

# Return to Work Strategies

## Introduction

With the introduction of COVID 19 in the United States in the first quarter of 2020, we have seen an unprecedented upheaval of social processes and a dramatic response to control of this deadly organism. A number of key points have emerged that have created a somber and sobering re-evaluation of many of the basic functions of society and the “new normal” moving forward that are particularly important for employers. These include the following:

### The COVID virus itself

- This virus appears to be highly infectious, being easily transmitted from one individual to another. For every individual infected some three to five other individuals can subsequently be infected. This number is referred to as the “R-naught” or  $R_0$ , and is a measure of infection capability of an infectious agent. The goal ultimately is to control the spread of the virus in the environment in such a way as to bring that number below one, at which time the rate of propagation of the virus will diminish and stop spreading. One concept known as “herd immunity,” could drive such an outcome, but only after 50-80% of the population has been exposed to the virus.<sup>1</sup>
- The virus is resistant to known treatments, and is unresponsive to major interventions used with viral infections, including various antiviral drugs, immunological drugs, and vaccines. There is significant work being done in all three areas, and progress is being made, but for the moment, physical measures such as social distancing, the use of masks, and topical antiseptic agents for surfaces must become part of any control plan or workplace operation.

<sup>1</sup> Herd immunity statistic from reference 30 Kwok, KO; Tang, JWT; et al “Herd immunity: estimating the level required to halt the COVID-19 epidemics in affected countries.” Journal of Infection. In press, epub accessed 4/28/2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151357/pdf/main.pdf>. (15)15. April 11, 2020. pp 1-2.

- The virus appears to be relatively hardy, persisting on various surfaces for hours or even days, making the need to decontaminate surfaces an absolute requirement for facilities where this may be an issue.<sup>2</sup> In the workplace, this will necessitate regular, deep cleaning of surfaces and exposed area where product is being handled by multiple employees and the public.
- There is a delay in the time from the initial contact and engagement of someone with the virus and the development of symptoms, in the range of 5 to 14 days, although it now seems possible that this timeline can be much longer. This delay in the development of disease makes it difficult to pinpoint the exact point where the virus was acquired, who might also have been exposed, and how one can prevent disease going forward.
- The delay in time from the initial contact to the development of disease is also characterized by a period of subclinical disease during which an individual is potentially infectious. As disease carriers, their presence further permits the occult spread of disease.
- While there is evidence that viral mutations are possible, there does not appear to be any evidence at this time that the viral syndrome is worsening, which is a good thing. Viral genetic drift however may portend difficulties in developing a vaccine and/or the re-emergence of a COVID-like recurrence in other seasons such as is seen with the flu.

**All of the above will require ongoing vigilance in the search for new disease and will require the addition of some form of surveillance program in the workplace until a definitive cure for the disease is found or it disappears as an infectious threat.**

