Part 2: Basics of infection control in the time of COVID-19

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Disclosures

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- I do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.

- Slides utilized from AAP and CDC

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CDC'S National Training Collaborative for Healthcare Infection Prevention & Control

Acknowledgements

Project Firstline is a national collaborative led by the US Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. AAP is proud to partner with Project Firstline, as supported through Cooperative Agreement CDC-RFA-OT18-1802. CDC is an agency within the Department of Health and Human Services (HHS). The contents of this program do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.

Key Messages

- The goal of everything we do in infection control, for any disease, is to keep people from getting sick.

- The goal of Project Firstline is to make sure you have the infection control knowledge that you need and deserve to keep yourself, your patients, your colleagues, and your family safe.

HTTPS://WWW.CDC.GOV/INFECTIONCONTROL/PROJECTFIRSTLINE/RESOURCES.HTML

16 inside infection control videos

Episode 9:
What is Personal Protective Equipment (PPE)?

View on Web Episode 9
[Video – 4:03]
YouTube Episode 9 [Video – 4:03]
Facebook Episode 9
Episode 9 Transcript
[TXT – 4 KB]

Episode 10:
Why is Eye Protection Recommended for COVID-19?

View on Web Episode 10
[Video – 5:55]
YouTube Episode 10 [Video – 5:55]
Facebook Episode 10
Episode 10 Transcript
[TXT – 5 KB]

Episode 11:
Why are Gloves Recommended for COVID-19?

View on Web Episode 11
[Video – 8:46]
YouTube Episode 11 [Video – 8:46]
Facebook Episode 11
Episode 11 Transcript
[TXT – 7 KB]

Objectives

- Understand routes of general infection transmission.
- Discuss COVID-19 transmission scenarios.

Infection Source

- A source is any place where infectious agents/pathogens live.

Can be found in many places within a health care setting.

-People: Patients, Healthcare workers, and Visitors.

-Environmental:

Dry surfaces in patient care areas (eg, bed rails, medical equipment, countertops and tables)

Wet surfaces, moist environments, and biofilms (eg, cooling towers, faucets and sinks and equipment such as ventilators)

Indwelling medical devices (eg, catheters and IV lines)

Dust or decaying debris (eg, construction dust or wet materials from water leaks)

Infection Transmission

- **Transmission** is the way pathogens are moved to the susceptible person.

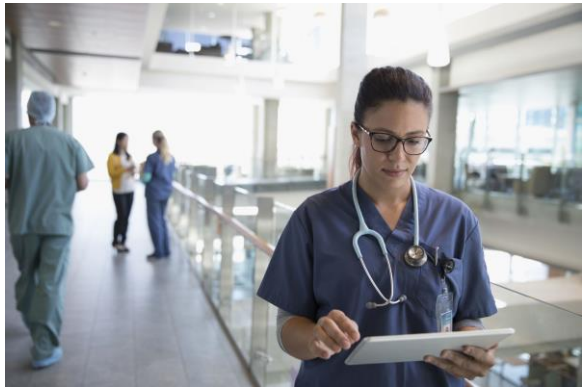
- Pathogens depend on **people, the environment, and/or medical equipment** to move in healthcare settings.

- Pathogens travel in healthcare settings through:
  - Contact (ie. touching)
  - Sprays and splashes
  - Inhalation, and
  - Sharp injuries (ie, when someone is accidentally stuck with a used needle or sharp instrument).

Contact

- Contact moves pathogens by touch (eg, MRSA or VRE).

- For example, healthcare provider hands become contaminated by touching pathogens present on medical equipment or high touch surfaces and then carry the pathogens on their hands and spread to a susceptible person when proper hand hygiene is not performed before touching the susceptible person.



Sprays and Splashes

- Sprays and splashes occur with any fluids, including when an infected person **coughs or sneezes**, creating **droplets** which carry pathogens short distances.

- These pathogens can land on a susceptible person's **eyes, nose, or mouth** and can cause infection (eg, pertussis or meningitis).

- Close range inhalation occurs when a droplet containing pathogens is small enough to breathe in but not durable over distance.

Inhalation

- Inhalation occurs when pathogens are aerosolized in tiny particles that **survive on air currents over great distances** and time and reach a susceptible person.

