Licking Memorial Health Systems

Quality Report Card

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Lung Damage and COVID-19

COVID-19 is a disease caused by the SARS-CoV-2 virus, which most commonly affects the respiratory system. Most people who are infected with COVID-19 will experience mild to moderate respiratory illness and recover without the occurrence of any long-term health issues. Individuals who have underlying medical conditions, including COPD, diabetes, asthma and cardiovascular disease, are at a higher risk of suffering severe complications from COVID-19, such as pneumonia and acute respiratory distress syndrome (ARDS), which could result in further damage to the lungs and other medical complications.

When a person breathes, oxygen fills the lungs and tiny air sacs at the end of the airways called alveoli. Epithelial cells, which line tissues of the airway, create a protective barrier between the air sacs and capillaries. Oxygen passes through this barrier to the red blood cells, which transport oxygen to other organs throughout the body.

As the COVID-19 virus replicates, the body's immune response causes inflammation in the lungs that can damage the lining of the airways and prevent oxygen from reaching the bloodstream when the alveoli fill with fluid and debris. As oxygen levels fall, breathing becomes more difficult. Physicians can see signs of pulmonary inflammation on a chest X-ray or computerized tomography (CT) scan. A CT scan may show grayish hazy areas, also referred to as ground-glass opacity, which indicate increased density in the lungs due to the virus.

The extent of a patient's lung damage depends on the severity of the infection and any existing comorbidities. In severe COVID-19 cases, pneumonia may develop, which makes breathing more difficult due to more inflammation and fluid in both of the lungs. ARDS is another extremely serious complication in which severe inflammation spreads throughout the lungs and further damages the walls and lining of the alveoli. Patients who develop this condition may need the assistance of a ventilator in an intensive care unit. The virus causes lung damage when once healthy cells are replaced with scar tissue, which is thick and stiff. This can result in diffuse alveolar damage, a condition that results in shortness of breath due to injury and makes it difficult for the lungs to work properly. Lung damage also can occur from being on a ventilator for a prolonged period, which is called ventilator-induced lung injury (VILI).

Symptoms of COVID-19 can persist for months after the infection is gone, the most common of which include fatigue, shortness of breath, cough, joint pain and chest pain. Older adults and people with underlying medical conditions are more likely to have lingering COVID-19 symptoms, but some people who experienced mild to moderate effects of the illness also reported longer-lasting symptoms.

Because COVID-19 is a new virus, it is difficult to predict how the infection will affect a person's long-term health. Physicians are relying on their experience of treating other long-term respiratory illnesses, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), to help those suffering with symptoms after recovering from COVID-19. It is possible for lung damage to lessen, but it can take months to years for a person's lungs to return to the level of function prior to contracting COVID-19. Studies have shown that people who suffered lung damage from SARS showed improvement in lung function and less damage was visible on CT scans over time. An early study of people recovering from COVID-19 found that lung damage also improves in the first few weeks after discharge from the hospital.

There are steps that can be taken to reduce the effects caused by lung damage. Patients who have recovered from COVID-19 can perform breathing exercises, such as diaphragmatic and pursed-lip breathing, to improve lung capacity. Physicians may give patients a spirometer device to use, which measures how deeply an individual can inhale and helps encourage taking slow, deep breaths to increase lung capacity. Light cardiovascular activity, if approved by the patient's physician, also can help to improve lung capacity and increase blood oxygen levels.

Licking Memorial Health Systems (LMHS) offers the most up-to-date technologies and testing to detect and diagnose lung diseases. With the use of minimally invasive methods, such as pulmonary function tests and pulmonary stress tests, the staff at LMHS can develop the best treatment plan for patients diagnosed with a lung ailment. In addition, the Respiratory Therapy Department at Licking Memorial Hospital is staffed with respiratory care professionals licensed by the State of Ohio. Respiratory therapists work under the direction of pulmonary specialists who assist in the diagnosis, treatment and management of patients with pulmonary disorders.

