NC*Notify

Business Process Innovation
North Carolina

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EXECUTIVE SUMMARY

One of the responsibilities of state government is to advance the health, safety, and well-being of the people we serve. This is impossible without close coordination of the health care provider community. North Carolina created [NC HealthConnex](#), a state-managed health information exchange (HIE), in part to provide the medical community with the data they need to make more informed decisions about patient care. NC Health Information Exchange Authority (NC HIEA) serves as a figurative "public utility" to connect all communities of care across the state to facilitate improved and more timely data sharing regardless of geography or provider type. With 98 percent of the state's health care providers covered, it is one of the largest HIEs in the country.

Since its inception five years ago, the NC HIEA has worked to build out the technical infrastructure and services to meet the needs of diverse stakeholders. Based on stakeholder feedback, NC HIEA added NC*Notify, a statewide event notification service, in 2018. Based on admission, discharge, and transfer data received from more than 120 participating hospitals plus encounter data from more than 6,500 ambulatory care settings, the NC*Notify real-time event notifications provide care teams with valuable information that spans geography and care settings and support state and federal efforts to focus on patient centered care. Its primary purpose is to alert subscribing health care providers when their patients have received care in other settings (e.g., hospitals, primary care practices, specialty practices, county health departments and behavioral health facilities) to enable more timely follow up and care coordination. A 2019 JAMA study cited that failure of care coordination cost the U.S. Health Care System $27.2 billion to $78.2 billion. The challenges of care coordination are exacerbated when there are data siloes. North Carolina is working to close these gaps across the care continuum with this service, and the Medicaid program in particular is focused on using NC*Notify to better coordinate care for its population.

Prior to NC*Notify, providers in small practices would not know if their patients were seen in an emergency room setting unless the patient reported the visit back to the provider, or wait for a daily fax from the hospitals they regularly worked with, or wait for their patients to inform them of their visits.

The first iteration of NC*Notify eliminated the need for a daily fax from local hospitals, notified practices about patient events in near real-time, removed geographic limitations, even beyond state lines, and sent notifications regardless of the electronic medical record (EMR) systems involved.
The second iteration allowed for daily flat file transfers, which significantly improved providers' access to information about their patients but were still time consuming to generate and distribute. Once a provider received the file it was their responsibility to make the data usable to their care teams and providers. Many participating providers did not have the technical capabilities and resources to automate these processes.

The latest upgrades and enhancements rolled out in 2020, gave providers an easier option that required no manipulation to access the data. Two key upgrades that made this possible are auto attribution, which automatically builds patient panels for organizations that are live and sending data to NC HealthConnex, and the NC*Notify dashboard, which allows users to search for and manage patient encounters using various criteria, filters, and notification fields. If the facility is live and sending data to NC HealthConnex, then auto attribution can build and monitor their entire population and send their notifications in near real-time to the dashboard.

IDEA

Health care providers are often unaware when one of their patients has received care outside of their facility or electronic health record (EHR) network. What's more, there is a growing need for health care providers to be notified of certain events in a timely manner to support successful transitions of care and improve care management.

Providers in North Carolina today use more than 200 disparate electronic health record (EHR) systems, and NC HealthConnex, North Carolina's state-managed health information exchange (HIE), bridges the gap between them—and between rural and urban health care—to promote access to and exchange of health information at the point of care for more appropriate treatment decisions and more effective care management. Sharing of this data also helps to create a more complete, longitudinal clinical patient record, resulting in less duplicative testing, more efficient and accurate diagnoses, recommendations, and treatment, and improved coordination across all levels of care.

