COVID-19: INFECTION CONTROL AND INFECTIOUS DISEASE CONSIDERATIONS

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OVERVIEW: A PRACTICAL PRIMER IN COVID-19 IN SKILLED NURSING, LICENSED CARE AND OTHER CONGREGATE LIVING ENVIRONMENTS

- Basic principles of SARS-COV2 infection (the virus, the disease, transmission)
- Published experience from COVID in a Skilled Nursing Setting
- Medical Management
- Effective Prevention Measures in congregate living environments
  - Personal Protective Equipment (PPE)
  - Effective Cohorting
- Testing
  - Benefits and limitations of testing
SARS-COV2

The virus causing the disease, COVID-19
DEFINITIONS

**Coronavirus**: a family of viruses causing acute infections in humans and animals

- 4 common human coronaviruses circulate and usually cause URIs, less commonly pneumonia
- 3 epidemic coronaviruses have been identified
  - SARS-CoV (AKA SARS-CoV1) in 2002
  - MERS-CoV in 2011
  - SARS-CoV2 in late 2019

**SARS-CoV2**: the name of the coronavirus virus causing the current pandemic

**COVID-19**: the name of the disease caused by SARS-CoV2
SEVEN HUMAN CORONAVIRUSES

Common Types
- 229E
- OC43
- HKU1
- NL63

Severe Types
- SARS
- MERS
- SARS-CoV2
INFECTIVITY, INCUBATION PERIOD AND EARLY ILLNESS

- Asymptomatic carriage
- Presymptomatic stage
- Symptoms usually occur within 2 to 12 days after exposure to the virus (incubation period)
- Infectious period starts before symptoms and may peak 24 hours before first symptoms develop
- Virus test (PCR) can remain positive for weeks, but actively replicating, culturable virus usually not present after 9 days of symptoms
Atypical presentations have been described, and older adults and persons with medical comorbidities may have delayed presentation of fever and respiratory symptoms.

In one study of 1,099 hospitalized patients, fever was present in only 44% at hospital admission but later developed in 89% during hospitalization. Headache, confusion, rhinorrhea, sore throat, hemoptysis, vomiting, and diarrhea have been reported but are less common (<10%).

Some patients have experienced gastrointestinal symptoms such as diarrhea and nausea prior to developing fever and lower respiratory tract signs and symptoms.

Loss of taste and smell before the onset of respiratory symptoms increasingly reported.

COVID-19 in children is typically similar to adults and are usually milder.

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**Presentation**

The signs and symptoms of COVID-19 present at illness onset vary, but over the course of the disease, most persons with COVID-19 will experience the following:

- Fever (83–99%)
- Cough (59–82%)
- Fatigue (44–70%)
- Anorexia (40–84%)
- Shortness of breath (31–40%)
- Sputum production (28–33%)
- Myalgia (11–35%)
For a typical patient, there is an exposure, followed by a median incubation period of 5 days before symptoms start.

After typical symptoms begin, these may worsen over several days.

Patients with mild disease usually improve within 5-14 days.

If moderate or severe disease develops, symptoms worsen after a median of 5 days, and hospitalization at median of 7 days.
Those with mild illness recover in ~2 weeks and those who recover from severe disease do so in 3-6 weeks.
How does COVID-19 spread through a population?
Index Case Exposure

- **Day 0**: 
  - Median incubation period for subsequent 1-3 cases: **+5 days**

Number of days from symptom onset to hospitalization: **+7 days**

- **Total Number of Days from Index Case Exposure to leaving the hospital**: **19 days**

  - Median hospital stay for severe COVID-19 disease: **+7 days**

  - Number of days from symptom onset to hospitalization: **+7 days**
Presymptomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility

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Study Overview

• The authors assessed transmission of SARS-CoV-2 and evaluated the adequacy of symptom-based screening in a skilled nursing facility.
• More than half of residents with positive test results were asymptomatic at the time of testing.
• Infection-control strategies focused solely on symptomatic residents were not sufficient to prevent transmission.
Cycle Threshold Values and Results of Viral Culture for Residents with Positive SARS-CoV-2 Tests According to Their Symptom Status.