Patient Story – David Riffle

When David Riffle began feeling tightness in his chest, he thought it was due to his asthma. He had forgotten his inhaler while working and believed the symptoms would pass once he was home. Although he had been experiencing a cough prior to the attack, he never considered the possibility that he had contracted COVID-19. At the time, the disease was just starting to spread in Ohio, and Licking County had reported only a few cases. As his symptoms worsened, David began struggling for breath. When his rescue inhaler did nothing to open his airways, he tried a breathing treatment. Finally, his wife, Christy, had to call Emergency Medical Services. David was rushed to Licking Memorial Hospital (LMH) for immediate care. "I remember being taken into a room, closing my eyes and thinking I was dying," said David. "The next thing I remember was waking up many days later with tubes and wires everywhere."

LMH staff members determined he was experiencing acute respiratory distress syndrome (ARDS) due to the coronavirus. He was placed on a ventilator for more than two weeks. The shortness of breath and other symptoms were a result of COVID-19 pneumonia which caused the air sacs in both of his lungs to fill with fluid and limited his ability to take in oxygen. As the COVID-19 pneumonia progressed, more of the air sacs became filled with fluid that leaked from the blood vessels in the lungs and caused ARDS, a form of lung failure. At the time of David's admittance, information on COVID-19 was limited because the disease was caused by a novel coronavirus. Treatment options had not yet been identified, and different medications were proposed to try to treat the disease. None of the medications or treatments seemed to make a difference once a patient experienced ARDS. Healthcare professionals were concerned that many patients placed on ventilators quickly deteriorated and did not survive. The staff at LMH, including Phillip G. Savage, D.O., and Bassam Kret, M.D., continually researched the virus and treatments. They administered steroids and other antibiotics to prompt David's recovery.

Due to safety precautions to limit the transmission of COVID-19, visitation to LMH had been restricted with no visitors allowed in the designated COVID-19 unit. David remained unconscious while on the ventilator for 13 days. The nursing staff, including Brittani Hunt, B.S.N., called and spoke with Christy every day, keeping her informed and comforting her. To create a more personal connection, Brittani began to video call Christy as well. "I get emotional thinking about the time I spent on the COVID ward," David said. "Brittani became a very important part of our family, first connecting with my wife, then caring for and helping me." When David regained consciousness, he was startled and pulled at the tubes. Brittani calmed him down and explained what had happened to him. The entire staff celebrated as the ventilator was removed. The nursing staff continued the daily conferences with Christy for the remainder of David's hospitalization which lasted over 30 days.

As David gained strength, he was concerned about his future. "I asked the pulmonologist, Asegid H. Kebede, M.D., if he thought I would be able to return to work. Based on the images of my lungs, he was not convinced I would be able to work again," David remembered. Computerized tomography (CT) scans revealed fibroid-like features that could indicate potentially permanent damage, such as honeycombing patterns and parenchymal bands – thick, long lines that appear as a shadows on X-rays. These features have been common in those who suffered COVID-19 pneumonia. David's lungs also became very stiff, which is another side effect from the disease. When David was strong enough, he was transferred to a rehabilitation facility where he had to relearn many daily skills, including how to walk. During his rehabilitation, Dr. Kebede informed David his lungs were healing much better than anticipated, and he would be able to return to work after all.

After 10 days of rehabilitation, David returned home to his family. David is a longtime resident of Licking County, having moved to Hanover as a child with his mother and three siblings. He and Christy married in 2000, and have since adopted four children, Ashlee, Lilly, Payton and David, through a foster-to-adopt program. "Having COVID-19 was a life-changing experience. My children were so frightened and upset that they could not visit me while I was ill," David shared. "They were very concerned about me returning to my job at Amazon because they worried I would get sick again." The family has been extremely careful to wear masks, wash their hands and practice social distancing to safeguard everyone's health. David's in-laws assisted the family in finding a new single-story house so that David would not have to struggle to go up and down stairs during his recovery.