#### **The Pandemic as a social issue for business**

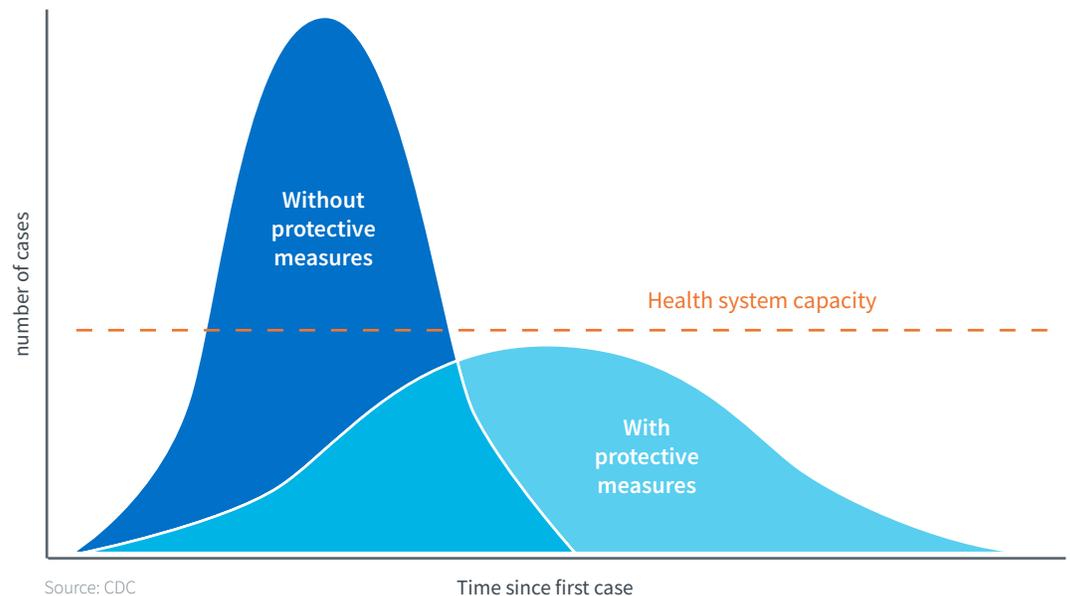
- This pandemic has moved from a localized area in China to involve essentially every part of the globe, moving transnationally with the movement of people and business. This will make it difficult to conduct business regionally, nationally and internationally.
- The degree of penetration of the virus has been inconsistent, affecting some parts of the world and country at different times and with varying degree of intensity. Some areas have severe outbreaks that threaten the health care delivery system while others seem to have little involvement, for a number of reasons. These may include more diffuse geographic spread of citizens, a simple delay before they become affected, or a better response to the containment measures being instituted by the citizens and government.
- Until a definitive treatment is developed, the disease will be with the world, and will require monitoring, surveillance and aggressive response wherever it is occurring. Herd immunity which refers to the ability of a population to suppress spread of an infectious agent through the presence or development of immunity may not occur for some time, although it appears there is a much larger segment of society that has been infected and recovered than was first suspected.

**The “new normal” at the population level will thus likely be a long term state, with the need for social distancing, regular decontamination procedures and personal protective equipment as normal features of business operation.**

### Initial Response of Society and the Business Community

- The initial response of society and the business community was to first identify the problem and begin to appreciate the scope and scale of the problem.
- Standard epidemiologic interventions such as social isolation, containment of infected individuals, decontamination of surfaces, etc., were implemented almost immediately as it became recognized that the features of the virus described above were present.
- New therapies are also being pursued, with new drug identification, older drug trials, immunotherapy solutions and vaccine in active development at this time. While it is anticipated that various new therapies show promise, most scientists predict that the development of a definitive solution will take some time, perhaps as much as a year or more, we should plan accordingly.
- The overall goal of the current efforts is to “flatten the curve” or reduce the peak number of new cases occurring in a given period of time to be reduced or spread out so as to permit effective treatment and containment by the health care system. These measures will have an effect on the ongoing ability to do business, maintain employee positions as historically defined, and conduct ongoing operations.

### Flattening the curve of COVID-19



- As countermeasures are undertaken and then relaxed as the virus spread is contained, there is also concern that a “second wave” may occur, either as a result of relaxed vigilance, or as a result of viral seasonality or both. If this occurs, the clinical and economic effects we have seen in the first quarter of 2020 may be revisited.
- Real-time data on disease progression available per JHU CSSE COVID-19 Dashboard <https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

The economic consequences of social distancing, closing businesses, and other mechanisms for the spread of disease have had a devastating effect on businesses, particularly small businesses. As a result, there is considerable pressure to resume economic activity of the country and “restart the economy”. It is against this backdrop that this paper presents the current thinking on measures an employer can initiate to begin that process as restrictions are being raised.