Cycle Threshold Values Relative to First Evidence of Fever, Cough, or Shortness of Breath.

Conclusions

• Rapid and widespread transmission of SARS-CoV-2 was demonstrated in this skilled nursing facility.

• More than half of residents with positive test results were asymptomatic at the time of testing and most likely contributed to transmission.

• Infection-control strategies focused solely on symptomatic residents were not sufficient to prevent transmission after SARS-CoV-2 introduction into this facility.
OUTPATIENT MANAGEMENT OVERVIEW

The majority of patients with mild disease will not progress to moderate or severe disease and will not need hospitalization.

Outpatients who should be referred to ED:

- Severe dyspnea
- Hypoxia
- Mental status changes

Outpatient care is supportive, with no usual change to home medications (including ACE/ARB), but nebulizers should be avoided around others.

Self-isolation and recommendation for communication with public health and employee health if patient is a healthcare worker.
COVID PATIENT CLINICAL MANAGEMENT

• If hypoxic and not on hospice, consider admission to hospital where therapies (with reasonable evidence) can be accessed
  
  • Remdesivir
  • Convalescent plasma
  • Interferon/Ribavirin (if <7 days symptoms)
CONSIDER LOVENOX ANTICOAGULATION FOR ANY SNF PATIENT WHO IS COVID POS IF NO CONTRAINDICATIONS

THROMBOSSES COMMON-DVT, PE, CVA’S

DEXAMETHASONE 6mg/day FOR ANY COVID+ WITH HYPOXIA

REDUCES INFLAMMATION
MORTALITY BENEFIT
CAN BE DONE AT FACILITIES
COVID in Congregate Living Settings

David Fisk, MD
August 20, 2020
WHAT WE KNOW….

- FACT-COVID TRANSMISSION IS AIRBORNE (SOME IF NOT MOST)
- FACT-OF US DEATHS FROM COVID, 40%-66% FROM SNF’S
- LIKELY FACT-MOST COVID INTRODUCED INTO SNF’S BY STAFF
- THEREFORE-COMPREHENSIVE PLANNING NEEDED IN FACILITIES
  - STAFF EDUCATION
  - COVID TESTING
  - PPE OPTIMIZATION
  - COHORTING/ISOLATION
  - ROOM SANITIZATION
  - PATIENT MANAGEMENT
  - ETC., ETC., ETC…….
HELPFUL CDC TOOL....

Infection Prevention and Control Assessment Tool for Nursing Homes Preparing for COVID-19
<table>
<thead>
<tr>
<th>Elements to be assessed</th>
<th>Assessment (Y/N)</th>
<th>Notes/Areas for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>How are staff taught to remove PPE?</td>
<td></td>
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<tr>
<td>PPE are removed in a manner to prevent self-contamination and hand hygiene is performed immediately after removal.</td>
<td>○ Yes ○ No</td>
<td></td>
</tr>
<tr>
<td>What product do you use for alcohol-based hand sanitizer – do you know the alcohol percentage? Are you experiencing any shortages in alcohol-based hand sanitizer? If so, how are you addressing?</td>
<td></td>
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</tr>
<tr>
<td>Hand hygiene supplies are available in all resident care areas.</td>
<td>○ Yes ○ No</td>
<td></td>
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<tr>
<td>- Alcohol-based hand sanitizer* with 60-95% alcohol is available in every resident room and other resident care and common areas.</td>
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<tr>
<td>*If there are shortages of alcohol-based hand sanitizer, hand hygiene using soap and water is still expected.</td>
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<tr>
<td>Do you ever audit or record performance of things like hand hygiene? Selection and use of personal protective equipment? What do you do if you see someone not washing their hands appropriately?</td>
<td></td>
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<tr>
<td>Hand hygiene and PPE compliance are audited.</td>
<td>○ Yes ○ No</td>
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<tr>
<td>How often are shared equipment like blood pressure cuffs/machines cleaned? These need to be cleaned after every patient use. Who is responsible for that? Are you able to dedicate equipment to residents that may be symptomatic or a case like thermometers, BP cuffs, and stethoscopes?</td>
<td>○ Yes ○ No</td>
<td></td>
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<tr>
<td>Non-dedicated, non-disposable resident care equipment is cleaned and disinfected after each use.</td>
<td>○ Yes ○ No</td>
<td></td>
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<tr>
<td>What disinfectant is used at your facility? Is this ready-to-use (premixed) or does it need to be diluted by your staff? Have you checked to see if that product is effective for coronavirus (EPA List N)? EPA-registered, hospital-grade disinfectants with an emerging viral pathogens claim* against SARS-CoV-2 are available to allow for frequent cleaning of high-touch surfaces and shared resident</td>
<td>○ Yes ○ No</td>
<td></td>
</tr>
</tbody>
</table>
State of COVID testing in SB

