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The COVID-19 pandemic is still ravaging our world with a new wave of illness and death. The disease and the reaction to it continue to generate chaos, confusion and discourse within the scientific, medical, political and civilian communities. Was this pandemic predictable? Yes. Previous pandemics are a testament to history repeating itself.

The first article compares the movie *Contagion* with the current COVID-19 pandemic and highlights some parallels between the fictional pandemic and the current public health crisis. Maybe preparation for future pandemics will address the medical response as well as include a humanistic response, focusing mental and emotional reactions with public education, national plans and local exercises, such as practiced emergency response plans for natural disasters or nuclear threats.

The second and third articles address ways employers can improve employee COVID-19 vaccination rates and provide some legal information about asking a job applicant about his or her COVID-19 vaccination status, respectively.

The “Complex Regional Pain Syndrome” article identifies an uncommon pain syndrome affecting peripheral nerves, causing disconcerting symptoms for the patient and the provider.

We address spirometry in the final article, explaining the reasons for using the test, what is tested, and how the test is performed. Education on pulmonary function testing can improve technique and consistency of results.

On a quick note, I’d like to welcome our new providers to our clinic. Dr. Julie McDermott is a board-certified family medicine physician, and Dr. Wes Boose is a board-certified occupational medicine physician. We are excited to have them join us at Lexington Medical Center Occupational Health!

If you have any suggestions for future *Working Well* topics or any comments or questions, please contact me at darawl@lexhealth.org. Thank you for trusting us to be your occupational health provider..

– Dana Rawl, MD, MPH

Contagion – The Movie

COVID-19 – The Sequel

By Dana Rawl, MD, MPH

In 2011, I was the state air surgeon for the South Carolina Air National Guard, and we helped assess and plan for potential homeland defense contingencies and disaster responses. Natural disasters, like hurricanes, tornadoes, floods and earthquakes, were always part of annual planning. At times, we exercised our contingency plans in concert with military and civilian intrastate and interstate agencies. Recent history involving nuclear disasters as occurred in Japan; terrorist attacks with conventional explosives, plane bombs and the potential for “dirty bombs;” and biological and chemical threats from natural causes, such as Ebola, or designed weapons (e.g., anthrax, nerve gas) have greatly expanded the possibilities of a mass casualty event.

A friend of mine, Col. William Pond, MD, and the state air surgeon for Indiana at the time wrote an article for the Alliance of Air National Guard Flight Surgeons’ winter 2011 newsletter that reviewed the movie *Contagion*. Rereading his article about the movie and his prognostication about a real pandemic are eerily true.

The 1918 “Spanish flu” pandemic claimed more than 50 million lives. “What if today another such pandemic occurred with a strain that was just a little more deadly with a larger population at risk and with jet-age mobility?” posed Col. Pond. The movie was intended to depict a “plausible” virus outbreak that was scientifically credible and capture the world response, “nothing spreads like fear.”



The movie creates the origin of the virus from a bat in Hong Kong that has its habitat demolished to pen domestic pigs. A pig contracts the virus by eating a banana dropped by the bat. The bat virus incorporates and mutates with a pig virus. The chef who prepared the infected pig transmits the virus by direct contact with his unwashed hands, highlighting the classic transmission of a disease. The virus in the movie had a 20 percent mortality rate. Disease control protocols implemented by the Centers for Disease Control and Prevention were initiated to include case and cluster identification and contact tracing. The virus in the movie affects young, otherwise healthy people and realistically captures the disbelief, grief, helplessness, frustration and fear felt by society. The realism is palpable in those fighting to save lives, find a cure and restore order.

There are parallels of the Contagion virus to the SARS CoV2 virus that causes COVID-19. Both seemed to originate in China (not withstanding media misinformation). The movie virus jumped species from animal to human and was transmissible from human to human not unlike the SARS CoV2 virus. The response from the CDC was similar

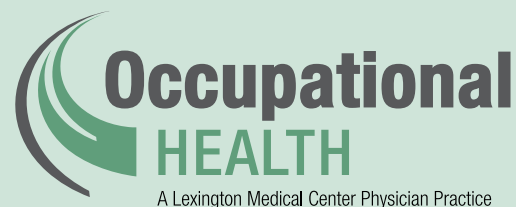
in identifying cases and clusters and performing contact tracing. The need for personal protective equipment and the strain on the medical system, manpower, beds and supplies were similar. Societal response to a novel infectious disease was also similar and predictable with denial, uncertainty, anger, anxiety, fear, grief, frustration and disorder.

