

# COVID-19

# Moving forward

4.23.2020

DONNA NUCCI RN MS CIC



Signs

Work-flow

Visitors

Tools

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**ATTENTION  
ALL PATIENTS**

**STOP**

**PLEASE READ BEFORE ENTERING:**

**If you have ANY of the following symptoms:**

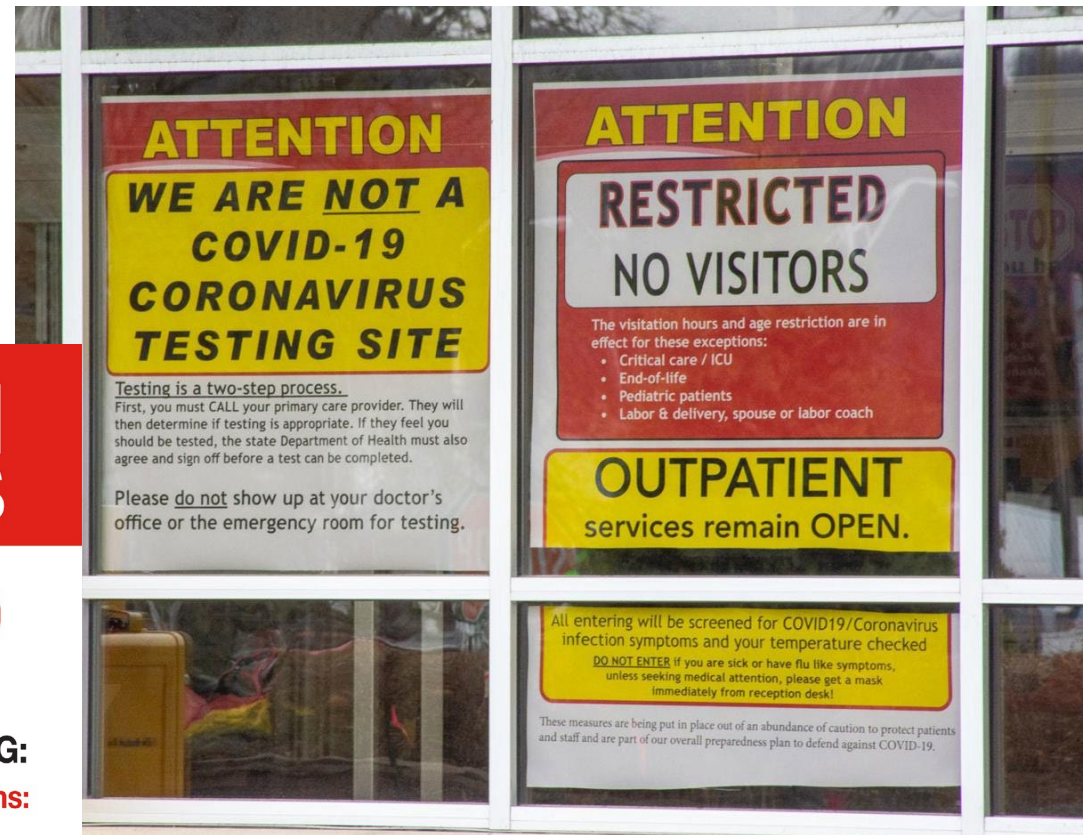
Fever • Cough • Rash • Vomiting • Diarrhea  
Respiratory Symptoms, including trouble breathing



**DO NOT enter the office.**

**Call from outside and we will assist you.**

Thank you for your cooperation as we work to keep everyone safe and healthy.



**A new 'normal'**

# **VISITOR RESTRICTIONS ARE IN PLACE**

## **LEVEL 3**

### **No Visitation allowed**

**Care providers for patients must be  
free of the symptoms below**

**Only symptom free persons  
can pick up or drop off patients**

**DO NOT HAVE CONTACT with the patient if you  
are feeling sick or having any of these symptoms**

**Cough**

**Fever Chills**

**diarrhea**

**Runny/stuffy Nose**

**Sore Throat**



## Use Telehealth

Use telephone management and other remote methods of triaging, assessing, and caring for all patients to **decrease the AMOUNT OF TIME PATIENTS ARE IN THE BUILDING.**

If a formal telehealth system is not available, healthcare providers can still communicate with patients by telephone instead of in person visits which will reduce the number of those who seek face-to-face care.

