COVID-19: A Growing Pandemic

Presented by:
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For resources and information, please visit gi.org/COVID19

Panelists

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Special Thanks to:
Professor Zhen Ding MD, PhD
Full Professor in GI, Wuhan Union Hospital

The ACG Board of Trustees was able to have a conference call on Monday March 16, 2020 with Professor Ding from Wuhan, China to learn more about the COVID-19 virus.
What is COVID-19?

- Disease caused by infection with a type of coronavirus called SARS-CoV-2
  - 7th coronavirus known to cause disease in humans
  - RNA virus
- Most common symptoms are fever, cough, and shortness of breath
  - 80% of cases are mild to moderate in severity
- Spread by respiratory droplets and contact with infected surfaces
  - On average, an infected person will spread the infection to 2-3 other people
- May have fecal-oral spread (RNA is found in stool)
The virus enters the body through the nose, mouth or eyes, then attaches to cells in the airway that produce a protein called ACE2.

ACE2 receptors are in the alveolar cells of the lungs and line the GI tract.

The coronavirus is named after the crownlike spikes that protrude from its surface. The virus is enveloped in a bubble of oily lipid molecules which soap molecules can pry apart and destroy.

Symptoms

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Total</th>
<th>ICU</th>
<th>Non-ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>98-100%</td>
<td>98-100%</td>
<td>98-100%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>~10%</td>
<td>10%</td>
<td>~10%</td>
</tr>
<tr>
<td>Nausea</td>
<td>~10%</td>
<td>10%</td>
<td>~10%</td>
</tr>
</tbody>
</table>

Fever and fatigue are most common, several patients only have diarrhea and nausea without fever.

JAMA. 2020 Feb
Many patients present initially with diarrhea, anorexia, and vomiting, not necessarily with respiratory symptoms.

Of the 48.5% with digestive symptoms as their chief complaint:

- 83.8% reported anorexia
- 29.3% reported diarrhea

**Xiao F, Gastro, Feb 27; Gu J, Gastro Feb 26**

Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: a descriptive, cross-sectional, multicenter study

[https://journals.lww.com/ajg/Documents/COVID_Digestive_Symptoms_AIG_Preproof.pdf](https://journals.lww.com/ajg/Documents/COVID_Digestive_Symptoms_AIG_Preproof.pdf)
With no restrictions – that is, public life going on largely as usual – the outbreak could sweep across most of the country by early May.

With some control measures, but social distancing unevenly enforced, much of the country, including California, Florida and the Northeast, would face severe outbreaks that peak in the summer.

With strict nationwide curbs on social contact, the outbreak could be limited in areas that do not now have large numbers of known cases.

Note: model does not produce estimates for Alaska and Hawaii.

Source: Sen Pei and Jeffrey Shaman, Columbia University (https://stat.columbia.edu/2020/03/21/nytimes/03/21/nycoronavirus-percent-infected-by-july-1/scan.pdf)
St. Louis: 2 Days from first case to Social Distancing = 1/5 the deaths per 100,000

Philadelphia: 16 Days from first case to Social Distancing = 5 times the deaths per 100,000

EFFECTS OF SOCIAL DISTANCING ON 1918 FLU DEATHS

As the first cases of the 1918 flu were reported in Philadelphia in September 1918, authorities played down the significance and allowed public gatherings to continue. Closures in Philadelphia were only enacted once the virus had spread. The first cases in St. Louis were reported in early October, with measures to contain the spread enacted two days later. This resulted in a slower spread and lower mortality rate.

Ideally, the peak outbreak should not exceed local health care system capacity.


COVID-19 outbreak in the world

Source: Professor Zhe Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China
New case of COVID-19 in China each day – there were 15,152 cases diagnosed on a single day. Currently the number of new cases per day is closer to 10.

Source: Professor Zhen Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

\( R_0 \) is a mathematical term that indicates how contagious an infectious disease is. It's also referred to as the reproduction number. As an infection spreads to new people, it reproduces itself.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Transmission route</th>
<th>( R_0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Airborne</td>
<td>12-18</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>saliva</td>
<td>6-7</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Airborne droplets</td>
<td>5-7</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>Fecal-oral</td>
<td>5-7</td>
</tr>
<tr>
<td>Rubella</td>
<td>Airborne droplets</td>
<td>5-7</td>
</tr>
<tr>
<td>Mumps</td>
<td>Airborne droplets</td>
<td>4-7</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Airborne droplets</td>
<td>5.5</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Sexual contact</td>
<td>2-5</td>
</tr>
<tr>
<td>SARS</td>
<td>Airborne droplets</td>
<td>2-5</td>
</tr>
<tr>
<td>Influenza (1918)</td>
<td>Airborne droplets</td>
<td>2-3</td>
</tr>
<tr>
<td>Ebola virus (2014)</td>
<td>body fluid</td>
<td>1.5-2.5</td>
</tr>
</tbody>
</table>