- Airborne transmission can occur when infected patients cough, talk, or sneeze pathogens into the air (eg, tuberculosis or measles), or when pathogens are aerosolized by medical equipment or by dust from a construction zone (eg, nontuberculous mycobacteria or aspergillus).

Sharp Injuries

- Sharps injuries can lead to infections (eg, HIV, Hepatitis B, Hepatitis C) when bloodborne **pathogens enter a person through a skin puncture** by a used needle or sharp instrument.

Standard Precautions

- Standard precautions are **used for all patient care**.
  - Based on a risk assessment and make use of common-sense practices and personal protective equipment (PPE) use that protect health care providers from infection and prevent the spread of infection from patient to patient.

- Standard precautions include:
  - Performing hand hygiene,
  - Using PPE whenever there is an expectation of possible exposure,
  - Following respiratory hygiene/cough etiquette principles,
  - Ensuring appropriate patient placement,
  - Proper handling, cleaning and disinfecting patient care equipment and environment appropriately,
  - Handling textile and laundry carefully,
  - Following safe injection practices,
  - Wearing surgical mask for lumbar punctures, and
  - Ensuring healthcare worker safety including proper handling of needles and other sharps.

Transmission-based Precautions

- Transmission-based precautions are used in addition to standard precautions for patients with **known or suspected infections.**
- CDC released Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html

How CDC Interim Guidance Compares with "Traditional" Transmission-based Precautions

- In addition to standard practices recommended as a part of routine health care delivery to all patients, the CDC suggests using additional infection prevention and control practices **during the COVID-19 pandemic**.
- **Practices are intended to apply to all patients**, not just those with suspected or confirmed SARS-CoV-2 infection.
- Facilities should develop policies and procedures to ensure recommendations are appropriately applied in their setting.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

Infection Transmission: COVID-19

- COVID-19 spreads very easily from person to person, including from people who don't seem sick. Like the flu, **COVID-19 spreads mainly between people when they are close to each other** –through **respiratory droplets** produced when an infected person coughs, sneezes, or talks. There is no evidence of transmission through chemical absorption (ie, through the skin).[1]

- In general, the closer a person interacts with others and the longer that interaction is, the higher the risk that COVID-19 will spread.

- Being with others in an enclosed space without good ventilation, especially where people are close together and breathing hard, shouting or singing, can increase the risk of infection.

- SARS-CoV-2 can be aerosolized through aerosol generating procedures (ie, intubation). Aerosol generating procedures should be avoided, if possible.[2]

[1] Centers for Disease Control and Prevention. Accessed December 2, 2020. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html
[2] Centers for Disease Control and Prevention. Accessed December 2, 2020. https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html

Recommended Practices when Caring for a Patient Exposed to SARS-CoV-2 Infection

- **The following recommendations apply to patients who have met criteria for a 14-day quarantine:**
  - Patients in this 14-day quarantine period should be isolated in a single-person room and cared for by health care providers using all PPE recommended for a patient with suspected or confirmed SARS-CoV-2 infection.
  - Patients should NOT be cohorted with patients with SARS-CoV-2 infection unless they are also confirmed to have SARS-CoV-2 infection through testing.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

