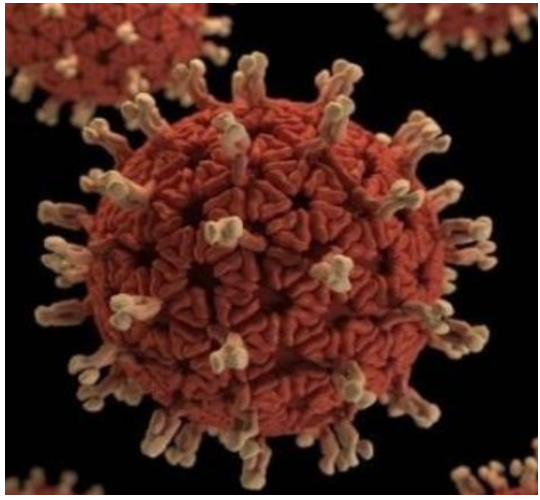


RESTARTING YOUR LAB
A PATHWAY TO RESUMING DIAGNOSTIC TESTING DURING COVID-19

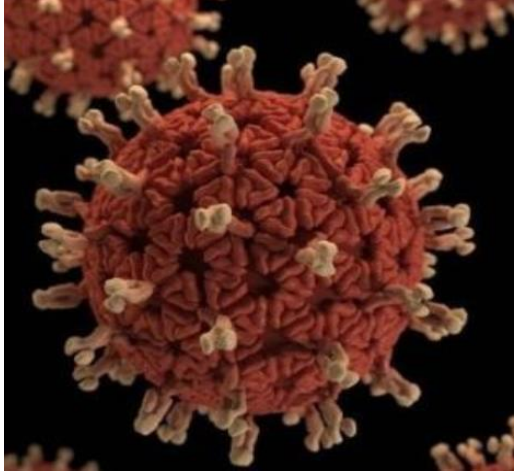
Matt O'Brien MS RRT RPFT FAARC

May 5, 2020

BACKGROUND / DISCLOSURES

- I manage the pulmonary labs at the University of Wisconsin Hospital and Clinics in Madison Wisconsin
- We have approximately 12 staff that cover 4 separate testing sites in the Madison area.
- We have been doing “essential” testing and are in the process of restarting our lab.
- We use a variety of vendor equipment for clinical and research related applications.
- References will be made to a variety of equipment types and are for example only.

CONSEQUENCES… COVID-19



Preparedness phase

Patient surge phase

Global pandemic

Sickness, Death

Economic pandemic

Job losses
Business failures

Hospital pandemic

De-escalation or reopening phase

Loss of revenue,
Staff layoffs and pay cuts

WHY THIS TALK?

- This is a historic event for everyone and especially for respiratory care.
- There are many unknowns about the SARS-CoV-2, (COVID-19) virus, its transmission, and ***how*** to safely proceed with pulmonary testing.
- Cardiopulmonary labs, clinics and research facilities all need guidance to restart services.
- To avoid further transmission, we need to proceed with caution and focus on safety.
- ***When*** is it likely safe to resume testing?

ANSWERING WHEN…IS NOT SIMPLE

OBJECTIVES: RESTARTING PULMONARY DIAGNOSTICS-DURING COVID-19

- Review of **ATS *initial, expected and ERS*** guidance.
- Consider your location: Is the prevalence high or low?
- Explore strategies to help you safely restart diagnostic testing.
- How does the CDC define an aerosol generating procedure?
- Discuss when it is wise to obtain a negative COVID-19 test prior to seeing at patient?
- What infection control practices make sense for pulmonary diagnostics and COVID-19.
- Equipment and testing considerations.
- What role can remote monitoring / telemedicine play?

INITIAL GUIDANCE ATS

Advice Regarding COVID 19 For Pulmonary Function Laboratories

Concern has been raised that pulmonary function testing could represent a potential avenue for COVID 19 transmission due to the congregation of patients with lung disease and because of the potential for coughing and droplet formation surrounding pulmonary function testing procedures. We recognize that most patients are screened for symptoms and travel before entry into our health care systems, but it is more difficult to screen and assess pulmonary patients who are more likely to have respiratory symptoms unrelated to COVID 19. There remain many unknowns about the possibility of transmission in this setting and the data are in evolution; however, the risks of transmission may be significant, and likely vary based on the prevalence of the virus in the community and the age, severity of lung disease and presence of immunosuppression.

We recommend that pulmonary function testing be limited to tests that are only essential for immediate treatment decisions, that the type of pulmonary function testing be limited to the most essential tests when possible, and that measures to protect both the staff and individuals being tested should be put in place. Protective measures include personal protective equipment (PPE) that limits aerosolized droplet acquisition for staff and enhanced cleaning of the testing space such as wiping down surfaces with appropriate cleaners. Use of PPE should be considered in discussions with your infection control team.

Decisions regarding the conduct of pulmonary function tests need to balance the potential risks against the need for assessment of lung function to make treatment decisions. We realize that this is an evolving situation and that the risk/benefit ratio will also continue to change over time.

Meredith C. McCormack, MD MHS

David A. Kaminsky, MD

2020 members of the ATS Proficiency Standards for Pulmonary Function Testing Committee

March 2020

KEY POINTS OF INITIAL RECOMMENDATION

- PFT testing could represent an avenue for transmission, because of congregation of patients, coughing and droplet formation surrounding PFT procedures.
- Risk may be significant based on the prevalence, age, severity of lung disease and presence of immunosuppression.
- Limit testing to essential for immediate treatment decisions
- **Limit type of testing to essential.**
- Implement measures to protect patients and staff.
- Use appropriate PPE
- Enhanced cleaning of testing spaces
- Balance potential risk against need for assessment of lung function to make Rx decisions.
- Risk benefit ratio will change over time

OUR EXPERIENCE

- We limited testing to “essential” or urgent testing needed for immediate treatment decisions.
- Over the last 2 months we performed testing on 143 patients / 303 procedures using minimal staff
- We implemented full PPE during all testing (N95, face shield, gown, gloves, and changed the pneumotach out between each patient.
- We ran a HEPA filter in the PFT testing rooms.
- Patients were not required to have a nasal swab test for COVID-19.