Source: Professor Zhen Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China
Here we provide an initial assessment of the transmission dynamics and epidemiologic characteristics of COVID-19. Although the majority of the earliest cases were linked to the Huanan Seafood Wholesale Market and the patients could have been infected through zoanic or environmental exposures, it is now clear that human-to-human transmission has been occurring and that the epidemic has been gradually growing in recent weeks. Our findings provide important parameters for further analyses, including evaluations of the impact of control measures and predictions of the future spread of infection.

We estimated an R₀ of approximately 2.2, meaning that on average each patient has been spreading infection to 2.2 other people. In general, an epidemic will increase as long as R₀ is

Doubling time: 7.4 d
R₀ = 2.2

Clinical Characteristics of Coronavirus Disease 2019 in China


Mortality/Severity

The Majority of Infections are Mild

Seriousness of symptoms: 80.9%

- Mild: Like the flu, stay at home (13.8%)
- Severe: Hospitalisation (4.7%)
- Critical: Intensive Care (0.2%)
Incubation Period

In general the incubation period is 1-14 days with an average of ~5 days.

Infectiousness: ~ 12 hours prior to symptom onset to 5-6 day after
• Symptomatic individuals 50% more infectious than asymptomatic

Two-thirds of infected individuals are symptomatic (many mild)

Long incubation period without any obvious symptom

Ferguson NM, et al. March 16; Imperial College COVID-19 Response Team
https://doi.org/10.25561/77482

Examples of Virologic Examination

Nucleic Acid Detection

Antibody Detection

Source: Professor Zhen Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China
Table 2 Detection sensitivity and specificity of the assay

<table>
<thead>
<tr>
<th></th>
<th>NCP(+)</th>
<th>Non-NCP(+)</th>
<th>Sensitivity(%)</th>
<th>Specificity(%)</th>
<th>+PV(%)</th>
<th>-PV(%)</th>
<th>Coincidence rate(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nucleic acid+</td>
<td>58(+)</td>
<td>29(-)</td>
<td>3(+)</td>
<td>21(-)</td>
<td>66.67%</td>
<td>87.50%</td>
<td>95.08%</td>
</tr>
<tr>
<td>Serum IgG/IgM+</td>
<td>72(+)</td>
<td>15(-)</td>
<td>4(+)</td>
<td>20(-)</td>
<td>83.76%</td>
<td>83.33%</td>
<td>94.74%</td>
</tr>
<tr>
<td>Nucleic acid+  or</td>
<td>76(+)</td>
<td>11(-)</td>
<td>4(+)</td>
<td>20(-)</td>
<td>87.36%</td>
<td>83.33%</td>
<td>95.00%</td>
</tr>
<tr>
<td>Serum IgG/IgM+ or</td>
<td>82(+)</td>
<td>8(-)</td>
<td>5(+)</td>
<td>20(-)</td>
<td>88.88%</td>
<td>83.33%</td>
<td>95.00%</td>
</tr>
</tbody>
</table>

Detection sensitivity and specificity of the assay

- Nucleic acid testing is only 66.67% sensitive to detecting the CORVID-19 virus.
- Serum IgG/IgM testing is 82.76% sensitive. A positive result can confirm the diagnosis, a negative result cannot exclude the diagnosis.

Submitted data Source: Professor Zhen Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

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**Routine Blood Test**

![Blood Test Graphs]

Traditional results of routine blood test: WBC count ↑ lymphocyte count ↓

※ Degree of their variation relates to the severity of disease

Source: Professor Zhen Ding Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

JAMA. 2020 Feb
One NYC hospital inpatients with positive PCR

- Monday  7
- Tuesday 15
- Wednesday 43
- Saturday 80 (22 ICU)
Cyclic nature of influenza and coronavirus in the Northern Hemisphere

Non-pharmaceutical Interventions (NPI)

- **Community mitigation strategies**
- Social distancing
  - "Is it essential?"
- Cover coughs and sneezes with tissue or arm
- Wash hands frequently
- Avoid touching face
- Don’t go to work if you are sick

- Source control – surgical mask promptly onto patient with respiratory symptoms
- PPE
Medical Countermeasures

- **Diagnostics**
  - Increased availability of testing
  - Developing real-time blood tests
  - Sensitivity and specificity

- **Therapeutics**
  - Antiviral
  - Hydroxychloroquine
  - Chloroquine +/- azithromycin
  - Antibiotics
  - Immunosuppressants?

