

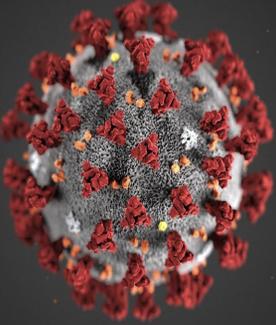
Hot Topics with Coronavirus: An Outpatient Approach to Infection Prevention

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Disclaimer

- The information contained in this presentation is not meant to be construed as medical advice, but rather as important information to mitigate risk of transmission of Coronavirus.
- For the most up-to-date information about the COVID-19 outbreak, please visit the Centers for Disease Control and Prevention (CDC) website: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>.
- Always check with your local health department guidelines to specific guidance.



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Objectives

- Discuss the current global and domestic status of the COVID-19 outbreak and its broad public health interventions
- Review evidence-based infection control strategies to mitigate risk to both healthcare workers and patients
- Discuss a common cents approach to ensuring a safe work environment and maintaining clinical continuity of care in outpatient settings

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My Objectives for Our Time Together

1. To **Keep YOU** (The Healthcare Professional) **SAFE**.
2. To Keep **INFECTED OR SUSPECTED INFECTED PATIENTS HOME and OUT of YOUR FACILITY**.
3. To Keep **YOUR PATIENTS** Safe
4. To make **RATIONALE** and **PRAGMATIC** decisions regarding this outbreak

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Goals of CDC and Federal Agencies with Coronavirus Response

- Reduce morbidity and mortality
- Minimize disease transmission
- Protect healthcare personnel
- Preserve healthcare system functioning



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Risk Profile of COVID-19

- For most people, the immediate risk of being exposed to the virus that causes COVID-19 is thought to be low. This virus is not currently widespread in the United States.
- People in places where ongoing community spread of the virus that causes COVID-19 has been reported are at elevated risk of exposure, with increase in risk dependent on the location.
- Healthcare workers caring for patients with COVID-19 are at elevated risk of exposure.
- Close contacts of persons with COVID-19 also are at elevated risk of exposure.
- Travelers returning from affected international geographies where community spread is occurring also are at elevated risk of exposure, with increase in risk dependent on the location.

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Current Status of the Outbreak (as of 3/11/20)

- Total Cases Globally: 126,136
- Total Deaths Globally: 4,630
- Total Cases in the US: 1,312
- Total Deaths in the US: 38



Source: <https://www.cdc.gov/coronavirus/2019-nCoV/summary.html>

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Coronavirus COVID-19 Global Cases by Johns Hopkins CSSE

Total Confirmed: **113,584**

Total Deaths: **3,996**

Total Recovered: **62,496**

Confirmed Cases by Country/Region:

- 80,738 Mainland China
- 9,172 Italy
- 7,473 South Korea
- 7,161 Iran
- 1,297 France
- 1,172 Germany
- 1,027 Spain
- 938 Others
- 407 US
- 311 Japan
- 374 Switzerland
- 321 Netherlands
- 321 UK

Complete Confirmed Cases: **111**

Source: <https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

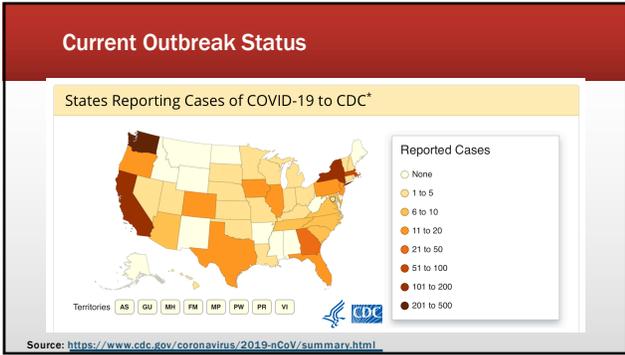
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Current COVID-19 Infections in the US

Cases of COVID-19 Reported in the US, by Source of Exposure*†	
Travel-related	92
Close contact	75
Under investigation	771
Total cases	938

