

Functionality and Usability of Various Electronic Health Record Systems: State Psychiatric Hospitals and Systems

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Executive Summary

States have continued to move forward with the implementation of electronic health records in their state operated psychiatric hospitals. A survey of states conducted in 2018 focused on identifying systems that were most satisfactory to clinician end users while providing the most added value in the provision of patient care. This report provides a summary of three specific items in the survey: availability of 13 specific components, expectation and reasons for changing or upgrading the current EHR system, and perception of usability along 11 dimensions. For purposes of analysis, the EHRs were grouped into 3 categories due to half of the states using a single product, and nearly one-quarter each having homegrown systems or a variety of other commercial products.

Many advanced clinical components are present, however, none are universal. Computerized Physician Order Enter and Electronic Medication Administration are present in more than 60% of states' systems, while the ability to transmit data to other health information systems is nearly absent (only 20% of states).

More than half of the states indicated that they were planning to upgrade or change their EHR in the near future. The most common reason for the change or upgrade was that the system was inadequate to meet the needs. States expect to add modules and improve functionality through the change.

Perception of usability generally fell near 60% or fewer states with a positive rating on most dimensions. Customization, navigation, and interface with other systems were the lowest rated. It is expected that EHR systems will continue to evolve and be used to output performance measures as well as provide a resource to the clinical team. Critically evaluating the functionality and utility is an ongoing process. A balance among clinician need, patient preference, and administrative requirements will need to be reconciled in the design and enhancement of EHR. An eye on the future expectations from oversight entities will also need to be included to ensure the EHR can aid in driving clinical best practices and organizational accountability.

Background

The first definition for an electronic health record (EHR) was authored by the Committee on Data Standards for Patient Safety of the Institute of Medicine(1) at the request of the Department of Health and Human Services (DHHS). The committee's report was a think-tank type effort on what an EHR should include but limited the focus to clinical care practices to promote greater safety, quality, and efficiency in health care delivery. In addition to the experts present at the meeting, numerous research is cited in the letter.

The following 8 core care delivery functions were defined:

- Health information and data (Data about patients that allow care providers to make sound clinical decisions.);
- Result management (Computerized results that are accessible to the provider at the time and place they are needed.);
- Order management (Computerized order entry);
- Decision support (Computerized reminders and prompts designed to assist care providers as they provide care);
- Electronic communication and connectivity (The ability to collect information for a patient from a variety of sources to populate a patient's record);
- Patient support (The ability to educate patients on their health and treatment);
- Administrative process and reporting (The ability to electronically schedule admissions, procedures and visits, the validation of insurance eligibility, and billing and claims management); and
- Reporting and population health (The ability to meet reporting requirements and inform quality improvement efforts).

The committee's report was then used by Health Level Seven (HL7) to outline a common industry standard for EHR functionality that could be used to guide software developers. Within a few years, the EHR incentive program was developed by Center for Medicare and Medicaid Services (CMS), and over the course of several years, the pay-for-performance model was updated and converted in the past few years to MACRA. All of these programs have focused on acute care hospitals and designated providers and specifically excluded inpatient psychiatric hospitals.

Given that it has been 15 years since the committee's report, how well do EHR systems align to a single standard and what functionalities are readily available to psychiatric hospitals? EHR development initially focused on acute care hospitals and provider offices, which may have different needs than inpatient psychiatric care. The question has been raised whether the EHR systems that are available to state psychiatric hospitals are meeting their unique needs and providing a common standardized framework for information.

States have continued to move forward with the adoption of EHR in their psychiatric hospitals. In a survey of state mental health authorities conducted in 2018, 41 states reported some level of EHR adoption in their state psychiatric hospitals. This research report is a supplement to the original report entitled “Implementation Status of Electronic Health Record (EHR) Systems in State Psychiatric Hospitals” issued April 18, 2019(2). The current report focuses on the functionality of the components of an EHR and the rating of usability.

Method

A survey developed with the NASMHPD Medical Directors council was distributed to each state office of mental health in the summer 2018. Outreach to non-respondents was provided by NRI in the autumn to ensure complete reporting on the status of EHR adoption in all state operated psychiatric hospitals. In addition to the need for systems that are technically proficient in all major EHR functions, the Council's interest focused on systems that were most satisfactory to clinician end users while providing the most added value in the provision of patient care. For the survey, an EHR was defined simply as a digital version of a patient’s paper chart. The EHR could therefore be in the form of a full or partial version of the paper chart or include all or some components of the paper chart.

