

Coronavirus Tech Handbook



Resources for Doctors

Protocols, Lab findings, Radiology, ICU, PPE, Medications...

✎ **Edit this document to make it better** ✎

Join the Whatsapp Chat for deep dive discussions:

["Doctors" CoronavirusTechHandbook Whatsapp Chat](#)

part of coronavirustechhandbook.com

Section initiated by Ruth Ann Crystal MD [@CatchTheBaby](#),
Ping me for questions or suggestions!

Please add info under the different headings (Protocols, Lab findings, Radiology, ICU, PPE, Medications, Swab Tests, Telemedicine, Journal Articles, Helpful Tips, Blogs, Money for COVID19 research)

This is part of a larger document <https://coronavirustechhandbook.com/> that is for scientists, volunteers, etc.

START HERE for summary

◆ **The Internet Book of Critical Care**, an online textbook written by Josh Farkas (@PulmCrit) <https://emcrit.org/ibcc/COVID19/>

◆ **Coronavirus: Why You Must Act Now** | @TomasPueyo <https://t.co/D1fbok5jpu>

The only way to prevent this is social distancing today. Not tomorrow. Today.

That means keeping as many people home as possible, starting now.

◆ **Official Chinese COVID treatment guidelines, translated**, 7th edition of the official diagnosis and treatment guide in China. Largely mirrors IBCC.











<https://www.chinalawtranslate.com/en/coronavirus-treatment-plan-7/>

Agency Resources

- ◆ **WHO:** Technical guidance from WHO for COVID-19 <https://buff.ly/2TYmhQZ>
- ◆ **UK NHS/Public Health England:** <https://buff.ly/3aLI3Py>
- ◆ **Europe ECDC guidelines:** <https://buff.ly/33bz0UD>
- ◆ **US CDC:** Coronavirus Disease 2019 (COVID-19) <https://buff.ly/2Th67mE>
- ◆ **US Directory of Local Health Departments** <https://buff.ly/2Sj6zPg>
- ◆ **UK Intensive Care Society** info for the critical care community <https://buff.ly/3aM8cwz>
- ◆ **US Society of Critical Care Medicine (SCCM) | COVID-19** <https://buff.ly/2W7uwNe>
- ◆ **Johns Hopkins live COVID19 map** <https://buff.ly/2xqcJsD>

Protocols

- ◆ **UW Medicine COVID-19 Protocols:** <https://buff.ly/2xrFYc2>

-  1 - Testing Criteria 3/9/2020 12:42 AM <https://buff.ly/2xrFYc2>
-  1a - Sample Collection for COVID19 Testing_Nasopharyngeal 3/8/2020 10:49 AM
-  2 - PPE - Recommendations Schematic 3/6/2020 5:32 PM
-  2a - PPE - Summary and Rationale for Recommendations 3/6/2020 9:51 PM
-  3- Ambulatory Settings - Workflow 3/6/2020 5:31 PM
-  3a - RN Phone Triage 3/7/2020 11:34 PM
-  3b - RN Phone Triage Resources 3/7/2020 11:34 PM
-  4 - Immunocompromised Patients - Protocol 3/9/2020 3:07 PM
-  5 - Pregnancy Protocol 3/10/2020 12:05 AM
-  6 - Procedural Areas - Patient Symptom Check 3/6/2020 5:31 PM
-  7 - Current Outbreak List 3/6/2020 3:27 PM
-  8 - Staff with Respiratory Infections_FAQ 3/6/2020 4:44 PM

- ◆ **UK King's College** (12 Mar 2020): Great educational video **Intubation and Rapid Sequence Induction** using simulation. Protocols included.
<https://www.youtube.com/watch?v=pv5A0I3p0zs>

Triage Protocols

- ◆ CDC Checklist for **transport** patients <https://buff.ly/3cR3nUE>

◆ Triage in Emergency Dept

- NHS PHE UK flowchart <https://buff.ly/38KIQid>
- UCSF flowchart https://twitter.com/daniel_kraft/status/1236806891914706944
- ACEP National Strategic Plan PDF with helpful links: <https://buff.ly/2xvwMDI>
- Infographic on COVID-19 Intubation by @WeAreCanadiEM <https://buff.ly/2U4hmOu>

◆ Triage in Primary Care

- NHS PHE UK: Interim guidance for primary care <https://buff.ly/38BtLhP>
- UCSF <https://buff.ly/2TETIJj>