The North Carolina Health Information Exchange Authority (NC HIEA), part of the North Carolina Department of Information Technology (NCDIT), works closely with the North Carolina Department of Health and Human Services (NCDHHS), the North Carolina General Assembly, and other key stakeholders to provide meaningful input for needed policy and funding changes that support NC HealthConnex as a useful tool for the provider community. NC HealthConnex is continually evolving, as NC HIEA uses stakeholder feedback to expand its suite of services.
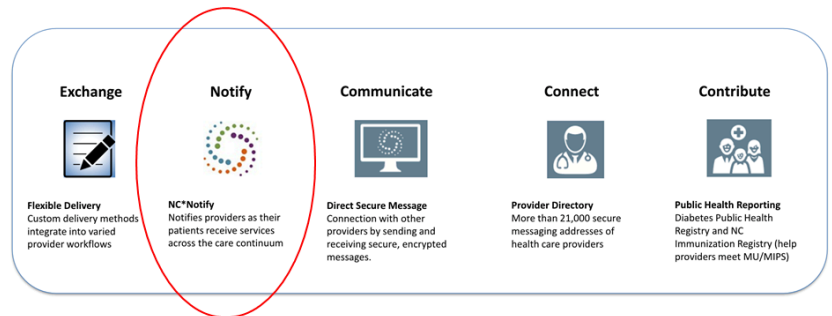
Based on stakeholder feedback, in 2018 the NC HIEA added NC*Notify, a statewide event notification service, in collaboration with vendor partners InterSystems, J2 Interactive and SAS Institute. NC*Notify is a subscription-based service that notifies providers as their patients receive services across the care continuum. Based on admission, discharge, and transfer data received from more than 120 participating hospitals plus encounter data from more than 6,500 ambulatory care settings, the NC*Notify real-time event notifications provide care teams with valuable information that spans geography and care settings and support state and federal efforts to focus on patient centered care. In 2019 this was expanded to include out-of-state alerts from the SHIEC Patient Centered Data HomeTM, which lets providers know a care event has occurred outside of the patient's "home" HIE, and confirms the availability and specific location of the clinical data. This capability enables providers to initiate additional data exchanges to access real-time information across state and regional lines and the care continuum for some 22 different states. NC HealthConnex participating providers enroll in NC*Notify to gain significant insights into patients' health care activity across North Carolina.

Providing care to patients is a process – NC HealthConnex, and NC*Notify in particular, streamlines this process, allowing physicians to get more accurate and more timely information on their patients, allowing for more complete and efficient care.

NC*Notify What It Does:

The NC*Notify real-time event notifications provide care teams with valuable information that spans geography and care settings and support state and federal efforts to focus on patient-centered care. NC HealthConnex upgraded NC*Notify in 2020 to be more tailored and bridge gaps in the day-to-day operations of the health care delivery. The NC HIEA's NC*Notify 2020 version 3+ is built on the Encounter Notification Service, ENS, Audacious Inquiry's leading care coordination platform that is currently used by interoperability-driven organizations in 12 states, representing more than 60 million active patient subscriptions. Additionally, the service incorporates data from national networks, including the Patient-Centered Data HomeTM (PCDH), managed by the Strategic Health Information Exchange Collaborative (SHIEC) that has distributed 1 billion total event notifications nationwide. Along with near real-time notifications, other new service offerings include:

a. Self-service panel loader – This feature offers participants the ability to submit whole patient panels or subsets of entire panels for monitoring.

b. Auto attribution – This upgrade automatically generates patient panels based on encounters sent to NC HealthConnex from community providers who have subscribed to the service.

c. Multiple notification options (sFTP/DSM) – Participants will have the flexibility to tailor notifications in a way that best meets their needs.

Giving providers insight to check in with patients after events and to schedule follow-up appointments for clinical interventions helps to reduce avoidable hospital readmissions, improves coordination across the care continuum, and helps providers achieve financial goals under value-based care contracts. As recently as April 2021, NC HIEA also offers clinical intelligence alerts in addition to the current notifications, including dental alerts, chronic care management, prediabetes and diabetes alerts, and care team changes Additionally in 2020, the Center for Medicare and Medicaid Services (CMS) released new notification guidelines for hospitals across North Carolina as part of the Condition of Participation (CoP) requirements for Medicare and Medicaid. Through the notification service, NC HealthConnex helps hospital participants meet the CMS CoP requirements and provides timely insights for primary care, behavioral health, and other community providers who are instrumental in care coordination for their patients.