DEVELOPING YOUR PLAN TO SAFELY OPEN YOUR PULMONARY OR CPX LAB

- **Prevalence:** In the local community/surrounding areas.
- **Patients:** Prescreen using current recommendations.
- **Equipment:** Implement additional safety measures to minimize the potential for cross contamination.
- **Testing environment**: Find solutions to reduce aerosol contamination (patient, nebulizers)
- **Time**: Allow extra time between patients for disinfection practices and reduce PPE fatigue.
- **Review / update your plan as conditions change.**

SHOULD PATIENTS SCHEDULED FOR A "PFT" BE REQUIRED TO HAVE A NEGATIVE COVID TEST PRIOR TO THE VISIT?

- **It depends…**
- What specific PFT test is ordered?
- Is the procedure considered "aerosol generating" by CDC?
- Is the patient symptomatic?
- What is the **local** prevalence of COVID-19?
- Does prescreening suggest a high or low risk patient or community for infection?
- What is your infection control department guidance?

THE LOCAL PREVALENCE OF COVID-19

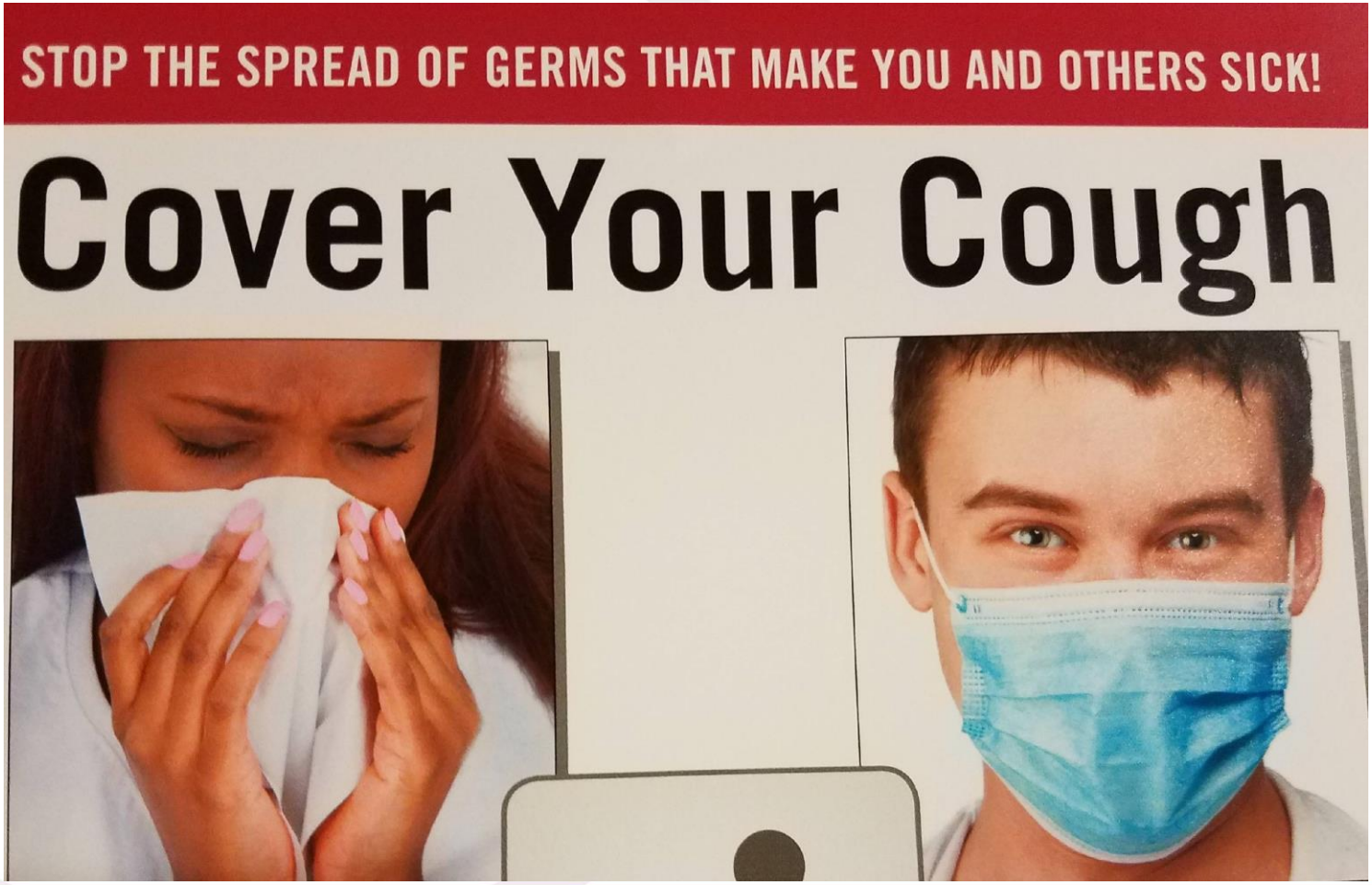
- **What is going on in your area?**

LAST UPDATE 5/3/2020, 10AM

Market Statistics		
	Confirmed Cases	**Deaths**
Dane County	438	22
Wisconsin	7,660	334
United States	1,140,100	66,490
World	3.4M+	243,884

** Source: New York Times Dashboard, Dane County COVID-19 Dashboar*

WHAT IS AN AEROSOL GENERATING PROCEDURE?



AEROSOL GENERATING PROCEDURES (AGP)

Which procedures are considered aerosol generating procedures in healthcare settings? –

Some procedures performed on patients are more likely to generate higher concentrations of infectious respiratory aerosols than coughing, sneezing, talking, or breathing. These aerosol generating procedures (AGPs) potentially put healthcare personnel and others at an increased risk for pathogen exposure and infection.

Development of a comprehensive list of AGPs for healthcare settings has not been possible, due to limitations in available data on which procedures may generate potentially infectious aerosols and the challenges in determining if reported transmissions during AGPs are due to aerosols or other exposures.

There is neither expert consensus, nor sufficient supporting data, to create a definitive and comprehensive list of AGPs for healthcare settings.

CDC.gov

AEROSOL GENERATING PROCEDURES PER THE CDC

Commonly performed medical procedures that are often considered AGPs, or that create uncontrolled respiratory secretions, include:

- open suctioning of airways
- sputum induction
- cardiopulmonary resuscitation
- endotracheal intubation and extubation
- non-invasive ventilation (e.g., BiPAP, CPAP)
- bronchoscopy
- manual ventilation

CDC.gov

ARE ALL AEROSOLS INFECTIOUS?