The following few slides have been compiled from CDC, WHO and American College of Surgeons POST COVID RECCOMENDATIONS as well as best practice guidance for health care facilities.

## **Prepare your facility to safely triage and manage patients to maintain:**

**Mask the patient**

**6 feet social distance between patients**

**6 feet distance between staff and patients as much as feasible**

**NON-essential staff should not interact with patients**

**STAFF should maintain 6 feet from each other**

- Place visual alerts such as signs and posters at entrances and in strategic places providing instruction on hand hygiene, respiratory hygiene, and cough etiquette.
- Ensure supplies are available such as tissues, hand soap, waste receptacles, and alcohol-based hand sanitizer in readily accessible areas.
- DO NOT FILL YOUR WAITING ROOMS --Ask patients waiting to be seen to remain outside (e.g., stay in their vehicles) until they are called into the facility for their appointment or set up triage booths to screen patients safely. Visitors should be restricted unless the patient is a minor or has a disability.

## PLANNING FOR POST COVID-19 SURGICAL PROCEDURE WORKFLOW

### VIRAL EXPOSURE RISK

THE CDC REPORTS: THERE IS NOT EXPERT CONSENSUS, NOR SUFFICIENT SUPPORTING DATA, TO CREATE A DEFINITIVE AND COMPREHENSIVE LIST OF AGPS FOR HEALTHCARE SETTINGS.

- OPEN SUCTIONING OF AIRWAYS
- SPUTUM INDUCTION
- CARDIOPULMONARY RESUSCITATION
- ENDOTRACHEAL INTUBATION AND EXTUBATION
- BRONCHOSCOPY
- MANUAL VENTILATION
- INTUBATION/EXTUBATION
- LAPAROSCOPIC SURGERY
- ELECTROCAUTERY

### PREPARATION

- FORM A COVID-19 TASK FORCE INCLUDING MEMBER OF EACH CARE TEAM AND PHYSICIAN LEADERS.
- TASK FORCE SHOULD PLAN FOR CAREFUL COORDINATION BETWEEN SURGERY, ANESTHESIA, NURSING, PACU TEAMS.
- MINIMIZE LONGER CASES UNTIL CASE MIX AND WORKFLOW ARE EVALUATED AND STANDARDIZED

### IN THE OPERATING ROOM

- ONLY ESSENTIAL PERSONNEL IN ROOM NO VENDORS OR STUDENTS
- RUNNER OUTSIDE OF ROOM FOR NEEDED EQUIPMENT
- MINIMIZE EQUIPMENT IN THE ROOM

### PPE

PPE REQUIREMENT SHOULD BE BASED ON A COMPREHENSIVE RISK ASSESSMENT PERFORM A RISK ASSESSMENT BASED ON:  
TYPE OF SURGERY  
LENGTH OF SURGERY  
ENGINEERING CONTROLS

STRICT ADHERENCE TO PPE REQUIREMENTS SET BY THE FACILITY SHOULD BE IMPLEMENTED AND AUDITED

### DON/DOFF CAREFULLY



AS PART OF COVID-19 PPE, SURGEONS MAY CONSIDER THE USE OF SHOE COVERS AS WITH ANY OPERATION

**SURGICAL GOWN**      **DOUBLE GLOVE TO DECREASE CONTAMINATION DURING DOFFING**

### OTHER KEYS FOR DONNING AND DOFFING

- CONSIDER DON/DOFF AS A TEAM WITH OBSERVATION OF EACH OTHER
- DOFFING CARRIES A HIGH RISK OF SELF-CONTAMINATION

Continue to check for more custom tools and guidance on my website

<https://www.donnanucci.com/>



# Healthy Workforce

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## Implementing Safety Practices for Critical Infrastructure Workers CDC has minimum guidance.

