



HOW ETOR SOLUTIONS WORK IN PUBLIC HEALTH

Introduction

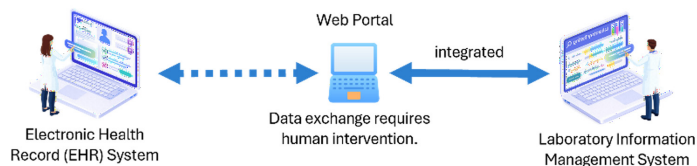
Electronic Test Orders and Results (ETOR) refers to the electronic exchange of laboratory test orders and results between test submitters and laboratories. The CDC Public Health ETOR Initiative focuses on the data exchange between healthcare organizations (HCOs) and public health laboratories (PHLs). Traditionally, these entities have relied on paper forms, mail, fax, or email to exchange critical test information. These manual methods are inefficient and can introduce delays and poor data quality that compromises patient care and impedes public health efforts. ETOR modernizes this workflow by enabling secure, standards-based communication between systems, allowing test orders and results to move quickly and accurately between partners. By improving how laboratory data is shared, ETOR supports more timely clinical decision-making, increases operational efficiency, and strengthens public health response.

Types of ETOR Solutions

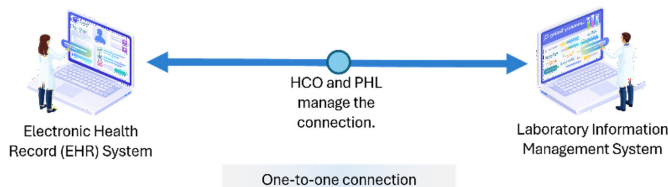
ETOR can be implemented through three main approaches: a web portal, direct systems integration, and indirect systems integration. Each approach differs in how information is transmitted between systems, the level of automation involved, and the effort required to implement and maintain the solution. Understanding these approaches can help organizations determine which type of ETOR solution is best suited to their specific use cases and operational needs.

Web Portal

A web portal is a secure, web-based system managed by PHLs that allows healthcare providers to manually submit laboratory test orders, track test status, and retrieve results. While web portals reduce reliance on paper and fax, they still require manual data entry and additional steps for both submitters and laboratories. As a result, this approach may be most appropriate for submitters with lower testing volumes, limited technical resources, or temporary needs. A web portal is an essential solution for public health response as it is relatively easy to set up and can expand rapidly to accommodate new tests and submitters. Web portal solutions can serve as an important starting point for electronic exchange of laboratory data, but they may not provide the same level of efficiency as direct or indirect systems integration.



Direct Systems Integration



Direct integration allows HCOs and PHLs to exchange laboratory test orders and results by connecting their internal systems. In this approach, healthcare providers use their electronic health record (EHR) system to submit test orders, which are transmitted electronically to the PHL's laboratory information management system (LIMS)

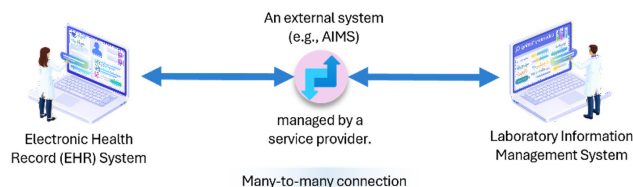
for processing. After testing is completed, laboratory staff use the LIMS to send results electronically back to the healthcare organization. These results are then incorporated into the patient's EHR record. This level of automation improves efficiency and reduces errors, particularly for organizations with higher testing volumes. However, each connection must be individually negotiated, built, and maintained between partners.

Differences in how EHRs and LIMS structure and interpret data mean that each partner must configure interfaces and manage data transformation/ translation. These integrations often become highly customized and difficult to reuse for other partners or use cases. As the number of partners grows, the required time, coordination, and technical resources increase, making this approach difficult to scale. Direct integration is often best suited for medium- to high-volume testing needs, where both HCOs and PHLs have dedicated technical staff and resources to support the implementation and ongoing management of these connections.

Indirect Systems Integration

Indirect systems integration enables HCOs and PHLs to exchange laboratory data by connecting their internal systems to a shared centralized platform, an intermediary managed by a service provider. This approach addresses many of the scalability challenges associated with direct integration.

Instead of each organization building and maintaining a separate, customized connection with every partner, this solution manages differences between systems, including how data is transported, validated, formatted, translated, and delivered. This reduces the need for customizations and repeated testing for each new connection. By centralizing these functions, intermediaries reduce technical complexity, shift some of the maintenance burden away from HCOs and PHLs, make it easier to onboard new partners, and scale ETOR solutions over time.



Choosing the Right ETOR Solution

There is no single ETOR solution that fits every organization or use case. The most appropriate approach depends on factors such as testing volume, technical capacity, available resources, and long-term goals. For example, web portal solutions may be suitable for organizations with lower testing volumes or limited technical infrastructure, while direct or indirect system integration may be more effective for organizations with higher testing volumes. Indirect integration, in particular, can offer advantages in scalability and efficiency when connecting multiple partners. In some cases, organizations may use a combination of approaches to meet different needs. Selecting the right solution involves balancing implementation effort, operational efficiency, and the ability to support future growth.

Conclusion

ETOR represents a significant step toward modernizing the exchange of laboratory information between HCOs and PHLs. It can be implemented using web portals, direct integration, or indirect integration. By replacing manual processes with electronic, standards-based solutions, ETOR improves the speed, accuracy, and reliability of test ordering and result delivery. It also strengthens the nation's readiness by enabling organizations to add new tests more quickly, onboard partners, and respond to increased testing demand during public health emergencies. As adoption continues to grow, ETOR can help strengthen connections across the healthcare and public health systems, supporting more timely care and effective public health responses.



Organizations interested in learning more about ETOR or exploring which solution may best fit their operational and technical needs can contact DLS_Informatics@cdc.gov for additional information and support.