Based on limited available data, it is uncertain whether aerosols generated from some procedures may be infectious, such as:

- nebulizer administration*
- high flow O2 delivery

*Aerosols generated by nebulizers are derived from medication in the nebulizer. It is uncertain whether potential associations between performing this common procedure and increased risk of infection might be due to aerosols generated by the procedure or due to increased contact between those administering the nebulized medication and infected patients.

References related to aerosol generating procedures:

Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J (2012) Aerosol Generating Procedures and Risk of Transmission of Acute Respiratory Infections to Healthcare Workers: A Systematic Review. PLoS ONE 7(4); https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3338532/#!po=72.2222).

CDC.gov

ATS: The use of MDIs should be used when at all possible to minimize the risk of excess aerosol that maybe infectious

PATIENT & COMMUNITY RISK

Low

- No new symptoms
- History of self monitoring.
- No known contact with someone who was ill.
- Symptoms of cough or sputum production are consistent with the known or underlying chronic disease process.
- Local ID and Public Health report local prevalence is reduced

High

- New or multiple symptoms
- Family member is / was ill.
- Temp was 100 or greater recently or on arrival.
- Nursing home or long term care worker or resident.
- Food processing plant
- “Essential” worker
- Multi family household?

TWO APPROACHES: TO DECIDE WHETHER TO SCHEDULE A COVID TEST PRIOR TO PFT VISIT

#1

- Consider all cardiopulmonary testing to be aerosol generating procedures:
- Require a negative COVID test prior to pulmonary testing.

#2

- Assess each patient and visit carefully for risks and probability.
- Aerosol generating procedure: Obtain test for COVID prior.
- Higher probability: Obtain test for COVID prior.
- Low probability: Pre-screen and use appropriate PPE

TESTS WE PERFORM

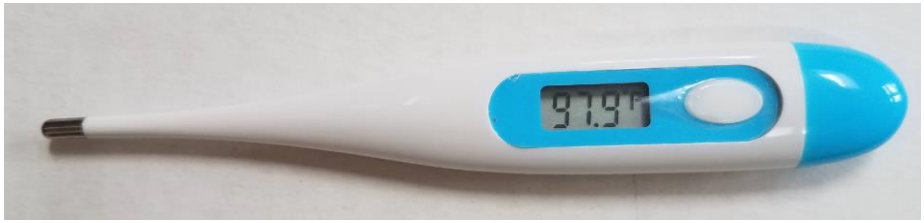
- **Spirometry** pre/post
- Lung volumes (Pleth & Dilutional)
- **Diffusion**
- ABG
- 6MWT
- RMF
- LCI
- Shunt / HAST
- Breath hydrogen testing
- Sputum induction
- Pentamidine administration
- Bronchoprovocation
  - Methacholine challenge
  - Exercise
  - EIB w/cold air
  - Mannitol
- Cardiopulmonary exercise (VO2)
- Metabolic testing (REE)

Text in red are procedures I feel fall into the category of known or potential aerosol generating procedures because of high ventilation and risk of significant coughing

PRESCREENING THE PATIENT

SYMPTOM PRE-SCREENING **PATIENTS** AND STAFF

- Fever (100◦F or higher)
- Chills
- Cough
- Sore throat
- Shortness of breath/chest tightness
- Loss of taste or smell
- Runny nose
- Nasal congestion
- Headache
- Severe fatigue/exhaustion
- Muscle pain



Be on the alert for any new and unexplained symptoms

PRE-SCREENING PATIENTS PRIOR TO PFTS

- Form is completed for each patient
  - EMR
  - Phone screening
  - Is testing requested appropriate or needed?
  - Consult ordering provider if patient has high risk factors

MGC DIAGNOSTICS®

Pre-Screening Patients for Pulmonary Testing
Assessing for low or high-risk patient and low or high-risk community.

Patient name_____

Type of testing requested_____Dx_____

Provider requesting testing_____

Review of EMR: Date/Time of access _____

State of residence _____City _____ County _____

Previous result found for COVID-19 test _____ Date_____

Previous PFT testing? Type_____ Date of testing: _____

Phone Screening: Are your self-monitoring? _____Do you practice social distancing? _____

Living situation: Lives alone Lives with partner Family/ Multi-family Group/Nursing home

Are / were any family members ill recently? _____

Occupation: _____

Are you considered an "essential worker"? _____

Location of employment: City/State _____

Were any of your co-workers ill recently or dx /screen for COVID-19? _____

Travel history – past 6 weeks _____

Symptom Review

- Fever (100◦F or higher)
- Chills
- Cough
- Sore throat
- Shortness of breath/chest tightness
- Loss of taste or smell
- Runny nose
- Nasal congestion
- Headache
- Severe fatigue/exhaustion
- Muscle pain

Assessment: **Low risk patient** **Low risk community** **High risk patient** **High risk community**

SHOULD WE PERFORM PULMONARY FUNCTION TESTING ON PATIENTS SUSPECTED OR + FOR COVID-19?

NO... Wait until after they recover and have a negative test.

SHOULD WE PERFORM PULMONARY FUNCTION TESTING ON PATIENTS WHO HAVE FLU LIKE SYMPTOMS?

