

Quality Report Card

Licking Memorial Health Systems

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EMERGENCY CARE

Molecular Testing to Identify Bacterial Infections

Infections caused by bacteria have a major impact on public health, and the rapid spread of multidrug-resistant bacteria poses a serious threat to public health worldwide. Traditional microbial culture methods can take several days, making diagnoses difficult and often leads to an overuse of broad-spectrum antibiotics to combat the illness. Molecular testing for bacterial infections can help clinicians rapidly identify serious bacterial infections in patients. This method of testing can also detect antibiotic-resistant genes, which leads to quicker, more targeted treatment.

When a person visits a physician office, urgent care, or emergency department with an infection, the physician may order a bacteria culture to identify organisms causing the illness. A sample of tissue, blood, or other body fluids may be collected at the site of the suspected infection and sent to the laboratory for testing. With microbial culture testing, enough bacteria must grow to test the sample for infection. Results can take several days or weeks, as some types of bacteria grow slowly. Once there are enough bacteria, the sample is examined using biochemical and other techniques to identify the causative pathogen.

Molecular diagnostic testing is much quicker and produces more sensitive results than microbial culturing. A molecular test analyzes a patient's sample for deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) coming from microorganisms. DNA is located in the

nucleus of every human and bacterial cell and is comprised of long strands of molecules that contain all of a person's genetic information. RNA is a single strand of genetic material found outside the nucleus that tells the functional structures in the cell what to do.

A polymerase chain reaction (PCR) is a specific type of molecular testing technique that amplifies and detects specific DNA and RNA sequences from a wide range of pathogens. Molecular probes are used to identify and measure amplified DNA and RNA. The probes are designed to target specific gene sequences that are unique to each pathogen, ensuring greater accuracy in identifying specific microorganisms. Results are available within a few hours, making them useful in emergencies and for rapidly diagnosing contagious diseases.

Licking Memorial Hospital Laboratory uses molecular testing instruments to quickly identify infectious diseases. The Cepheid GeneXpert is a closed-system PCR instrument that allows for testing a specific infectious disease, such as COVID-19 or Group B Streptococcus. The BioFire FilmArray is a multiplex PCR system that can detect and identify several infections in a single sample simultaneously. Such panels include:

- Respiratory Panel – can identify numerous viruses and bacteria that cause respiratory illness, including influenza, COVID-19, and RSV.

- Gastrointestinal Panel – can identify a wide range of viruses, bacteria, and parasites responsible for gastrointestinal problems.
- Meningitis/Encephalitis Panel – identifies pathogens that cause infections of the central nervous system.
- Blood culture panels – identifies infections in the blood stream, such as sepsis.

Molecular testing offers faster, more accurate diagnoses, which aids in timely treatment decisions, especially in an emergency setting. This leads to improved patient outcomes, shorter hospital stays, and lower healthcare costs due to targeted therapies and reduced complications. Molecular testing is also beneficial in rapidly identifying antibiotic resistance profiles for specific pathogens, which helps to promote antibiotic stewardship and reduce the rise of antibiotic-resistant bacteria.

Patient Story – Josh James

In his lifetime, Josh James had not experienced a serious illness. He grew up in the Licking County area where he graduated from Granville High School and was content with his health. Even when he began to feel pain on the right side of his lower abdomen, Josh believed the pain would subside and he would recover quickly. He did not feel unwell; however, the pain grew worse and Josh decided he could no longer ignore the symptoms. Josh's grandmother accompanied him to the Licking Memorial Hospital (LMH) Emergency Department (ED) for treatment.

"From the very first contact, the nurses and staff were very kind. I was directed quickly to a triage room where the nurse informed me and my grandmother that I might be septic," remembered Josh. "Working in registration at a different hospital, I understood what it meant to be septic, but my grandmother was frightened. Together with the staff, we were able to explain what was happening."

Sepsis is a serious, potentially life-threatening condition in which the body responds improperly to an infection. Infections may be caused by bacteria, parasites, fungi, or viruses that enter the body. During sepsis, the immune system, which defends the body from diseases, begins attacking healthy tissue which in-turn triggers inflammation that can lead to organ damage. At the same time, an abnormal chain reaction in the blood clotting system may cause blood clots to form in the blood vessels reducing blood flow to the various organs and can also cause significant damage to the organs or even failure. Just as a stroke or heart attack, sepsis is a medical emergency that requires rapid diagnosis and treatment. Symptoms include a temperature higher or lower than normal, shivering, confusion, sleepiness, pain, discomfort, or shortness of breath.

