Leveraging predictive analytics to reduce influenza and COVID-19-related adverse events

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Abstract: Optimizing technology can help healthcare facilities better manage the risks from a potential "twindemic" of COVID-19 and influenza. This article explores the use of predictive analytics and artificial intelligence to address these risks and improve overall patient care and safety amid a simultaneous pandemic and flu season.

Keywords: analytics, artificial intelligence, COVID-19, flu, patient safety, technology, risk management

As COVID-19 cases surged across the US in early 2021, hospitals also had to prepare for the additional threat of the peak of the annual influenza season. With many resources focused on the COVID-19 pandemic, many healthcare professionals have been worried about how increased influenza activity colliding with the current pandemic could bring about a "twindemic." Both viruses individually pose a considerable hazard to the public, but the potential for these two highly contagious respiratory illnesses to simultaneously affect communities is especially worrisome. It may be difficult to tell the difference between the viruses based on symptoms alone, and

increased testing–which could stretch the supply chain as critical materials may not be readily available–will be necessary.[1,2] In addition to the issues in supply chain, patient safety, and "twindemic" risk, healthcare professionals still need to address historical risk challenges such as patient falls and diagnostic errors, and new risks associated with the availability of personal protective equipment, mechanical ventilators, testing, and qualified healthcare staff; potential hospital capacity issues; and preventing any transmission of flu to patients with COVID-19 and vice versa. This article explores the use of predictive analytics and artificial intelligence (AI) to better understand and address these risks and improve overall patient care amid a pandemic and flu season.

The use of predictive analytics and data discovery can identify essential hidden patterns and trends.

Benefits of predictive analytics

Healthcare centers can start by reviewing historical data on adverse patient events associated with flu. The CDC has reported over 20,000 flu-related deaths in the 2019-20 season, and more than 50,000 flu deaths in 2017-18.[3,4] By aggregating data collected during past flu seasons and recent data during the COVID-19 pandemic, organizations can make predictive models that will allow patient safety and risk managers to create action plans based on unbiased data analysis, which may reveal patterns and trends not easily recognized using manual analysis.

As most facilities use patient safety and risk management systems to tag events associated with COVID-19, predictive modeling will improve the collection of the most up-to-date incidents associated with a facility's pandemic response and the flu season. Improving the effort among teams to collect risk information during the intertwining crises will assist in developing better processes and procedures to enhance care and personnel preparedness. To preserve the continuity of patient care, it is critical for risk and patient safety managers to be able to capture, track, and record vital insights in their facilities. These essential data could provide lifesaving information for coordinating workflow efforts throughout the various phases of the pandemic and enable a stronger focus on sustainable efforts to reduce patient and staff risk across all channels.

Enhance care, reduce risk

Technology plays a central role in effective risk management and patient safety for hospitals. Healthcare professionals must adhere to a heightened level of safety practices to correct gaps in longstanding processes and provide a safe environment. Effective risk management and patient safety protocols require systems with the ability to capture, track, and analyze data to enhance processes that can help hospitals mitigate future risks.

By implementing risk management and patient safety tools centralized on one platform, a hospital can collect internal data to monitor events in real-time. The use of predictive analytics and data discovery can identify essential hidden patterns and trends. AI analyzes data, and hypotheses and predictive analytics generate actionable insights for possible future scenarios. Both remove perceived biases to enhance decisions and drive operational efficiencies, which ultimately benefit patients, employees, and operations.

For an organization to learn from events, it is necessary to have complete insights into what occurred through efficient reporting. Here are suggested strategies for healthcare facilities to ensure effective and comprehensive reporting of incidents without adding more tasks to already overburdened staff:

- **Provide alternative reporting methods.** Encourage staff to consider an acceptable alternative to reporting such as calling risk or patient safety managers to report an event so it is recorded and captured.
- **Implement clear and efficient reporting procedures.** Make sure that the event report form is short and concise so it takes only a couple of minutes to complete. Consider adding drop-down options or picklists to make reporting faster and easier. Be sure to include a COVID-19 option to help categorize the event during analysis. For example, a medication event is a medication event, but if it occurred while treating a patient with COVID-19 or influenza, there might be some underlying patterns specific to its management during the pandemic that should be reviewed later.
- **Provide quality feedback.** Feedback is essential to remind the staff of the importance of reporting and assist with strengthening reporting procedures. If possible, when an event

occurs, the reporter and those involved should have a scheduled time to review the event and address how essential reporting is to improving patient care. Additionally, organizations can support initial staff training by discussing case studies with the new staff.

Working together, these dynamic functions break down departmental silos by bringing together data from across the continuum of care and identifying opportunities to improve patient safety measures and risk response. With the intelligence gathered via reporting, coupled with predictive analytics, healthcare facilities can be in a better position to anticipate patient risks and develop focused interventions in the future.

The double threat of a flu season and the COVID-19 pandemic underscores the need for a robust patient safety and risk management platform in healthcare facilities. Fortunately, technology is up to the task of enhancing safety in these uncertain and changing conditions. By adopting centralized and integrated reporting, tools to investigate events, and predictive analytics driven by AI, healthcare facilities can be more empowered to provide a safe environment for patients and staff. ■

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