States that reported an EHR system were asked additional questions about their system. Three items from the survey are explored in this report.

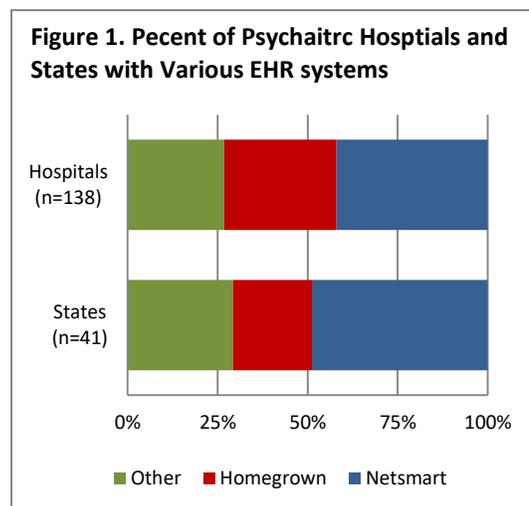
1. The inclusion (or not) of 13 EHR specific components or functions.
2. The expectation and reasons for changing or upgrading the current EHR system.
3. The perception of the usability of the current EHR system.

This report also provides an interpretation of the findings and the implications for quality.

Findings

Representatives for all states completed the survey. Forty-one states (82%) indicated that they had some level of EHR in their state operated psychiatric hospitals, 8 (20%) of which indicated that the EHR was not in all their hospitals, sometimes only in 1 hospital as a pilot.

For purposes of analysis, the EHRs were grouped into 3 categories. Figure 1 displays the distribution by state and by hospital of the three categories of EHRs. Netsmart product had the greatest penetration, in 20 states and 58 hospitals. Homegrown systems are those that were either

