COVID-19: Implications for Pharmacists

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March 20, 2020
Learning Objectives

- Identify the unique clinical and epidemiological characteristics of Coronavirus (COVID-19) in the spectrum of viral clinical illnesses and previous Coronavirus (SARS, MERS) and non-Coronavirus (influenza, common cold) related illnesses
- Describe the epidemiological impact of interventions to reduce spread of disease in the setting of limited healthcare resources
- Summarize common clinical presentations of COVID-19 compared to other cold and influenza related illnesses and describe who should receiving referral for testing
- Analyze emerging literature regarding potential treatment modalities for COVID-19
- Devise potential roles for pharmacists and technicians in a variety of healthcare settings for the management of a COVID-19 pandemic
- List the steps the Colorado Pharmacists Society (CPS) is taking to address COVID-19.
- Describe how CPS is collaborating with other professional pharmacy organizations and state and federal agencies.
Before Our Talk…

- Information regarding COVID-19 is rapidly evolving
- Quality of data in a pandemic is limited (especially early)
  - Case Series
  - Case Reports
  - Important to separate preliminary information from fact
  - Experimental conditions vs real world data
  - Efficacy of antivirals vs clinical efficacy
- Pharmacist’s role:
  - Trusted
  - Source of truth
  - Separate science from theory and opinion
Introduction and Nomenclature

Coronavirus as a Family of Viruses
- Positive sense RNA viruses
- Largest genome of RNA viruses
- Beta-Coronaviruses most common to infect humans
  - HCoV variants – the common cold (infecting humans for 800 plus years)
  - Mutant variants – SARS-CoV, MERS, SARS-CoV-2/COVID19

COVID-2019
- Also known as “coronavirus” or SARS-CoV-2
- Origination in China (patient zero likely November or December 2019)
- 76% identical genome to SARS
- 96% identical genome to Cave Bat CoV
Chloroquine
Hydroxychloroquine

Entry Proteins
ACE2 (SARS and COVID)
DPP4 (MERS)

Remdesivir
+/- favipiravir

Lopinavir/ritonavir

Protease inhibitors block polyprotein processing

Vaccine or neutralizing Ab

Uncoating

Receptor blockade

Assembly of polymerase complex

Transcription Replication

mRNAs

Translation

Protein

Nucleus

Exocytosis

Budding

Chloroquine

? Nitazoxanide

COVID-19 Myth 1: ACE/ARB Treated Patients Do Worse Because of Viral Entry ACE Protein

Answer: Could Happen But No Data

ACC/HFSA/ESC say do not discontinue to prevent COVID-19

Few differences in hypertensive patients with mild vs severe disease
Why Is COVID-19 So Clinically Relevant?

COVID-19 Has a Basic Reproduction (Ro) number of 2-3
COVID-19 Myth 2: COVID-19 Can Live on Surfaces for Days

Answer 1: Partially False
Determined by Inoculum Size and Half Life on Object

Steel: 5.6 hours
Plastic: 6.8 hours

Very low inoculum at 72 hours but still there (same as SARS)

Answer 2:
Droplets are primary mode of transmission (Aerosol Half Life – 1 hour)

Asymptomatic patients with a high viral load can transmit (2 days before symptoms)

Image source amazon
Why Is COVID-19 So Clinically Relevant?

Source: CDC
Source: Baud et al Lancet Infectious disease 2020
# Update on Newly Discovered Coronavirus

