

WHITE PAPER

THE ROLE OF INFORMATICS AND BEST PRACTICE SHARING IN PANDEMIC RESPONSE

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Abstract

As the Covid-19 pandemic continues to spread, laboratories are feeling the strain of the demand for testing.ⁱ Diagnostic testing is critical to diagnosing and containing Covid-19, and health care systems must prepare now to face an unprecedented surge across the diagnosis cycle, with increased demand and stressors on processes, instruments, inventory and staffing.

Beyond the lab, healthcare executives are also seeking strategies to ensure their institutions' readiness and effectiveness while combatting Covid-19 in their communities. These executives are anticipating challenges in connecting different data sets together along with difficulty in visualizing what the health data means for their institution, including possible stress and burnout among their employees from the effort.ⁱⁱ

Clinical Triage and Care Pathway

The U.S. Centers for Disease Control and Prevention (CDC) has identified which patients are at increased risk for severe illnessⁱⁱⁱ and has provided guidance on who should be prioritized for testing.^{iv} Guidance as of April 27, 2020 gives highest priority to hospitalized patients, as well as symptomatic healthcare facility workers, first responders and workers in congregate living settings. Symptomatic residents in long-term care facilities, or other congregate living settings, including prisons and shelters, are also prioritized, as are persons identified through public health cluster and selected contact investigations.

In addition to test prioritization guidance, early testing data suggests that among patients for whom data on underlying health conditions and other known risk factors for severe

visibility and sharing of data across the network and throughout the diagnosis cycle is critical to maintaining efficiency, value and leadership. A robust and integrated informatics and consulting platform can ensure the entire system is prepared for increased demand, understands the situation at a micro and macro level, and can make intelligent decisions to manage the response.

Laboratories can position themselves to provide value and leadership by implementing integrated solutions in three key areas:

- Clinical Triage and Care Pathway
- Lab Surge Response
- Hospital IT Data Integration

outcomes from respiratory infections were reported, 37.6% had one more underlying health conditions or risk factor. The percentage of Covid-19 patients with at least one underlying health condition or risk factor was higher among those requiring intensive care unit (ICU) admission and those requiring hospitalization without ICU admission than among those who were not hospitalized.^v

At the triage level, a comprehensive triage system that works within the existing workflow or electronic medical record (EMR) can help providers identify and manage high-risk patients. Remote triage, including tele-triage and app-based diagnostic tools can help prioritize patients for testing while reducing the exposure of healthcare workers.^{vi}

Clinical Triage and Care Pathway (continued)

Going further, a clinical insights solution can identify patients who have specific risk factors, and alert providers to the need for additional monitoring. For example, patients admitted to the ICU with increased PCT levels may be at higher risk for bacterial coinfection, and ongoing PCT monitoring may help identify infection and monitor progression to more severe states.^{vii} Clinical insights can also facilitate outpatient communication, monitoring and follow-up, consistent with CDC guidelines, for those who do not meet the threshold for

hospitalization. These follow-up notifications can recommend next actions based on approved guidelines to lessen demands on triage phone systems.

Clinical insights can also identify and prioritize testing and resources for non-pandemic care. Many patients with specific comorbidities will still require care during this time, and clinical decision support can effectively enable proactive surveillance and disease monitoring of high-risk patients.

Lab Surge Response

To limit the spread of Covid-19 or other outbreaks in communities and provide timely results, laboratories may respond with new protocols and “surge” efforts to accommodate the increase in volumes resulting from an influx of testing.^{viii}

Within the lab, demand capacity metrics can optimize the time to diagnosis by identifying instruments, departments or laboratories that have available capacity or are facing increased demand. Correct test utilization protocols can help minimize inappropriate or unnecessary testing and may be valuable in freeing up resources to support the surge.^{ix} Inventory management solutions can help proactively identify and adjust inventory ordering patterns in response to supply shortages or substitutions. Access to the institution’s consolidated data – from within the lab and out – combined with on-demand reports to ease the reporting burden on staff while adhering to government reporting guidelines is key.