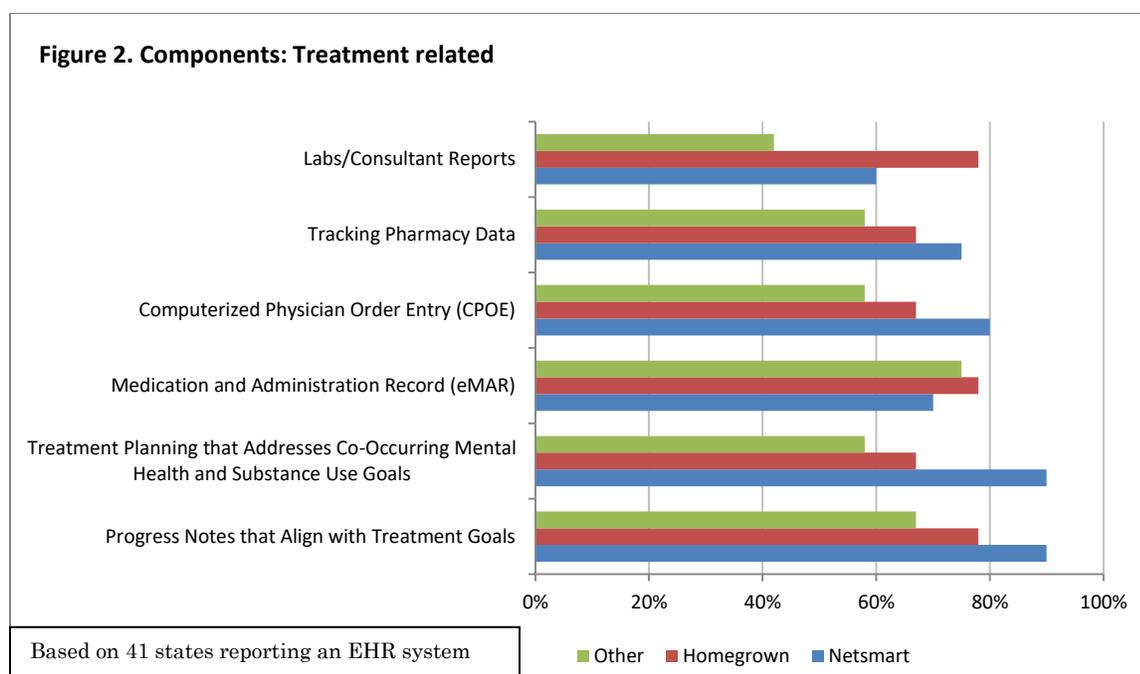


developed by the state/facility or the Vista product from the Veterans Administration (9 states, 43 hospitals). In some cases, states added modules from other commercial products onto a base structure designed by the state. Other commercial products represent a variety of vendors, most of which are used by only 1 or 2 states (12 states, 37 hospitals).

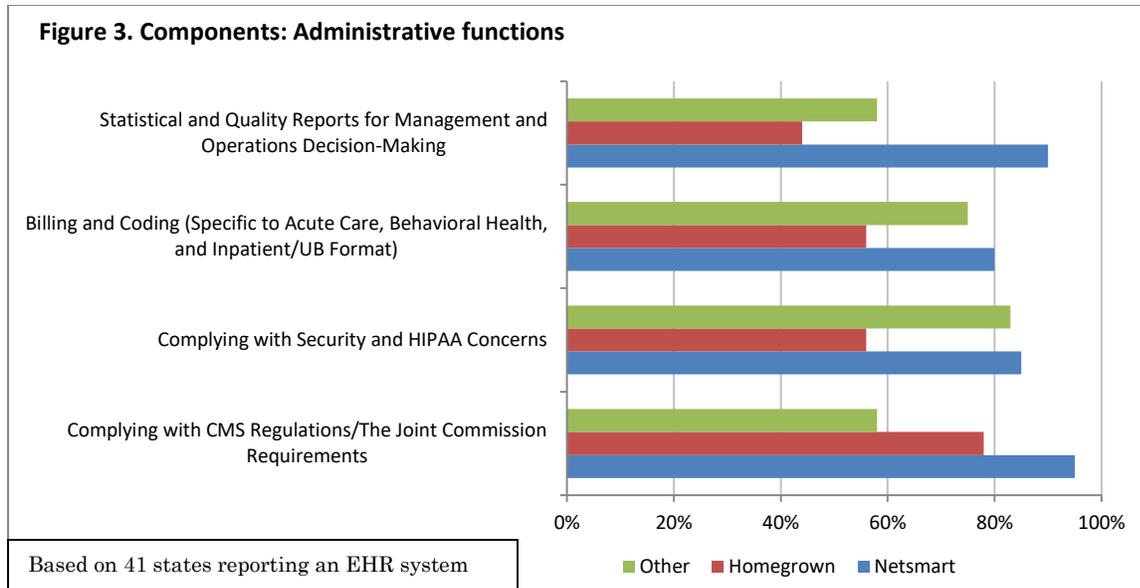
Inclusion (or not) of 13 EHR specific components or functions

Thirteen specific components or functions were listed in the survey. These components were grouped into the following categories for analysis: Treatment (including medication), administrative functions, and interoperability. The charts below display the percent of states that indicated the component was included in their EHR.

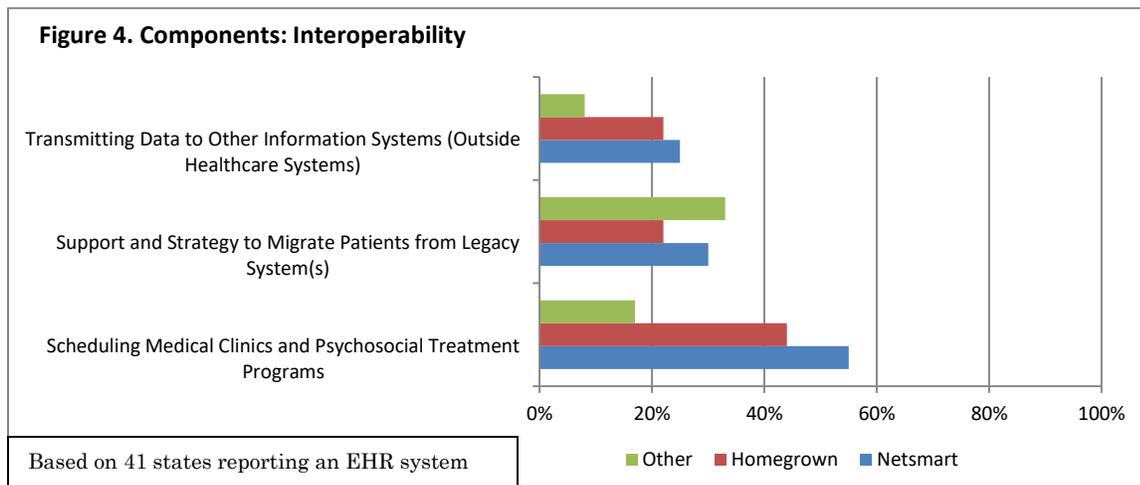
In terms of treatment components (see Figure 2), many states reported the presence of progress notes that align with treatment goals and treatment planning that addresses co-occurring mental health and substance use goals. However, the components of eMAR, CPOE, and tracking pharmacy were less prevalent. A higher proportion of states with Homegrown systems had labs/consultant reports as part of their EHR.