Source: <https://www.cdc.gov/coronavirus/2019-nCoV/summary.html>

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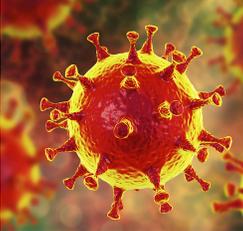
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- ### COVID-19 Clinical Presentation
- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
 - Incubation Period: Estimated 4 days
 - MERS-CoV and SARS-CoV incubation period is 2-14 days
 - Common Presenting Symptoms:
 - Fever
 - Myalgia/Fatigue
 - Cough
 - SOB
 - Less Common Symptoms: Sore Throat, Headache, Cough with Sputum Production
- <https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html>

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Case Fatality Information

- No underlying medical conditions:
Overall Case Fatality of 0.9% in US
- Patients with Comorbidities have Increase Case Fatality (in US):
 - Diabetes: 7%
 - Cardiovascular Disease: 10.5%
 - Chronic Respiratory Disease: 6%
 - Cancer: 6%
 - Hypertension: 6%
 - Respiratory Failure, Shock, or Multiple Organ Dysfunction: 49%
- In China, case fatality proportion was 49%



Source: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>

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Hospitalizations

- Most hospitalizations with COVID-19 patients are limited to patients with pneumonia
- Some reports have indicated clinical deterioration within second week of illness
- ARDS developed in 17-29% of patients admitted

Source: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>

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Diagnostic Testing

- Real-Time RT-PCR Panel for Detection of COVID-19
- Testing Options:
 - State Public Health Laboratories
 - Centers for Disease Control and Prevention
 - Private Laboratories (In Progress)

Source: <https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>

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Case Presentation

- Data suggests that symptoms may appear in as few as 2 days or as long as 14 days after exposure to the virus that causes COVID-19.
- Symptoms can include fever, cough, difficulty breathing, and shortness of breath.
- The virus causing COVID-19 is called SARS-CoV-2. It is thought to spread mainly from person-to-person via respiratory droplets among close contacts. Respiratory droplets are produced when an infected person coughs or sneezes and can land in the mouths or noses, or possibly be inhaled into the lungs, of people who are nearby. Close contact may include:
 - Being within approximately 6 feet of an individual with COVID-19 for a prolonged period of time.
 - Having direct contact with body fluids (such as blood, phlegm, and respiratory droplets) from an individual with COVID-19.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html>

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Routes of Transmission

- Person-to-Person Transmission:
 - Between people who are in close contact with one another (within about 6 feet)
 - Through respiratory droplets produced when an infected person coughs or sneezes
- Environmental Surface Transmission
- Contact with Mucous Membranes
- Documented Community Spread

Source: <https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html>

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Risk of Transmission

- People are most contagious when they are symptomatic
- There is some limited evidence that people not showing symptoms can transmit Coronavirus
- There have been some limited reports that this has occurred with the new coronavirus
 - Not the main way the virus is spreading
- Community Transmission has occurred in the US and globally
- Environmental Transmission from contaminated surfaces or objects

Source: <https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html>

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Community Spread

- Community Spread/Transmission refers to people that have been infected with the virus in an area, including some who are not sure how or where they became infected.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html>

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Identified At Risk Populations

- Vulnerable Populations:
 - Older Adults
 - People who has serious chronic medical conditions such as:
 - Heart Disease
 - Diabetes
 - Lung Disease
 - Renal Disease
 - Immunocompromised Patients
- Children and Pregnant Women are NOT being impacted

Source: <https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/index.html>

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New CDC Recommendations Released

- Updated PPE recommendations for the care of patients with known or suspected COVID-19:
 - Based on local and regional situational analysis of PPE supplies, facemasks are an acceptable alternative when the supply chain of respirators cannot meet the demand. During this time, available respirators should be prioritized for procedures that are likely to generate respiratory aerosols, which would pose the highest exposure risk to HCP.
 - Facemasks protect the wearer from splashes and sprays.
 - Respirators, which filter inspired air, offer respiratory protection.
 - When the supply chain is restored, facilities with a respiratory protection program should return to use of respirators for patients with known or suspected COVID-19. Facilities that do not currently have a respiratory protection program, but care for patients infected with pathogens for which a respirator is recommended, should implement a respiratory protection program.
 - Eye protection, gown, and gloves continue to be recommended.
 - If there are shortages of gowns, they should be prioritized for aerosol-generating procedures, care activities where splashes and sprays are anticipated, and high-contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothing of HCP.