NC HealthConnex's NC*Notify Ai Data Flow
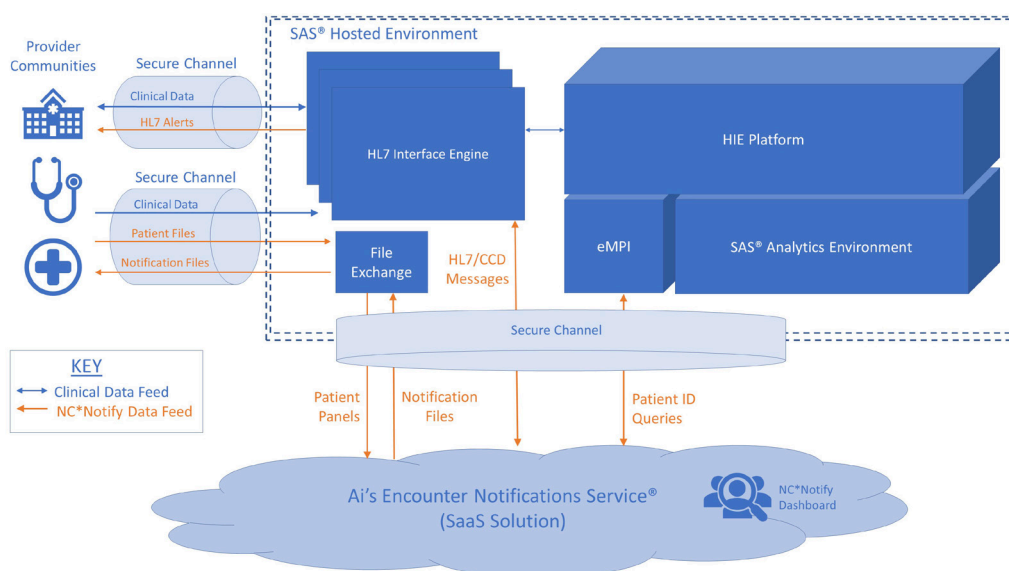
IMPLEMENTATION

During 2020, NC*Notify provided two service options. NC*Notify v3 targets larger organizations that may have dedicated IT staff can generate a patient panel; may wish to integrate notification files into their systems; and often have a high number of patients for whom they would like to receive notifications. NC*Notify v3+ is suitable for smaller organizations and large organizations who may want to receive more targeted notifications for a subset of their patients and leverage the NC HealthConnex platform for downstream processing and coordination of follow-up activities.

Patient panels are required for NC*Notify v3. Subscribers may choose to securely deliver these files to SAS, the NC HIEA's technical partner, via Secure File Transfer Protocol (sFTP) or Direct Secure Messaging (DSM). Patient panels may be updated no more frequently than once per week. Patient panels must be updated at least every 90 days to ensure subscribers are receiving notifications for patients with whom they currently have a relationship.

Subscribers to NC*Notify v3 can choose to send patient panels which are full replacements of previous panels or patient panels which are updates to an existing panel. When sending replacement panels, all patients are marked for addition. When sending update panels, patients within the panel are marked either for deletion, addition, or update. The processing of the patient panel and handling of each patient is determined based on the name of the file and the first column in the file.

In addition to the improved notification transfer methods, NC*Notify Version 3+ added a dashboard feature allowing subscribers to manage their patients' alerts via a Single Sign On from the NC HealthConnex Clinical Portal and to create work lists for care team follow up. modification of routing policies, set priorities and modify their operational state through the NCPIP, a web-based management portal maintained and operated by the NC 911 Board.

IMPACT

"Having access to timely information about when our patients are seen at the hospital is always important to deliver better care. But especially during a public health crisis such as COVID-19, having access to timely notifications when my patients have been admitted or released from the hospital helps our staff schedule important follow up care with our patients," said Dr. Harriett Burns, associate medical director and primary care provider at Piedmont Health Services Inc., an NC*Notify subscriber, and member of the N.C. Health Information Exchange Authority Advisory Board.

NC*Notify alerts providers when and where their patients interact with the health care system. To help providers make more informed decisions about appropriate care management, NC*Notify includes chief complaint and diagnosis. During the public health crisis, the NC HIEA partnered with its state public health agency to add COVID lab results to the service. This feature went into production in December 2020. Prior to NC*Notify, providers in small practices would not know if their patients were seen in an emergency room setting unless the patient reported the visit back to the provider. In most cases, local providers had working relationships with local hospitals would wait for a daily fax from the hospitals they regularly worked with if patients didn't call. This was extremely time consuming and did not always provide reliable information. It was also limited only to the hospitals with which the provider had a relationship – if the patient was on vacation elsewhere at the time of their emergency, the only way for the provider to know is if the patient notified them.