-  3- Ambulatory Settings - Workflow Univ of Washington 3/6/2020

◆Triage remotely

- UCSF <https://buff.ly/2vJZpfX>
- Cancer follow up care questions by Matthew Katz MD (@subatomicdoc): <https://buff.ly/33e9mOY>
Scroll to bottom of spreadsheet to see questions for cancer type

◆Drive-thru or Tent ideas

- Stanford Drive-Through testing detailed protocols from 2009: <https://buff.ly/2INm5yQ>
- Drive-Through Medicine: A Novel Proposal for Rapid Evaluation of Patients During an Influenza Pandemic (2010) <https://buff.ly/39TXKms>



- South Korea's Drive-Through Testing For Coronavirus Is Fast — And Free | @NPR (3.13.20) <https://buff.ly/33gnwiB>

Put car in park, turn A/C to recirculation

One Seoul test center consists of four trailer-like offices with white canopies in front. Doctors in full protective suits and goggles take the driver's temperature with an infrared ear thermometer and hand out a questionnaire to fill out. If you're running a fever and, in the doctor's opinion, may be at risk based on where you've been or whom you've contacted, you're eligible for a test. Samples are collected from your nose and throat Only the driver is tested — passengers are not. Results are texted the next day. The test is free.

◆Home Care

WHO on home care: <https://buff.ly/2TUjyrt>

- ◆ CDC: Help prevent the spread of COVID-19 if you are sick <https://buff.ly/39EAPvs>
- ◆ US: Free **Advance Directive Forms** by State from AARP <https://buff.ly/2KpXRJC>

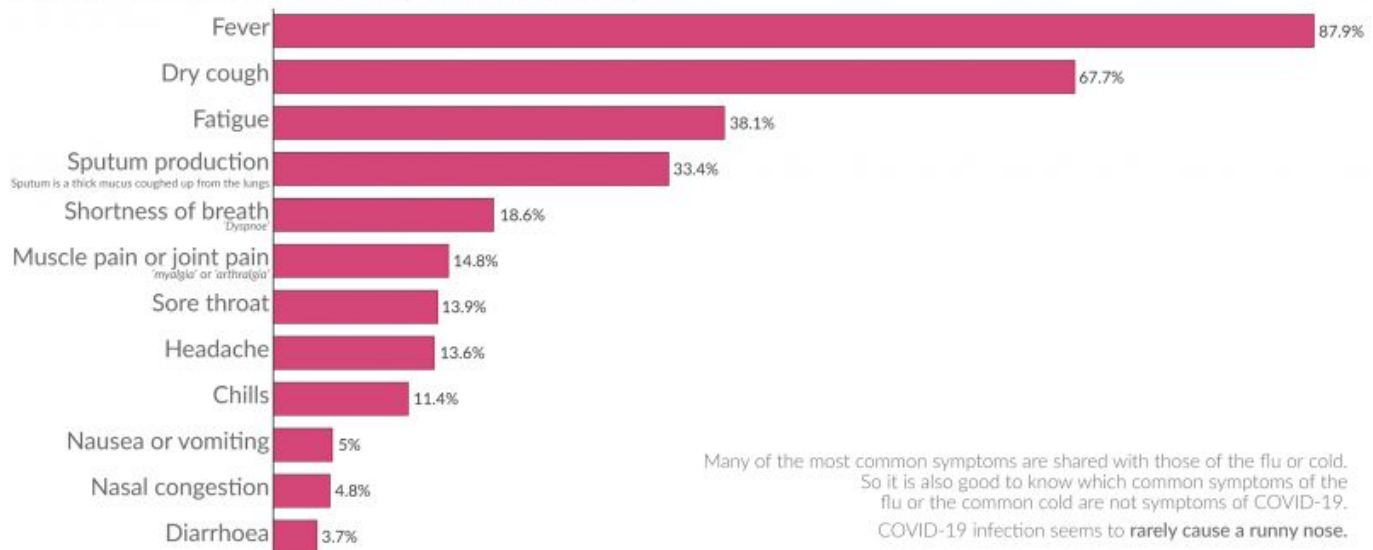
Findings on Examination

- ◆ Normal auscultation
- ◆ Severity in China: 81% mild, 14% severe, 5% critical, 2.3% died <https://buff.ly/2Qme6wT>
- ◆ Symptoms: Fever, dry cough but no runny nose usually <https://buff.ly/2Wfo8Uj>
- ◆ Incubation: It takes 2-10 days before infected person shows fever <https://buff.ly/2Q8ygKB>

The symptoms of coronavirus disease [COVID-19]

Our World
in Data

The most common signs and symptoms of 55,924 laboratory confirmed cases of COVID-19. Reported from China in the period up to February 22, 2020



Data source: World Health Organization (2020). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). Symptoms in fewer than 1% are not shown. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the authors.