<table>
<thead>
<tr>
<th></th>
<th>SARS CoV</th>
<th>MERS CoV</th>
<th>SARS-CoV 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Virion Structure</strong></td>
<td>Enveloped RNA virus</td>
<td>Enveloped RNA virus</td>
<td>Enveloped RNA virus</td>
</tr>
<tr>
<td><strong>Outbreak period</strong></td>
<td>2003-2004</td>
<td>2012-present</td>
<td>Dec 2019-present</td>
</tr>
<tr>
<td><strong>Initial site of isolation</strong></td>
<td>Guangdong province, China</td>
<td>Saudi Arabia</td>
<td>Wuhan, China</td>
</tr>
<tr>
<td><strong>No. of countries/cases</strong></td>
<td>29</td>
<td>27</td>
<td>&gt;70</td>
</tr>
<tr>
<td><strong>No. of cases (mortality)</strong></td>
<td>8,096 (9.6%)</td>
<td>2,494 (~34%)</td>
<td>~109,936 (N=3,806) (3.4%)*</td>
</tr>
<tr>
<td><strong>No. of cases U.S.</strong></td>
<td>8</td>
<td>2 (2014)</td>
<td>538 (WA, IL, CA, AZ, Mass, Wis)</td>
</tr>
<tr>
<td><strong>Reservoir (intermediate host)</strong></td>
<td>Bats (palm civet)</td>
<td>Bats (dromedary camels)</td>
<td>Bats (likely a zoonosis)</td>
</tr>
<tr>
<td><strong>Incubation period</strong></td>
<td>2-7 days (range, 2-21)</td>
<td>2-7 (range, 2-14 days)</td>
<td>2-14 days (mean 5-6)</td>
</tr>
<tr>
<td><strong>Infectivity, rho</strong></td>
<td>1.8-2.5</td>
<td>0.3-1.3</td>
<td>~3 (2.4-3.8)*</td>
</tr>
<tr>
<td><strong>Super spreaders</strong></td>
<td>Yes</td>
<td>Yes (common)</td>
<td>Yes (many examples)</td>
</tr>
<tr>
<td><strong>Asymptomatic/mild spread</strong></td>
<td>No</td>
<td>Rare</td>
<td>Yes/Yes</td>
</tr>
<tr>
<td><strong>Attack Rate</strong></td>
<td>10.3% to 60%</td>
<td>4 to 20%</td>
<td>20-30%, 80% (early study)?</td>
</tr>
<tr>
<td><strong>Transmission (including to HCP)</strong></td>
<td>Droplet/Direct, Airborne/Indirect?</td>
<td>Droplet/Direct, Airborne/Indirect?</td>
<td>Droplet/Direct, Airborne/Indirect/Fecal</td>
</tr>
<tr>
<td><strong>Treatment (PEP)</strong></td>
<td>Supportive (none)</td>
<td>Supportive (none)</td>
<td>Supportive (drug)</td>
</tr>
<tr>
<td><strong>Infection Prevention</strong></td>
<td>Airborne, contact, face shield</td>
<td>Airborne, contact, face shield</td>
<td>Airborne, contact, face shield</td>
</tr>
</tbody>
</table>

*About 83% of cases are mild or asymptomatic, Mortality Rates are age Stratified:

Source: https://special.croi.capitalreach.com/
## Differentiating Symptoms

<table>
<thead>
<tr>
<th>Symptom/Lab</th>
<th>COVID-19</th>
<th>Influenza</th>
<th>Common Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>&gt;80-90% – careful sometimes delayed!</td>
<td>&gt;80-90%</td>
<td>Very Rare</td>
</tr>
<tr>
<td>Cough</td>
<td>70% of which majority is dry cough (30% sputum producing)</td>
<td>Often dry</td>
<td>Common – dry or wet</td>
</tr>
<tr>
<td>Myalgia/Fatigue</td>
<td>11-50%</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Immune effects</td>
<td>Leukopenia (30-60%) – T cell Depression</td>
<td>Rare</td>
<td>Never</td>
</tr>
<tr>
<td>Platelet effects</td>
<td>Thrombocytopenia (40-60%)</td>
<td>Rare</td>
<td>Never</td>
</tr>
<tr>
<td>Sneezing</td>
<td>No</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Congestion</td>
<td>No</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Sore Throat</td>
<td>13%</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Hospitalization Rate</td>
<td>4-16% (ICU)</td>
<td>0.03%</td>
<td>Rare</td>
</tr>
<tr>
<td>Cause of Death</td>
<td>Acute Respiratory Distress Syndrome (ARDS)</td>
<td>ARDS</td>
<td>Rare</td>
</tr>
</tbody>
</table>
Testing for COVID-19

➤ What tests are available?
   ▪ Standard of care: Real time rRT-PCR (Nasopharyngeal, oropharyngeal, bronchioalveolar lavage, aspirates, sputum)
   ▪ Alternative testing (in development): IgM ELISA, Point of care testing

