from dialysis despite implementation of universal droplet and contact precautions within the hemodialysis unit.

Yau K, et al. COVID-19 Outbreak in an Urban Hemodialysis Unit. Am J Kidney Dis. 76(5):690-695

# Evidence based guidelines for management of HD during the COVID-19 pandemic

The COVID pandemic continues to evolve...

The most updated recommendations for management are available on the Center's for Disease Control and Prevention, December 16, 2020

- <https://www.cdc.gov/coronavirus/2019-ncov/hcp/dialysis.html>

Additional resources:


American Society of Nephrology's COVID-19 Information

- <https://www.asn-online.org/covid-19/>

# CDC's Outpatient dialysis facility preparedness assessment tool

“Outpatient dialysis facilities should be prepared for the possible arrival of patients with COVID-19 and should ensure their staff are trained, equipped, and capable of practices to manage these patients”

## Coronavirus Disease 2019 (COVID-19) Outpatient Dialysis Facility Preparedness Assessment Tool



---

All U.S. outpatient dialysis facilities should be prepared for the possible arrival of patients with Coronavirus Disease 2019 (COVID-19). All outpatient dialysis facilities should ensure their staff are trained, equipped, and capable of practices needed to:

- Prevent the spread of respiratory infections, including COVID-19, within the dialysis facility.
- Promptly identify and isolate patients with possible COVID-19 and inform the correct dialysis facility staff and public health authorities.
- Provide dialysis for a limited number of patients with confirmed or suspected COVID-19 as part of routine operations.
- Potentially provide dialysis for a larger number of COVID-19 patients in the context of an escalating outbreak.
- Monitor and manage any healthcare personnel that might be exposed to COVID-19.
- Communicate effectively within the dialysis facility and plan for appropriate external communication related to COVID-19.

---

The following checklist is not a list of mandatory requirements; rather, it highlights important areas CDC recommends outpatient dialysis facilities review in preparation for potential arrivals of COVID-19 patients.

**Elements to be assessed**

1. Infection prevention and control policies and training for healthcare personnel (HCP):	Completed	In Progress	Not Started
Facility leadership including, but not limited to, the Chief Medical Officer, quality officers, medical directors, facility administrator, nurse manager, infection prevention personnel, chief operating officer, nephrologists, nurse practitioners has reviewed the Centers for Disease Control and Prevention's COVID-19 guidance for dialysis facilities. <a href="http://www.cdc.gov/coronavirus/2019-ncov/health-care-facilities/dialysis.html">www.cdc.gov/coronavirus/2019-ncov/health-care-facilities/dialysis.html</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Facility provides education and job-specific training to HCP regarding COVID-19 including:</b>			
Signs and symptoms of infection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Importance of hand hygiene, respiratory hygiene, cough etiquette and wearing a facemask or cloth face covering for source control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of personal protective equipment (PPE) including competency evaluation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Triage procedures and patient placement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HCP sick leave policies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-monitoring for fever or respiratory symptoms including not reporting to work when ill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How and to whom suspected and confirmed COVID-19 cases should be reported.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[www.cdc.gov/coronavirus](http://www.cdc.gov/coronavirus)

## Topics covered

1. Screening, Triage, and Management of Individuals with Suspected or Confirmed SARS-CoV-2 Infection
2. Recommended PPE When Caring for a Patient with Suspected or Confirmed SARS-CoV-2 Infection
3. Recommended PPE When Caring for Patients Not Suspected to Have SARS-CoV-2 Infection
4. Cleaning & Disinfection
5. Response to Newly Identified Patients or HCP with SARS-CoV-2 Infection
6. Discontinuation of Transmission-Based Precautions and Disposition of Patients with SARS-CoV-2 Infection in Healthcare Settings



# Screening, Triage, and Management of Individuals with Suspected or Confirmed SARS-CoV-2 Infection

- Instruct patients and HD staff to call ahead
  - To report “close contact” in the past 14 days with someone with SARS-CoV-2 infection
  - If symptoms of COVID-19 present (without a test)
  - Confirmed COVID-19 positive
- The HD facility can be prepared for their arrival or triage them to a more appropriate setting
  - Acute care hospital
  - PUI\* facility or isolation area in home HD facility
  - COVID cohort facility
- HD staff should not report to work when they are ill
- Notify occupational health services if they have an unprotected exposure to someone with SARS-CoV-2 infection