Lab Findings

- ◆ WBC normal, with low Lymphocytes
- ◆ Mild Thrombocytopenia (> 100K)
- ◆ Moderate hypoxemia
- ◆ ABG: Mild acidosis with normal lactate and severe base deficit
- ◆ Elevated LDH, Very high CRP, Elevated CK
- ◆ Normal Procalcitonin (If elevated, may mean bacterial involvement)
- ◆ Glucose _____
- ◆ D-Dimer may be elevated
- ◆ LFTs elevated in 30% pts
- ◆ Low PTT in 30% pts
- ◆ DO NOT TRUST NEGATIVE COVID19 SWAB if x-ray positive or pneumonia symptoms

Radiology Findings

◆ Chest Xray

Bilateral interstitial pneumonia

Bilateral infiltrates common with gravitational distribution

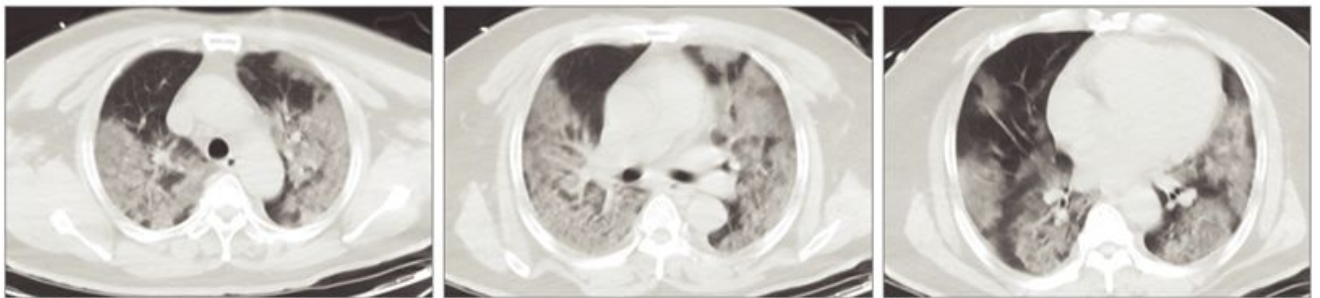
Asymmetry if bacterial superinfection (secondary bacterial infection is uncommon)

◆ Chest CT

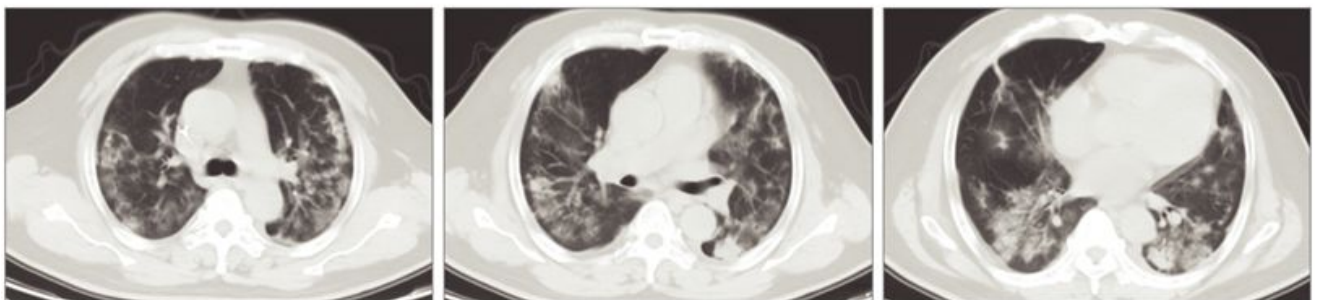
Relation Between Chest CT Findings and Clinical Conditions of COVID-19 Pneumonia: A Multicenter Study : American Journal of Roentgenology <https://buff.ly/2TK8uhH>