In addition to clinical functions, the EHR must be able to perform certain administrative functions (see Figure 3). This includes security considerations, regulatory compliance, billing, and reporting for management and operations decision-making. Many states indicated that their systems were not capable of these administrative functions.



Finally, there were a few functions related to interoperability (see Figure 4). Most states indicated that their systems were not able to perform these functions. Few states indicated that their systems were able to transmit data to other information system and to migrate patient data from legacy systems.



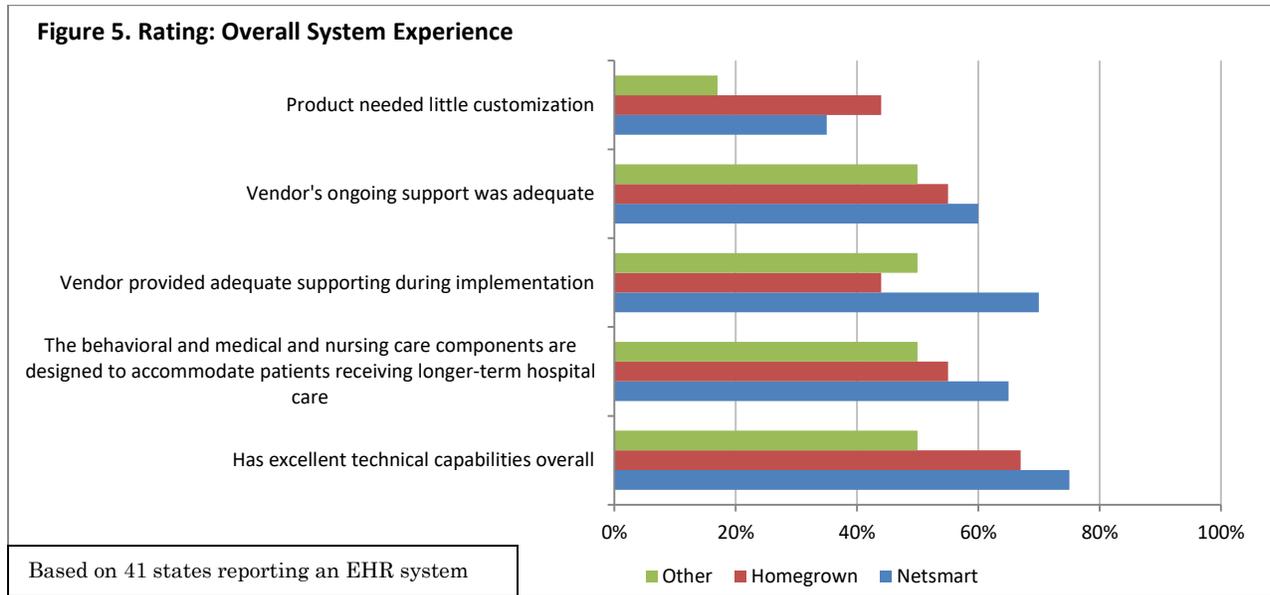
Expectation and reason for changing or upgrading the current EHR system

More than half of the states are planning to change or upgrade their EHR. Ten of 20 states (50%) using Netsmart, 7 of 9 states (78%) using Homegrown systems, and 7 of 12 states (58%) using Other commercial products are also planning to change or upgrade their system. Most states indicated that the reason for the change or upgrade was that the system was inadequate to meet the needs. States expect to add modules and improve functionality through the change.