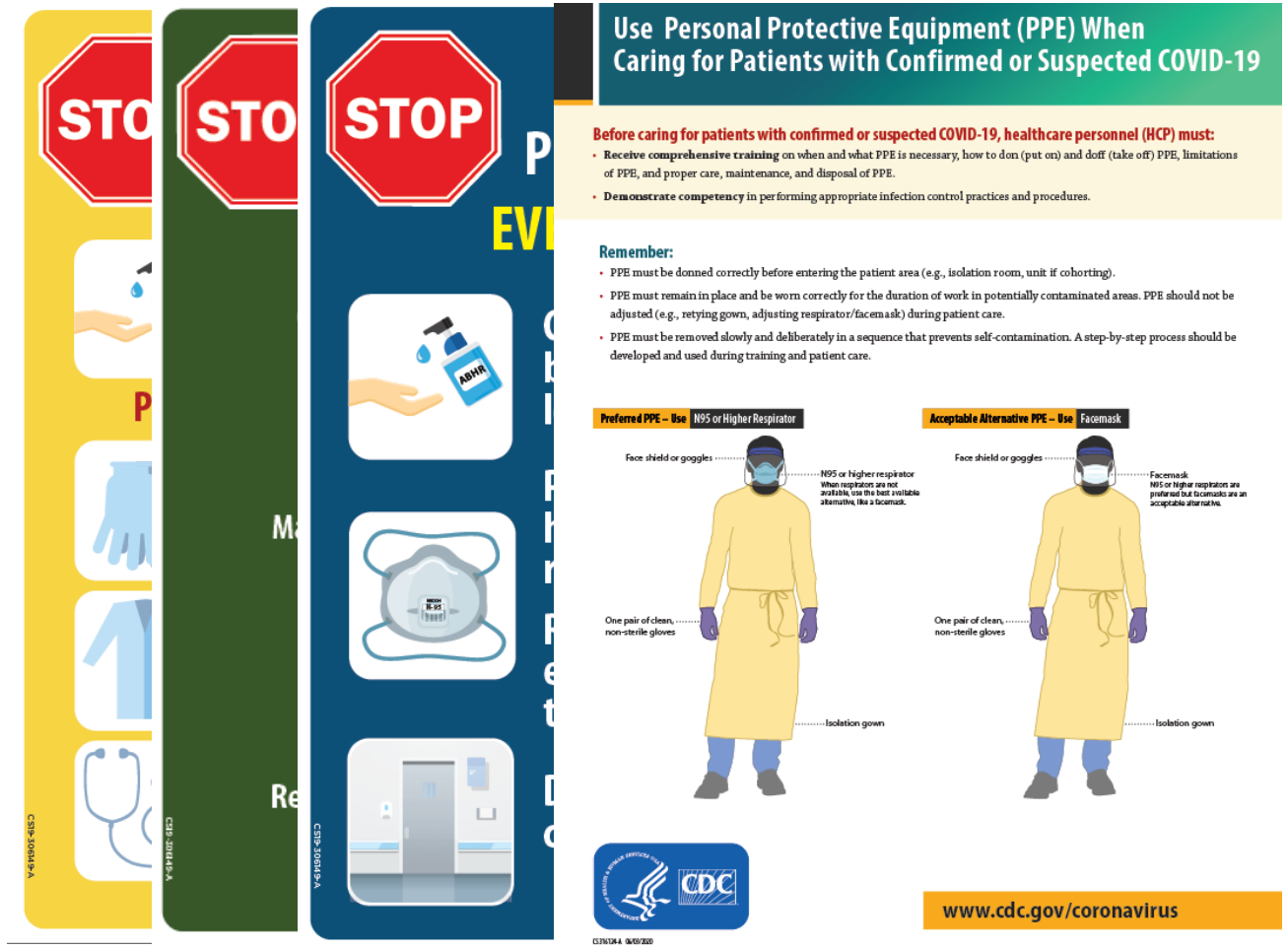
Recommended Practices when Caring for a Patient with Suspected or Confirmed SARS-CoV-2 Infection (cont.)

- **Personal Protective Equipment**
  - Health care providers who enter the room of a patient with suspected or confirmed SARS-CoV-2 infection should adhere to standard precautions and use a NIOSH-approved N95 or equivalent or higher-level respirator (or facemask if a respirator is not available), gown, gloves, and eye protection.
  - Perform hand hygiene before and after all patient contact.
  - Health care providers must receive training on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly don, use, and doff PPE in a manner to prevent self-contamination; how to properly dispose of or disinfect and maintain PPE; and the limitations of PPE.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

Communicating Transmission-Based Precautions

- Ensure precautions are followed in all settings of your clinic by posting proper signage:
  - Entrance of patient exam rooms
  - Health care personnel common spaces



https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

STOP

Visitors: Check-

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STOP

Visitors: Check-

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STOP

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STOP

Airborne Precautions

(In addition to Standard Precautions)

Visitors: Check-in at Nurses Station before entering room.

Clean hands when entering and leaving room.

Private room. Keep door closed. Negative pressure required.

Wear PAPR or fit-tested N95 mask

- **Tuberculosis:**
  - ~ All staff to wear N95 respirator or PAPR.
- **Chicken pox and measles:**
  - ~ Immune healthcare workers, no respiratory protection required.
  - ~ Nonimmune health care workers, not to enter room if immune healthcare workers are available.

Limit the transport of patients to necessary activities only.

- Patient to wear surgical mask during transport.