- Ground-glass opacities (GGO) (86.1%)
- Mixed GGO and consolidation (64.4%)
- Vascular enlargement in the lesion (71.3%).
- Peripheral distribution (87.1%)
- Bilateral involvement (82.2%)
- Lower lung predominant (54.5%)
- Multifocal (54.5%)

A Computed tomography images on day 5 after symptom onset



B Computed tomography images after treatment on day 19 after symptom onset



In patients at high risk for COVID19 infection, chest CT evidence of viral pneumonia may precede positive negative RT-PCR test results. <https://buff.ly/2U1jlmG>

◆ Lung Ultrasound (LUS)

◇ [From GiViTI COVID19 Meeting document \(10 March 2020\)](#)

LUS daily to evaluate the lungs

- PATTERN 1: Diffuse B-line profile = Responds well to PEEP
- PATTERN 2: Basal PLAPS points showing consolidation / parapneumonic effusions / atelectasis where front areas ventilated, rear areas atelectatic are responsive to pronation

- Useful in evaluating the effect of high PEEP and managing recruitment manoeuvres
- ◇ Findings of lung ultrasonography of novel coronavirus pneumonia during the 2019–2020 epidemic <https://buff.ly/2W7huze>
- Characteristic findings included the following:
 - Thickening of the pleural line with pleural line irregularity;
 - B lines in a variety of patterns including focal, multifocal, and confluent;
 - Consolidations in a variety of patterns including multifocal small, non-translobar, and translobar with occasional mobile air bronchograms;
 - Appearance of A lines during recovery phase;
 - Pleural effusions are uncommon.

◇ Doctor with COVID19 doing #POCUS on his own lungs

<https://twitter.com/yaletung>

◆ Echocardiography

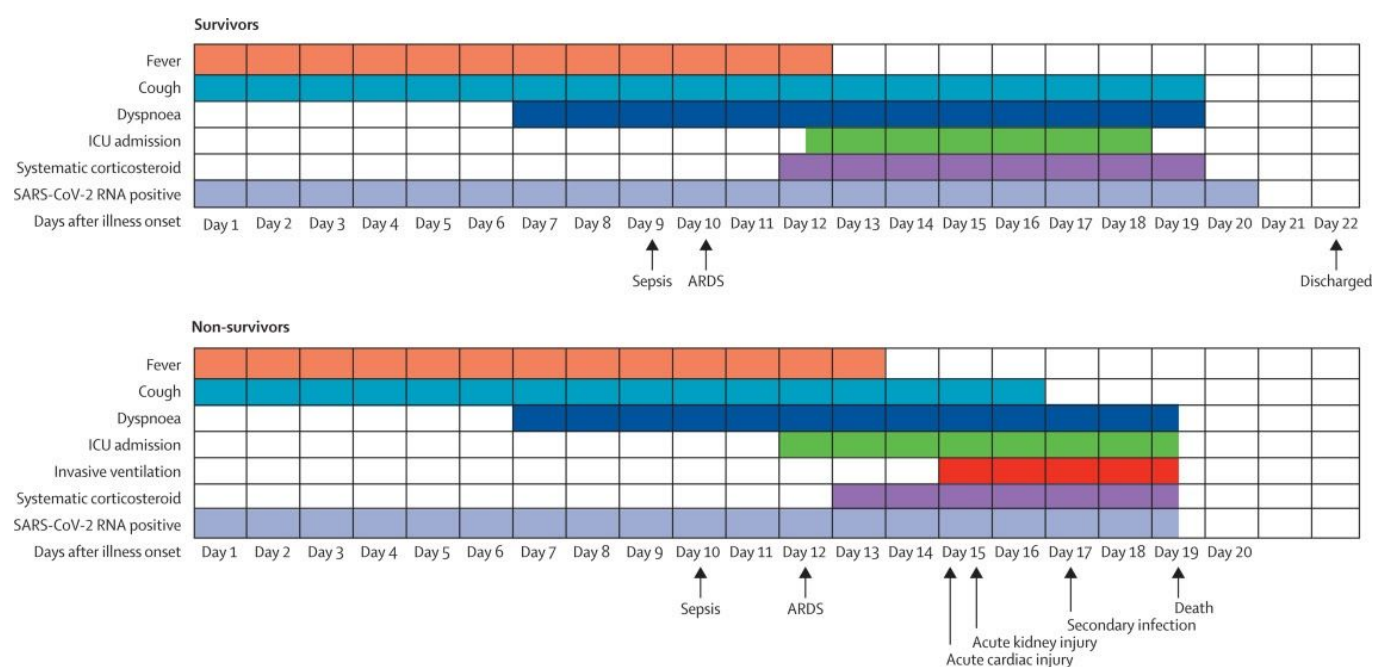
Watch for dyskinesias (myocarditis?)