#### Economics

- Containment induced consequences
- Unemployment rising
- Business (large and small) distress
- Recession
- Pressure to resume economic activity



#### General next steps

- Gradual easing of restrictions
- Maintain containment strategies long term
- Local and regional approaches, data driven
- Close monitoring of disease prevalence, testing



#### Business specific suggestions, evolving

- Gradual reopening
- Long term social distancing, infection control
- Universal precautions
- Employee protection, regular screening
- Collaborative environment with government, academics, business leaders etc.

## Context

### “The new normal” – The problem as it seems to the business community

- Every person you meet could be infected and contagious, and it may not be apparent when you meet them.
- Every surface you touch may be contaminated.
- If you assume the first two points, you will be right maybe only one percent of the time or less, but when you are, you could contract a lethal disease if you aren't careful.
- You can test for the disease, but the tests are not perfect, and they aren't cheap (at least the one's that offer some value), and the situation may change again tomorrow.
- The situation will never be perfect. You can't get to zero risk, only work to minimize the probability of the spread of disease by adopting “universal precautions” that assume risk is everywhere.

The above situation may not change for a year or more.

- Do you give up? No.
- But what do you do?

The approach of an employer with respect to reopening or expanding the business is unique, often industry specific. Individual considerations are relevant at many levels, but a number of commonalities will be present for all employers.



**There are a number of as yet unsettled issues across these domains**

- The exact timing of the peak that will permit reopening of businesses.
- How ongoing monitoring needs to be conducted for new infection or recurrence of disease in the workforce or in the population.
- The limitations and uncertainty of testing results in employees tested.
- Whether or not test results can predict employee immunity from the disease.
- What level of medical oversight is needed for test collection, results interpretation and follow-up.
- Employee rights and responsibilities under the unique circumstances of a pandemic.

## Common Questions From Employers

As employers begin to seriously consider what is needed to reopen business, directions from the government and clinicians are quite clear that simply reopening business is not acceptable. At the very least, recognition that the virus is still active in the community must be considered, albeit in a reduced way. Some type of training and cleaning processes need to be implemented, and specific attention needs to be paid to the safety and health of employees. Typical questions that are immediately generated by employers include the following:

- What do I need to do to get my business restarted?
- How can I screen and protect my employees?
- What should the testing program look like for me?

- Which test(s) do I need to do? – PCR, Antibody, rapid testing, nasal swab, saliva, blood, what? How do I know I am using a good test approved by the FDA?
- Do I conduct testing once initially, weekly, every day, and how do I determine who gets tested?
- How often do I need to retest my employees? Daily, weekly, just with symptoms? What does disease surveillance look like?
- When can they come back to work if they are out from a positive test?
- How can I check to make sure my program is working well?
- I know a program will not be 100% certain with inevitability of false positives and false negatives, and some might slip through who are sick. How do I deal with that and how do I minimize the chances of that happening?
- What is the best way to link to intelligent systems to keep track of all this, keep me informed as to whether I am doing the best I can, and make recommendations for change?

**As a start, an employer needs to create and follow a strategy to engage employees as they are “replaced” in the work environment under the “new normal” conditions. In many ways, an employer is taking an existing job and work process, and re-creating it to be able to operate under the environmental conditions that now exist.**

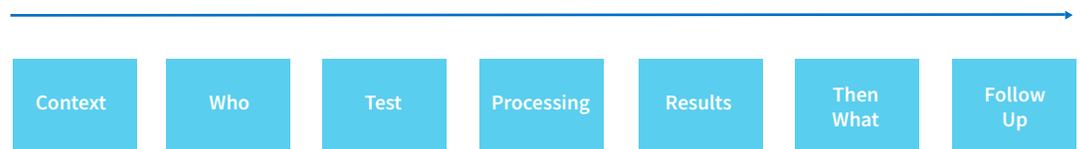
This may be less of an issue for health care employers, where training and acceptance of biologically challenging environments is ongoing, and may be not too far afield of the issues faced by food service workers, but may be radically different in situations where this was never an issue.