➤ Who to test?
   ▪ At risk individuals with symptoms compatible with COVID-19
   ▪ Hospitalized patients with symptoms compatible with COVID-19
   ▪ Any persons (esp healthcare workers) within 14 days of close contact (from sx onset) of a confirmed COVID-19 patient

➤ Colorado: Mitigation strategies may go into effect
Chart 9: Total Cases of Coronavirus Outside of China
(Countries with >50 cases as of 3/7/2020)

Source: Tomas Pueyo analysis from primary data from Github:
Chart 7: Timeline of Events in Hubei

- True new cases immediately plummet
- Lockdown
- Official cases start exploding

4 Unusual cases of pneumonia (3 in the same family) noticed by Jixian Zhang, MD, in HICWM Hospital

Dr Zhang reported unusual pneumonia cases to the local CDC

3 More cases of pneumonia found in HICWM Hospital (for a total of 7)

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Huanan Seafood Market closed

2019-nCoV identified

Wuhan Health Commission alerts National Health Commission and China CDC, and WHO is notified

2019-nCoV sequences first shared

COVID-19 a Class B notifiable disease

Wuhan City shut down

Active case finding begins in Wuhan City

2019-nCoV test kits first available

Another 15 cities shut down

WHO declares "public health emergency of international concern"

Lunar New Year national holiday

Nationwide mandatory extended holiday

Source: JAMA
Chart 20: Excess Death in Denver during the 1918 Flu Pandemic

Total excess death rate: 631/100,000 population
Public health response time: +9 d
Total No. of days of nonpharmaceutical interventions: 151

Weekly Excess Death Rate, No. of Deaths per 100,000 Population

Compliance and spread

COVID-19 SEIR Model with Social Distancing ($\alpha = 0.2$, $\beta = 1.75$, $\gamma = 0.5$)

No Distancing

50% Distancing

USA Has:
- 95,000 ICU beds (68,000 adult)
- 62,000 ventilators (60% of which for adults) – may be able to get to 200,000 with old ventilators and emergency supplies (130,000 to staff)
- If unchecked: 900,000 will require ventilation


https://towardsdatascience.com/social-distancing-to-slow-the-coronavirus-768292f04296
Chart 22: Model of Daily New Cases of Coronavirus with Social Distancing Measures Taken One Day Apart

Source: Tomas Pueyo
Therapeutics for COVID-19

No antiviral therapy has proven effects against COVID-19, and none of the following agents have any approved indications for COVID-19.
Chloroquine
Hydroxychloroquine
Lopinavir/ritonavir
Remdesivir +/- favipiravir

Receptor blockade
Fusion inhibitors
Uncoating
Protease inhibitors block polyprotein processing
Assembly of polymerase complex
Translation
Transcription Replication
Virus release
Exocytosis
Nucleus
Budding


? Nitazoxanide
In Vitro Activity

- **SARS-CoV-2 EC\textsubscript{50} lowest for:**
  - Remdesivir (Gilead) – investigational, broadly active against RNA viruses
  - Chloroquine – FDA approved anti-malarial agent
    - CID. 2020: Hydroxychloroquine EC\textsubscript{50} = 0.72 μM vs. chloroquine EC\textsubscript{50} = 5.5 μM
  - Nitazoxanide – FDA approved anti-parasitic with reported anti-viral effects

- **Lopinavir/ritonavir**
  - SARS-CoV-1: EC\textsubscript{50} = 17 μM
    - EC\textsubscript{50} down to 1 μg/mL if ribavirin added
    - HIV EC\textsubscript{50} = 0.017-0.102 μM

*Clin Infect Dis*. 2020; Epub (PMID: 32150618)  
Clinical Evidence – Chloroquine/hydroxychloroquine

- In vitro data only published
  - Hydroxychloroquine 400mg PO BID x 1 day, then 200mg PO BID x 4 days
  - Chloroquine 500mg PO BID x 5 days

- No published clinical experience to date

- Reports from China (not actual data presented/published)
  - Reduces pneumonia exacerbation
  - Reduces duration of symptoms
  - Improves viral clearance
  - Well-tolerated