Clinical Course

◆ Clinical Characteristics of Patients With 2019 Novel Coronavirus (2019-nCoV)–Infected Pneumonia in Wuhan, China <https://buff.ly/37dVZig>

◆ Lancet: Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study <https://buff.ly/2W63buS>

- Table: Demographic, Clinical, Laboratory, and Radiographic findings of patients on admission: Non-survivors vs. Survivors <https://buff.ly/3cO1Puu>
- Summary of this article by Dr. Abraar Karan: <https://twitter.com/AbraarKaran/status/1238284989323718668>



◆ **Pediatrics:** Detection of Covid-19 in Children in Early January 2020 in Wuhan, China | NEJM Editorial (3/12/20) <https://buff.ly/2WhwRoL>

◆ **UK King's College:** Great educational video on PPE and intubation (Rapid Sequence Induction) technique using simulation. Protocols included.

<https://www.youtube.com/watch?v=pv5A0I3p0zs>

◆ **WHO:** Clinical management of severe acute respiratory infection when novel coronavirus (COVID-19) infection is suspected (28 Jan 2020) <https://buff.ly/2lyTIE7>

◆ **US Society of Critical Care Medicine (SCCM) | COVID-19** <https://buff.ly/2W7uwNe>

COVID-19 ICU Preparedness Checklist

Preparing Your ICU For Disaster Response

Educational Videos

Online Training Modules:

- [ICU Microcosm Within Disaster Medical Response](#)
- [Augmenting Critical Care Capacity During a Disaster](#)
- [Disaster Triage and Allocation of Scarce Resources](#)
- [Sustained Mechanical Ventilation Outside Traditional Intensive Care Units](#)

◆ **Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy: Early Experience and Forecast During an Emergency Response | JAMA (13 Mar 2020)**

<https://buff.ly/33gFKAj>

Video conference on this via JAMA: <https://www.pscp.tv/w/1ZkKzLvQpPNJv>

◆ Infographic on Airway Management (mult languages)

<https://www.aic.cuhk.edu.hk/covid19/>

◆ Ventilator settings

[From GiViTI COVID19 Meeting document \(10 March 2020\)](#)

<https://twitter.com/FOAMecmo/status/1237477129014648835/photo/1>

◆ ICU Tips

*** ICU recs from GiViTI Meeting:

◆ [From GiViTI COVID19 Meeting document \(10 March 2020\)](#)

◆ <https://twitter.com/FOAMecmo/status/1237477129014648835>

◆ From a front-line ICU physician in a Seattle hospital <https://buff.ly/2IMPOI2>
Thread by @Chenbariatrics1: (March 10, 2020)

◆ ICU recommendations from Italian doctor G. Pattino <https://buff.ly/2IO2T41>

◆ **The Internet Book of Critical Care**, an online textbook written by Josh Farkas (@PulmCrit) <https://emcrit.org/ibcc/COVID19/>

◆ PulmCrit- WHO guidelines regarding fluid administration for coronavirus are dangerously misguided: <https://emcrit.org/pulmcrit/coronavirus/>

◆ Some Additional COVID Airway Management Thoughts <https://buff.ly/38N15m1>

◆ Infographic on COVID-19 Intubation by @WeAreCanadiEM <https://buff.ly/2U4hmOu>

◆ Very helpful summary of all that is COVID19 infection including lab values, medications

used, lab findings and clinical course:

For Doctors and Clinical People by Dr. Jordan Shlain <https://buff.ly/2wOUKtl>

◆ **ICU vent management for Dummies** tweetorial: by @aribindi
<https://twitter.com/aribindi/status/1238629714069032961>

Personal Protective Equipment (PPE)

- ◆ CDC (10 Mar 2020) Healthcare PPE FAQs for COVID-19 <https://buff.ly/337lxMc>
- ◆ How to don and doff PPE correctly
 - NHS video: Donning of Personal Protective Equipment (PPE) <https://buff.ly/2TGo2Dt>
 - Sunnybrook: Donning and doffing instructions for PPE <https://buff.ly/3aG209e>
 - NHS PDF: Donning PPE <https://buff.ly/2vblzGt>
 - NHS PDF: Doffing PPE <https://buff.ly/39GD0Pj>
 - Germany: Corona Schutzkleidung an_aus <https://buff.ly/39SVvQr>
 - Note: In Italy and in Germany, 2 pairs of gloves are worn. PPE is removed with inner gloves and not bare hands.