# Close contact

- Someone who has been within 6 feet of an infected person (laboratory-confirmed or a clinically compatible illness) for a cumulative total of 15 minutes or more over a 24-hour period
- People who have been in close contact with someone who has COVID-19 should [quarantine](#). However, the following people with recent exposure may NOT need to quarantine:
  - People who have been [fully vaccinated](#)
  - People who were [previously diagnosed with COVID-19](#) within the last three months

# Instructions for patients and visitors



- Post signs at clinic entrances and strategic places around the facility with instructions:
- Provide information about screening and triage procedures
  - source control
  - distance of at least 6 feet
  - performing frequent hand hygiene
  - how to use masks
  - how to use tissues to cover nose and mouth when coughing or sneezing (if a mask cannot be tolerated)



# Triage in outpatient HD facilities

- Place a staff member near all entrances to screen everyone before they enter the treatment area and ensure they are practicing source control
  - Confirm **absence of symptoms consistent with COVID-19**.
  - **Fever is either measured temperature  $\geq 100.0^{\circ}\text{F}$  or subjective fever.**
  - Ask them if **they have been advised to self-quarantine** because of **exposure to someone** with SARS-CoV-2 infection.
- Position supplies close to dialysis chairs and nursing stations to promote adherence to hand and respiratory hygiene and cough etiquette.



# Implement Universal Source Control Measures



- Masks are recommended for everyone in a healthcare facility, even if they do not have symptoms of COVID-19
- Upon arrival and throughout stay in facility
- Healthcare personnel (HCP) should wear a medical facemask at all times while they are in the HD facility, including in breakrooms or other spaces where they might encounter co-workers

# Placement of Patients with Suspected or Confirmed SARS-CoV-2 Infection

- Patients wait separated by at least 6 feet. Medically stable patients might opt to wait in a personal vehicle or outside the healthcare facility where they can be contacted by mobile phone when it is their turn to be seen.
- Patients with suspected or confirmed SARS-CoV-2 infection or who have reported close contact should be brought back to an appropriate treatment area as soon as possible in order to minimize time in waiting areas.
- If they must wait, facilities should ensure the following:
  - Patients with confirmed SARS-CoV-2 infection can be cohorted together (e.g., in the same waiting room)
  - Patients with suspected SARS-CoV-2 infection and patients who have had close contact with someone with SARS-CoV-2 infection should also maintain at least 6 feet of separation from each other and from other patients at all times in the dialysis facility.

# Placement of Patients with Suspected or Confirmed SARS-CoV-2 Infection

- Facilities should consider separating all patients by 6 feet during dialysis treatments, especially in areas with moderate to substantial community transmission.
- Ideally, a patient with suspected or confirmed SARS-CoV-2 infection or who has reported close contact would be dialyzed in a separate room (if available) with the door closed.
  - Hepatitis B isolation rooms should only be used for these patients if:
    - 1) the patient is hepatitis B surface antigen positive or
    - 2) the facility has no patients on the census with hepatitis B infection who would require treatment in the isolation room.
- If a separate room is not available, the patient with suspected or confirmed SARS-CoV-2 infection or who reported close contact should be treated at a corner or end-of-row station, away from the main flow of traffic (if available). The patient should be separated by at least 6 feet from the nearest patient (in all directions).
- If a hemodialysis facility is dialyzing more than one patient with confirmed SARS-CoV-2 infection, consideration should be given to cohorting these patients and the HCP caring for them together in the same section of the unit and/or on the same shift (e.g., consider the last shift of the day).
  - Only patients with confirmed SARS-CoV-2 infection should be cohorted together.
  - Patients who report close contact with someone with SARS-CoV-2 infection and patients with symptoms for whom SARS-CoV-2 infection has not been confirmed, should not be cohorted with patients with confirmed SARS-CoV-2 infection or with each other as their diagnosis is uncertain. These patients should be dialyzed at a station that is at least 6 feet from others in all directions.



## Recommended PPE When Caring for a Patient with Suspected or Confirmed SARS-CoV-2 Infection

- HCP caring for patients with suspected or confirmed SARS-CoV-2 infection or who have reported close contact with someone with SARS-CoV-2 infection
  - N95 or equivalent or higher-level respirator (or medical facemask if a respirator is not available)
  - Eye protection (i.e., goggles, a face shield that covers the front and sides of the face).
  - Gloves
  - Isolation gown
    - The isolation gown should be worn over or instead of the cover gown (e.g., laboratory coat, gown, or apron with incorporate sleeves) that is normally worn by hemodialysis personnel.