- Monitoring – QTc prolongation, GI side effects, retinopathy

Clin Infect Dis. 2020; Epub (PMID: 32150618)
Clinical Evidence – Hydroxychloroquine

Prospective, non-randomized, open-label study

- Hospitalized with confirmed COVID-19
- All patients offered hydroxychloroquine (HCQ) 200mg PO TID
  - Those refusing treatment or who met exclusion (allergic to HCQ, retinopathy, QT prolongation, G6PD deficiency) served as untreated controls
  - Antibiotics could be given for treatment/prevention of bacterial infection
- Primary endpoint = virologic clearance at day 6

Clinical Evidence – Hydroxychloroquine

- Results excluded 6 HCQ treated patients
  - 3 ICU transfers
  - 1 died
  - 1 left hospital
  - 1 stopped HCQ for GI upset
- Limited data for clinical outcomes
- Unclear role of azithromycin

Clinical Evidence – Hydroxychloroquine

Post-exposure prophylaxis study - HCWs:

**Screening Online Questionnaire**
- Email covid19@umn.edu if you think you have been exposed to COVID19
- You will be sent an email with information about our prevention study
- A URL link will be provided for you to take the online screening survey

**Medication Shipped**
- Study medicine will be shipped overnight to your address
- Study medicine should arrive by 10:30am
- Take 4 tablets of the study medicine with some food or milk

**Online Survey (Day 1)**
- You will receive an email with a link to an online survey
- Take the second dose of 3 tablets 6-8 hours after the first
- Take other medicines ≥ 4 hours apart from the study medicine

**Study Days 2-4**
- You should take 3 tablets each morning
- If you develop upset stomach, you may separate the pills, for example 2 at breakfast, 1 at lunch.
- Take other medicines ≥ 4 hours apart from the study medicine

**Online Survey (Day 5)**
- You will receive an email with a link to an online survey
- This should be the same day you finish the study medicine

**End of Study Survey (Day 14)**
- You will receive an email with a link to an online survey
- Unless you have developed symptoms, this marks the end of the study. There are no further requirements for you.
- If you have developed symptoms, we will reach out to you with further instructions.
Clinical Evidence – Lopinavir/ritonavir

SARS-CoV-1

- Chu et al. 2004: ARDS or death lower with lopinavir/ritonavir vs. ribavirin alone (2.4% vs. 29%)
  - Retrospective, imbalance in baseline characteristics between groups, lopinavir/ritonavir patients received concomitant ribavirin
  - Rapid viral load decline in lopinavir/ritonavir recipients from nasopharyngeal specimens
- Chan et al. 2003: lopinavir/ritonavir plus ribavirin decreased mortality compared to ribavirin alone (2.3% vs. 11%, p < 0.05)
  - Matched, retrospective study. All patients received concomitant corticosteroids as well
  - Rescue therapy with lopinavir/ritonavir not different from matched controls
- Park et al. 2019: lopinavir/ritonavir plus ribavirin effective as post-exposure prophylaxis against MERS-CoV

Hong Kong Med J. 2003; 9(6): 399-406
Clinical Evidence

Open label RCT, published 3/19/2020

- Inclusion: adults with confirmed COVID-19 with radiographic pneumonia and hypoxia (SaO2 < 94% on RA or PaO2:FiO2 < 300)
- Exclusion: severe liver dysfunction, HIV, pregnancy, significant interactions
- Outcomes:
  - Primary: time to clinical improvement
  - Secondary: clinical status, 28-day mortality, duration of mechanical ventilation, hospital and virologic measures