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Additional New Recommendations

- Included are considerations for designating entire units within the facility, with dedicated HCP, to care for known or suspected COVID-19 patients and options for extended use of respirators, facemasks, and eye protection on such units. Updated recommendations regarding need for an airborne infection isolation room (AIIR).
- Patients with known or suspected COVID-19 should be cared for in a single-person room with the door closed. Airborne Infection Isolation Rooms (AIIRs) (See definition of AIIR in appendix) should be reserved for patients undergoing aerosol-generating procedures (See Aerosol-Generating Procedures Section)
- Updated information in the background is based on currently available information about COVID-19 and the current situation in the United States, which includes reports of cases of community transmission, infections identified in healthcare personnel (HCP), and shortages of facemasks, N95 filtering facepiece respirators (FFRs) (commonly known as N95 respirators), and gowns.
- Increased emphasis on early identification and implementation of source control (i.e., putting a face mask on patients presenting with symptoms of respiratory infection).

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Key Definition of HCP

- For the purposes of this document, HCP refers to all paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials, including:
 - body substances
 - contaminated medical supplies, devices, and equipment
 - contaminated environmental surfaces
 - contaminated air

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Infection Control Approaches to Mitigate Transmission Risk

1. Minimize Chance for Exposures
2. Adherence to Standard, Contact, and Airborne Precautions, Including the Use of Eye Protection
3. Manage Visitor Access and Movement Within the Facility
4. Implement Engineering Controls
5. Monitor and Manage Ill and Exposed Healthcare Personnel
6. Train and Education Healthcare Personnel
7. Implement Environmental Infection Control
8. Establish Reporting within Healthcare Facilities and to Public Health Authorities

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Before Arrival

- When scheduling appointments, instruct patients and any persons accompanying them to call ahead and report any signs and symptoms of respiratory infection PRIOR to arrival
- Obtain Travel History PRIOR to arrival
- Those with symptoms

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Upon Arrival and During Visit

- Keep suspected or confirmed COVID-19 patients out of outpatient facilities and refer them to local hospitals and/or public health agencies
- If patients are demonstrating active respiratory illness symptoms upon arrival, immediately reschedule the patient's visit.
- Post Visual Signs of Signs, Symptoms, and Travel History at strategic places such as main entrance door, patient check-in area, employee entrances, etc.
- Remind patients and staff of cough etiquette
- Do not allow symptomatic patients to remain in waiting room and move them to a well-ventilated space (such as outside) or other area where patients are separated by at least 6 feet

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Protecting Your Workforce

- Screen patients and visitors for potential symptoms of acute respiratory illness (fever, cough, difficulty breathing) BEFORE entering your facility
- Ensure staff properly use PPE
- Encourage sick employees to stay home
- Work collaboratively with your employees to ensure that they are compensated for time off due to potential infectious illness
- Track workplace illness and monitor for trends

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Personal Protective Equipment Recommendations

- The minimum PPE recommended is:
 - A single pair of disposable examination gloves,
 - Disposable isolation gown or single-use/disposable coveralls*,
 - Any NIOSH-approved particulate respirator (i.e., N-95 or higher-level respirator), and
 - Eye protection (i.e., goggles or disposable face shield that fully covers the front and sides of the face)
- *If unable to wear a disposable gown or coveralls because it limits access to duty belt and gear, ensure duty belt and gear are disinfected after contact with individual.
- The timeframe that the COVID-19 remains infectious in the air is unknown