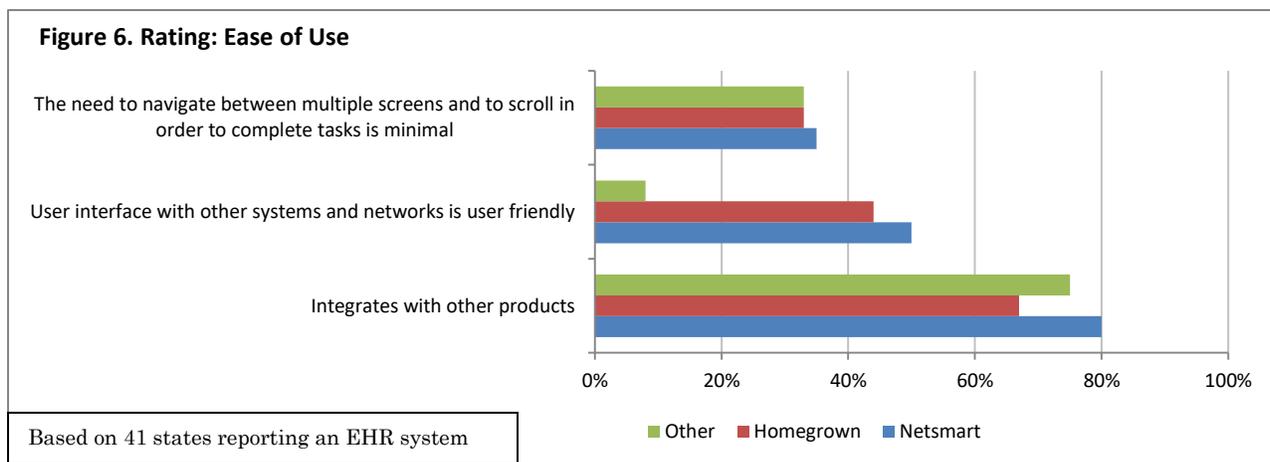
Perception of the usability of the current EHR system

Eleven factors were rated on a 4-point Likert scale (strongly disagree, disagree, agree, strongly agree; and no not know). These factors were grouped into the following categories for analysis: overall system experience, ease of use, and using data. The following charts display the percent of states that rated the usability factor as agree or strongly agree.

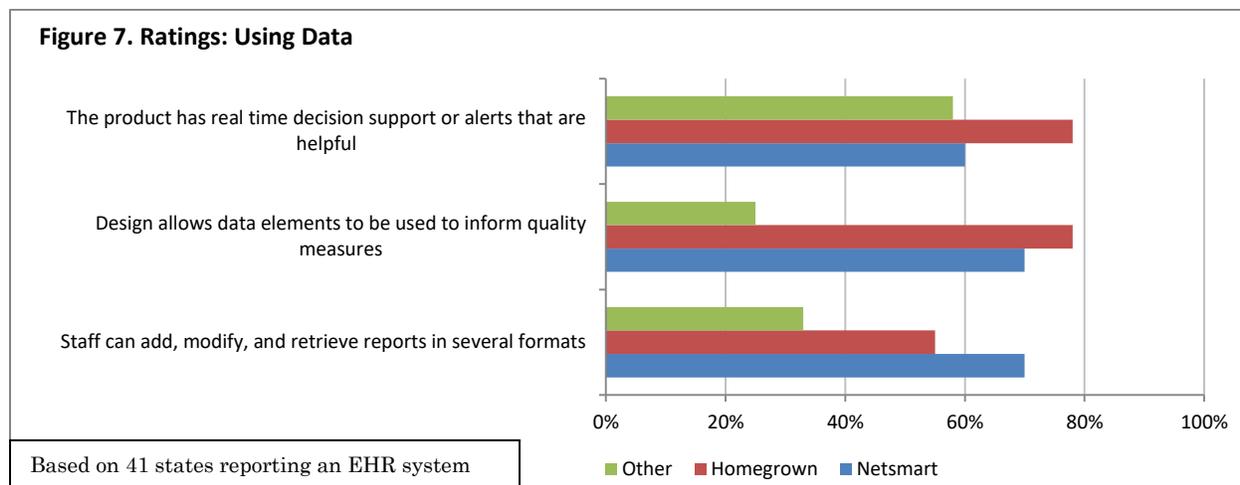
For overall system experience (see Figure 5), technical capabilities rated strongest. Customization and vendor support rated lowest.



