Community Health Center

MADPH 1422: Data Use for Quality Improvement

Current Operations Assessment and Recommendations

This assessment was performed as part of a contract with the Massachusetts League of Community Health Centers and the Massachusetts Department of Public Health, 1422 Grant.

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CONTENTS

BACKGROUND

The overall purpose of the three-year 1422 Massachusetts Department of Public Health (MDPH) Diabetes and Hypertension Improvement Initiative grant program is to collaborate with four participating community health centers (CHCs) and their respective community partners and to provide the training and services to support their efforts in building capacity for targeted health care service and health outcome improvements in patients identified with Hypertension and/or Diabetes. To assist the CHCs in achieving the goals and objectives of this DPH community-based initiative, the Massachusetts League of Community Health Centers (MLCHC) engaged a team of consultants to conduct a readiness assessment on data use to help drive quality improvement outcomes.

The purpose of this assessment is to perform a preliminary baseline performance and benchmarking of the four FQHCs participating in the 1422 MDPH grant program. The key components of this assessment include:

- Review of Data Standardization in the Certified Electronic Health Record Technology (CEHRT)
- Review of Data Extraction from the CEHRT and Use for Reporting
- Identification of Process Improvement Opportunities

PROCESS OVERVIEW

Data Standardization in the CEHRT

The main objective of this review is to assess the quality of data capture. To ensure quality reporting, processes must be in place to ensure accurate data capture which, generally, is achieved through implementation of standardized workflows. The processes may include direct entry by staff into the CEHRT or electronic capture of data via an interface into the CEHRT.

For this review, our focus was on the flow of information into the CEHRT and the workflows employed for capturing patient information: Who, What, Where and When. The workflow review was conducted in three phases. If the CHC had more than one clinical site, observations were usually conducted at one additional site with the detailed review focused on the main clinical site. If more than one session was required to complete the review or clinical observations, additional sessions were conducted on-site or by web conference.

It should be noted that CHC's implementation of CEHRT took place in a protracted process over eighteen months. CHC went "live" with CEHRT in January 2012. Phone messages and prescription refills were implemented in May/June 2012. Clinical staff began charting notes in CEHRT in September 2012. Paper charts were utilized for historical data until June 2013 when all paper charts were scanned into CEHRT. Typically, it is not uncommon for a practice to require three to five years to master fully an EHR. So it is fair to say that CHC is still in its formative stages of EHR utilization. It must also be pointed out that most all of the configuration and implementation work has been done by the IT staff of two persons without a great deal of collaboration and outside support.

Desktop Review

The first step in our review began with a desktop review of current processes, from the time an individual first registers as a patient of the CHC to the close of a patient visit. This review was conducted during a half-day on-site session with key members from operations, clinical and management. We utilized the MLCHC Current Operations Assessment and Recommendation ("Operations Assessment") tool to capture the information (Attachment 1: MLCHC Current Operations Assessment and Recommendations). CHC Staff provided a walkthrough of the steps for key processes, described how information was documented for each process, and identified challenges and potential gaps in the processes.

Clinical Observations

Second, we conducted a review of the actual clinical operations during a full-day on-site observation session. This included review of live documentation of patient information into the CEHRT during the session but outside of the actual patient encounter; discussion with - staff regarding advantages and challenges of using the CEHRT; review of standard and non-standard practices for entering information into the CEHRT; and an assessment of the overall flow of the clinic session and staff utilization. Using the Operations Assessment, we compared the information gathered during the Desktop Review with the actual processes used on a daily basis and noted any significant variances in processes, as well as key challenges and opportunities.

Standard CEHRT Workflow

Third, it is important to gain an understanding of the capabilities, configuration and prescribed workflows for standard documentation within the CEHRT. By doing so, we are able to 1) identify gaps in utilization focused on the technology itself as well as on the users; 2) draw conclusions regarding potential causes for erroneous or less than optimal outcomes; and 3) provide recommendations for optimizing the use of the CEHRT for accurate reporting and improved outcomes. For our review we met with provider CEHRT super users, CEHRT site specialists, and the CIOs of each CHC. To ensure we reviewed and captured key CEHRT functions and prescribed workflows, we utilized the Comprehensive Patient Visit Scenario form to record our findings (Attachment 2: Comprehensive Patient Visit Scenario). The CEHRT review also proved invaluable in identifying non-standard workflows that were often undertaken as shortcuts to documentation due to what was considered unwieldy or time-consuming documentation requirements. The CEHRT workflow review was conducted on-site and via web conference.

Strengths

CHC demonstrated a number of organizational strengths during our site visits and interactions during the course of this process. We believe these strengths will provide a firm base with which to manage the opportunities for improvement enumerated below. The following items are noted as strengths we consider distinguishing features:

- The IT staff demonstrated a mastery of CEHRT product. This will serve them well as the health center moves forward in reconfiguring certain aspects of the EHR workflows in concert with clinical end users.
- The patient access operations (registration, appointments, check-out) all work relatively well.
- The layout of the patient flow through the facility reinforces completion of an orderly process including the opportunity for patient check-out.