After the triage process, Josh was taken to the Licking Memorial Radiology Department for a computerized

tomography (CT), a type of imaging that uses X-ray techniques to create detailed images of the body. A computer then creates cross-sectional images, also called slices, of the bones, blood vessels, and soft tissues inside the body. The scans are used to diagnose disease or injury.

With the information gathered from the CT scan, it was determined that Josh was suffering from appendicitis, an infection in the appendix. The appendix is a thin tube that is joined to the large intestine in the lower right part of the abdomen. As a young child, the appendix functions as part of the immune system; however, as a person ages, the appendix is no longer utilized. Appendicitis occurs when the appendix becomes blocked and may be caused by various infections such as a virus, bacteria, or parasites, in the digestive tract.

Once infected, the appendix may become sore and swollen, and the blood supply to the area may stop, causing more swelling and soreness. Without enough blood flow, the appendix begins to die. The appendix can burst or develop holes or tears in the walls, which allow stool, mucus, and infection to leak through and enter the abdomen. The result can lead to more serious infections including sepsis. Symptoms may include dull pain centered around the navel, which progresses to a sharp pain in the lower right side of the abdomen, fever, vomiting, or loss of appetite.

To treat his appendicitis, Josh required immediate surgery to remove the infected appendix. Brent M. Savage, M.D., of Licking Memorial Surgical Services, met with Josh and his grandmother to explain the procedure. If the appendix has burst or the infection has spread, the surgeon may have to remove the organ using an open procedure which means creating an incision approximately four inches long to remove the organ. In most cases, however, laparoscopic or robot-assisted surgery may be performed which is much less invasive.

After creating several small incisions, a long, thin tube called a laparoscope is inserted into one of the incisions. With a small video camera and surgical tools, the surgeon performs the procedure while watching a monitor to view the inside of the abdomen and guide the tools. The appendix is removed through one of the small incisions.

"Dr. Savage quickly became my favorite physician," Josh shared. "He was very helpful as we talked through the process, and he made me very comfortable. He ensured both me and my grandmother completely understood the procedure." After spending two days recovering, Josh was released and advised to follow-up with his primary care physician.

"I was impressed with everyone I came into contact with at LMH," Josh said. "All of the nursing staff were amazing. During my stay, they were quick to assist when needed, especially with my pain control. When I felt uncomfortable, I was able to contact them, and they responded with kindness and great care. I would highly recommend LMH to anyone who is in need of care."

Since his recovery, Josh has returned to work and participating in the activities that he enjoys. He has a three-year old daughter whom he adores, and is happy to be able to spend time with her. Josh does suggest that anyone who experiences pain or other symptoms should seek care immediately.

Emergency 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. During 2023, there were 50,365 visits to the Licking Memorial Hospital (LMH) Emergency Department (ED).

	LMH 2021	LMH 2022	LMH 2023	Goal
Median length of stay in the ED for all patients*	218 min.**	190 min.	187 min.	Less than 188 min.
Median length of time from arrival until seen by a physician*	27 min.**	23 min.	18 min.	Less than 28 min.
Median length of stay in the ED for patients discharged home*	204 min.**	182 min.	189 min.	211 min. ⁽¹⁾
Median length of time from the ED physician's decision to admit a patient until the patient arrives in their Hospital room	75 min.	85 min.	73 min.	135 min. ⁽¹⁾
Percentage of patients who are in the ED for more than 6 hours	8.9%**	6.4%	6.3%	8.0% ⁽²⁾
<i>*LMH data represented on this table reflect nearly 100 percent of all ED visits, while goals reference Centers for Medicare & Medicaid Services hospital comparative data, which use a small sampling of all U.S. emergency department patients.</i>				
<i>**In 2021, admittance times were affected by an increase in patient visits and the need to test patients for COVID-19.</i>				

2. LMH operates three Urgent Care facilities: Licking Memorial Urgent Care – Pataskala, Licking Memorial Urgent Care – Granville, and Licking Memorial Urgent Care – Downtown Newark. Patients are encouraged to visit Urgent Care rather than the ED when they have illnesses and injuries that are not life-threatening, but need immediate attention, such as ear infections, minor fractures, and minor animal bites. Urgent Care visits usually require less time and offer lower costs than visits to the ED. During 2023, there were 17,766 visits to Licking Memorial Urgent Care – Granville, 9,306 visits to Licking Memorial Urgent Care – Pataskala, and 21,879 visits to Licking Memorial Urgent Care – Downtown Newark.