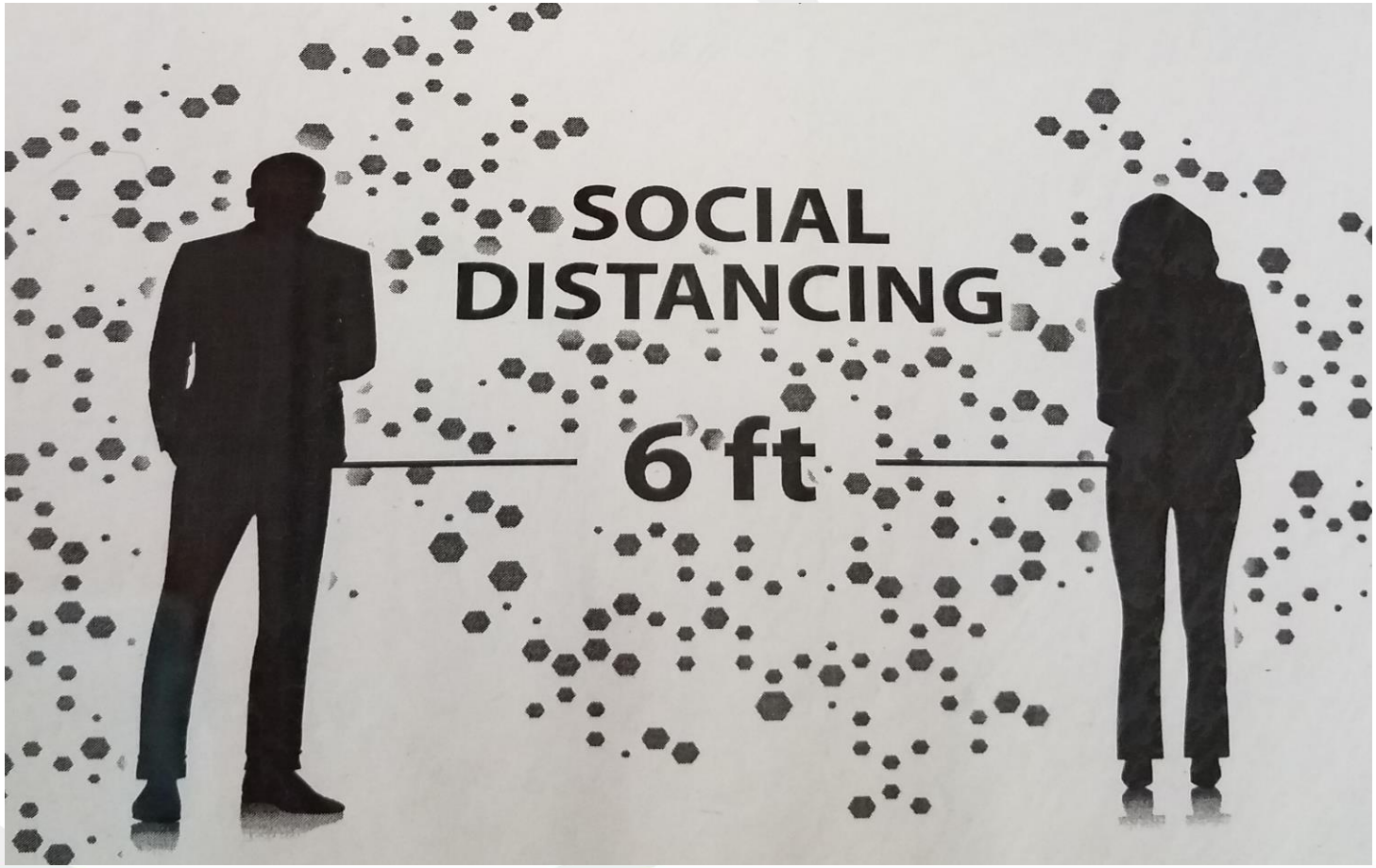
NO…

Wait until after they recover and have a negative test.

SCREENING WHEN THE PATIENT ENTERS THE CLINIC OR HOSPITAL

- Self monitoring?
- New symptoms?
- Temperature?

ENABLE SPACE FOR SOCIAL DISTANCING WHEN CHECKING IN AND IN SEATING AREAS



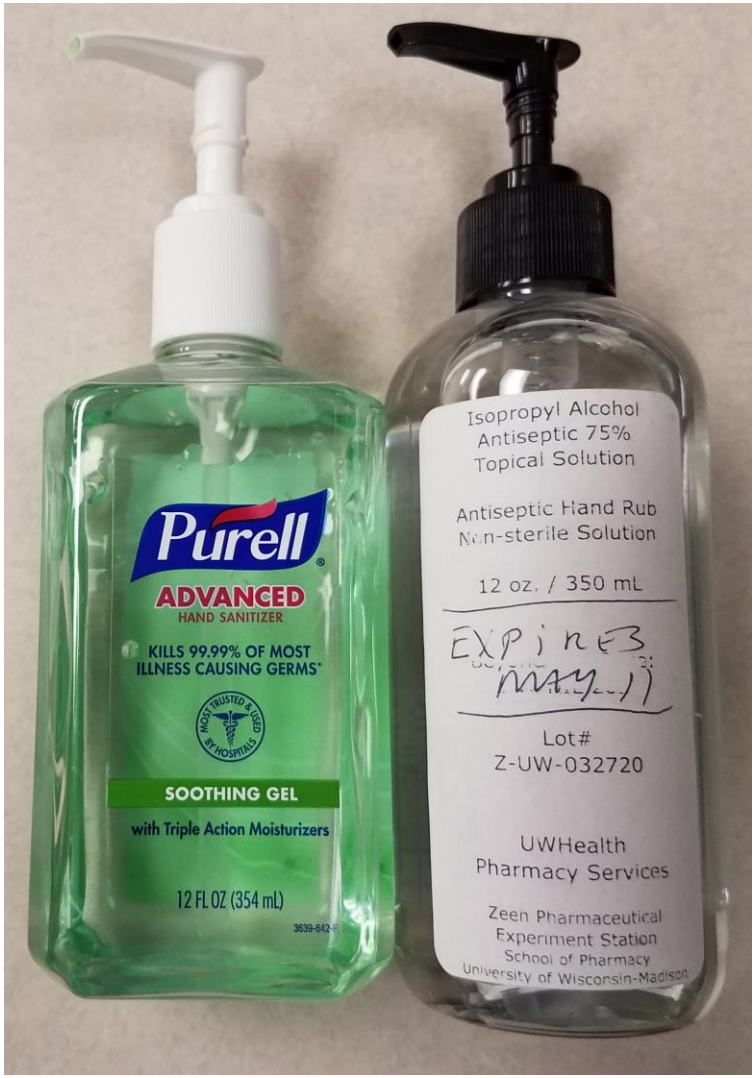
THE PATIENT WAITING AREAS

Rearrange furniture or tape off areas in patient waiting areas

STAFF WORKSTATIONS SHOULD ALSO BE SEPARATED

HAND HYGIENE

- Patients and staff should perform wash hands or gel prior to and at end of testing.
- Gel in / Gel out!