- PCR’s still gold standard
- Supply chain disruptions limiting PDL’s ability to do in house testing—→more sendouts
  - Sendout lab TAT about 3 days lately
  - PDL working to expand capacity in house
- Similar limitations at LVMC and Marian on PCR supply
- State OptumServe sites funded at least through end of September—mobile testing vans anticipated
COVID antiGEN testing
COVID antiGEN testing

- 15 minute results from nasal swab
- CLIA waived so can be point of care test
- Highly accurate if positive AND predicts communicability of infxn
- Negatives termed “presumptive negative”
- Detects virus about 75% of the time a PCR would detect it
- Have some utility for SNF’s esp given PCR shortages
- $$ not $$$$
PPE

- **N95’s**
  - Use at all times when in cohort areas
  - Use always when collecting NP samples
  - Can use for multiple patients if wear face shield over the N95
  - Recommend use at all times if facility-wide outbreak
  - ONLY can rely on the N95 to which you have fit tested
  - Can sanitize/repurpose N95’s via state program
  - Cannot wear another mask under the N95, it will disrupt seal
COVID cohorting and isolation precautions

- State has mandatory 14 day quarantine for new admissions - now CDPH says time spent in hospital prior to SNF admission can count towards those 14 days (assuming no outbreak in the hospital)
- It’s OK to place more than one COVID+ pt/room
- Avoid placing COVID suspects together in same room
- Cohorting of COVID+ in one area w/dedicated staff strongly advised
Discontinuing Home Isolation for Persons with COVID-19:

Accumulating evidence supports ending isolation and precautions for persons with COVID-19 using a symptom-based strategy. Specifically, researchers have reported that people with mild to moderate COVID-19 remain infectious no longer than 10 days after their symptoms began, and those with more severe illness or those who are severely immunocompromised remain infectious no longer than 20 days after their symptoms began. Therefore, CDC has updated the recommendations for discontinuing home isolation as follows:

**Persons with COVID-19 who have symptoms** and were directed to care for themselves at home may discontinue isolation under the following conditions:

- At least 10 days* have passed since symptom onset and
- At least 24 hours have passed since resolution of fever without the use of fever-reducing medications and
- Other symptoms have improved.

*A limited number of persons with severe illness may produce replication-competent virus beyond 10 days, that may warrant extending duration of isolation for up to 20 days after symptom onset. Consider consultation with infection control experts. See **Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings** (Interim Guidance).

**Persons infected with SARS-CoV-2 who never develop COVID-19 symptoms** may discontinue isolation and other precautions 10 days after the date of their first positive RT-PCR test for SARS-CoV-2 RNA.
Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance)

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

Note: For patients who are not severely immunocompromised and who were asymptomatic throughout their infection, Transmission-Based Precautions may be discontinued when 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:\n
- At least 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

Note: For severely immunocompromised\ patients who were asymptomatic throughout their infection, Transmission-Based Precautions may be discontinued when at least 20 days have passed since the date of their first positive viral diagnostic test.