	LMH 2021	LMH 2022	LMH 2023	Goal
Urgent Care – Downtown Newark: median length of stay	68 min.*	57 min.	47 min.	Less than 60 min.
Urgent Care – Granville: median length of stay	46 min.*	42 min.	31 min.	Less than 60 min.
Urgent Care – Pataskala: median length of stay	52 min.*	46 min.	38 min.	Less than 60 min.
<i>*In 2021, length of stay times were affected by an increase in patient visits and the need to test patients for COVID-19.</i>				

3. Emergency angioplasty restores blood flow in a blocked heart artery by inserting a catheter with a balloon into the artery to re-open the vessel. The procedure has been proven to save lives during a heart attack and is most effective when performed within 90 minutes of the patient's arrival to the ED to minimize irreversible damage from the heart attack.

	LMH 2021	LMH 2022	LMH 2023	Goal
Median time to opened artery	60 min.	53 min.	60 min.	90 min.
Percentage of patients with arteries opened within 90 minutes	99%	100%	98%	96%
	LMH 2021	LMH 2022	LMH 2023	National ⁽¹⁾
Median time from arrival to completion of EKG	3 min.	2 min.	4 min.	7 min.

4. Patients who are seen in the ED and return home can sometimes develop further problems that warrant a return to the Hospital. Returning to the ED within 24 hours may indicate a potential problem with initial diagnosis and treatment of a patient's condition. For this reason, LMH measures the rate of unplanned returns to the ED. LMH sets an aggressively stringent goal for this, as listed below.

	LMH 2021	LMH 2022	LMH 2023	Goal
ED patients who return to the ED within 24 hours of discharge	0.9%	1.2%	1.1%	Less than 2%

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



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- 5.** A high rate of patients who return to the Hospital within 72 hours after an ED visit and are admitted can possibly signal a problem with patient care. These cases are very heavily reviewed and scrutinized, and LMH sets an aggressively stringent goal for this indicator, as listed below.

	LMH 2021	LMH 2022	LMH 2023	Goal
Patients admitted to the Hospital within 72 hours of ED visit	0.4%	0.8%	0.7%	Less than 1%

- 6.** For personal reasons, some patients may elect to leave the ED prior to completing any recommended treatment. Doing so can place the patient at serious health risk. As a measure of ensuring patient safety, LMH measures the percentage of patients who elect to leave the ED prior to completing their treatment.

	LMH 2021	LMH 2022	LMH 2023	Goal
ED patients who leave before treatment is complete	2.2%	1.4%	1.7%	Less than 3%

Data Footnotes: (1) *Hospitalcompare.hhs.gov national benchmarks.* (2) *Comparative data from the Midas Comparative Database.*

*LMH data represented on this table reflects nearly 100% of all ED visits, while goals reference CMS hospital comparative data, which uses a small sampling of all U.S. emergency department patients.

Advance Care Planning

Advance directives are legal documents that convey a patient's healthcare wishes in the event that they are unable to communicate their preferences. Having an advance directive helps to reduce the burden on families, especially during an emergency situation, and also prevents costly interventions and tests that the patient would not want performed, saving costs for both the family and healthcare facility.

An advance directive is typically comprised of a living will and a durable power of attorney for healthcare. A living will outlines an individual's preferences for medical treatments if they become terminally ill or permanently unconscious. A durable power of attorney for healthcare designates a trusted person to make medical decisions on an individual's behalf if they are incapacitated.

State-specific forms can be found online or through a healthcare provider or attorney. It is not necessary to consult a lawyer to create an advance directive; however, it may be beneficial if a person has complex medical wishes or a large estate. Individuals can complete the forms themselves by following the state guidelines. Documents must also be signed and witnessed according to state requirements.

Licking Memorial Health Systems (LMHS) offers advance care planning resources and counseling. Providers are available to meet with individuals and their families to discuss issues and questions related to advance care planning. To schedule a free consultation, contact Dave Mason, Director of Pastoral Care, at (220) 564-7729.



**Licking Memorial
Health Systems**

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Visit us at [LMHealth.org](https://www.lmhealth.org).

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

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