PERSONAL PROTECTIVE EQUIPMENT

- High risk patients and communities require full PPE: N95 mask, face shield, gown and gloves.
- Low risk patients / communities require a surgical mask

FILTERS SHOULD BE USED

- Exceptions include:
  - disposable ultrasonic mouthpiece / flow sensors.
  - During a CPX test
  - Dosimeters

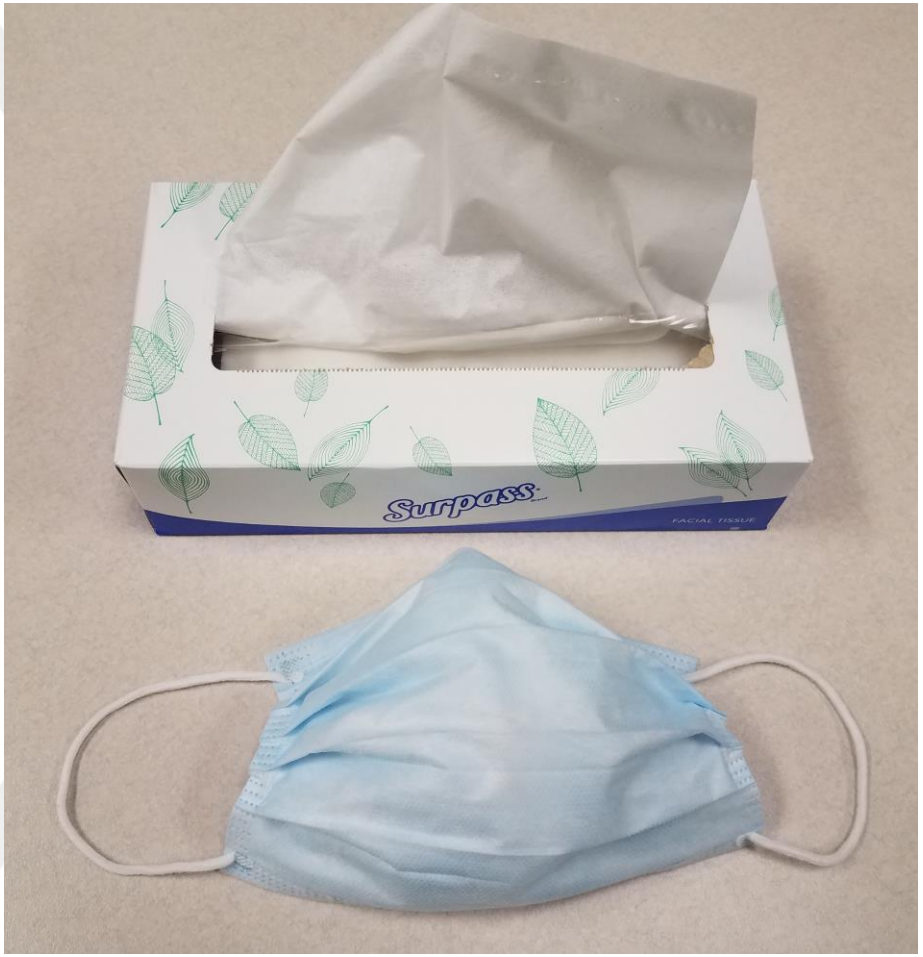
SOCIAL DISTANCING DURING SPIROMETRY IS POSSIBLE

- Consider cable length
- Most vendors offer ample cable length.

MGC CPF/D: 10 feet with USB cable

PRACTICE SAFE SPIROMETRY

- Maximize distance when possible
- Use a filter
- Instruct patient to wear mask between breathing maneuvers
- Cough etiquette
- Have tissues ready or dispense ahead of time



SOCIAL DISTANCING BODYPLETHYSMOGRAPHY

- Bodyplethysmography…depends on your system

CARDIOPULMONARY EXERCISE TESTING

- **Social distancing is more challenging.**
- Umbilical length is approximately 8 feet long.
- Increased risk of droplet contamination because of high ventilatory rates.
- No filter during CPX testing

6MWT
SOCIAL DISTANCING IS POSSIBLE

- The blue tooth communication to a device/tablet will enable distancing for some patients.

WIRELESS SPIROMETRY
ANOTHER TOOL TO AID IN DISTANCING

- There are several devices on the market that communicate via blue tooth.

FENO

- Controversies exist regarding filter efficiency
- Some devices include inspiratory and expiratory efforts, others are expiratory only.
- Additional evaluation is needed. (Double filter media?)

EQUIPMENT INFECTION CONTROL

CDC GUIDANCE
DISINFECTION OPTIONS

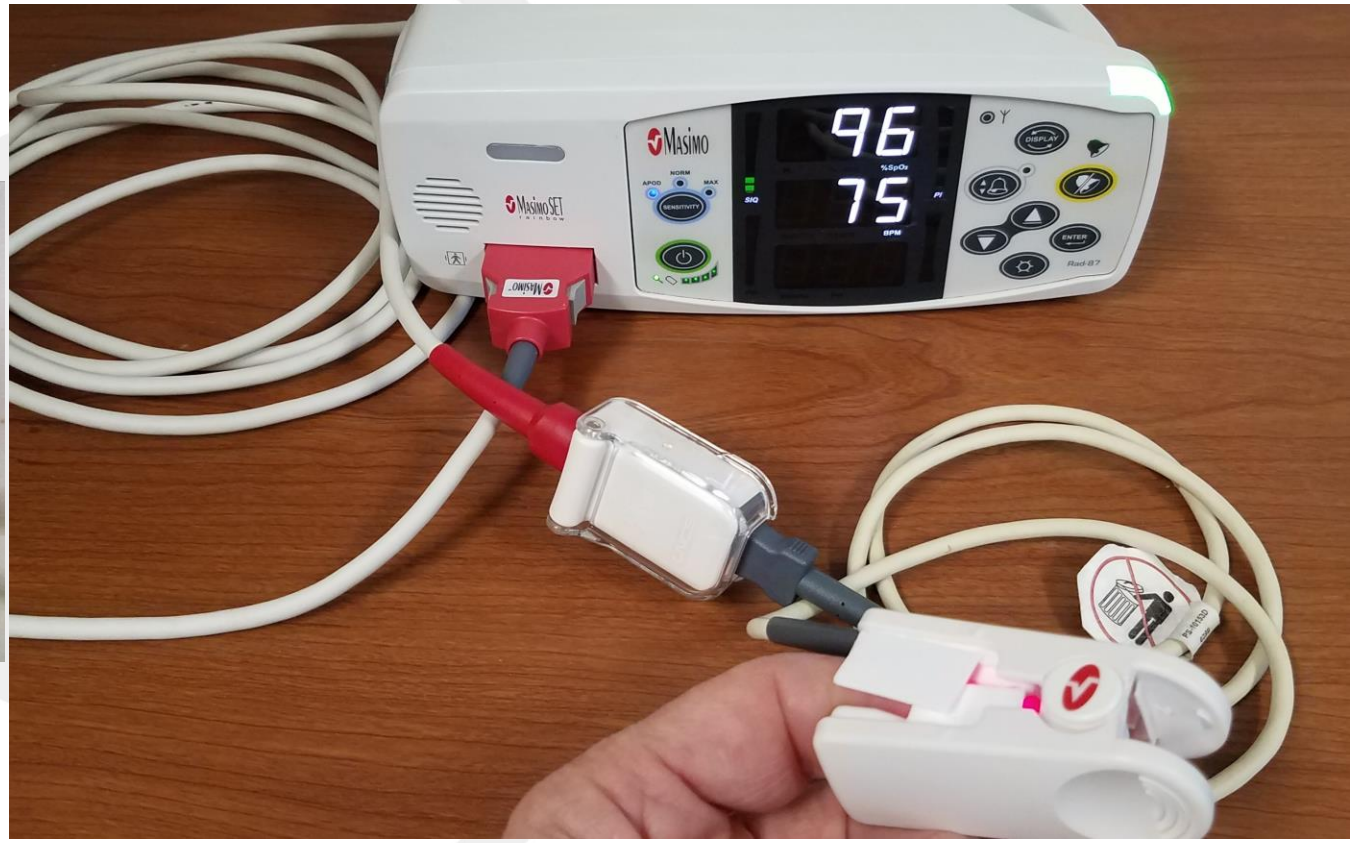
A Few Important Reminders about Coronaviruses and Reducing the Risk of Exposure:

- Coronaviruses on surfaces and objects naturally die within hours to days. Warmer temperatures and exposure to sunlight will reduce the time the virus survives on surfaces and objects.
- Normal routine cleaning with soap and water removes germs and dirt from surfaces. It lowers the risk of spreading COVID-19 infection.
- Disinfectants kill germs on surfaces. By killing germs on a surface after cleaning, you can further lower the risk of spreading infection. EPA-approved disinfectants are an important part of reducing the risk of exposure to COVID-19. If disinfectants on this list are in short supply, alternative disinfectants can be used (for example, 1/3 cup of bleach added to 1 gallon of water, or 70% alcohol solutions).

CDC.gov


Kills
C. difficile§
spores in
3 minutes
CLOROX
HEALTHCARE®
Germicidal Wipes
Germicidas con Blanqueador
• Ready-to-Use
One-Step Cleaner and Disinfectant
• Reduces the Risk of
Cross-Contamination on
Treated Surfaces
NET WT 1 LB 10 OZ (737 g)
0619045 2028 8251-0H-001
EXP 14APR20
CaviWipes
disinfecting
towelettes
• TUBERCULOCIDAL
• BACTERICIDAL
• VIRUCIDAL*
• FUNGICIDAL
Metrex™
Net Contents: 1 lb. 13 oz.
160 Pre-Saturated Towelettes (6" x 6.75")
70% ALCOHOL

PULSE OXIMETRY



High touch surfaces need cleaning after each patient

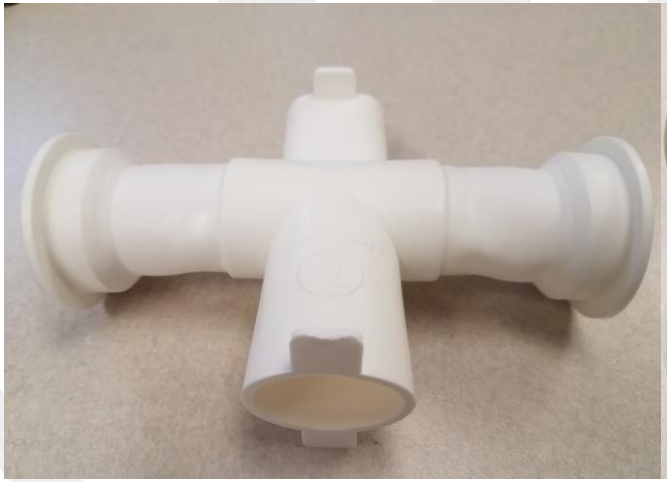
FLOW SENSING DEVICES

- Follow the manufacture recommendations for cleaning / use.
- Wipe off any high touch surfaces with a disinfecting wipe.
- Allow adequate contact time
- Several are single patient use.

THE BREATHING CIRCUIT OR ASSEMBLY

- **Follow the manufacture recommendations for cleaning.**

- If you are testing a high risk patient or are in an area of high prevalence you could change out between patients.



SAMPLE LINES

Gas sample lines **aspirate** gas during rapid gas analysis for:

- PFT
  - DLCO
- Gas exchange
  - VO2 max
  - REE
- Lung clearance index

- Wipe tip of sampling connection / interface.
- If contaminated with secretions blow out from reverse side.
- Do not flush with alcohol.
- Avoid saturating naphion with disinfecting wipes

INFECTION CONTROL RELATED TO THE TESTING ENVIRONMENT

Relating to the recommendations used for performing PFTs given a diagnosis of Cystic Fibrosis

1. Negative pressure rooms
2. HEPA filtration
3. 30 min wait between patients

AIRBORNE ISOLATION INFECTION ROOMS (AIIRS)

- AIIRs are single-patient rooms at negative pressure relative to the surrounding areas, and with a minimum of 6 air changes per hour (12 air changes per hour are recommended for new construction or renovation).
- Air from these rooms should be exhausted directly to the outside or be filtered through a high-efficiency particulate air (HEPA) filter directly before recirculation.
- Room doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized.
- Facilities should monitor and document the proper negative-pressure function of these rooms.

CDC.gov

PFT NEGATIVE PRESSURE ROOMS

True negative pressure rooms should have an indicator just outside of the room.