- The subscription to Azara DRVS will be of great value in this particular project as well as for other forms of reporting (e.g., patient registry, data validation, quality reporting and improvement projects).
- The recent appointment of a Chief Primary Care Officer who is a "super-use" of the EHR, among other positive attributes, is a positive indication of strategic changes taking place that will result in meaningful involvement of clinical staff.
- A Community Health Worker has been hired bringing a wealth of case work experience and knowledge of health benefits.
- The ratio of medical assistants to providers is optimized at one-to-one.
- Medical assistants are certified, or working toward certification.
- A Quality Improvement Coordinator has been added.

Data Extraction and Use for Reporting

A significant amount of data is captured in the CEHRT. If configured appropriately and standard workflows employed to accurately and consistently capture the data, the CEHRT will prove to be an essential and powerful tool in patient care planning and management and in improving health outcomes. Once data is captured accurately, in the right format and in the right place, retrieving data to produce accurate and actionable reports is enhanced. To understand the current reporting practices and capabilities, we met with key staff responsible for managing the reporting process which includes report development, data validation, and review and dissemination of reports. Our review included discussion of common internal and external reporting requirements, the level of success in meeting those requirements, and specific challenges related to accurate data collection and quality reporting.

To gauge the current level of reporting, we conducted high level reviews of standard and common quality reports. The reports reviewed included the:

- FQHC UDS
- Meaningful Use eCQMs for the CMS EHR Incentive Payment Program
- CEHRT Registries

The data used in this assessment is limited to a select group of clinical quality measures (CQMs) for Diabetes and Hypertension. The specific data reviewed was provided the by the CHCs, drawn from the UDS Report for Massachusetts CHCs, and/or drawn from the Azara DRVS (DRVS) database sponsored by the MLCHC for those CHCs currently subscribing to DRVS. For comparative analysis against other MA FQHCs, the DRVS data and/or UDS were used.

Process Improvement Opportunities

Recommendations for improvement are based on our review and assessment of actual versus prescribed workflows, comparison of CHC workflows against common best practices, and key challenges identified by the CHCs. Best practices include:

- Optimizing the role of clinical staff to the highest level of training, certification or licensure;
- Segregating clinical and administrative tasks;
- Identification, development and regular review of operational reports;
- Regular reporting and feedback to staff on compliance and for corrective action or intervention;

- Appropriate support staff to provider ratios; and
- Rapid cycle improvement processes launched from learning pods to correct deficiencies.

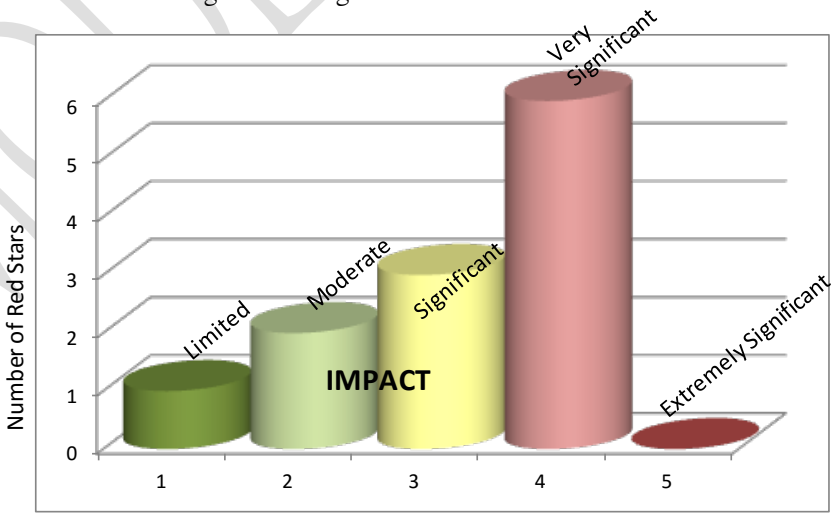
Our review includes a comprehensive list of findings and recommendations including 1) an assessment of the Impact on the process for ensuring the CHC meets the goals and objectives of the 1422 grant; and, based on the Impact assessment, 2) a ranking of Priority for corrective action (see the Table 1: Impact and Priority Description and Ranking Key below). Gaps (or faults) in processes or lack of processes were identified by a Red Star ( ).

Table 1: Impact and Priority Description and Ranking Key

Impact on 1422 Measures & Outcomes	Description	Priority	Description
Limited	Current process effective; minor improvement suggested but not required.	1	Very low priority
Moderate	Current process adequate, but improvement highly recommended.	2	Low priority
Significant	Current process inadequate; revision should be implemented as soon as possible.	3	Medium priority
Very Significant	Current process broken; major revision required immediately.	4	High priority
Extremely Significant	No process in place; new process needs to be developed and implemented immediately.	5	Essential

All findings, Red Stars, recommendations, assessment of Impact and Priority were documented in the detailed Operations Assessment then summarized in this document according to process category. Red Stars were rated on Impact from "Limited" to "Extremely Significant" and on Priority from "1" (limited priority) to "5" (Essential).