In terms of Ease of Use (see Figure 6), many states agreed that their EHR integrates with other products but fewer states agreed that their EHRs interface with other systems was user-friendly. Few states felt their systems were easy to navigate and limited scrolling was necessary.



Three items relate to using data (see Figure 7): real-time clinical decision-support and sending reminders/alerts, compiling the data into quality metrics, and creating/generating reports. More than half the states using Homegrown and Netsmart systems positively rated these items.



Interpretation of the Findings

Nationwide, EHRs have been implemented in 70% of state psychiatric hospitals. The states that have implemented EHRs in any of their state psychiatric hospitals reported 158 hospitals in total with 138 having an EHR, or 87% of hospitals in states with an EHR. There is still much to be done to implement EHRs in all state psychiatric hospitals.

Netsmart is the single largest provider of EHR systems to state psychiatric hospitals. However, the system varies considerably across states; no component was present in 100% of states using Netsmart. Half of the states using Netsmart indicated a plan to upgrade or change. The survey did not specifically request whether the upgrade or change meant a different EHR system or a modification to the current system; it cannot be assumed which course was being considered.

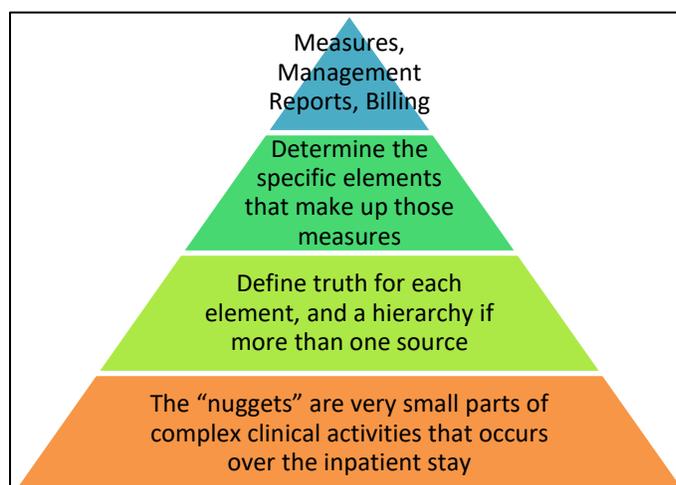
Many of the core care delivery functions suggested in the initial committee's report in 2003 are not present in the vast majority of systems. The survey items were not designed specifically to the report; however, there is much overlap. The table below provides the core care delivery functions and the related items in the survey. Based on survey responses, progress notes and treatment planning are present in more than half of the states' systems. It should be noted that the question was not asked if the progress notes and treatment planning were pre-defined products of the vendor or whether these were developed as customized components for the hospitals. On usability factors, there was evidence that there was a high need to customize the system and that the behavioral, medical, and nursing care components were not well designed to accommodate patients receiving longer-term hospital care.

Core Care delivery functions	Components in survey
Health information and data (Data about patients that allow care providers to make sound clinical decisions.);	<ul style="list-style-type: none"> • Treatment planning that addresses co-occurring mental health and substance use goals • Progress notes that align with treatment goals
Result management (Computerized results that are accessible to the provider at the time and place they are needed.);	<ul style="list-style-type: none"> • Tracking pharmacy data • Labs/consultant reports
Order management (Computerized order entry);	<ul style="list-style-type: none"> • Computerized physician order entry • Medication and Administration Record
Decision support (Computerized reminders and prompts designed to assist care providers as they provide care);	(asked as a rated item: The product has real time decision support or alerts that are helpful)
Electronic communication and connectivity (The ability to collect information for a patient from a variety of sources to populate a patient's record);	<ul style="list-style-type: none"> • Support and strategy to migrate patient data from legacy systems • Transmitting data to other information systems
Patient support (The ability to educate patients on their health and treatment);	
Administrative process and reporting (The ability to electronically schedule admissions, procedures and visits, the validation of insurance eligibility, and billing and claims management);	<ul style="list-style-type: none"> • Billing and coding • Scheduling medical clinics and psychosocial treatment programs • Complying with security and HIPAA concerns
Reporting and population health (The ability to meet reporting requirements and inform quality improvement efforts).	<ul style="list-style-type: none"> • Statistical and quality reports for management and operation decision-making • Complying with CMS regulations/The Joint Commission requirements