- ◆ CDC (March 7, 2020): Recommendations for Healthcare Staff with Potential Exposure in a Healthcare Setting to Patients with COVID-19 <https://buff.ly/2VxwJB1>

Medications

- ◆ **[From GiViTI COVID19 Meeting document \(10 March 2020\)](#)**
 - Lopinavir / ritonavir (KALETRA) 200/50 mg2cp BID
 - Chloroquine 500 mg BID or hydroxychloroquine 200 mg BID
 - Antibiotic prophylaxis (variable depending on the center): pip / tazo, ceftriaxone, bactrim, antifungals ...(abandoned use of azithromycin)
 - Acetylcysteine 300 mg TID (not abundant secretions but, where present, very dense)
 - Steroids? Only in case of signs of fibrosis (not early).
 - Tocilizumab? IL-6 receptor inhibitor. Rationale given by the strong inflammatory picture MA utility to be evaluated in the light of a picture of lymphopenia. At the moment, NO routine indication and NO early use.

- ◆ Coronavirus puts drug repurposing on the fast track | @Nature <https://buff.ly/2vE3CSI>
Rx: Remdesivir, Chloroquine, Kaletra
See Table 1

- ◆ Could an old malaria drug help fight the new coronavirus? <https://buff.ly/3cGsBVJ>
Both Chloroquine and the antiviral Remdesivir were, individually, “highly effective” at inhibiting replication of the novel coronavirus in cell culture.


- ◆ JAMA: Epidemiologic Features and Clinical Course of Patients Infected With SARS-CoV-2 in Singapore <https://buff.ly/38r55lX>
Kaletra (Lopinavir-Ritonavir)

- ◆ PulmCrit – Preview of Lopinavir/Ritonavir efficacy in COVID-19:
<https://emcrit.org/pulmcrit/lopinavir/>

- ◆ Drug treatment options for patients admitted with COVID-19 <https://buff.ly/2TPoKgj>
Translate from Dutch to English
- ◆ Datapunk | Covid2019/SARSCoV2 Antivirals tested <https://buff.ly/2vukVFp>
- ◆ A human **monoclonal 1 antibody** blocking SARS-CoV-2 infection. New study, not peer-reviewed (3/12/20) <https://buff.ly/2TNvtUo>

COVID-19 Swab Tests

◆ **In patients at high risk for COVID19 infection, chest CT evidence of viral pneumonia may precede positive RT-PCR test results. Don't rely on PCR swab results if the patient has symptoms and CT findings consistent with COVID19!** <https://buff.ly/2U1jlmG>

- ◆ WHO: National laboratory testing <https://buff.ly/2TFKrkq>
- ◆ NHS PHE UK: Guidance for sampling and for diagnostic laboratories <https://buff.ly/2Q4uhOV>
- ◆ CDC:
- ◆ MGH: How to collect Coronavirus NP and OP Swab (video) <https://buff.ly/3375Upe>
- ◆ UW:  1a - [Sample Collection for COVID19 Testing_Nasopharyngeal](#) 3/8/2020

◆ U.S. swab testing capacity (March 11, 2020):
<https://twitter.com/ScottGottliebMD/status/1237745451174105094>

- ◆ University of Washington <https://twitter.com/UWVirology/status/1235675168074129408>
- ◆ Seattle area home testing: Gates-funded program will soon offer home-testing kits for new coronavirus <https://buff.ly/2TCge5H>
- ◆ Stanford- rapid test. Only for ED and Inpatients.
- ◆ LabCorp- takes 3-4 days. Doctor's office only.
- ◆ Quest Diagnostics <https://www.questdiagnostics.com/home/Covid-19/>

- ◆ [Eric Feigl-Ding](#) in NPR article <https://buff.ly/33gnwiB>
Testing capacity depends on:
 - Get enough test kits
 - Invest in HC infrastructure- CLIA labs, lab hardware, technicians
 - Logistics of moving goods and providing services
 - Information technology- for supply chain, for data