For this guidance *high-risk* exposures refer to HCP who have had prolonged close contact with patients with COVID-19 (beginning 48 hours before onset of symptoms) without a facemask

Being present in the room for procedures that generate aerosols or during which respiratory secretions are likely to be poorly controlled on patients with COVID-19 (beginning 48 hours before onset of symptoms) when the healthcare providers' eyes, nose, or mouth were not protected, is also considered *high-risk*.

**Critical Infrastructure workers who have had an exposure but remain asymptomatic should adhere to the following practices prior to and during their work shift:**

- **Pre-Screen:** Employers should measure the employee's temperature and assess symptoms prior to them starting work. Ideally, temperature checks should happen before the individual enters the facility.
- **Regular Monitoring:** As long as the employee doesn't have a temperature or symptoms, they should self-monitor under the supervision of their employer's occupational health program.
- **Wear a Mask:** The employee should always wear a face mask while in the facility
- **Social Distance:** The employee should maintain 6 feet and practice social distancing as work duties permit in the workplace.
- **Disinfect and Clean workspaces:** Clean and disinfect all areas such as offices, bathrooms, common areas, shared electronic equipment routinely during the workday and after hours.

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

### Serologic/Antibody Tests

The FDA states that it is not aware of any antibody test that can prove a current COVID-19 diagnosis.<sup>9</sup> Until further studies are conducted, **these tests cannot reliably determine who might have had COVID-19 and who might be immune to COVID-19.** It is important to note that most of the antibody test kits have not been reviewed or approved by the FDA, and negative results do not rule out SARS-CoV-2 infection.

<https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/Facility-Licensing--Investigations/Blast-Faxes/Blast-Fax-202029A-Updated-Guidance-for-Healthcare-Professionals.pdf?la=en>

## Monitor HCP and ensure maintenance of essential healthcare facility staff and **LIMIT NON-ESSENTIAL PERSONNEL**

- Facilities should implement sick leave policies that are **non-punitive, flexible, and consistent** with public health policies and allow ill healthcare personnel (HCP) to stay home.
- HCP should be reminded to not report to work when they are ill.
- Do not require a healthcare provider's note for employees who are sick with respiratory symptoms before returning to work
- .
- **Advise employees to TAKE their TEMPERATURE TWICE A DAY INCLUDING before reporting to work each day**
- Consider screening staff for fever or respiratory symptoms before entering the facility.
- **Make contingency plans** for increased absenteeism caused by employee illness or illness in employees' family members that would require them to stay home. Planning for absenteeism could include extending hours, cross-training current employees, or hiring temporary employees.

# FIVE PHASES OF CARE CONTINUUM

Ensuring safe, high-quality, high-value care of the surgical patient. Utilize quality improvement programs/care standards to help support achieving safe, high-quality, high-value patient care.  
Use of risk-adjusted data to evaluate patient care and outcomes.

Consider the personal risk factors of staff members and mitigate the risk for those with higher risk factors.

## I PERIOPERATIVE PERIOD

- Plan a process to SCREEN employees and patients for COVID-19
- Repeat lab results, physicals, radiology, history, re-consent v. reusing prior results. USE telehealth if possible.
- Continue to practice 6 feet social distancing
- Discuss patient's potential post-acute care facility before surgery.
- HCP and patients should wear masks at all times.

## II IMMEDIATE PREOPERATIVE PERIOD

- Review nursing, anesthesia, surgery checklists for all should be revised to reflect COVID-19 prevention

## III INTRAOPERATIVE PERIOD

- ENSURE all time-outs and briefings reflect COVID-19 risk and COVID-19 testing results.
- Ensure PPE use guidelines are being followed.
- Maintain a strict protocol for AGP including intubation
- Maintain all COVID-19 PPE protocols
- Review specimen pick-up protocol.

## IV POSTOPERATIVE PERIOD

- Adhere to standardized care protocols as much as possible (e.g., enhanced recovery protocols) for increased reliability in light of potential different personnel as standardized protocols optimize lengths of hospital stay and efficiency and are associated with decreased complication rates.

## V POST DISCHARGE PERIOD

- COVID FREE Post-acute care facility availability.
- Post-acute care facility safety (COVID-19, non-COVID-19 issues).
- Home setting issue of exposure to ill contacts.
- Follow up telehealth to survey for post procedure COVID-19 infection .