# Recommended PPE When Caring for Patients Not Suspected to Have SARS-CoV-2 Infection

- HCP working in facilities located in areas with moderate to substantial community transmission are more likely to encounter asymptomatic or pre-symptomatic patients with SARS-CoV-2 infection
- If SARS-CoV-2 infection is not suspected in a patient presenting for care (based on symptom and exposure history)
  - HCP should follow [Standard Precautions and additional precautions routinely recommended for hemodialysis facilities \(e.g., wearing a gown, gloves, and face shield during catheter connection\)](#)
  - Wear eye protection and medical facemask to ensure the eyes, nose, and mouth are all protected from exposure to respiratory secretions during patient care encounters



# Response to Newly Identified Patients or HCP with SARS-CoV-2 Infection

- Facilities should have a process to respond to patients or HCP with newly identified SARS-CoV-2 infection, including assessing risk to others in the facility who may have had close contact with infected individuals
  - If the individual with infection is a patient: the HD facility can be prepared for their arrival or triage them to a more appropriate setting
    - Acute care hospital
    - PUI\* facility or isolation area in home HD facility
    - COVID cohort facility
  - If the individual with infection is a HCP
    - Patients who were within 6 feet of an infected HCP for a total of 15 minutes (close contact) should be considered potentially exposed or be moved to a PUI facility
    - They should be dialyzed separated from other patients by at least 6 feet and
    - Cared for by HCP using all recommended PPE for SARS-CoV-2
  - If the exposed patient was wearing a medical facemask during the entire exposure
    - A risk assessment should be performed
    - Patients in this group with lower risk exposures could be monitored for the development of symptoms without other precautions.
  - If the patient was wearing a cloth mask (instead of a medical facemask) or not wearing any type of face covering (mask or medical facemask), then they should be considered an unprotected close contact.
  - Exposed patients determined to be close contacts of infected HCPS or other patients: should be advised to self-quarantine at home for 14 days after their last contact with someone with SARS-CoV-2 infection, other than when they need to leave their home for hemodialysis treatments or other necessary medical appointments.
  - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html>

# Cleaning & Disinfection

- Current procedures for routine cleaning and disinfection of dialysis stations are appropriate for patients with SARS-CoV-2 infection
- Product used for surface disinfection is active against SARS-CoV-2.
- United States Environmental Protection Agency List N Tool: COVID-19 Disinfectants

- <https://cfpub.epa.gov/giwiz/disinfectants/index.cfm>

EPA United States Environmental Protection Agency

## List N Tool: COVID-19 Disinfectants

[More Information](#) [Feedback](#)

# EPA Registration Number  
Active Ingredient  
Use Site  
Surface Types  
Contact Time  
**Browse All**  
Keyword Search

Show results Clear results

Search by selecting one or more option above. Click the "Show Results" button to view your list of results. Select as many options as you wish. Click the "Clear Results" button to remove all selections and start over. Click "Browse All" to display all products.

Total count: 548

Show 10 entries [PDF](#) [CSV](#)

EPA Registration Number	Active Ingredient(s)	Product Name	Company	Follow the disinfection directions and preparation for the following virus	Contact Time (in minutes)	Formulation Type	Surface Type	Use Site	Why is this product on List N?
10190-14	Quaternary ammonium	Penetone XE-7417	Penetone Corp.	Porcine circovirus	10	Dilutable	Hard Nonporous	Institutional	Kills a harder-to-kill pathogen than SARS-CoV-2

Staff should be educated, trained, and have competency assessed for all cleaning and disinfection procedures in the facility.

- Ensure staff use appropriate PPE when cleaning.
- Training on routine cleaning and disinfection of the
  - dialysis station
  - high touch surfaces (such as scale and waiting areas)
- Ensure that routine cleaning and disinfection procedures are followed consistently and correctly for patients with suspected or confirmed SARS-CoV-2 infection or who report close contact to someone with SARS-CoV-2 infection.

# Discontinuation of Transmission-Based Precautions and Disposition of Patients with SARS-CoV-2 Infection in Healthcare Settings

- The symptom-based strategy depends on
  1. the time period since symptoms first appeared and
  2. whether symptoms are improving
  3. whether the patients is immunocompromised
  4. the severity of their illness
- A test-based strategy is not recommended
  - Because, in the majority of cases, it results in prolonged isolation of patients who continue to shed detectable SARS-CoV-2 RNA but are no longer infectious.