**Employees are an important component of such a reworking of the workplace, and a number of new issues need to be considered.**

-  There is a need to protect employees in the workplace from contacting the virus by shielding them using tools in place and time to minimize acquisition of the disease. (e.g. plexiglass shields, social distancing, shift changes to minimize congestion of workers, etc.)
-  There is a need to identify infected/noninfected employees and at risk/low risk employees, and take appropriate action to isolate them, treat them and track contacts.
-  There is a need for a program to sort employees into groups who can return to work and those who require further isolation/quarantine or who are at high risk when returning.
-  There is a need to identify individuals who can return to work as soon as possible, in keeping with government guidelines.
-  Approaches for both high risk and low risk employees may need to be different.
-  Participation with other employers to pool information collected to refine the process may be helpful as these issues are being dealt with in a constantly changing environment.
-  Employers should also consider the degree of integration with public health programs, which may supplement and guide efforts as the entire community responds. They also are a source of specialized knowledge on public health measures and disease surveillance.

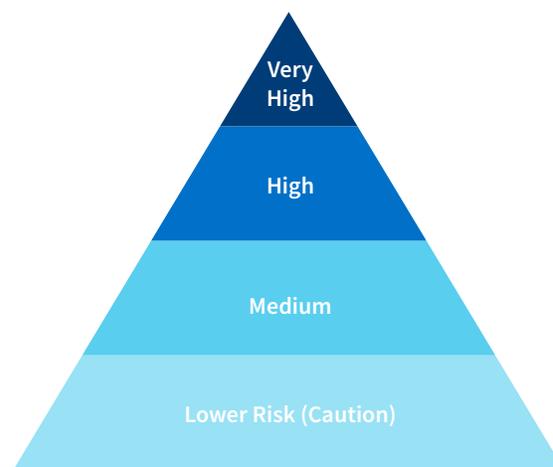
## A Plan for Employee Evaluation

With these various issues in mind, a reasonable way of breaking down the process of evaluating the employee workforce is best broken down into a series of steps. In answering the employer questions above, working through these steps will in the end result in an effective program for assessing the clinical status of employees and will work to minimize potential COVID disease exposure to the workforce and the customer base. Consider the following flow chart:



We have just discussed context in the first part of this document. The Occupational Safety and Health Administration (OSHA) provides additional contextual guidance under the visual structure below, as do various state and government agencies.<sup>3</sup> The remainder of the steps will walk us through the steps and decisions required in executing an employee plan.

### Occupational risk pyramid for COVID-19



Source: Occupational Safety and Health Administration (OSHA)

## Who? What is the Target Population?

Target/Risk Populations Currently of Key Interest and High Priority to Employers	Optimal Way to Reach these Populations
<ul style="list-style-type: none"> <li>• “Key Person” employees. Managers, critical positions, bottleneck locations, unique skill sets, high risk employees, etc.</li> <li>• Individuals with higher public exposure.</li> <li>• Ultimately, all employees engaged in the business of the firm.</li> </ul>	<ul style="list-style-type: none"> <li> <b>Communications.</b> Employer directed and coordinated.</li> <li> <b>Location.</b> Local site testing, near site testing, home testing.</li> <li> <b>Means of communication.</b> Phone app, web portal, incentivized programs, website, other interaction system.</li> </ul>

### Additional population considerations.

- **African Americans, other minorities.** May have worse outcomes.
- **Lower income employees.** Have lower access ability and higher potential disease rates.
- **Patients who need a PCP for follow up.**

## Testing Issues: What Test to Use, Testing Considerations and Issues with Interpretation

The safety and efficacy of testing is governed by the FDA, which created a special pathway, Emergency Use Authorization, to rapidly get new tests to market: <sup>4</sup>

“On the basis of the February 4, 2020 HHS EUA determination, the Secretary of HHS then declared that circumstances exist justifying the authorization of the emergency use of in vitro diagnostics for detection and/or diagnosis of the novel coronavirus (2019-nCoV) subject to the terms of any authorization issued under section 564(a) of the Act.”