The survey components categorized as interoperability fall into two core functions: Electronic communication and connectivity and Administrative process and reporting. These components were the least evident in the states' EHR system. Migrating patient data is a critical issue for providing continuity of care for patients that had previous hospital stays; inability to access prior records hinders the clinical team and interrupts management reporting of trends.

The survey results suggest that more than half of the states with an EHR have been able to use their EHR for clinical decision support as well as reporting out quality measures. Let's reflect on how measures are created to better understand how granular an EHR must be to support quality measures. Most measures are a small number of nuggets of key aspects of complex clinical activities. Determining the correct nuggets to use in a measure requires

critically reviewing the specifics in the measure definition and then determining the authoritative source for that information. This is not a trivial activity and often a facility will uncover information that does not meet the intent of the definition, redundancies across forms, and information on a form that is never used downstream – either clinically or in management reporting. It is expected that EHR systems will continue to evolve and be used to output performance measures as well as provide a resource to the clinical team. Critically evaluating the functionality and utility is an ongoing process.



Implications for Quality

The survey results highlight a number of opportunities to improve the EHR system at a hospital and across all hospitals.

- The experience of one hospital may be the catalyst for an improved product to other hospitals.
- Use the existing literature on the shortcomings of the current systems.
- Fundamental involvement of clinical staff and a commitment to keep the focus on the patient should be guiding principles.
- The integrity of the data should be tested – is there consistent collection and coding.
- An evaluation is an opportunity to add information that has been missing but important. An evaluation is also an opportunity to remove unused objects.
- Check the plan for data collection against not just prior practice but external requirements.
- Extracting the data may be more difficult when there is a lot of free-text – work with the clinical staff to compromise on the nuggets needed downstream and allow for the robust notes that tell more about patients, interventions, and response.
- As more data are entered at the point of service, these data become available to computerized extraction using well-defined algorithms if defined in discrete code sets, and reduce the human burden of abstraction.

As with any quality initiative, it is important that the team represent the diversity of stakeholders. The conversations as to “why” a design is proposed for example should also lead to a conversation about “why” the hospital uses a given process. This may be an opportunity to improve local processes, re-connect with the clinical teams and the patient on what is important information for the record. Administration and external reporting also have a role as the responsible parties for accountability (fiscal and compliance) and may

need other discrete information for these downstream processes. The question of usability may also be one of “speaking a common language” between a software developer and a clinician, who bring their own areas of expertise but speak very different languages. It is important to have a team member that can bridge these differences to ensure that the product you get is the product you expected.

References

(1) Institute of Medicine (2003). Key Capabilities of an Electronic Health Record System: Letter Report. Washington, DC: The National Academies Press.

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(2) Schacht L, Ortiz G, Shaw R (2019, April). Implementation Status of Electronic Health Record (EHR) Systems in State Psychiatric Hospitals. Falls Church VA: National Association of State Mental Health Program Directors Research Institute.

About NRI

NRI was formed in 1987 as the research ally of National Association of State Mental Health Program Directors (NASMHPD), the organization representing state mental health commissioners/directors and their agencies. NRI is a separate, strictly non-partisan, not-for-profit 501(c)(3) organization. NRI is the vendor of choice for nearly all state psychiatric hospitals for The Joint Commission and CMS reporting requirements by providing states with services designed to test their performance measures and improve the quality of care that is delivered within their state psychiatric hospitals. These services also address The Joint Commission accreditation and/or CMS certification requirements. And, with the assistance of Dr. Richard Fields of Fields & Associates, NRI provides onsite response to concerns of standards compliance and survey readiness, including mock surveys and gap analyses.