



Hospital and Healthcare Testing Services

Infection Control Testing Services

- Disinfection/Sterilization
- Healthcare-associated infections (HAIs)
- Pathogens
- *Legionella*
- Fungi
- Bacteria (Anaerobic and Aerobic)
- *Cryptosporidium*
- *Giardia*
- Coronavirus

Samples Accepted for Testing

- Medical Devices and Equipment
- Surface and Swab Samples
- Air Samples
- Water Samples
- Bulk Samples
- Cooling Tower Samples
- Laundries and Clothing
- Duodenoscopes

Healthcare-Associated Infections (HAIs)

Infection control in hospitals and healthcare-associated facilities such as nursing homes are an essential component of quality control in countries with high-quality healthcare. It began in the 19th century with the work of Florence Nightingale, who first recognized the importance of healthcare-associated infections (HAIs). Today, hospital and healthcare patients admitted to a hospital are the most susceptible to acquiring HAIs. Healthcare-associated infections are a major safety concern for both the providers and the patients, as well, as significantly increase healthcare costs. Considering morbidity, mortality, increased length of stay and the cost, efforts should be made to make the healthcare facilities as safe as possible by preventing such infections.

HAIs are a significant source of complications across the healthcare industry and can be transmitted between different healthcare facilities. However, recent studies suggest that implementing currently available prevention practices can lead to up to a 70 percent reduction in certain HAIs. Likewise, recent modeling data suggests that substantial reductions in resistant bacteria, like Methicillin-resistant *Staphylococcus aureus* (MRSA), can be achieved through coordinated activities between healthcare facilities in a given region. The financial benefit of using these prevention practices is estimated to be \$25 billion to \$31.5 billion in medical cost savings.

A variety of organisms are responsible for many different types of HAIs. Details about these organisms and specific prevention efforts can be found on the Centers for Disease Control and Prevention (CDC) website. EMSL Analytical, Inc. can test for the following organisms that cause HAIs:

- *Acinetobacter*
- *Burkholderia cepacia*
- *Clostridium difficile*
- Enterobacteriaceae (carbapenem-resistance)
- Gram-negative bacteria
- *Klebsiella*



- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- *Mycobacterium abscessus*
- *Pseudomonas auruginosa*
- *Staphylococcus aureus*
- *Mycobacterium tuberculosis* (TB)
- Vancomycin-resistant Enterococci (VRE)

Healthcare-associated Infections (HAIs) Analysis at EMSL

- VRE P/A Culture (M701)
- VRE Quantitative Culture (M702)
- VRSA P/A Culture (M703)
- VRSA Quantitative Culture (M704)
- CRE P/A Culture (M705)
- CRE Quantitative Culture (M706)
- *S. aureus* P/A Culture (M707)
- *S. aureus* Quantitative Culture (M708)
- *Streptococcus* P/A Culture (M709)
- *Streptococcus* Quantitative Culture (M710)
- *A. baumannii* P/A Culture (M711)
- *A. baumannii* Quantitative Culture (M712)
- *B. cepacia* complex P/A Culture (M713)
- *B. cepacia* complex Quantitative (M714)
- *L. monocytogenes* P/A Culture (M715)
- *L. Monocytogenes* Quantitative Culture (M716)
- Coronavirus by PCR (Air and Surface)
- *Salmonella* P/A Culture (M717)
- *Salmonella* Quantitative Culture (M718)
- *Campylobacter* P/A Culture (M719)
- *Campylobacter* Quantitative Culture (M720)
- *C. difficile* P/A Culture (M721)
- *C. difficile* Quantitative Culture (M722)
- *E. faecalis* P/A Culture (M723)
- *E. faecalis* Quantitative Culture (M724)
- *K. pneumoniae* P/A Culture (M725)
- *K. pneumoniae* Quantitative Culture (M726)
- *S. maltophilia* P/A Culture (M727)
- *S. maltophilia* Quantitative Culture (M728)
- MRSA P/A Culture (M729)
- MRSA Quantitative Culture (M730)
- ESBL P/A Culture (M731)
- ESBL Quantitative Culture (M732)
- *C. auris* P/A Culture (M733)
- *C. auris* Quantitative Culture (M734)

Means of Transmission

Among patients and healthcare personnel (HCP), microorganisms are spread to others through four common routes of transmission: contact (direct and indirect), respiratory droplets, airborne spread and common vehicle.

Contact Transmission

Contact is the most important and frequent mode of transmission in the healthcare setting. Organisms are transferred through direct contact between an infected or colonized patient and a susceptible healthcare worker or another person. Organisms can be transiently transferred to the intact skin of a healthcare worker (not causing infection) and then transferred to a susceptible patient who develops an infection from that organism—this demonstrates an indirect contact route of transmission from one patient to another. An infected patient touching and contaminating a doorknob, which is subsequently touched by a healthcare worker and carried to another patient, is another example of indirect contact. Microorganisms that can be spread by contact include those associated with antibiotic resistance (e.g., Methicillin-resistant *Staphylococcus aureus* (MRSA) and Vancomycin-resistant Enterococci (VRE).)

Respiratory Droplets

Droplets containing microorganisms can be generated during coughing, sneezing, talking, suctioning and bronchoscopy. They are propelled a short distance before settling quickly onto a surface. They can cause infection by being deposited directly onto nearby environmental surfaces, which can then be touched by a susceptible person who autoinoculates their own surface.





Airborne Spread

When small, particle-size microorganisms remain suspended in the air for long periods of time, they can spread to other people. The CDC has described an approach to reduce transmission of microorganisms through airborne spread in its *Guideline for Isolation Precautions in Hospitals*. Proper use of personal protective equipment (e.g., gloves, masks and gowns), aseptic technique, hand hygiene and environmental infection control measures are primary methods to protect the patient from transmission of microorganisms from another patient and from the healthcare worker. Personal protective equipment also protects the healthcare worker from exposure to microorganisms in the healthcare setting.

Common Vehicle

Common Vehicle (common source) transmission occurs when multiple people are exposed to a common inanimate vehicle of contaminated food, water, medication, solution, device or equipment and become ill. Bacteria may multiply in or on a common vehicle, but viral replication cannot occur. Examples include improperly processed food items that become contaminated with bacteria, waterborne shigellosis and bacteremia resulting from use of intravenous fluids contaminated with Gram-negative organisms.

Sampling for HAIs

Environmental Surface Sampling:

The culture swab is inexpensive and efficient. Surfaces can be sampled quickly. It is a useful test for initial site sampling and can be used to identify microorganisms to a species level.

Materials:

- Sterile culturette/swab with appropriate neutralizer or buffer solution to collect and transport specimen (provided at your request by EMSL)
- Latex/nitrile gloves

Sample Collection:

1. Wearing gloves, remove swab from packaging material.
2. Remove plug from media tube.
3. Swab the desired area thoroughly, rolling the swab lightly back and forth over sampling area.
4. Insert the swab back in the tube, firmly close cap and label appropriately.
5. For quantitative culture reporting, the area swabbed needs to be entered on the chain of custody (COC). Complete an EMSL COC, which is available on our website (www.emsl.com), detailing client name and information, project name or number, sample number and a description of the area.

Sample Shipment:

- Place samples in a cooler with reusable ice packs.
- Overnight shipping is recommended.