The Centers for Disease Control and Prevention (CDC) issues guidance on who should be tested and when, as stated: <sup>5</sup>

“The following interim guidance may help prevent workplace exposures to COVID-19, in non-healthcare settings. (CDC has provided separate guidance for healthcare settings.) This guidance also provides planning considerations for community spread of COVID-19.

<sup>4</sup> <https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations>

<sup>5</sup> [https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html?deliveryName=USCDC\\_2067-DM25771](https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html?deliveryName=USCDC_2067-DM25771)

To prevent stigma and discrimination in the workplace, use only the guidance described below to determine risk of COVID-19 infection. Do not make determinations of risk based on race or country of origin and be sure to maintain confidentiality of people with confirmed coronavirus infection. There is much more to learn about the transmissibility, severity, and other features of COVID-19 and investigations are ongoing.”

**Collection of data for both history and refining pre-test risk**

**Questionnaire and medical history relevant items to be collected on all employees.**

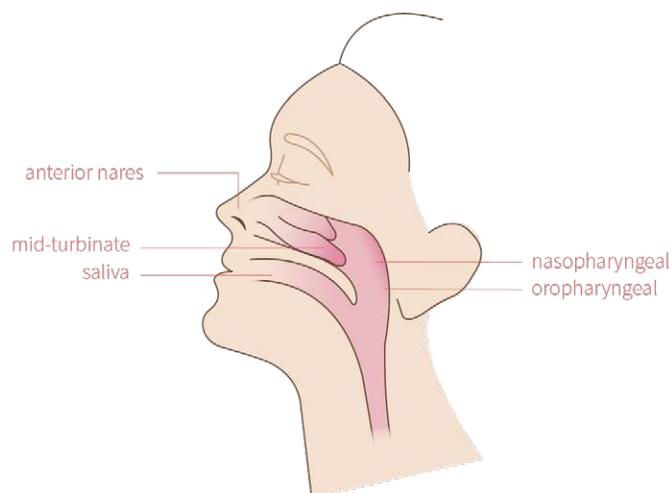
- Symptom questionnaire per the CDC guidelines
- Medical history, social history including travel
- COVID exposure and illness history

**Use CDC recommendations re: symptoms.**

**IVR or web portal data collection an option for initial collection of data.**

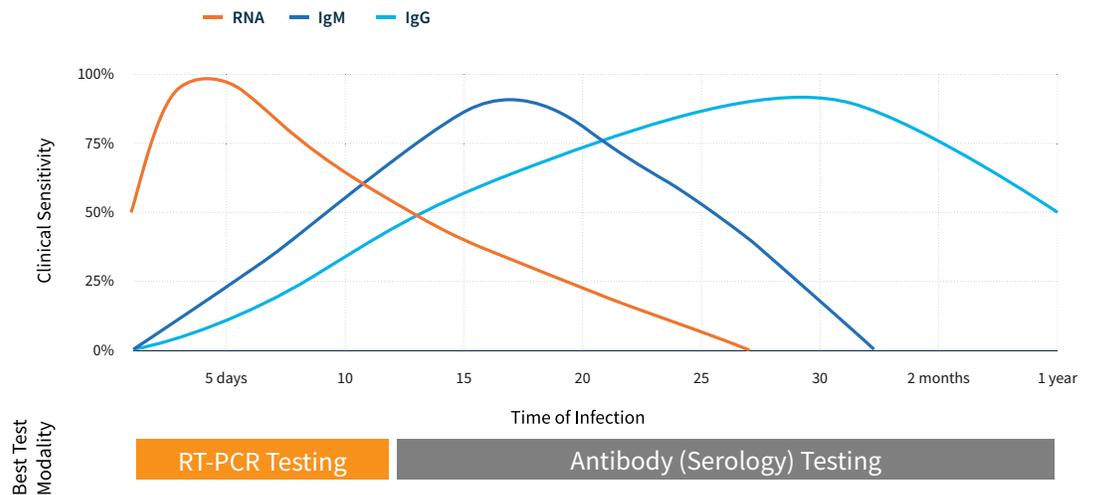
**Where/How to test: Different tests are used for different reasons**