The SARS CoV2 virus mortality is notably, and thankfully, unlike the movie virus with the rate being closer to 2 percent instead of 20 percent. The movie virus targeted a younger, healthier population unlike the SARS CoV2 virus, but new variants can change the transmissibility and the lethality of the virus. Contraction of the movie virus was by direct contact whereas the SARS CoV2 is transmitted through a more contagious aerosol transmission. Unfortunately, it appears the new variants of SARS CoV2 may be even more contagious.

Our world is not predictable. Advanced planning and preparation for disasters, natural or manmade, may not prevent occurrences, but utilizing resources, trusting science, developing foresight and implementing strategy from lessons learned or imagined may mitigate bad outcomes and save lives. Get vaccinated! 🍀

Resources:

[NPR.org/sections/goatsandsoda/2020/02/16/802704825/fact-checking-contagion-in-wake-of-coronavirus-the-2011-movie-is-trending](https://www.npr.org/sections/goatsandsoda/2020/02/16/802704825/fact-checking-contagion-in-wake-of-coronavirus-the-2011-movie-is-trending)



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Employer Options to Improve Vaccination Rates

By Dana Rawl, MD, MPH

Vaccine hesitancy is a major obstacle in reducing the current surge of COVID-19 infections, particularly with the Delta-variant wave upon us. Employers are keenly aware of the Centers for Disease Control and Prevention masking guidance and potential resumption of restrictions that will adversely affect business, as well as threaten the health of their employees. Employers need options to encourage and inspire their employees (and their families) to get a COVID-19 vaccination to help prevent the spread of the disease and reduce serious infections. They need to invoke confidence in the vaccine to improve the prospects of ending the pandemic.

People are continuously bombarded with information about COVID-19 through social media, news sources and word of mouth, and sorting the disinformation from the fact is frustrating. Offering reliable, truthful information from trusted sources through an informational campaign would benefit employees in making an informed decision in getting the vaccine. The information should be factual and referenced. Emphasis should be placed on truths, such as the vaccine is not 100 percent effective at preventing infection or transmission of the disease, but it is the best defense against serious illness, hospitalization and death. A targeted informational campaign addressing specific questions, concerns or misconceptions should be effective.

Delivery of targeted information can be accomplished with the following examples:

- Hosting informal question-and-answer sessions presented by human resources, legal representatives, company leadership or medical personnel.
- Organizing a lunch-and-learn presentation from outside medical or public health professionals.
- Including community leaders and employees in interactive conversations regarding the impact of COVID-19 and the benefits of the vaccine.

- Showing video presentations from the CDC, local or state resources in common areas in the company.
- Offering group gatherings to answer previously solicited anonymous questions about the vaccine.

Offering incentives to get the vaccine is another option to improve vaccine rates. Some incentives include cash, gifts or paid time off, but be sure the incentives are within legal guidelines. If an employee voluntarily provides confirmation of vaccination from a non-employer-sponsored source, the incentive offered is without apparent limitation. But, if the company or an entity acting on the company's behalf administers the vaccine, the incentive cannot be of such value as to be considered coercive. In either case, the employer should take every precaution to separate any medical information gathered through the vaccination process.

Create policy to require all non-vaccinated employees to be regularly tested for COVID-19 to "ensure the highest level of workplace safety." Such a new policy should be clear and direct and disseminated through multiple sources, such as electronic mail, letters, employee meetings and written materials. They should explain the rationale driving the new policy as well as the specific actions to take. The frequency of testing should reasonably catch potential outbreaks but not so frequent as to perceive it to be punitive. The policy should also outline the steps required within the latest CDC, Occupational Safety and Health Administration and local guidance if an employee tests positive for COVID-19.

In addition, employers could implement workplace safety policy for those who have not been vaccinated by renewing masking and social distancing requirements as well as restricting business-related travel. Such policy changes should be pre-announced through company communication channels and should not be perceived as coercive or punitive.



Finally, mandating the COVID-19 vaccination as a condition of employment has become an option. If a vaccine mandate policy is necessary, provide timely communication to employees about the policy and reasoning for the change. Include the plan for logistics and compensation to get the vaccine and the reasonable accommodation policy addressing any religious or disability issues. Determine ahead of time how to handle pushback and refusals. Consider developing a vaccination team to organize, coordinate and manage the program.