LMH staff members continue to check on David and his family. "The entire staff was amazing and so caring. I am blessed to have been cared for by such dedicated professionals." Recently, David's blood was tested to see if he still had the antibodies produced by his immune system to fight the virus. Nearly a year after his ordeal, the antibodies are still present in David's blood; however, his primary care physician and pulmonologist suggested he receive the COVID-19 vaccine, which David has since obtained. Much more is known about the virus, and LMH now has several treatment options for patients with severe symptoms from COVID-19. Several vaccines also have been approved for emergency use to assist in stopping the spread of COVID-19. For more information on the vaccines, COVID-19 and LMH policies, please visit LMHealth.org.

Respiratory Care – *How do we compare?*

At Licking Memorial Health Systems (LMHS), we take pride in the care we provide. To monitor the quality of that care, we track specific quality measures and compare to benchmark measures. Then, we publish the information so you can draw your own conclusions regarding your healthcare choices.

1. Tobacco use has been linked to many serious and life-threatening conditions, such as cancer, heart disease, cardiopulmonary disease and diabetes. An estimated 24 percent of Licking County adults smoke.[1] LMHS offers free Quit For Your Health tobacco cessation education, counseling, and nicotine-replacement products. A similar program, Quit for You, Quit for Your Baby, adds incentives to help pregnant women stop using tobacco products. Over 2,253 visits were made as part of the LMHS tobacco cessation programs in 2020.

	LMH 2018	LMH 2019	LMH 2020	LMH Goal[1]
Six-month success rate for patients who completed Quit for Your Health[1]	73%	68%	73%	**25%**

2. Chronic obstructive pulmonary disease (COPD) is a serious lung condition that includes two life-threatening diagnoses – chronic bronchitis and emphysema. According to the American Lung Association, COPD is the third leading cause of death in the U.S. There is no cure for COPD, but with careful management, patients can enjoy longer and healthier lives. To monitor the quality of COPD patients' care, the Centers for Medicare/Medicaid Services tracks the death rate nationally for patients who died (for any reason, including reasons not related to COPD) within 30 days of a hospital admission.

	LMH 2018	LMH 2019	LMH 2020	National[2]
Mortality rate of COPD patients within 30 days of hospital admission	10%	8.5%	9.7%	**8.4%**

3. Protecting patients from hospital-acquired infections is a primary patient safety goal. LMH has many ongoing programs and safety mechanisms in place to help prevent patient infections. In accordance with the Centers for Disease Control and Prevention (CDC) recommendations, LMH monitors patients who are at high risk for infections, including those using invasive devices, such as ventilators (breathing machines). The following data reflect the number of respiratory infections associated with ventilator use, per every 1,000 patient days.

	LMH 2018	LMH 2019	LMH 2020	LMH Goal
Pneumonia infection rate of Intensive Care Unit patients on ventilators per 1,000 ventilator days	0.0	0.0	0.0	**0.0**

4. Some pneumonia patients who are hospitalized require treatment with a ventilator to assist their breathing. Although the ventilator can be life-saving, it carries the risk of serious complications, such as infections, stomach ulcers, blood clots and extended dependency on the ventilator. To help prevent complications, LMH staff members follow a best-practices protocol for patients on ventilators. Known as the "ventilator bundle," these five steps are carefully documented to ensure each patient receives the best possible care.

	LMH 2018	LMH 2019	LMH 2020	LMH Goal
Head of bed elevated to 30 degrees	100%	99.9%	100%	**greater than 90%**
Oral care	99.7%	98.6%	100%	**greater than 90%**
Daily test to reduce sedation	100%	99.6%	99.8%	**greater than 90%**
Stomach ulcer prevention	99.5%	99.9%	100%	**greater than 90%**
Blood clot prevention	99.9%	99.6%	100%	**greater than 90%**

5. LMHS is committed to providing and encouraging free, easily accessible vaccines to all employees. In order to provide the safest care to our community, LMHS recognizes the importance of keeping the staff healthy.