- **Acute or active disease, generally done by looking for viral RNA:**
  - Swab collection at a specific anatomical site(s) targeting viral DNA.
    - nasopharyngeal (NP)
    - oropharyngeal (OP)
    - mid-turbinate (MT)
    - anterior nares / nostril (AN)
    - saliva (SV)
  - Home saliva or nostril swab self collection for viral DNA has limited approval – anticipated to expand over the month of May.



- Immunity status or prior exposure history generally done by looking for antibodies in the blood:
  - Qualitative, rapid antibody testing, with concurrent second test type to confirm result (current recommendation).
  - Semi-quantitative, lab-based ELISA antibody testing (forthcoming).
- Preferred testing methodology varies based upon the timing of initial infection and desired function as noted below:

### Sensitivity of key biomarkers for COVID-19



### Test procedures



#### Currently

1. Collection of clinical data for assessment of risk and application of CDC testing guidelines (Text/SMS, telephone, web portal, provider administered).
2. PCR testing initially, looking for active viral infection.
3. Two initial samples: one saliva and one nasal swab.
4. Collected by individual being tested, in designated healthcare settings.
5. Shipped to laboratory via express courier.
6. Sample processed within 48 hours of lab receipt.



#### Near future

1. Collection of at-home self collection of samples (+/- telemedicine oversight)
2. Rapid antibody will assist in the possible return to work options for employers/workers as well.
3. Multisite locations with data collection and centralized analytics.
4. Employer directed and coordinated communications.
5. Phone app, website, other interaction system.

## Test comparison

Test	RT-PCR (Reverse Transcriptase - Polymerase Chain Reaction)	Point of Care Molecular Testing (POCT)	Rapid Point of Care Antibody Testing (POCT)	Semi-Quantitative Antibody Testing
<b>Description</b>	<ul style="list-style-type: none"> <li>• Extracts, then amplifies the amount of RNA, then compares it to standard</li> </ul>	<ul style="list-style-type: none"> <li>• Extracts, then amplifies the amount of RNA, then compares it to standard</li> </ul>	<ul style="list-style-type: none"> <li>• IgM/IgG Qualitative antigen testing (various tests in development)</li> <li>• Use drop of blood (from a fingerstick) in as little as 5 minutes</li> </ul>	<ul style="list-style-type: none"> <li>• Blood/serum assay for IgM and/or IgG using Serology or EUSA testing</li> </ul>
<b>Source/ Technician</b>	<ul style="list-style-type: none"> <li>• Nasal/oral swab (flocked or newer synthetic)</li> <li>• Bronchia/alveolar lavage</li> <li>• Trained clinician</li> </ul>	<ul style="list-style-type: none"> <li>• Nasal/oral swab (flocked or newer synthetic)</li> <li>• Bronchia/alveolar lavage</li> </ul>	<ul style="list-style-type: none"> <li>• Variable sources, blood at the moment is main source</li> <li>• Point of care admin and result</li> </ul>	<ul style="list-style-type: none"> <li>• Blood or serum</li> <li>• Technician/ physician</li> </ul>
<b>Uses</b>	<ul style="list-style-type: none"> <li>• Acute illness screening and testing</li> <li>• Virus exposure, carriage</li> </ul>	<ul style="list-style-type: none"> <li>• Acute illness screening and testing</li> <li>• Virus exposure, carriage</li> <li>• Test done real-time in a clinical setting</li> </ul>	<ul style="list-style-type: none"> <li>• Acute illness screening and testing, indicates if you have been exposed</li> </ul>	<ul style="list-style-type: none"> <li>• Acute exposure and illness</li> </ul>
<b>Pros</b>	<ul style="list-style-type: none"> <li>• Gold standard</li> <li>• Lab high sensitivity</li> <li>• Clinical high sensitivity</li> <li>• Experience with test</li> </ul>	<ul style="list-style-type: none"> <li>• Utilizes recommended molecular diagnostic testing principles.</li> <li>• Results obtained in 15-45 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>• Quick</li> <li>• Rapid turnaround</li> <li>• Doctors office or locality based testing</li> <li>• Potentially scalable at clinician office level</li> </ul>	<ul style="list-style-type: none"> <li>• Can test immune response and suggest acute reason for illness</li> <li>• May suggest immunity as research evolves and with serial testing over time.</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>• Turnaround time</li> <li>• Equipment and skilled staff needed</li> <li>• Central lab needed</li> <li>• Expensive</li> </ul>	<ul style="list-style-type: none"> <li>• Limited sensitivity / specificity.</li> <li>• Serial testing limits capacity to 1-4 tests per hour.</li> </ul>	<ul style="list-style-type: none"> <li>• No experience at scale</li> <li>• Unknown clinical sensitivity and specificity</li> <li>• Not applicable for “immunity” testing.</li> </ul>	<ul style="list-style-type: none"> <li>• Actual concurrent viral load and infectability uncertain</li> </ul>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Specificity unknown in current clinical situations - concern re: false negative rate.</li> <li>• Working on alternative collection methods</li> </ul>	<ul style="list-style-type: none"> <li>• Leading devices have generated concerns regarding safety (to lab personnel) and accuracy.</li> </ul>	<ul style="list-style-type: none"> <li>• Can be used as a screening test to be followed with confirmatory test if needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Immunity may not be long lasting</li> </ul>