In all instances, keep current with CDC medical recommendations and consult with your company's legal professionals to provide guidance regarding COVID-19 vaccination and safety policies. The goal is to balance workplace safety and employee health to overcome this pandemic with the best outcome possible. 🌱

Reference:

[FisherPhillips.com/news-insights/5-options-employers-improve-vaccination-rates.html](https://fisherphillips.com/news-insights/5-options-employers-improve-vaccination-rates.html)

If a vaccine mandate policy is necessary, provide timely communication to employees about the policy and reasoning for the change. Include the plan for logistics and compensation to get the vaccine and the reasonable accommodation policy addressing any religious or disability issues.

Asking an Applicant About COVID-19 Vaccine Status

By Dana Rawl, MD, MPH

Is it lawful to ask a job applicant about their COVID-19 vaccine status? The short answer is yes, but...

The Equal Employment Opportunity Commission issued guidance in 2020 that indicates asking an employee about vaccination status is not a violation of the Americans with Disabilities Act. But the ADA prohibits employers from asking questions that may reveal an applicant's disability prior to a conditional offer of employment. Questions posed after extending a job offer need to be job-related and consistent with business necessity.

Further, in May 2021, the EEOC clarified that asking an employee about vaccine status or requesting proof of vaccination was not a disability-related inquiry under

the ADA. Therefore, the inquiry is not an ADA violation, but the inquiry may lead to the employee volunteering disability-related information as to why he or she is or is not vaccinated. So, the question must be crafted carefully.

Considerations should be observed before asking about an applicant's COVID-19 vaccine status. First, know whether state or local laws allow or prohibit vaccination status inquiries. This consideration can vary from state to state and/or from state entities to private employers. Second, know why the applicant's vaccination status is important. Is the inquiry business-related and related to the job? Is there an industry requirement for vaccination such as health care workers in California, or has the organization mandated a vaccination policy? Also, if there is a policy mandate, update the job posting so it's clear that vaccination is a condition of employment.

If a vaccine status inquiry is permissible and warranted, the employer should ensure the inquiry procedure is exact and followed consistently. Employers can express the policy as a blanket statement in the hiring process, informing the applicant that vaccination is required as a condition of employment, subject to accommodation. Asking someone on a job application if he or she has been vaccinated with a simple yes or no response could be appropriate, but the question should include language advising reasonable accommodations for a valid medical or religious reason not to be vaccinated. A riskier option is to ask the applicant during the face-to-face interview if he or she has been vaccinated. A direct question is likely to spur more conversation that could result in exposing disability-related information. In all instances, the vaccination question should be consistent with company policy and appropriately delivered to the applicant to reduce the risk of violating any ADA rules. 🌱

Reference

[FisherPhillips.com/news-insights/applicants-vaccine-status-3-options-employers.html](https://fisherphillips.com/news-insights/applicants-vaccine-status-3-options-employers.html)



Complex Regional Pain Syndrome

By Dana Rawl, MD, MPH

Complex regional pain syndrome, previously known as reflex sympathetic dystrophy or causalgia, is an uncommon pain syndrome usually affecting an arm, leg or foot.

The symptoms may develop after minor or major trauma to an extremity or after surgery, but CRPS may be a result of a stroke, tumor or heart attack. Symptoms vary and can change in character, but they typically seem to be excessive relative to the examination or mechanism of injury. For example, a patient may have excruciating pain to light touch after a minor ankle sprain.

Symptoms and signs of CRPS include: constant burning or throbbing pain; unprovoked or spontaneous pain; sensitivity to light touch or cold temperature; swelling; skin temperature changes; skin color changes; skin texture changes; changes in nail and hair growth; abnormal sweating; joint swelling and stiffness; muscle loss and weakness; and decreased movement of affected limb. Hypersensitivity, redness, pain and swelling usually occur early in the syndrome, while skin changes such as variable skin temperature, pale or mottled color changes and skin texture changes develop over time.

CRPS is thought to be initiated by peripheral nerve injury that creates improper and excess firing of the (C-fiber) nerve, leading to secondary effects on the brain and spinal cord. The trigger leading to CRPS is not well understood, but there are two types. Type 1, which accounts for about 90 percent of CRPS cases, involves peripheral nerves that are subtle and difficult to identify. The causal injury is more commonly diffuse trauma, such as a crushing injury, fracture or tight casting or splinting. Type 2 involves directly injured peripheral nerves, such as through surgery or direct laceration. Note: less than 10 percent of CRPS patients have no known causal condition.