Continue to check for more custom tools and guidance on my website

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## Ensuring safe, high-quality, high-value care of the surgical patient across the Five Phases of Care continuum.

- Utilize quality improvement programs/care standards to help support achieving safe, **high-quality**, high-value patient care.
- Use of risk-adjusted **data** to evaluate patient care and outcomes.
- Ensure optimal patient care across **Five Phases of Care:**
  - **Phase I: Preoperative Period** **USE TELEHEALTH**
    - Consider guideline for repeating laboratory results, radiology, history and physical, re-consent vs. use of prior results.
    - Consider guideline to (re)assess comorbidities especially if COVID-19/PUI or extended length of time of postponed operation.
    - The composite assessment, in conjunction with sound clinical judgment, provides the surgeon and other decision makers with the information needed to make decisions regarding clinical appropriateness as well as surgical prioritization.
    - Office, clinic, hospital public areas (e.g., waiting room) should continue to practice physical distancing (e.g., six-foot spacing of chairs)
    - Consider review of patient advance directive, especially older adults, frail, COVID-19+, other.

# FORM A COVID-19 TASK FORCE

**Assign a roles and include governing board to clarify, interpret, and iterate policies, make real-time decisions, and initiate and communicate messaging.**

- Function: **Real-time** governance, decision-making body
- Members: **Multidisciplinary** (e.g., surgery, anesthesia, nursing, others)
- Frequency: **At least daily huddles during ramp-up period and possibly beyond**
- **Data-driven**, e.g., utilization, efficiency, COVID-19 awareness data, errors/near misses, complications.
- **Additional topics for consideration**
  - Prioritization of staff and procedures
  - PPE supply
  - NEW workflows to maintain distance
  - Newly diagnosed patients/staff
  - Pandemic assessment
  - Patient backlog
  - Clinical priorities
  - Community backlog
  - Patient access
  - Newly uninsured plan, low income plan
  - Safety/quality



**I recommend PRE-SCREENING with COVID testing for all patients being admitted for procedures that require an Aerosol Generating Procedure.**

**GI teams will have to discuss the true risk of colonoscopy with medical leadership. This guidance evolving.**

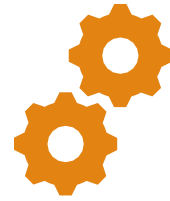
<https://gut.bmj.com/content/early/2020/04/02/gutjnl-2020-321185#T2>

<https://gi.org/2020/03/15/joint-gi-society-message-on-covid-19/>

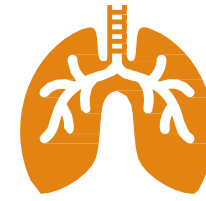
## DIAGNOSTIC TESTING: Know your COVID-19 diagnostic testing availability and develop operational testing policies for patients and health care workers.

1. Know, understand, and update your **local COVID-19 diagnostic testing capabilities** and turnaround times. The testing availability will likely change during the ramp-up period. While it is to be hoped that availability is on the rise, some predict that *availability may actually decrease* as the community testing demands increase.
2. Develop **local diagnostic testing policies for patients**. Rapid testing for COVID-19 infection through real-time reverse transcription polymerase chain reaction (RT-PCR) testing may be considered for all patients undergoing planned surgery, or for selected patients after screening with or without mandatory preoperative quarantine. The prevalence of asymptomatic/presymptomatic patients is unknown, but likely varies according to the pretest probability, i.e., prevalence of disease in the community. Surgeons should be involved in institutional policymaking since the risk to the patient and the staff varies with the type of procedure, the patient's condition, local circumstances, and over time. Some surgeon discretion is necessary and should be permitted.
3. Develop diagnostic screening testing **policies for health care workers**. With near-future reversal of physical distancing, local incidence may increase, including among health care workers. As ramp up proceeds, screening and testing policies and planning for staff should be considered.
4. **Consider false negative test rates** and need for retesting. False negatives have been reported as high as 30 percent. Guidelines for potential retesting in negative patients might be considered. A particular challenge to health care worker safety is our current lack of understanding of duration for transmissibility of the virus in either asymptomatic COVID-19-positive patients or individuals who have recovered from a COVID-19 illness. There is evidence that even after respiratory samples are negative in patients who have recovered from a COVID-19 illness, viral RNA remains in the stool for >30 days. The clinical significance of fecal RNA is not well understood.
5. **Consider guidelines for postoperative COVID-19 testing** of symptomatic patients/patients under investigation (PUI). Atelectasis, fevers, etc., are not uncommon in the postoperative course. Establishing operational guidelines for COVID-19 testing in these patients and concurrent testing results should be considered.
6. There is not likely to be a highly sensitive and specific **mass testing ability** in the U.S. for at least several months. Therefore, reasonable alternative methods of determining risk versus benefit to the patient and public health in all facilities, inpatient and outpatient, will be required in the interim in order to continue the care of patients now waiting for surgeries previously delayed during the first phase of the pandemic. If optimal screening/testing is unavailable locally, implementation of such alternative screening methods is a local decision and should be done in conjunction with local public health officials.