## Test interpretation grid

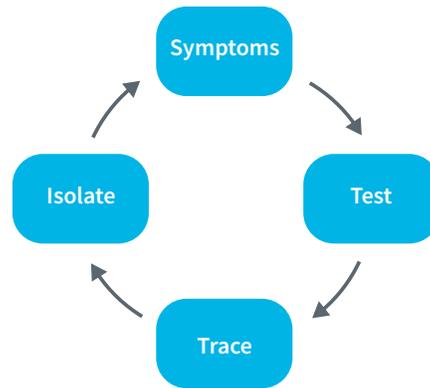
	PCR Test-Virus Present	IgM Antibody-Recent exposure	IgG Antibody-Past exposure, ? Immunity	Next steps
Active infection or carriage of virus	+	-	-	Follow CDC guidelines for active infection
Active Infection with Ab response	+	+	-	Follow CDC guidelines for active infection
Not infectious? Recent exposure	-	+	-	Retest PCR. If negative can possibly work
Not infectious? Past exposure. Possible immunity	-	+	+	Retest PCR. If negative can likely work.

**Note:** The above paradigm is currently being worked out and confirmed. As yet these approaches are **not validated**.

New tests are being made available daily, with improving sensitivity, specificity and value. The above represent general descriptions.

## Back to Work Framework

### Basic protocol



### Environmental Controls

Given the above, one of the first questions often asked is “OK, Got it. What do I actually do now?”

The following represents a typical solution being implemented in the workplace. Individual details might change based on the nature or location of the workplace, but this can be a starting place to developing a detailed plan:

1. **Screen all employees** with a standard set of questions to capture.
2. **Demographic information.** name, age, sex, ethnicity, recent travel, job title.
3. **Symptoms.** Symptoms screen per the CDC questionnaire.
4. **Test all employees who meet the screening criteria for testing.** It is recommended that this occur rather than testing all employees including asymptomatic ones, but the workplace exposure and critical nature of the job should be discussed.
5. **Process all positive, negative and indeterminate screens** with a third party capable of doing so and who can also interpret the results, get back to the patient, and make appropriate referrals to the health care system.
6. **A standard workflow process is outlined below for the initial screening.**
7. **Follow up medical surveillance is conducted on a daily basis,** per the CDC guidelines, looking for evidence that the employee may be ill or becoming ill. This can be done expeditiously by phone, web portal or other private, secure method of screening. Positive screening results will be processed as positive screens above with testing and follow-up in the same manner.
8. **Return to work guidelines** published by the CDC will permit a medically sound return to work program that can be certified by the testing/analytic team.