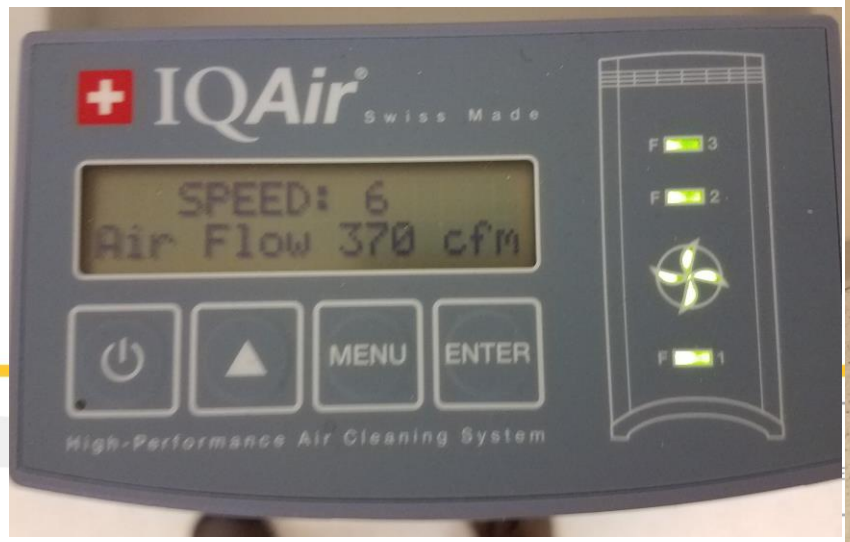
WOULD TESTING OF A PATIENT CONSIDERED A HIGH RISK PATIENT OR IS FROM A HIGH RISK COMMUNITY NEED TO BE TESTED IN A ROOM CAPABLE OF NEGATIVE PRESSURE?

YES*

*According to the expected ATS recommendation… I suggested, "**or in a room using a hospital grade HEPA filter".**

HEPA FILTRATION

- Multiple manufactures of hospital grade devices
- Portable
- Variable fan settings
- Cost ~$1,800 each
- Is this required?



EXTRA MEASURES TO CONSIDER FOR THE TESTING ENVIRONMENT

UVC Light Room Disinfection

- Performed by hospital environmental services department.
- Multiple cycles of light over 15-30 minutes.
- Done once per week
- Cost prohibitive for most.
- Is this essential?

TELEMEDICINE AND REMOTE MONITORING

- Telemedicine is now a vital tool.
- Home spirometry has evolved significantly
- Costs for home spirometers vary depending on:
  - Design
  - Accuracy
  - Parameter outputs
  - Connectivity to a portal

GoSpiro® - Features

- The ONLY turbine spirometer that meets ATS/ERS Low Flow Requirements for accurate Lung Function measurements.
- The ONLY spirometer that meets the new ISO60601-1-11 stringent Home Use Standard
- The ONLY home spirometer with automated Slow Spirometry measurements for tracking lung volume diseases
- The ONLY real-time spirometry coaching with post-test review Avatar-Assisted technology for the home and the clinic
- Interfaces to computers, tablets, smartphones, and other data collection hubs

MGC DIAGNOSTICS®

EXAMPLE: PLAN ON RESTARTING

EXAMPLE PLAN

Restarting the Pulmonary Function Labs During COVID-19

Matt O'Brien MS RRT RPFT May 3, 2020

As ancillary clinics open back up and we are approved to move from essential only pulmonary testing to all testing, we plan on implementing the following strategy to protect staff as well as patients we see.

Prevalence in Dane County, Madison Wisconsin: The local prevalence of COVID-19 is considered low by infectious disease.

Pre-screening: We will prescreen each patient several days prior to testing for appropriateness and assessment of risk. If high risks are identified, we will consult with the ordering provider or our medical director for further evaluation and coordination of nasal swab COVID-19 testing prior to the visit.

Protective Pulmonary Function Testing: Given the fact that persons can be symptom free with COVID-19, we to treat everyone we test as if they might be positive.

During and after testing:

- All staff need to wear PPE, specifically a N95 mask, face shield, gown and gloves.
- Test all high-risk patients in a room that has negative airflow or a portable HEPA filtration unit.
- Instruct the patient to gel or wash hands prior to testing to reduce potential contamination of equipment surfaces they may touch.
- After testing, when a HEPA filter is available, close the door to the room and run the HEPA filter on the high setting for at least 15 minutes. When negative pressure rooms or HEPA filtration is not an option, wait 30 minutes between patients.

PFT equipment

Filters: Single use filters will be used with each patient. Removal of the filter should be done with a gloved hand and wipe down all surfaces touched by the patient with disinfecting wipes (allow for appropriate contact time)

Flow sensors: Replace PFT flow sensors between each patient and recalibrate. Disinfect flow sensor with 70% isopropyl alcohol and allow to air dry.

Pulse oximeters: Wipe with disinfecting wipes after each use.

PFT patient-system contact tracing: Staff will indicate on the PFT report which test system each patient was tested on to enable contact tracing if a patient tested in the lab later becomes diagnosed with the virus.

UV Light Sterilization: Each pulmonary lab room in the CSC are treated with UV Light treatment once a week.

- Work with your hospital infectious disease and local public health authority to determine prevalence in your area.
- Hospital based labs may need to obtain approval from administration.
- All staff should be trained regarding the approved plan to prevent resurgence.

ATS *EXPECTED* RECOMMENDATIONS –13 SLIDES

Expected ATS Recommendations

Four General Recommendations

#1: Understand the prevalence of COVID-19 in your community and those from which referrals may be coming from

Expected ATS Recommendations

Community Prevalence

In high prevalence communities testing must be more restrictive, testing should be done only if absolutely necessary

A negative COVID-19 test is less reliable in a high prevalence community because there are a greater number of false negative subjects in the community

Expected ATS Recommendations

Community Prevalence

In low prevalence communities a negative COVID-19 test is more reliable because there are fewer false negative subjects in the community

Under these conditions pulmonary function testing may be less restrictive

Expected ATS Recommendations

Community Prevalence

Community prevalence should be determined by consultation with local infectious disease and public health authorities

Under no circumstances should COVID-19 + patients or those with flu-like symptoms be tested

Expected ATS Recommendations

Four General Recommendations

#2 Weigh the risks/benefits of PFTs

Pathogen Exposure vs. Clinical Importance

Expected ATS Recommendations

Weigh the risks/benefits of PFTs

Some Examples of Essential PFTs

- Evaluate transplant or resection candidacy
- Monitor for bronchiolitis obliterans syndrome in transplant patients
- Preoperative risk stratification
- Diagnosis of idiopathic or complex dyspnea
- Monitor patients at risk for drug-related pulmonary toxicity