As the situation evolves, health care systems must be flexible and responsive to changes. A universal dashboard system is an effective communication point between providers and the lab, supplying real-time notifications of policy updates and processes changes, inventory and supply limitations, and revised testing protocols.

A surge response will strain staff, and laboratories must prepare for potential staff shortages, illnesses, exhaustion, skill gaps and errors. Automated verification controls and clinical decision support can help prevent errors and fatigue related to overwork. In a large health system, automated check-ins for staff who are self-isolating and self-monitoring can reduce the workload for those managing staffing needs. While the laboratory is a critical function, a workflow assessment can help identify opportunities for telework or social distancing in a lab environment.

Hospital IT Data Integration

During a surge response, governments and healthcare providers must quickly identify outbreak locations and trends in addition to monitoring and assessing the impact of mitigation efforts on community spread. Providers rely on laboratory data systems to develop these reports, but existing LIS or EMR systems may be limited to the data sets within their system and unable to bring together all the data required to meet government reporting mandates.^x Instead, the information required for government reporting is likely housed in multiple databases that cannot easily communicate with each other.^{xi}

A surge response may also result in unbudgeted expenses, additional supply chain costs, routinely used supplies expiring and loss of revenue as focus shifts to the outbreak.^{xiii} Some hospital IT leaders are also reporting concerns over IT employee stress, loss of productivity due to ill or quarantined staff as well as overarching challenges in connecting the various data sets that are needed for efficient tracking of outbreaks, patient care and hospital resources.ⁱⁱ

Automating such functions not only reduces the burden on an already-overtaxed staff, but also mitigates effects of possible loss of labor due to sick time or self-isolation orders.

For instance, an inventory management system is able to help staff automatically monitor not only the amount of Personal Protective Equipment and testing supplies such as synthetic swabs that are available throughout the healthcare network but can also help pinpoint where those items are located in the event more inventory needs to be transferred to a different site. Furthermore, as lab focus shifts away from routine samples while annual physical exams or elective surgeries are postponed, an inventory management system can automate the tracking of reagent supplies that may be about to expire so that those items are consumed first, even if at a slower rate.

An integrated platform solution can aggregate data from disparate sources, automate the process of gathering required information and help visualize metrics or even prepare reports based on specific parameters.

Hospital IT Data Integration (continued)

An integrated system can also track testing volumes, positive versus negative results and identify trends based on demographics like postal codes, gender and age. Similarly, diagnostic rates can be tracked based on postal codes, testing sites and ordering providers. These reports are critical for understanding community spread, making data-driven decisions to optimize resource allocation and identifying the impact of surveillance efforts over time.

A vendor-neutral, flexible solution can also integrate up-to-date metrics from across the health system. Using such a system, laboratories can quickly and automatically track metrics and visualize trends in order to take evidence-based actions. Such tracking is also necessary to understanding and confirming if the curve of community spread is rapidly increasing or being flattened.^{xii}

Conclusion

Diagnostics are a critical part of containment strategy in every stage of a pandemic^{xiii} and laboratories and health care systems must actively prepare their surge response. Processes that improve efficiency can positively impact surge capacity.^{xiv} Every aspect of the diagnosis cycle must be evaluated for efficiency and improvement, including staff, instruments and departments.

References

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Moreover, when an integrated solution is combined with a clinical decision support system as part of an overall solution, laboratories can help clinicians at each stage of the diagnosis cycle – from patient triage and initial exam to testing and analysis all the way to final results reporting and prompts for recommended patient care pathways.

Deploying informatics solutions such as these can provide a hospital system the ability to automatically monitor inventory to efficiently use available stock, visualize demand and capacity trends for resource optimization, align on approved and consistent patient care pathways, and, ultimately, help identify evidence-based actions that can be taken to help flatten the curve during a pandemic situation.

The lab is in a unique position to be an involved and contributing partner during a surge response – helping the entire hospital system to be more efficient and respond faster. Solutions that integrate data from disparate sources, provide communication channels between departments, and optimize workflow to minimize time to diagnosis can be vital to helping alleviate some of the system strain posed by a pandemic.