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Type and Duration of Precautions Recommended for Selected Infections and Conditions[1]

A B C D E F G H I J K L M N O P Q R S T U V W Y Z

Infection/Condition	Type of Precaution	Duration	Comments
Abscess Draining, major	Contact + Standard	Duration of illness	Until drainage stops or can be contained by dressing.
Abscess Draining, minor or limited	Standard	n/a	If dressing covers and contains drainage.
Respiratory infectious disease, acute (if not covered elsewhere) Infants and young children	Contact + Standard	Duration of illness	Also see syndromes or conditions listed in Table 2.
Respiratory syncytial virus infection, in infants, young children and immunocompromised adults	Contact + Standard	Duration of illness	Wear mask according to Standard Precautions.
Rhinovirus	Droplet + Standard	Duration of illness	Droplet most important route of transmission. Outbreaks have occurred in NICUs and LTCFs. Add Contact Precautions if copious moist secretions and close contact likely to occur (e.g., young infants).

https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/type-duration-precautions.html#sars

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Respiratory Infections	Respiratory infections, particularly bronchiolitis and pneumonia, in infants and young children	Respiratory syncytial virus, parainfluenza virus, adenovirus, influenza virus, *Human metapneumovirus*	Contact plus Droplet Precautions; Droplet Precautions may be discontinued when adenovirus and influenza have been ruled out
Skin or Wound Infection	Abscess or draining wound that cannot be covered	*Staphylococcus aureus* (MSSA or MRSA), group A streptococcus	Contact Precautions Add Droplet Precautions for the first 24 hours of appropriate antimicrobial therapy if invasive Group A streptococcal disease is suspected

https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/type-duration-precautions.html#sars

Communicating Transmission-Based Precautions

- Ensure precautions are followed in all settings of your clinic by posting proper signage:
  - Health care personnel common spaces
  - Entering/exiting building
  - Break rooms/ lunchrooms

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

Discontinuation of Transmission-Based Precautions for COVID-19

- **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 (eg, cough, shortness of breath) have improved

  - *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 (eg, cough, shortness of breath) have improved
    - Consider consultation with infection control experts

- A test-based strategy is no longer 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.

Centers for Disease Control and Prevention. Accessed December 3, 2020. https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html.

Ending Quarantine and Return to Work if You Are Exposed to a COVID-19 Case

Household Contact: Self-quarantine and monitor for symptoms while COVID-19 case is home sick. Once case is released from isolation, quarantine for 10 additional days, then continue to monitor for symptoms for 4 days.

Person's onset date. | Person released from isolation. | **10 days** | Household contact **released from quarantine** if not sick. | Monitor for symptoms 4 more days.

Non-Household Contact: Self-quarantine and monitor for symptoms until 10 days after the date of last contact. Continue to monitor for symptoms for 4 more days.

Date of last contact with COVID-19 case. | **10 days** | Contact released from quarantine if not sick. | Monitor for symptoms 4 more days.

Healthcare Personnel: Asymptomatic healthcare personnel should self-quarantine for 14 days if the healthcare facility can function without them. If the facility would close without them, they can continue to work as long as they:

- Are not sick.
- Monitor for symptoms.
- Follow quarantine guidelines outside of work.
- Wear a mask.
- Keep a 6-foot distance as much as possible.

Critical Infrastructure: Personnel considered critical infrastructure workers by US CDC may continue to work following potential exposure if they do not have any symptoms and take additional precautions prior to and during their work shift. Follow US CDC recommendations for critical infrastructure workers (non-healthcare).

https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/documents/COVID-19-Discontinuation-of-Quarantine-2b.pdf


Telemedicine Visit in Progress

COVID-19 Transmission Scenario 1

- As a health care provider, you are examining a young infant who is accompanied by his mother. **Do your infection control precautions change based on the mother's COVID-19 status?**
  - Asymptomatic
  - Pre-symptomatic
  - Symptomatic
- Other transmission factors:
  - Exam room is small
  - Multiple parents, siblings in the room
  - Handwashing not performed
  - Mask not worn or incorrectly worn

COVID-19 Transmission Scenario 2

- Infections may be transmitted by a staff member unknowingly exposed to COVID-19:
  - A front desk staff member at your clinic has been exposed to a COVID-19 positive person and has begun showing mild symptoms but is not aware his symptoms may be linked to COVID-19.
  - The same staff member takes his child to the clinic for a sick visit and finds out that the child is COVID-19 positive.
  - **What do you do?**