Expected ATS Recommendations

Four General Recommendations

#3 Only perform tests that are essential

Expected ATS Recommendations

Only perform tests that are essential

- Spirometry with or without DL_{CO}
- If post BD testing is necessary, MDIs are preferred over nebulizers
- Lung volumes less frequently affect clinical decision-making
- Bronchoprovocation and exercise tests should be post-postponed if possible due to the higher risk of aerosol production from high minute ventilation and coughing
- Consider home spirometry for patients requiring on-going surveillance

Expected ATS Recommendations

Four General Recommendations

#4 Appropriate precautions and disinfection procedures must be followed

Expected ATS Recommendations

Appropriate precautions and disinfection

- Video-based language interpreters are recommended
- Patients and staff must clean their hands before and after testing
- Filters must be used
- Instruct the patient in cough etiquette and provide tissues *before* testing begins
- Patients should wear surgical masks when not performing a testing maneuver

Expected ATS Recommendations

Appropriate precautions and disinfection

High Risk Patients/High Risk Communities

- Testing should be done in a negative pressure room
- Staff should wear full PPE including N95 mask, gown, gloves, and face shield

Expected ATS Recommendations

Appropriate precautions and disinfection

Low Risk Patients/Low Risk Communities

- Staff should wear a surgical mask during testing to avoid exposure to aerosols

Expected ATS Recommendations

Appropriate precautions and disinfection

- Equipment should be disinfected according to the manufacturer's instructions
- Local policy should dictate cleaning procedures between patients, and time allotted between patients to allow adequate room ventilation

KEY POINTS OF THE ERS RECOMMENDATIONS

Pandemic phase (Postpone all routine testing)	High community prevalence	Level 1 safety recommendations (Full PPE)
Limit testing to Spiro and DLCO Telemedicine for remote testing with video coaching		Test in a neg pressure room Eye protection: goggles or face shield Gloves Hand hygiene protocols for patient and staff. HEPA filters are NOT recommended (viral colonization)

KEY POINTS OF THE ERS RECOMMENDATIONS

Post Peak phase (All testing can be reintroduced with extra precautions including: Exercise testing, nebulization, Bronchoprovocation.)	Low community prevalence	Level 2 safety recommendations Full PPE and mask guided by locate policy

- Use filters to minimize escape of aerosol from exhalation ports when using nebulizers.
- Filters for CPX testing suggested but not recommended (Full PPE)

KEY POINTS OF THE ERS RECOMMENDATIONS

- Screening patient referrals and prioritize patients. Use triage questionnaire.
- Reorganize waiting areas, testing rooms, staff spaces to minimize transmission of the virus. (IP / OP space)
- Ventilate room (min 15 min)
- Recalibrate equipment after decontamination.
- HEPA Filters not recommended because of possible viral colonization.
- Spiro devices without filters should be adapted to accommodate a filter.
- Post Pandemic Phase –Level 3 safety (return to normal)

ERS TRIAGE QUESTIONNAIRE

Appendix 1. Example of a Triage questionnaire:

Date and time of triage	Vital and epidemiological data														
	Body Temp.	Cold symptoms		Cough		Malaise, fatigue		Diarrhoea		Conjunctivitis		Throat (sore, ache,...)		Family history or respiratory illness in last 14 days	
	Result	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	Quantitative and qualitative anomalies of taste /smell									COVID-19 Swab PCR Result (if available)					Other information
	YES			No						Positive		Negative			
Details															

Full Name	
Date of Birth	
Contact number	
Contact number of accompanying person (if needed)	
Full Name	
Date of Birth	
Contact number	
Triage MD (so notification of positive status)	
Full Name of MD	
Signature of MD	
Actions (mark one):	
Patient is OK, no need for COVID brush	
Patient is possible COVID positive; isolation till nasopharyngeal brush result is available	
Patient is very probable COVID19 positive; isolation till nasopharyngeal brush result is available	

This Triage questionnaire was kindly provided by Professor Matjaž Fležar, MD PhD, Specialist in Pulmonology and Internal medicine.

MGC DIAGNOSTICS®

HOW WILL COVID-19 CHANGE PULMONARY DIAGNOSTICS?

- The volume of testing and FTE may decrease.
  - Ordering frequency and scope of testing
  - Additional time for:
    - Prescreening patients
    - Appropriate PPE
    - Room and equipment cleaning

- The ease of equipment cleaning related to infection control - will be more important.

- Negative pressure rooms for all hospital PFT rooms will be the norm.

REVIEW

- Know the prevalence of the virus in your area and the surrounding areas.
- Develop a method to prescreen patients in advance of testing.
- Considering your testing environment; are you allowing enough time for appropriate disinfection?
- Considering your PFT or CPX equipment: what additional steps can be implemented to enhance patient safety?
- Perform only essential testing when in an area of high prevalence.
- Keep up to date regarding additional recommendations from the CDC, ATS and ERS.

THANK YOU

- MGC DIAGNOSTICS
- Jeff Haynes for expected ATS recommendations
- EVERYONE IN ATTENDANCE

Matthew J. O'Brien MS RRT RPFT FAARC

Common Cannister Method Bronchodilator Administration

Multi-use Albuterol MDI instructions in ED Aka the "common cannister method" COVID 19

To conserve on MDI medication, the ED will be using common cannister practice. This will allow RT to utilize the same MDI on multiple patients and cleaning the MDI in between patients while in the ED.

MDI will be dispensed from the acudoses.
Medication scanning practice will continue in the same manner.
MDI will be used with a personal spacer.
Cavi wipe the plastic holder before and after patient use.
Cavi wipe the MDI canister when placing into and removing from the plastic holder.

If the MDI does not come with a counter, RT will monitor the puffs given and record on the MDI counter card.

RT will notify pharmacy when MDI gets to ≤ 20 puffs .

Soak in a bleach solution: 10% bleach 90% sterile water for 10 minutes. Rinse with sterile water and then rinse with 70% isopropyl alcohol. Blow out opening thoroughly with oxygen or compressed air.

SAFE HANDLING OF LAUNDRY FROM WORK

- Transport clothes in a plastic bag if removed prior to exiting the healthcare environment.
- Perform hand hygiene after handling dirty laundry
- Wash and dry laundry at the highest temp the fabric can stand to kill germs
- When providing direct care to COVID-19 or persons of interest patients; remove scrubs/work attire either at the end of a shift or immediately after arriving home. Place clothes in plastic bag for 48 hours before laundering. Throw away plastic bag-do not reuse.