Clinical Evidence

- Baseline demographics

A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe Covid-19

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (N=199)</th>
<th>Lopinavir–Ritonavir (N=99)</th>
<th>Standard Care (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median (IQR) — yr</td>
<td>58.0 (49.0–68.0)</td>
<td>58.0 (50.0–68.0)</td>
<td>58.0 (48.0–68.0)</td>
</tr>
<tr>
<td>Male sex — no. (%)</td>
<td>120 (60.3)</td>
<td>61 (61.6)</td>
<td>59 (59.0)</td>
</tr>
<tr>
<td>Comorbid conditions — no. (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>23 (11.6)</td>
<td>10 (10.1)</td>
<td>13 (13.0)</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>13 (6.5)</td>
<td>5 (5.1)</td>
<td>8 (8.0)</td>
</tr>
<tr>
<td>Cancer</td>
<td>6 (3.0)</td>
<td>5 (5.1)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Body temperature, median (IQR) — °C</td>
<td>36.5 (35.4–36.8)</td>
<td>36.5 (35.4–37.0)</td>
<td>36.5 (35.5–36.8)</td>
</tr>
<tr>
<td>Fever — no. (%)</td>
<td>182 (91.5)</td>
<td>89 (89.9)</td>
<td>93 (93.0)</td>
</tr>
<tr>
<td>Respiratory rate &gt;24/min — no. (%)</td>
<td>37 (18.8)</td>
<td>21 (21.8)</td>
<td>16 (16.0)</td>
</tr>
</tbody>
</table>

Clinical Evidence

Outcomes:
- Lower rate of serious AEs

Clinical Evidence - Remdesivir

- Appears effective against Ebola
- Clinical studies lacking for SARS-CoV-2
- Ongoing clinical trials
  - U.S. = 3 studies (1 NIAID and 2 Gilead sponsored)
  - China = 2 studies
- Dosing – 200mg IV load, then 100mg IV daily x 5-10 days
- Safety: mostly GI and liver-related effects to date reported
  - IV contains cyclodextrin (SBECDD)

Remdesivir

- Compassionate use available (https://rdvcu.gilead.com/)

The following patient criteria must currently be met in order to submit a compassionate use request for remdesivir:

**Key Inclusion criteria:**
- Hospitalization
- Confirmed SARS-CoV-2 by PCR
- Invasive (i.e. intubated or tracheostomy) Mechanical Ventilation

**Key Exclusion criteria:**
- Evidence of Multi-organ failure
- Pressor requirement to maintain blood pressure
- ALT levels > 5 X ULN
- Cr Clearance <30 mL/min or dialysis or Continuous Veno-Venous Hemofiltration
Hyperinflammation

✦ Subset of COVID-19 progress to hyperinflammatory state
  - High, persistent fever
  - Cytopenias
  - Hyperferritinemia
  - Increased IL-6, CRP, and d-dimer

✦ Screening – Hscore for probability of secondary HLH

✦ Immunosuppression - tocilizumab

Mehta P, et al. Lancet. 2020; epub - DOI: https://doi.org/10.1016/S0140-6736(20)30628-0
Huang C et al. Lancet. 2020; 395: 497-506
Clinical Evidence – Tocilizumab

- Observational study from China, n=21
- Standard of care + Tocilizumab 400mg IV single dose
  - n=3 had repeat dose within 12 hours
- Severe (81%) and critical disease (19%) at time of treatment
  - Severe = RR ≥ 30, SpO2 < 94% on RA, or PaO2:FiO2 ≤ 300
  - Critical = mechanically ventilated, shock, other organ failure
- All 21 survived, 91% discharged
  - Only 10% were mechanically ventilated

http://www.chinaxiv.org/user/download.htm?id=30387&filetype=pdf
Clinical Evidence - Others

- Nitazoxanide – in vitro only to date
- Interferon – in vitro and limited clinical experience from SARS-CoV-1 and MERS-CoV (combined with other agents)
- Statins – anti-inflammatory mechanism – theoretical presently and no published evidence of direct benefit for COVID-19
- IVIG – not expected to be effective, pooled sources unlikely to have any sufficient anti-SARS-CoV-2 neutralizing antibodies
- Corticosteroids – unclear role, likely beneficial during later stages of infection where inflammatory response increased

Antimicrob Agents Chemother. 2020; epub. PMID: 32152082
### Tocilizumab and Sarilumab