# HOT TOPICS



Engineering  
controls and work  
practice controls



AGP



Air exchanges



Respiratory  
Program Mandated

# Aerosol Generating Procedures (AGP) FAQs for Clinicians

Aerosol Generating Procedures (AGP) are defined as procedures that may promote the generation of small particle aerosols not filtered by surgical masks that could expose health care workers to pathogens. These AGPs require personal protective equipment (PPE) to protect the health care workers.

While many aerosols are large enough and are effectively filtered by surgical masks, some generate smaller aerosols from deep in the lungs that could transmit some infectious diseases. These would require N95 respirators or PAPRs be worn during the procedures. While there are lists of AGPs on various guidelines, the AGPs specified often differ (see Appendix). This understandably causes great confusion and anxiety among health care workers.

## What procedures are defined as AGPs?

The most consistently recommended procedures that are considered AGP are bronchoscopy, intubation/extubation, induced sputum, and open suctioning of airways. Some groups have included Bipap and bedside tracheotomy. Systematic reviews of the risk of SARS virus transmission (Tran K, PLoS One 2012, see appendix) have found, however, that only the following procedures were associated with an increased risk: tracheal intubation, suction before and after intubation, and tracheotomy. Other procedures, including manipulation of BiPAP mask, endotracheal aspiration, suction of body fluids, mechanical ventilation, manual ventilation, manual ventilation after intubation, high-frequency oscillatory ventilation, administration of oxygen, chest physiotherapy, and collection of sputum sample **were not** significantly associated with an increased risk of infection acquisition. In a separate study of H1N1 influenza patients, bronchoscopy was noted to have an increased risk of viral positive aerosols.

**Why is intubation/extubation considered an AGP?** Studies of intubation/extubation have shown that small particle aerosols can be generated, but this is often related to more emergent intubation (perhaps due to more aggressive use of bag mask in patients with tenuous respiratory statuses). Controlled intubation has not noted similar aerosol development when this has specifically been studied. Even with these data, out of an abundance of caution, all intubations and extubations have been labeled as an AGP.

## Is Bipap or CPAP considered an AGP?

Bipap for routine sleep apnea is not considered an AGP. However, Bipap used for patients that are decompensating may be paired with rigorous bagging and eventual intubation. This combination would be recommended for negative

## Aerosol Generating Procedures:

- Bronchoscopy
- Intubation
- Extubation
- Open Suctioning
- Induced Sputum
- Bipap (not for sleep apnea)
- CPR
- Bedside tracheotomy
- HFNC: Optiflow, Vapotherm

*We will perform periodic review of new published COVID-19 information and provide updated guidance to ensure that our staff and employees are protected*

# Aerosol Generating Procedures (AGP) FAQs for Clinicians

The following chart depicts the time necessary to achieve 99.9% of room air exchange:

VUH/VCH UNITS	TIMEFRAME ROOM IS CLOSED TO ANOTHER PATIENT & ANYONE ENTERING ROOM WEARS PPE IF INDICATED
VCH 3 <sup>rd</sup> floor (All ORs, GI Lab, Cath Lab, Dental)	30 minutes
VCH Interventional Radiology	2 hours
VCH ICUs, ED and Inpatient Rooms (non- negative pressure)	2 hours
VCH ICUs, ED and Inpatient Rooms (negative pressure)	1 hour
VUH Diagnostic Cardiology (MCE 5 <sup>th</sup> floor)	2 hours
VUH ORs: FEL, MCE, 4 South	30 minutes
VUH Cardiac Cath Lab	30 minutes
VUH GI Lab	2 hours
VUH Interventional Radiology	2 hours
VUH Interventional Radiology ROOM 1078 only	30 minutes
VUH ICUs, ED and Inpatient Rooms (negative pressure)	1 hour
VUH ICUs, ED and Inpatient Rooms (non- negative pressure)	2 hours

Ventilation requirements for surgery and critical care areas.

Area designation	Air movement relationship to adjacent area <sup>2</sup>	Minimum air changes of outdoor air per hour <sup>3</sup>	Minimum total air change per hour <sup>4,5</sup>	All air exhausted directly to outdoors <sup>6</sup>	Recirculated by means of room units <sup>7</sup>	Relative humidity <sup>8</sup> (%)	Design temperature <sup>9</sup> (degrees F [C])
Operating/surgical cystoscopic rooms <sup>10,11</sup>	Out	3	15	–	No	30–60	68–73 (20–23) <sup>12</sup>
Delivery room <sup>10</sup>	Out	3	15	–	No	30–60	68–73 (20–23)
Recovery room <sup>10</sup>	–	2	6	–	No	30–60	70–75 (21–24)
Critical and intensive care	–	2	6	–	No	30–60	70–75 (21–24)
Newborn intensive care	–	2	6	–	No	30–60	72–78 (22–26)
Treatment room <sup>13</sup>	–	–	6	–	–	–	75 (24)
Trauma room <sup>13</sup>	Out	3	15	–	No	30–60	70–75 (21–24)
Anesthesia gas storage	In	–	8	Yes	–	–	–
Endoscopy	In	2	6	–	No	30–60	68–73 (20–23)
Bronchoscopy <sup>11</sup>	In	2	12	Yes	No	30–60	68–73 (20–23)
ER waiting rooms	In	2	12	Yes <sup>14,15</sup>	–	–	70–75 (21–24)
Triage	In	2	12	Yes <sup>14</sup>	–	–	70–75 (21–24)
Radiology waiting rooms	In	2	12	Yes <sup>14,15</sup>	–	–	70–75 (21–24)
Procedure room	Out	3	15	–	No	30–60	70–75 (21–24)

Please review more information here: <https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html>

# 1. Airborne Contaminant Removal

<https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1>

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency \*

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

\* This table is revised from Table S3-1 in reference 4 and has been adapted from the formula for the rate of purging airborne contaminants presented in reference 1435.

+ Denotes frequently cited ACH for patient-care areas.

§ Values were derived from the formula:

$$t_2 - t_1 = - [\ln (C_2 / C_1) / (Q / V)] \times 60, \text{ with } t_1 = 0$$

**Table 2**

Type of endoscopy procedures in relation to the use of PPE (standard or enhanced), manpower and frequency of gown down

Procedure	AGP	Standard PPE for non-suspected/test negative cases	Enhanced PPE for high risk/confirmed COVID-19	Endoscopist manpower	Endoscopy nurses manpower	Frequency of gown down
<b>OGD</b>	To be determined	Surgical mask or N95 Blue isolation gown Gloves Standard endoscopy room	N95 Blue isolation gown Gloves Goggles or face shield Negative pressure room	1 (at specialist level)	2	Mask: end of each session Gown: change when contaminated Gloves: after each case
<b>Colonoscopy</b>	To be determined	Surgical mask or N95 Blue isolation gown Gloves Standard endoscopy room	N95 Blue isolation gown Gloves Goggles or face shield Negative pressure room	1 (at specialist level)	2	Mask: end of each session Gown: change when contaminated Gloves: after each case
<b>ERCP</b>	To be determined	Surgical mask or N95 Blue isolation gown Gloves Standard endoscopy room	N95 Blue isolation gown Gloves Goggles or face shield Negative pressure room (with enough space and X-ray shielding)	1 (at specialist level)	2	Mask: end of each session Gown: change when contaminated Gloves: after each case
<b>Bronchoscopy</b>	Yes	N95 Blue isolation gown Gloves Goggles or face shield Negative pressure room	N95 Blue isolation gown Gloves Goggles or face shield Negative pressure room	1 (at specialist level)	2	Mask: end of each session Gown: change when contaminated Gloves: after each case