- **Vaccines**
- **Predictive biomarkers**

Who is at risk?

- **Older adults**
  - Age 70-79 years: 8% case fatality in China
  - Age ≥ 80 years: 14.8% case fatality in China

- **Younger adults**
  - Age 20-44 years: highest rate of hospitalization second only to 65-74 years in the U.S.
  - 18-49 year are 54% of the cases in New York (Gov Cuomo 3/21)

- **People with underlying medical conditions or compromised immune systems**
  - Cardiovascular disease, diabetes, chronic lung disease, high blood pressure, malignancies, decompensated cirrhosis, HIV with low CD4 counts, and immunosuppression, (including liver and other solid organ transplant recipients).
  - Pregnancy may be a risk

Source: Professor Ding, Division of Gastroenterology, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

https://jg.org/2020/03/15/joint-gi-society-message-on-covid-19/
New CDC report on US COVID-19 cases affirms seriousness for the young

BY RICH HARIDY
MARCH 19, 2020

COVID Considerations for Patients with IBD

- If patient is well continue therapy

- Well controlled IBD on an immunosuppressant not a reason to isolate if asymptomatic

- If patient on steroids do what you can to taper or reduce dosing

- If patient flaring then work up as usual for cause and if COVID negative OK to start a biologic

- Would avoid tofacitinib for now

- covidibd.org to register cases
On March 15th, the four U.S. Based Gastroenterology Societies published a joint statement with recommendations for Community Gastroenterologists and Gastroenterology Care Providers. The full document and other resources can be found at gi.org/COVID19.

**Joint GI Society Recommendations for GI Endoscopy & Clinic Practices:**

1. Strongly consider rescheduling elective non-urgent endoscopic procedures
2. Pre-screen all patients
3. Make sure appropriate personal protective equipment (PPE) is available and worn by all members of the endoscopy team
4. Know how to put on and take off PPE appropriately
5. Check body temperature of the patient upon arrival at endoscopy unit or clinic.
6. Keep all patients at an appropriate distance from each other
7. Conservation of PPE is critical
8. COVID-19 positive patients, or those awaiting test results, isolation precautions should be taken with procedures performed in negative pressure rooms.
9. Consider phone follow-up
10. Strategically assign available personnel
11. Consider offering elective office visits remotely
12. Address our collective staff needs and institute policies
13. Patients on immunosuppressive drugs for IBD and autoimmune hepatitis should continue taking their medications

Joint GI Society Message on COVID-19 March 15, 2020
AASLD ACG AGA ASGE COVID-19 Clinical Insights for Our Community of Gastroenterologists and Gastroenterology Care Providers
https://gi.org/2020/03/15/joint-gi-society-message-on-covid-19/
Recommendation #1 - Strongly consider rescheduling elective non-urgent endoscopic procedures

U.S. Surgeon General
Hospital & healthcare systems, PLEASE CONSIDER STOPPING ELECTIVE PROCEDURES until we can #FlattenTheCurve!

Each elective surgery you do:
1) Brings possible COVID-19 to your facilities
2) Puts from PPE stores
3) Taxes personnel who may be needed for COVID-19 response twitter.com/AmColSurg

NYSGE recommends delaying elective procedures until the COVID-19 outbreak is considered over, using the following priority classification:

<table>
<thead>
<tr>
<th>Elective Procedures that May be Delayed</th>
<th>Urgent/Emergent Procedures that May Not be Delayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Screening and surveillance colonoscopy in asymptomatic patients</td>
<td>1. Upper and lower GI bleeding</td>
</tr>
<tr>
<td>2. Screening and surveillance for upper GI diseases in asymptomatic patients</td>
<td>2. Suspected GI bleeding</td>
</tr>
<tr>
<td>3. Evaluation of non-urgent symptoms or disease states where procedure results will not imminently (within 4-6 weeks) change clinical management (e.g., EGD for non-alarm symptoms, EUS for intermediate risk pancreatic cysts)</td>
<td>3. Dysphagia significantly impacting oral intake</td>
</tr>
<tr>
<td>4. Motility procedures - esophageal manometry, ambulatory pH testing, wireless motility capsule testing and anorectal manometry</td>
<td>4. Cholangitis or impeding cholangitis</td>
</tr>
<tr>
<td>5. Symptomatic pancreaticobiliary disease</td>
<td>5. Symptomatic pancreaticobiliary disease</td>
</tr>
<tr>
<td>6. Palliation of GI obstruction (UGI, LGI and pancreaticobiliary)</td>
<td>6. Palliation of GI obstruction (UGI, LGI and pancreaticobiliary)</td>
</tr>
<tr>
<td>7. Patients with a time-sensitive diagnosis (evaluation/surveillance/treatment of premalignant or malignant conditions, staging malignancy prior to chemotherapy or surgery)</td>
<td>7. Patients with a time-sensitive diagnosis (evaluation/surveillance/treatment of premalignant or malignant conditions, staging malignancy prior to chemotherapy or surgery)</td>
</tr>
<tr>
<td>8. Cases where endoscopic procedure will urgently change management</td>
<td>8. Cases where endoscopic procedure will urgently change management</td>
</tr>
<tr>
<td>9. Exceptional cases will require evaluation and approval by local leadership on a case by case basis</td>
<td>9. Exceptional cases will require evaluation and approval by local leadership on a case by case basis</td>
</tr>
</tbody>
</table>
PPE

- Endoscopy is an aerosol generating procedure, and respiratory protection necessary\textsuperscript{1}
- PPE (gown, gloves, face mask/shield or googles) for all procedures following WHO and CDC guidelines
- Proper sequence and protocol for donning and doffing PPE
- Algorithm for COVID 19 positive and suspected patients vs. low suspicion
- Given significant potential for asymptomatic persons to shed and transmit virus, continued questions about all patients currently having EGD or all GI procedures considered high risk

\textsuperscript{1} Soetikno, \textit{GIE} March 19, 2020

Important Considerations

- Limited supply of equipment/equipment shortages
- Limited supply of masks/N95 respirators
- Questions about alternative ways of using equipment
- Questions about reuse of masks
- Questions about securing additional PPE equipment from other sources

PPE Masks

- All health care worked should be fitted for N95 respirator
- Powered air purifying respirator (PAPR) is an alternative (no fit testing, can be used with facial hair, not widely available)
- Data inconsistent—some evidence protection may be achievable without N95 respirator through use of medical masks\textsuperscript{1}

\textsuperscript{1} Soetikno, \textit{GIE} March 19, 2020
Early infection in Wuhan China: 29% of patients were healthcare workers (40/138)
Viable virus particles detected up to 3 hours after aerosolization
Viable virus particles detected up to 3 days on surfaces

CDC Guidance on Putting on & Removing Personal Protective Equipment

What is Happening Now?

- Widespread testing becoming more available
- Hospitals converting units for COVID patients
- Elective procedures canceled
- Elective surgeries canceled
- A tsunami has arrived
What is Happening Now?

• Sharply limited GI specific care
• Consolidation of remaining endoscopy
• Medical personnel, including gastroenterologists, are being reassigned to care for patients in the hospitals and telehealth
• Those with recent ICU experience or critical care experience (young faculty, senior fellows) are being additionally trained for ICU care
• Redeploying hospitalists to ICU care and backfilling their positions with those trained in internal medicine
• Trainees are contributing voluntarily as trained internists on the floors

If it has not reached you yet:

• Encourage your hospital to scale up COVID-19 testing now
• Conserve PPE
• Encourage everyone to stay home
• Wash their hands
• This is REAL!
• Everyone is counting on us!

#HealthCareHeroes
Other COVID-19 Tips:

• Uniform communication messaging wherever possible

• Limiting access to hospitals—No or very limited visitor policies

• Self-monitoring for symptoms—keeping those sick away from work

• Recognizing stress/anxiety for patients, staff, and MDs
  • Exacerbation of underlying anxiety and mental illness—all ramped up by severe limitations on “usual” activities
  • Uncertainty how long this will last

TAKE ACTION NOW!

Urge Congress to act now to protect our health care community during the COVID-19 pandemic

The coronavirus is impacting the entire health care community, including specialty physicians and researchers like us. There has been an outcry for more congressional support to protect health care professionals on the frontlines managing this deadly outbreak.

• Increasing funding for and access to personal protective equipment (PPE)
• Easing prior authorization and Medicare reporting requirements
• Providing financial safeguards for health care professionals and practices
• Providing coverage for telehealth and phone calls

We are in this together and we will get through it together!

Visit ACG's COVID-19 Resource Page
www.gi.org/COVID19