Exposure	Personal Protective Equipment Used	Work Restrictions
HCP who had prolonged[1] close contact[2] with a patient, visitor, or HCP with confirmed SARS-CoV-2 infection[3]	• HCP not wearing a respirator or facemask[4] • HCP not wearing eye protection if the person with SARS-CoV-2 infection was not wearing a cloth mask or facemask • HCP not wearing all recommended PPE (i.e., gown, gloves, eye protection, respirator) while performing an aerosol-generating procedure[1]	• Exclude from work for 14 days after last exposure[5,6,7] • Advise HCP to monitor themselves for fever or symptoms consistent with COVID-19[8] • Any HCP who develop fever or symptoms consistent with COVID-19[8] should immediately contact their established point of contact (e.g., occupational health program) to arrange for medical evaluation and testing. fully vaccinated-do not need to exclude from work
HCP other than those with exposure risk described above	• N/A	• No work restrictions • Follow all recommended infection prevention and control practices, including wearing a facemask for source control while at work, monitoring themselves for fever or symptoms consistent with COVID-19[8] and not reporting to work when ill, and undergoing active screening for fever or symptoms consistent with COVID-19[8] at the beginning of their shift. • Any HCP who develop fever or symptoms consistent with COVID-19[8] should immediately self-isolate and contact their established point of contact (e.g., occupational health program) to arrange for medical evaluation and testing.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html

WHAT YOU CAN DO ONCE YOU HAVE BEEN FULLY VACCINATED

Activity	
Visit inside a home or private setting without a mask with other fully vaccinated people of any age	✓
Visit inside a home or private setting without a mask with one household of unvaccinated people who are not at risk for severe illness	✓
Travel domestically without a pre- or post-travel test	✓
Travel domestically without quarantining after travel	✓
Travel internationally without a pre-travel test depending on destination	✓
Travel internationally without quarantining after travel	✓
Visit indoors, without a mask, with people at increased risk for severe illness from COVID-19	✗
Attend medium or large gatherings	✗

cdc.gov/coronavirus

CS323698-A 04/02/2021

We are still learning

- How well vaccine keeps people from spreading virus
- How effective vaccine is against variants of interest/concern
- Duration of vaccine protection

COVID-19 Transmission Scenarios

- Mother tested positive for COVID-19 on admission to labor and delivery
  - Room in with her infant with PPE, or to have her infant separated at birth
  - Outpatient scheduling first newborn visit
- HCP has recovered from SARS-CoV-2 infection but has a high-risk exposure within 3 months of their initial infection to a patient with SARS-CoV-2 infection, should they be restricted from work for 14 days after the exposure?
  - HCP immunocompromised
  - HCP diagnosed by antigen test and was asymptomatic
  - Variants
- Fully vaccinated HCP has high-risk exposure
  - asymptomatic do not need to be restricted from work for 14 days
    - HCP immunocompromised

https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/faqs-management-of-infants-born-to-covid-19-mothers/
https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html#anchor-handling

Closing

- Pathogens depend on **people, the environment, and/or medical equipment** to move in healthcare settings.

- Pathogens travel in healthcare settings through:
  - Contact (ie, touching),
  - Sprays and splashes,
  - Inhalation, and
  - Sharp injuries (eg, when someone is accidentally stuck with a used needle or sharp instrument).

- Transmission of COVID-19 and other agents can be prevented through standard infection control protocols
  - Importance of Communication, Education, Reinforcement, PPE

What's one action you can take to support infection control in the workplace?

Is it something you can do for yourself? Does it build on something you already do?

Is it something you can do for others?

Is it thanking some else for something that makes your job easier?

Resources

- American Academy of Pediatrics COVID-19 Guidance and Resources
  - COVID Town Halls
  - Practice Management Tips
  - Discounts on PPE and COVID-19 Supplies
- Centers for Disease Control and Prevention
  - Standard Precautions
  - Transmission-Based Precautions
  - Clinical Questions about COVID-19: Questions and Answers
- Project Firstline

Thank you

Thanks to Maine AAP and Dee Kerry for inviting me to speak and directing me to the resources from AAP ECHO and CDC Project FirstLine

Questions?

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