Medical Specialties Specific

- ◆ **Nephrology:** COVID19 NephJC <https://buff.ly/33eY3Ww>
- ◆ **Pediatrics:**
 - Guidance from UK RCPCH <https://buff.ly/39SlszE>
 - Detection of Covid-19 in Children in Early January 2020 in Wuhan, China | NEJM Editorial (3/12/20) <https://buff.ly/2WhwRoL>
- ◆ **Obstetrics:**
CDC- Inpatient Obstetric COVID-19 control <https://buff.ly/39LY1rJ>

◆ [Immunocompromised Patients - Protocol](#) Univ of Washington 3/9/2020

◆ **Cancer** follow up care questions by Matthew Katz MD (@subatomicdoc):

<https://buff.ly/33e9mOY>

Scroll to bottom of spreadsheet to see questions for cancer type

◆ **Ophthalmology** AAO.org (3/12/20): <https://buff.ly/2TR2Lab>

COVID19 is contagious through conjunctivitis.

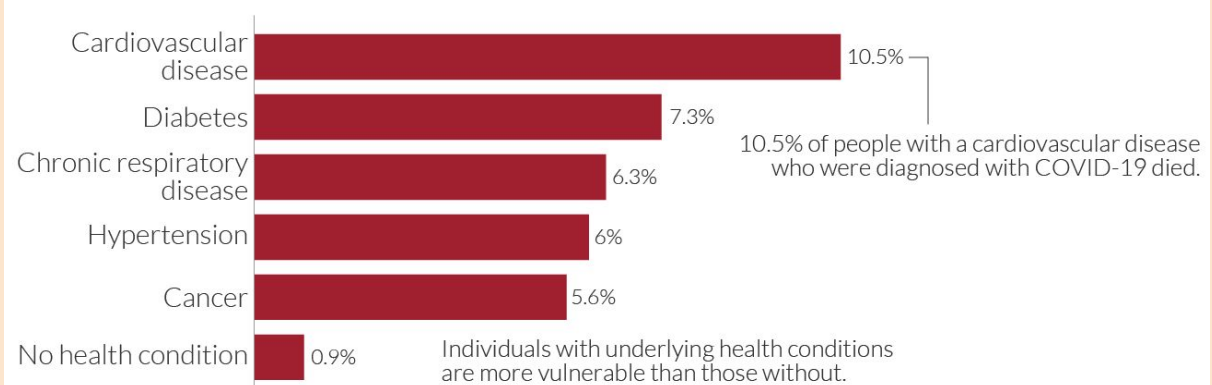
- Several reports suggest the virus can cause conjunctivitis and possibly be transmitted by aerosol contact with conjunctiva.
- Patients who present to ophthalmologists for conjunctivitis who also have fever and respiratory symptoms including cough and shortness of breath could represent cases of COVID-19.
- PPE: The Academy and federal officials recommend protection for the **mouth**, **nose** and **eyes** when caring for patients potentially infected with SARS-CoV-2.

◆ **Long term care patients** (AMDA): <https://paltc.org/COVID-19>

Coronavirus: early-stage case fatality rates by underlying health condition in China

Our World in Data

Case fatality rate (CFR) is calculated by dividing the total number of deaths from a disease by the number of confirmed cases. Data is based on early-stage analysis of the COVID-19 outbreak in China in the period up to February 11, 2020.



Data source: Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. *Vital surveillances: the epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020*. China CDC Weekly.

OurWorldinData.org – Research and data to make progress against the world's largest problems.

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Telemedicine

◆ Some COVID19 Telehealth options

- @Amwell COVID-19 Telemedicine Prog <https://buff.ly/331NGFz>
- VUMC <https://buff.ly/2TH6F3S>
- Sheba Hosp @DatosHealth @TytoCare 4 coronavirus pts <https://buff.ly/2SK1vF0>
- Coronavirus Telehealth w/@Ro <https://buff.ly/2vGbOS9>
- @drondemand

Journal Articles

- ◆ Chest CT for Typical 2019-nCoV Pneumonia: Relationship to Negative RT-PCR Testing | Radiology <https://buff.ly/2U1jlmG>
- ◆ Care for Critically Ill Patients With COVID-19 | @JAMA March 11,2020 <https://buff.ly/33bP48F>
- ◆ Drive-Through Medicine: A Novel Proposal for Rapid Evaluation of Patients During an Influenza Pandemic (2010) <https://buff.ly/39TXKmS>
- ◆ WHO database of latest scientific finds and knowledge on COVID-19, compiled from daily searches of bibliographic databases: [Global research on coronavirus disease \(COVID-19\)](#)
- ◆ A human **monoclonal 1 antibody** blocking SARS-CoV-2 infection. New study, not peer-reviewed (3/12/20) <https://buff.ly/2TNVtUo>