There is no specific test to confirm a CRPS diagnosis and identify the injured nerve. A history of injury, symptoms and a detailed clinical examination can lead to a working diagnosis. Nerve conduction studies may not identify smaller nerves that may be affected. Magnetic resonance imaging or ultrasound



can identify nerve damage or bone abnormalities from damaged nerves, but it may miss affected peripheral nerves.

The good news is that CRPS usually improves with time and can resolve completely. Studies and clinical experience have shown that early diagnosis and treatment effectively reduces disability and improves recovery from CRPS. Early rehabilitation with range-of-motion therapy maintains flexibility and improves blood flow and lymphatic circulation and, in turn, reduces swelling. Therapy also helps reduce or prevent muscle atrophy and nerve-related changes to the muscle and bone. Medications to reduce pain and inflammation, including non-steroidal anti-inflammatories, acetaminophen, corticosteroids, neuropathic analgesics and topical anesthetics, can be helpful. Opioids may be necessary for pain control but can heighten pain sensitivity, be addictive and are not recommended for long-term use. Spinal cord stimulation, sympathetic nerve blocks, psychotherapy and other alternative therapies may be useful.

CRPS is an uncommon complication usually associated with mild or significant trauma to a leg, foot or arm that causes pain, swelling and/or skin changes that seem exaggerated or inconsistent with the injury. Early recognition and treatment of the syndrome produces the best outcomes for recovery. Unexpected symptoms or out-of-proportion pain to the injury or illness warrants an urgent evaluation from a medical provider. 🌀

References

[MayoClinic.org/diseases-conditions/crps-complex-regional-pain-syndrome/symptoms-causes/syc-20371151](https://www.mayoclinic.org/diseases-conditions/crps-complex-regional-pain-syndrome/symptoms-causes/syc-20371151)

[NINDS.NIH.gov/disorders/patient-caregiver-education/fact-sheets/complex-regional-pain-syndrome-fact-sheet](https://www.ninds.nih.gov/disorders/patient-caregiver-education/fact-sheets/complex-regional-pain-syndrome-fact-sheet)

Spirometry

By Dana Rawl, MD, MPH

Asthma, chronic obstructive pulmonary disease, restrictive airway disease, lung damage from pneumonia (as in pneumonia from COVID-19), and exposure related lung disease (such as silicosis) are examples of disease processes that can affect the lung's ability to function.

Spirometry or pulmonary function testing (PFT) can monitor current lung disease or uncover underlying lung problems that need further evaluation, diagnosis and treatment.

In a medical office, a provider may request PFT because a patient has shortness of breath or breathing symptoms. PFT would be beneficial in the diagnosis of a lung disease, such as asthma or COPD, leading to treatment and/or further evaluation.

In an occupational setting, employers may require an employee to be in an Occupational Safety and Health Administration respiratory program relative to his or her job position or environment. For example, a painter needs protection from inhaled exposure to paint mist, and a worker in an enclosed space may need a respirator for supplemental air. Both workers would need to use a respirator. PFT could be part of medical approval to wear a respirator.

PFT consists of a certified medical person guiding and coaching a patient to blow into a tube as hard and long as he or she can. This activity may be easier said than done but, with a reproducible test, PFT provides valuable parameters of lung function to monitor over time. Subtle findings may be accentuated over the years and lead to identification of an occupational disease or detrimental lung process.

When reviewing spirometry results, providers generally focus on the forced expiratory volume at one second (FEV1) and the forced vital capacity (FVC). FEV1 is how much air expires in one second with a fast and forceful blow. FVC estimates the total volume of air in the lungs, which accounts for the duration of the exhalation. A decrease in predicted FEV1 compared with FVC may indicate an obstructive lung disease, such as asthma, where air sacs collapse and obstruct airflow. Whereas a decrease in predicted values of both FEV1 and FVC may indicate a restrictive lung process



PFT consists of a certified medical person guiding and coaching a patient to blow into a tube as hard and long as he or she can.

where lung capacity decreases, and inspirational volume is restricted from disease or scarring.

Knowing the parameters of what is tested sometimes helps the test taker perform better on his or her PFT. Getting a full breath and expelling air into the tube/machine as quickly, forcefully and long as possible provides the most reliable and reproducible information. The value of this test depends on the motivation, consistency and technique applied by the tested subject. Take a deep breath and blow! 🌬️