<table>
<thead>
<tr>
<th>Row</th>
<th>Saved</th>
<th>Status</th>
<th>Study Title</th>
<th>Conditions</th>
<th>Interventions</th>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Recruiting</td>
<td>Evaluation of the Efficacy and Safety of Sarilumab in Hospitalized Patients With COVID-19</td>
<td>COVID-19</td>
<td>Drug: Sarilumab, Drug: Placebo</td>
<td>Regeneron Study Site (New York, New York, United States)</td>
</tr>
</tbody>
</table>

| 1   |       | Recruiting | Tocilizumab vs CRRT in Management of Cytokine Release Syndrome (CRS) in COVID-19 | Covid-19, SARS, Cytokine Storm (and 2 more...) | Drug: Tocilizumab, Other: Standard of care, Procedure: Continuous renal replacement therapy | Tongji Hospital (Wuhan, Hubei, China) |

| 2   |       | Recruiting | Favipiravir Combined With Tocilizumab in the Treatment of Corona Virus Disease 2019 | COVID-19 | Drug: Favipiravir Combined With Tocilizumab | Anhui Medical University Affiliated First Hospital (Hefei, Anhui, China) |
|     |       |           |                                                  |           | Drug: Favipiravir, Drug: Tocilizumab | Guiyang Wang (Beijing, Beijing, China) |
|     |       |           |                                                  |           |                                      | Peking University First Hospital (Beijing, Beijing, China) |
|     |       |           |                                                  |           |                                      | (and 5 more...) |

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**Genentech Launches Phase III Trial of Actemra as Coronavirus Treatment**

March 19, 2020  
0
Clinical Evidence - Others

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- Interferon – in vitro and limited clinical experience from SARS-CoV-1 and MERS-CoV (combined with other agents)
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Antimicrob Agents Chemother, 2020; epub. PMID: 32152082
NIH clinical trial of investigational vaccine for COVID-19 begins

Study enrolling Seattle-based healthy adult volunteers.

Trials to begin on Covid-19 vaccine in UK next month

Researchers hope to conduct animal tests next week and safety trials as early as next month

- Coronavirus - latest updates
- See all our coronavirus coverage
Proposed Management Algorithm

- No approved or proven treatment of COVID-19 to date
- Limited evidence may support trial of off-label agents with possible anti-viral activity (rapidly evolving, keep up to date)
- Challenges – diagnostic delays, shortages, and low quality evidence to date
Pharmacist Involvement

- Strategies to limit healthcare exposure of patients not suffering from COVID-19
- Inventory control and resource conservation
- Treatment pathway development and resource for critical evaluation of related evidence for novel therapies to manage COVID-19
- Navigation of clinical trials/compassionate use of investigational therapies
- Problem solving around supportive care measures
EIND Process


- Step 1: contact company with investigational product to obtain approval for compassionate use
- Step 2: contact FDA for approval to use investigational product
- Step 3: if FDA approves, reach back out to company and coordinate with pharmacy and local IRB
Social Media and Misinformation

Covid-19: ibuprofen should not be used for managing symptoms, say doctors and scientists

EMA gives advice on the use of non-steroidal anti-inflammatories for COVID-19

Press release 18/03/2020

EMA is aware of reports, especially on social media, which raise questions about whether non-steroidal anti-inflammatory medicines (NSAIDs) such as ibuprofen could worsen coronavirus disease (COVID-19).

There is currently no scientific evidence establishing a link between ibuprofen and worsening of COVID-19. EMA is monitoring the situation closely and will review any new information that becomes available on this issue in the context of the pandemic.
What is CPS doing?

- Letter to the governor asking for emergency measures (sent March 13th)
  - Remote pharmacy practice – remove requirements for prior board approval
  - Allow 90 day supplies of chronic medications
  - Extend technician certification deadlines
  - Allow the CMO of CDPHE to allow pharmacists to provide designated services for:
    - Testing
    - Screening
    - Prescribing (standing order or CPA)
What is CPS doing?

- Community forum for COVID-19
  - Childcare options for healthcare workers
  - Clinical trial information (post-COVID exposure prophylaxis)
- Dedicated web page
- Social media posts (follow us!)
National professional organizations

NACDS policy requests (partial list)
- In anticipation of a COVID-19 vaccine, making sure pharmacists may access and immunize without barriers
- Allowing pharmacists and techs to work across state lines
- Broader prescriptive authority for mild ailments
- Allowing remote verification of prescriptions

NASPA
- Regular communication regarding activities in other states
Questions and Answers