Helpful Tips & Testimonials

- ◆ [GiViTI COVID19 Meeting document \(10 March 2020\)](#) ***very helpful***
- ◆ Great related infographic: <https://twitter.com/FOAMecmo/status/1237477129014648835>
- ◆ **Very helpful** summary of all that is COVID19 infection including lab values, medications used, lab findings and clinical course:
For Doctors and Clinical People on COVID19 by Dr. Jordan Shlain <https://buff.ly/2wOUKtl>
- ◆ Preparing for COVID-19 - Msg from ESICM President & colleagues <https://buff.ly/2TF0Khb>
- ◆ ESICM COVID-19 March 9th Webinar with Prof Yaseen Arabi <https://buff.ly/2W5cj2T>
- ◆ WHO database of latest scientific finds and knowledge on COVID-19, compiled from daily searches of bibliographic databases: [Global research on coronavirus disease \(COVID-19\)](#)
- ◆ https://twitter.com/Yascha_Mounk/status/1237731864233807872
"The Italian College of Anesthesia, Analgesia, Resuscitation and Intensive Care just published the most extraordinary medical document I've ever seen.
To help people from Germany to America understand what we're about to face, I am publishing translated extracts here."
- ◆ What ER doctors want (Twitter thread)
<https://twitter.com/grahamwalker/status/1238150836242370560>

Helpful Infographics for Patients

- ◆ SF Public Health: Stay home, wash hands <https://buff.ly/337Li02>
- ◆ Flatten the Curve: <https://buff.ly/3aN0SAK>
- ◆ Wash your hands lyrics generator: <https://washyourlyrics.com/>
- ◆ NHS simple patient advice in many languages:
https://drive.google.com/drive/folders/193qQN9I04Dvf0N9L5zeWTiXK_DRbrAxg
- ◆ Great visual info for patients <https://twitter.com/EpiEllie/status/1238824669404368902>

- ◆ NHS: Advice for patients with **Diabetes**:
https://www.diabetes.org.uk/about_us/news/coronavirus

Medical Blogs on COVID19

- ◆ **The Internet Book of Critical Care**, an online textbook by Josh Farkas (@PulmCrit)
<https://emcrit.org/ibcc/COVID19/>
- ◆ [From GiViTI COVID19 Meeting document \(10 March 2020\)](#)
- ◆ Sanford Guide: COVID-19 <https://buff.ly/2w2nezt>
- ◆ CriticalCareNorthampton.com <https://buff.ly/2TYTkEg>
- ◆ TheAnaesthesia.blog <https://buff.ly/3cN5Pvb>
- ◆ Propofology.com <https://buff.ly/39lhsSe>

Support for Healthcare workers well-being

- ◆ Health Workers: While You Combat COVID-19, We Support You | Supportiv
<https://buff.ly/2W8UGiA>
Peer-support chat for HC workers to vent about what is going on

- ◆ Philadelphia medical students organize to provide childcare for healthcare workers' children <https://buff.ly/2xEJGiO>

Money for Medical Research on COVID19

- ◆ US: NSF https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg or email rapid-covid19@nsf.gov
- ◆ Gates Foundation: Announcing the COVID-19 Therapeutics Accelerator
<https://buff.ly/3cKTK3l>
- ◆ Submit treatment ideas to CDC via BARDA: <https://buff.ly/2W0HtZ9>

Humour to lighten the mood

- ◆ [Ben Phillips on Twitter: "♥♥♥ To beat #Covid19, listen to this Italian grandma.... "](#)
- ◆ <https://twitter.com/BetootAdvocate/status/1238013005624819718>
- ◆ <https://www.youtube.com/watch?v=nSXletP5iak>
- ◆ Wash your hands lyrics generator: <https://washyourlyrics.com/>
- ◆ <https://twitter.com/CatchTheBaby/status/1238652535193337856>
- ◆ https://twitter.com/YoYo_Ma/status/1238572657278431234

Coronavirus Dank Meme Stash

<https://www.facebook.com/groups/coronavirus.memes>

Doctor's note: laughter is NOT the best medicine.