NC*Notify streamlined this process and provided more complete information by:

- Eliminating the need for a daily fax from local hospitals
- Notifying practices about patient events in near real-time
- Removing geographic limitations, even beyond state lines
- Sending notifications regardless of the electronic medical/health record (EMR/EHR) systems involved

In the second iteration of NC*Notify, event notifications were sent to providers as a flat file once daily. These records follow a uniform format, and there are no structures for indexing or recognizing relationships between records.

While these daily file transfers significantly improved providers' access to information about their patients, they were time consuming to generate and distribute. Once a participating health care provider received the file it was their responsibility to make the data usable to their care teams and providers. Many participating providers did not have the technical capabilities and resources to automate these processes.

With the upgrades and enhancements of V3 & V3+ in July 2020, providers were given an easier option that required no manipulation to access the data. Two key upgrades that made this possible are auto attribution and the NC*Notify dashboard. If the facility is live and sending data to NC HealthConnex, then auto attribution can build and monitor their entire population and send their notifications in near real-time to the dashboard.

Auto Attribution (AA): This feature automatically builds patient panels for organizations that are live and sending data to NC HealthConnex. This is a huge benefit to providers that may lack on-site technical resources and those with time limitations. AA builds the panel and keeps it updated with their entire patient population while continuously monitoring their activity.

Notification Filtering via the NC*Notify Dashboard: The NC*Notify Dashboard allows users to search for and manage patient encounters using various criteria, filters, and notification fields. Complex searches and filtering can be customized and saved, creating a one-step method to call up prior searches, revisit the status of patients over time, or check on the status of patients with chronic conditions.

Care Coordination via the Dashboard: This feature allows users to quickly mark notifications as "in progress" or "completed." Care teams and providers can keep track of work queues and mark notifications to avoid duplicative efforts, supporting coordination of follow-up activities with patients.

Reporting via the Dashboard: This function gives users the ability to export data received for up to the last 30 days into .csv or Excel file formats. Data can be exported based on time period or filtered criteria. Data can easily be imported into preferred visualization software for analysis and reporting.

By December 2020 94 participants were live, monitoring approximately 2.5 million patients and generating over 500,000 alerts per month. In March 2021 the service was monitoring 3.3 million patients and generating over 1M alerts per month.

Continuous Improvement: To continue this growth and improvement, the NC HIEA launched NC*Notify V4 to participating providers in April 2021. The framework for new V4 features, including COVID-19 Lab Alerts, Dental Alerts, High Utilizers Alerts, Diabetes & Pre-Diabetes Alerts, Care Team Change Alerts, and Chronic Care Management Alerts were put into production in December 2020.

- **COVID Lab Alerts:** notify providers when a patient's COVID-19 laboratory results are available.
- **High Utilizer Alert**: helps providers identify frequent visitors to the Emergency Department (2 or more visits in 90 days or less) or patients that are at a high risk for readmission (4 or more admissions in 12 months). Dental Alerts: alerts providers when patients utilize the emergency department for dental care.
- **Care Team Change Alert:** informs providers when a new practice has subscribed to their patient.
- **Diabetes Diagnosis Alert:** alerts providers upon a new diabetes and/or pre-diabetes diagnosis.
- **Chronic Care Management Alert:** alerts providers when a patient meets the Centers for Medicare and Medicaid Services (CMS) Chronic Care Management (CCM) services criteria.

Each of these capabilities will significantly improve providers' ability to deliver comprehensive patient care. We will continue to survey our users to learn what additional functionality will help them. We want to make sure that NC's healthcare providers have the tools they need to keep North Carolinians healthy.

Event Notifications By Month

Month	Notifications
January	195,469
February	174,094
March	161,960
April	126,718
May	152,105
June	168,051
July	183,128
August	228,719
September	290,680
October	388,511
November	412,181
December	519,481