## Program Results: What Do You Do Next?



### Negative on both samples

- Individual informed of test results.
- Isolation while symptomatic per usual care recommendations; Follow CDC recommended guidelines.
- Repeat testing day 7 if symptoms persist. Confirmational testing to rule out false negatives.
- Additional medical management as needed per provider. Telemedicine follow up.



### Positive on either sample

- Individual informed of test result.
- Isolation per CDC confirmed COVID-19 cases protocol.
- State and local health department notified
- Contact tracing per health department (close contacts to self-quarantine per CDC guidelines).
- Additional medical management as needed per provider; e.g. telemedicine follow up.



### False positive and false negative test results possible

- Need for confirmatory testing if high level of suspicion that negative is false negative.
- Regularly obtain both questionnaire and repeat testing, perhaps every 14 days.
- Serial testing will be more accurate and will be more reassuring as well as picking up new illness exposure and disease.
- Concerns re: PPV need to be understood if low pretest probability of disease. (Bayesian analysis should be conducted).

### Concurrent contact tracing inputs:

- Coworkers
- Location of positive tested employees and follow up of contacts
- Other contacts if available

### Additional options to consider:

- Formal telemedicine follow up
- Provide app based follow up for patient
- Home food kit for quarantined patients
- IVR calls for follow up
- Other contacts if available

Test results can be tricky, in that there are issues with the tests used and how results are interpreted. One of the biggest challenges to testing for a serious disease is the issue of incorrect test results. Both false positive and false negative test results can occur, depending on the testing. The level of concern on this issue is related to the pretest probability of disease (asymptomatic populations have lower predictive value of positive test results) and the seriousness of a false negative result ( i.e. missing the presence of an infected employee).

## Testing Follow up



### Negative

- Follow up PCR and serology in 14 days
- Directions to patient if symptoms change
- Telemedicine options for patients-  
Confirmational testing to rule out false negatives



### Positive

- Isolation
- Medical follow up with telemedicine
- Follow up medical interaction with  
system instructions to patient



### Additional options

- None
- IVR calls for follow up
- Formal telemedicine follow up
- Provide app based follow up for patient
- Home food kit for quarantined patients
- Analytic tracking by data managers  
using the program IT platform



After the initial testing and employee review, ongoing surveillance should be conducted according to the principles above.

## Case Scenario: General Case

Here, we discuss how a typical business might implement the steps described above with an actual example.

1. **Screen** all employees with a standard questionnaire.
2. **Test** all employees who meet the screening criteria for testing.
  - a. Process all positive, negative and indeterminate screens with a third party who can also interpret the results, contact the patient, and make appropriate referrals.
3. **Follow up COVID surveillance** is conducted on a daily basis, using CDC guidelines (**daily questionnaire**).
4. **Surveillance** ongoing to identify evidence that an employee may be ill or becoming ill (**physical / temperature check**).
5. Leverage **tracing app** or **notification tools** to identify potential exposure and heightened awareness of protocol.

## Conclusion

There is no clear end in sight to the pandemic and employers must adapt to the “new normal” in order to get employees safely back to work and reboot the economy. Similar to travel post-911, systems and protocols need to be established to foster confidence and peace of mind amongst the workforce and general public. These need to be based on current and ongoing scientific progression, taking into account research and recommendations from global, federal, state, and local authorities. Simultaneously, these need to be applied in a scalable, user-friendly manner in order to achieve success in back to work initiatives.

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