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Gloves and Gown Usage

- **Gloves:**
 - Perform hand hygiene, then put on clean, non-sterile gloves upon entry into the patient room or care area.
 - Change gloves if they become torn or heavily contaminated.
 - Remove and discard gloves when leaving the patient room or care area, and immediately perform hand hygiene.
- **Gowns:**
 - Put on a clean isolation gown upon entry into the patient room or area. Change the gown if it becomes soiled.
 - Remove and discard the gown in a dedicated container for waste or linen before leaving the patient room or care area.
 - Disposable gowns should be discarded after use.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Respiratory Protection

- Use respiratory protection (i.e., a respirator) that is at least as protective as a fit-tested NIOSH-certified disposable N95 filtering facepiece respirator before entry into the patient room or care area.
- Disposable respirators should be removed and discarded after exiting the patient's room or care area and closing the door.
- Perform hand hygiene after discarding the respirator.
- If reusable respirators (e.g., powered air purifying respirator/PAPR) are used, they must be cleaned and disinfected according to manufacturer's reprocessing instructions prior to re-use.
- Respirator use must be in the context of a complete respiratory protection program in accordance with Occupational Safety and Health Administration (OSHA) Respiratory Protection standard

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Respirator Usage Reminders

- Patients requiring airborne isolation precautions should not be cared for in outpatient healthcare settings.
- A respirator is a personal protective device that is worn on the face, covers at least the nose and mouth, and is used to reduce the wearer's risk of inhaling hazardous airborne particles (including dust particles and infectious agents), gases, or vapors.
- Respirators are certified by the CDC/NIOSH, including those intended for use in healthcare.
- Respirator use must be in the context of a complete respiratory protection program in accordance with OSHA Respiratory Protection standard.
- HCP should be medically cleared and fit-tested if using respirators with tight-fitting facepieces (e.g., a NIOSH-approved N95 respirator) and trained in the proper use of respirators, safe removal and disposal, and medical contraindications to respirator use.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Critical Caveats Regarding Facemask Usage

- If worn properly, a facemask helps block respiratory secretions produced by the wearer from contaminating other persons and surfaces (often called source control).
- Facemasks are cleared by the U.S. Food and Drug Administration (FDA) for use as medical devices. Facemasks should be used once and then thrown away in the trash.
- Masks should NOT be reused.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Eye Protection

- Put on eye protection (e.g., goggles, a disposable face shield that covers the front and sides of the face) upon entry to the patient room or care area.
- Remove eye protection before leaving the patient room or care area.
- Reusable eye protection (e.g., goggles) must be cleaned and disinfected according to manufacturer's reprocessing instructions prior to re-use.
- Disposable eye protection should be discarded after use.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Aerosol-Generating Procedures Risk

- Some procedures performed on COVID-19 patients could generate infectious aerosols.
- In particular, procedures that are likely to induce coughing (e.g., sputum induction, open suctioning of airways) should be performed cautiously and avoided if possible.
- If performed, these procedures should take place in an AIIR and personnel should use respiratory protection as described above. In addition:
 - Limit the number of HCP present during the procedure to only those essential for patient care and procedural support.
 - Clean and disinfect procedure room surfaces promptly as described in the section on environmental infection control below.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control->

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Visitor Management

- Screening visitors for symptoms of acute respiratory illness before entering the healthcare facility.
- Facilities should evaluate risk to the health of the visitor (e.g., visitor might have underlying illness putting them at higher risk for COVID-19) and ability to comply with precautions.
- Facilities should provide instruction, before visitors enter clinical areas, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy while in the patient's room.
- Facilities should maintain a record (e.g., log book) of all visitors who enter the facility.
- Visitors should not be present during aerosol-generating procedures.
- Visitors should be instructed to limit their movement within the facility.
- Exposed visitors (e.g., contact with COVID-19 patient prior to admission) should be advised to report any signs and symptoms of acute illness to their health care provider for a period of at least 14 days after the last known exposure to the sick patient.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Environmental Infection Control Recommendations