	LMHS 2018	LMHS 2019	LMHS 2020	LMH Goal	National[2]
LMHS employees receiving the influenza vaccine	95%	95%	94%	**greater than 90%**	**90%**

Respiratory Care – How do we compare? (continued on back)

Check out our Quality Report Cards online at **www.LMHealth.org.**

6.

Licking Memorial Health Professionals (LMHP) office patients who are at high risk for these illnesses also are screened and vaccinated as appropriate. LMHP physicians strongly encourage patients over the age of 65 years to receive a one-time dose of pneumonia vaccine and an annual influenza vaccine during each "flu season," which runs from October to March.

	LMHP 2018	LMHP 2019	LMHP 2020	National[3]
Physician office patients over 65 years receiving the pneumonia vaccine	78%	78%	80%	**73%**
	LMHP 2017-2018	**LMHP 2018-2019**	**LMHP 2019-2020**	**National[3]**
Physician office patients over 65 years receiving the influenza vaccine	76%	78%	75%	**64%**

7.

Asthma is a condition in which swelling or inflammation can cause narrowing of the breathing tubes, making it difficult to breathe and sometimes resulting in a medical emergency. By using the correct medications, such as inhaled corticosteroids, asthma can be controlled. Use of these medications can reduce asthma-related emergency room visits, hospital admissions, and missed work/school days. Licking Memorial Pulmonology assesses all asthma patients during their office visits to ensure that they are being treated with the correct long-acting corticosteroid.

	LMHP Pulmonology 2018	LMHP Pulmonology 2019	LMHP Pulmonology 2020	National[4]
Asthma patients assessed for appropriate inhaled corticosteroid	95%	94%	85%*	**90%**

**In 2020, fewer patients visited LMHP Pulmonology due to COVID-19 restrictions.*

Data Footnotes:

(1) Tobacco-free status is self-reported by patients in a six-month follow-up after completing the Quit for Your Health program.
(2) HospitalCompare.hhs.gov national benchmarks
(3) Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [2016].
(4) National Committee for Quality Assurance, "The State of Health Care Quality 2013."

Reducing the Spread of COVID-19

The COVID-19 vaccine is an important tool in the fight against the novel coronavirus, and studies show that the vaccine is safe and effective in preventing people from contracting the disease. While the COVID-19 vaccine affords protection to those who receive it, the emergence of new variant strains of COVID-19 and the possibility of low-level infection and transmissibility even after vaccination make precautions pivotal in preventing the spread of COVID-19.

Proper mask usage helps protect the person who is wearing the mask as well as those around them. The mask should cover the nose and mouth with a snug fit under the chin and around the face. Using a mask with multiple layers will prevent more respiratory droplets from getting inside or escaping. Cloth masks can be stored in a dry, breathable bag after each use and should be washed frequently. Disposable masks should be discarded after one use.

Handwashing is one of the best ways to prevent the spread of illness, including COVID-19. Individuals should wash their hands often with soap and water for at least 20 seconds after activities such as handling their mask, being in a public place, blowing their nose, coughing, sneezing and using the restroom. If soap and water are not available, individuals should use a hand sanitizer that contains at least 60 percent alcohol.

Social distancing is essential to prevent the spread of COVID-19. Keeping a physical distance of at least six feet between individuals helps lower the chances of spreading the virus to others. Social distancing is especially important to protect high-risk individuals, including older adults and people who have serious underlying medical conditions.

Vaccination is a key component to ending the spread of COVID-19, and it will take time for the majority of the population to receive the COVID-19 vaccine. Studies are ongoing to determine whether receiving the COVID-19 vaccine will prevent people from spreading the virus to others. It is important for everyone to continue to adhere to the preventive measures mentioned above to protect themselves and those around them.

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Visit us at LMHealth.org.

Please take a few minutes to read this month's report on **Respiratory Care.** You will soon discover why Licking Memorial Health Systems is measurably different ... for your health!

The Quality Report Card is a publication of the LMHS Public Relations Department. Please contact the Public Relations Department at (220) 564-1572 to receive future mailings.