- AGP, aerosol generating procedure; ERCP, endoscopic retrograde cholangiopancreatography; OGD, oesophagogastroduodenoscopy; PPE, personal protective equipment.

## Implement a Respiratory Protection Program



<https://www.osha.gov/SLTC/respiratoryprotection/>

<https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134>

<https://www.cdc.gov/niosh/docs/2015-117/default.html>

<https://www.who.int/ihr/lyon/surveillance/infectioncontrol/en/>



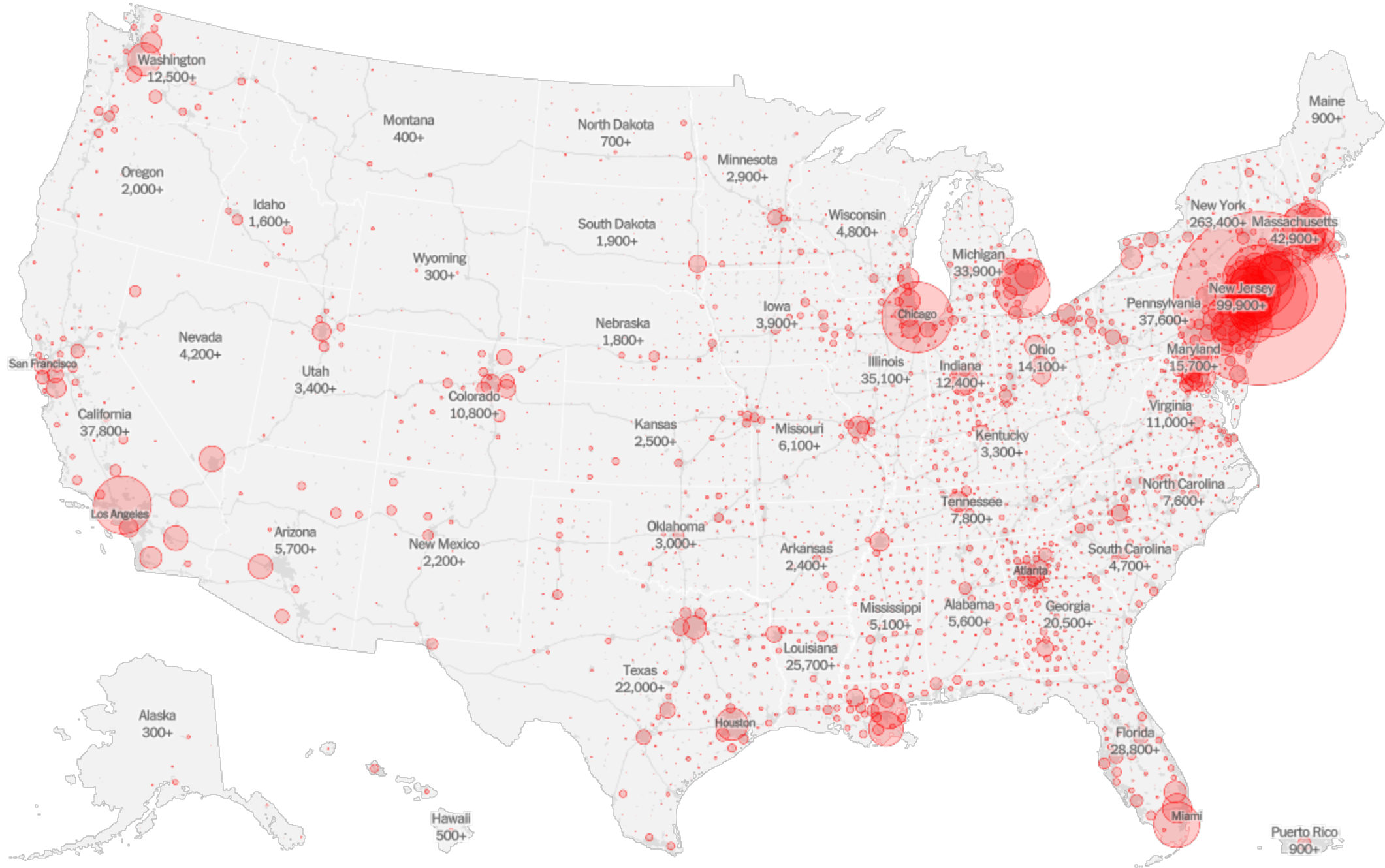
Mask Type	Standards	Filtration Effectiveness		
 Single-Use Face Mask	China: YY/T0969	<small>Open-Data Tests Smart Air SmartAirFilters.com</small> 3.0 Microns: ≥95% 0.1 Microns: ✗		
 Surgical Mask	China: YY 0469	3.0 Microns: ≥95% 0.1 Microns: ≥30%		
	USA: ASTM F2100	Level 1	Level 2	Level 3
		3.0 Microns: ≥95% 0.1 Microns: ≥95%	3.0 Microns: ≥98% 0.1 Microns: ≥98%	3.0 Microns: ≥98% 0.1 Microns: ≥98%
	Europe: EN 14683	Type I	Type II	Type III
3.0 Microns: ≥95% 0.1 Microns: ✗		3.0 Microns: ≥98% 0.1 Microns: ✗	3.0 Microns: ≥98% 0.1 Microns: ✗	
 Respirator Mask	USA: NIOSH (42 CFR 84) China: GB2626	N95 / KN95	N99 / KN99	N100 / KN100
		0.3 Microns: ≥95%	0.3 Microns ≥99%	0.3 Microns ≥99.97%
	Europe: EN 149:2001	FFP1	FFP2	FFP3
		0.3 Microns: ≥80%	0.3 Microns: ≥94%	0.3 Microns: 99%