# Discontinuation of Transmission-Based Precautions and Disposition of Patients with SARS-CoV-2 Infection in Healthcare Settings

- **Symptom-Based Strategy for Discontinuing Transmission-Based Precautions**
  - **Patients with mild to moderate illness who are *not* severely immunocompromised:**
    - At least 10 days have passed *since symptoms first appeared* and
    - At least 24 hours have passed *since last fever* without the use of fever-reducing medications **and**
    - Symptoms (e.g., cough, shortness of breath) have improved
  - **Patients who were asymptomatic throughout their infection and are *not* severely immunocompromised:**
    - At least 10 days have passed since the date of their first positive viral diagnostic test.
  - **Patients with severe to critical illness or who are severely immunocompromised:**
    - At least 10 days and up to 20 days have passed *since symptoms first appeared* and
    - At least 24 hours have passed *since last fever* without the use of fever-reducing medications **and**
    - Symptoms (e.g., cough, shortness of breath) have improved
    - Consider consultation with infection control experts
      - Patients who are **severely immunocompromised** may produce replication-competent virus beyond 20 days after symptom onset or, for those who were asymptomatic throughout their infection, the date of their first positive viral test. Use of a test-based strategy for determining when to discontinue Transmission-Based Precautions could be considered for these patients.

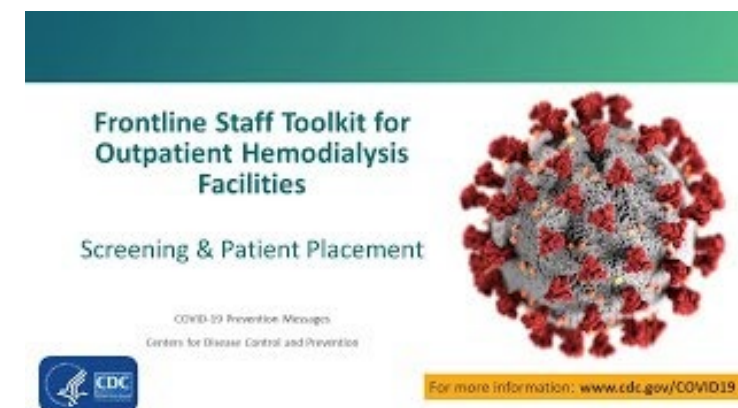
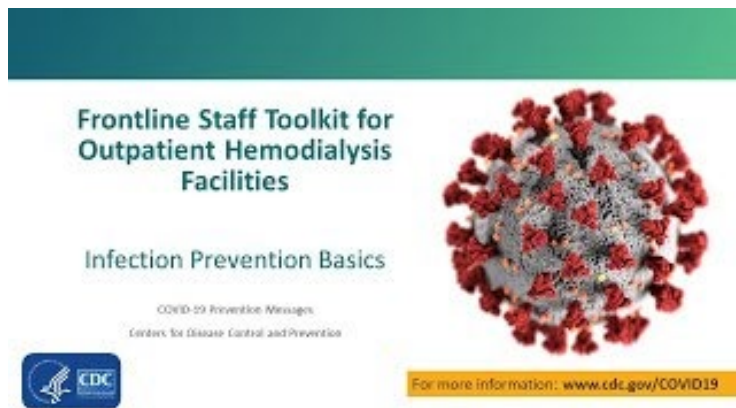


# SARS-CoV-2 Testing Guidelines for Patients in Outpatient Hemodialysis Facilities

- Viral testing of patients in outpatient dialysis facilities can be an important addition to other infection prevention and control recommendations
  - Testing conducted at dialysis facilities should be implemented
  - Not all dialysis facilities can perform on-site testing; however, all facilities should have a plan for testing patients for SARS-CoV-2 (e.g., identify where patients will be referred for testing if the dialysis facility cannot perform onsite testing).
  - Testing practices with rapid turnaround times (i.e., less than 48 hours) in order to facilitate effective interventions



# Additional CDC resources: Frontline Staff Toolkits - Tips for Outpatient Hemodialysis Facilities During COVID-19 Videos



<https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/disinfecting-transport-vehicles.html>

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/dialysis.html>