- All non-dedicated, non-disposable medical equipment used for patient care should be cleaned and disinfected according to manufacturer's instructions and facility policies.
- Ensure that environmental cleaning and disinfection procedures are followed consistently and correctly.
- Routine cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces prior to applying an EPA-registered, hospital-grade disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product's label) are appropriate for COVID-19 in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.
- Products with EPA-approved emerging viral pathogens claims are recommended for use against COVID-19. These products can be identified by the following claim: "[Product name] has demonstrated effectiveness against viruses similar to COVID-19 on hard non-porous surfaces. Therefore, this product can be used against COVID-19 when used in accordance with the directions for use against [name of supporting virus] on hard, non-porous surfaces."
- Specific claims for "COVID-19" will not appear on the product or master label.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Clean Those Hands

- Healthcare Professionals should perform hand hygiene with ABHS with alcohol content between 60-90%.
- Soap and Water for at least 20 seconds is also permitted.
- If Hands are visibly soiled, use soap and water.
- Current ABHS that hold FDA approval are acceptable for use with COVID-19

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Proper Steps to Utilize PPE

Putting On PPE

1. Gown
2. Mask or Respirator
3. Goggles or Face Shield
4. Gloves

Taking Off PPE

- Gloves
- Goggles or Face Shield
- Gown
- Mask or Respirator

Source: <https://www.cdc.gov/hai/ndfs/ppe/ppe-sequence.pdf>

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Other Steps To Consider

- No-touch trash receptacles for waste disposal
- Facemasks at Facility Entrances
- Deployment of Alcohol-Based Hand Sanitizer throughout facility
- Availability of tissues and PPE stations
- If facility rooms have doors, keep doors closed to minimize entrance/exit
- If masks are not available, cases should not be performed

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Relevance of Air Exchanges and Transmission

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

ACH (h ⁻¹)	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.99% efficiency
2	138	207
4	69	104
6	46	69
8	35	52
10	28	41
12	23	35
15	18	28
20	14	21
50	6	8

Source: <https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1>

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Potential Engineering Controls

- Physical Partitions between patient care areas
- Closed Suctioning Systems
- Air Handling Systems with appropriate directionality, filtration, and exchange rate
- Curtains between patient care areas

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Hierarchy of Controls



Source: <https://www.cdc.gov/niosh/topics/hierarchy/default.html>

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Building Continuous Competency

- Provide HCP with job- or task-specific education and training on preventing transmission of infectious agents, including refresher training.
- HCP must be medically cleared, trained, and fit tested for respiratory protection device use (e.g., N95 filtering facepiece respirators), or medically cleared and trained in the use of an alternative respiratory protection device (e.g., Powered Air-Purifying Respirator, PAPR) whenever respirators are required.
- Ensure that HCP are educated, trained, and have practiced the appropriate use of PPE prior to caring for a patient, including attention to correct use of PPE and prevention of contamination of clothing, skin, and environment during the process of removing such equipment.

Source: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

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Treatment Options

- Remdesivir is an investigational antiviral drug that was reported to have in-vitro activity against SARS-CoV-2.
- No FDA approved treatment options exist as of 3/9/2020
- Corticosteroids should be avoided due to prolonged viral replication

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Conclusions

- A continuous state of readiness is appropriate and necessary for all emergent viruses.
- Healthcare Professionals should conduct prescreening of patients prior to arrival at the facility.
- Employ a pragmatic approach to infection prevention and control focused on: 1) Prevention, 2) Hand Hygiene, 3) PPE, and 4) Environmental Cleaning and Disinfection.
- Utilize this outbreak as a training opportunity to ensure preparedness for future infection control challenges.

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Important Reminders

- For the most up-to-date information about the COVID-19 outbreak, please visit the Centers for Disease Control and Prevention (CDC) website: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>.
- Always check with your local health department guidelines to specific guidance.



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References

- Training and Education Resources, electronically accessed from: <https://www.cdc.gov/infectioncontrol/training/index.html>, Centers for Disease Control and Prevention.
- Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Settings to Patients, electronically accessed from: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assessment-hcp.html>, Centers for Disease Control and Prevention.
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Question and Answer

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