**3.0 Microns:** Bacteria Filtration Efficiency standard (BFE).

**0.1 Microns:** Particle Filtration Efficiency standard (PFE).

**0.3 Microns:** Used to represent the most-penetrating particle size (MPPS), which is the most difficult size particle to capture.

**✗:** No requirements.





# COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)



Total Confirmed

# 2,682,225

Confirmed Cases by  
Country/Region/Sovereignty

- 856,209 US
- 213,024 Spain
- 189,973 Italy
- 157,135 France
- 151,285 Germany
- 139,246 United Kingdom
- 101,790 Turkey
- 87,026 Iran
- 83,878 China
- 62,773 Russia

Admin0

Last Updated at (M/D/YYYY)  
4/23/2020, 2:31:23 PM



[Cumulative Confirmed Cases](#) | 
 [Active Cases](#) | 
 [Incidence Rate](#) | 
 [Case-Fatality Ratio](#) | 
 [Testing Rate](#) | 
 [Hospitalization Rate](#)

# 185

countries/regions

Lancet Inf Dis Article: [Here](#). Mobile Version: [Here](#).  
 Lead by JHU CSSE. Automation Support: [Esri Living Atlas team](#) and [JHU APL](#). [Contact US](#). [FAQ](#).

Total Deaths

# 187,330

- 25,549 deaths Italy
- 22,157 deaths Spain
- 21,856 deaths France
- 18,738 deaths United Kingdom
- 15,074 deaths New York City **New York US**

Deaths | Recovered

Total Test Conducted in U.S.

# 4,493,106

- 669,982 tested New York US
- 465,327 tested California US
- 288,627 tested Florida US
- 216,783 tested Texas US
- 191,659 tested New Jersey US

US Tested



Confirmed | Logarithmic | Daily Cases

As always please be sure to check your local and state  
DPH site, the CDC and WHO for updates.