Our findings were distributed among these categories as follows:



FINDINGS AND RECOMMENDATIONS

As noted previously, during our review we used Red Stars to designate gaps in key processes or missing processes. We then reviewed each Red Star and assessed Impact (ranging from "Limited" to "Extremely Significant") and the Priority (ranging from a low of "1" to a high of "5") for corrective action.

The following Red Stars are findings that we believe warrant attention. The focus of the 1422 DPH grant is on chronic disease management of hypertension and diabetes to improve health outcomes. The purpose of this assessment is to review the existing systems and workflows and how well they are designed to meet the goal of ensuring that accurate and validated data is recorded in the CEHRT. It is our experience that the barriers to having accurate and validated data rarely result from a single cause and effect relationship; but, instead, result from a wider range of more systemic issues. Poor workflows are rarely the onl cause for suspect data. The real cause is usually due to processes (including the resources and technology provided for the process) that are not sufficiently robust and break down in times of stress. These wider ranging more systemic causes are often the most difficult to identify and resolve.

The recording of good quality data requires that well designed processes operate efficiently and consistently.

Most of the Red Stars reported were witnessed during the assessment. Others were reported as potential problems. In all cases, the Red Stars should be verified and quantified before action is taken as part of a PDSA approach to quality improvement. The Red Stars should not be resolved individually but should be seen as indicators of deeper process issues. Resolution of a root cause may well resolve a number of disparate but interdependent issues. Therefore, it is important to take the posture of breaking down issues into small, well-defined, short-term projects that create rapid results versus trying to resolve everything at once. A template for a rapid cycle PDSA process improvement and an example of a mini project are found in Attachment 3: Rapid Cycle Improvement Process.

Summary Table of Findings and Recommendations:

The table below presents in summary fashion the findings from our two site visits reviewing the workflow processes in place. These findings were also reviewed (and in some cases, modified) in a teleconference which followed our two site visits.

Each finding is categorized by the operational area, the impact level of the finding, and the priority level. These categorizations are repeated in the detail explanations of our findings and observations that follow.

No.	Category	Finding	Impact Level	Priority Level
1	Registration	Potential Delay of Patient at Check-in	Limited	1
2		Patient Recall Process	Significant	3
3	EHR Workflow Configuration	Optimize Preventive Maintenance Workflows	Very Significant	4
4		Improving Provider EHR Workflows	Very Significant	4
5	Pre-Visit Planning	Not adopted as Standard workflow	Moderate	2
6	Data Management	Data for QI	Significant	3
7		Incorporating Lab Results	Very Significant	3
8		Reporting Data Validity	Very Significant	4
9	Chronic Disease Management	Registries	Very Significant	4
10		Reintegration after Hospital Discharge	Very Significant	4
11		Farmworker Transition of Care	Very Significant	4
12	Referral Management	Increase use of CEHRT to track referral management.	Moderate	2
	None	None	Extremely Significant	5

Patient Registration, Scheduling, Appointments, Check-Out, and Recalls

1	Potential Delay at Patient Check-in	Impact: Limited	Priority: 1

The Front Desk operation is a key customer facing process. Just like in any other customer facing environment, customers expect to be seen quickly and efficiently. Combining patient registration and check in functions creates a workflow that is unpredictable and may cause an arriving patient to face lengthy waits while new patients are registered or insurance issues are resolved. Front Desk staff is also required to answer incoming calls which disrupts the workflow and compounds the problems.

ISSUE/OPPORTUNITY

Registration is performed at the Front Desk by Front Desk Staff which can disrupt and move the patient registration from the normal check-in process and to a more private space.

RECOMMENDATION

Develop PDSA project to implement processes which reduce the "face-time" between patients and Front Desk Personnel and move the patient registration from the normal check-in process and to a more private space.

2	Patient Recall Process	Impact: Significant	Priority: 3
A well-executed recall system has proven to be an effective tool in engaging patients and managing their care. For the chronic disease populations specified in the1422 Project, an effective recall system has been demonstrated to be an effective care management tool and magnifies the effectiveness of the Community Health Workers and Disease Management program. Additionally, it can help reduce the no show rate by reminding patients to book their appointment and allowing them to book an appointment within one to two weeks when implemented as part of an overall advanced access program.			
ISSUE/OPPORTUNITY No standardized process (including policies and procedures) were evident for patient recalls. A number of benefits including patient care management and reduction in DNKAs are positively correlated with an effective patient recall process.			
RECOMMENDATION Conduct PDSA projects to: 1. Implementing a recall system, including what reports will be required to monitor effectiveness. 2. The recall process should be optimized to integrate preventive maintenance, patient reminders, and patient engagement through patient electronic access, among others.			

EHR Workflow Configuration

3	Optimize Preventive Maintenance Workflows	Impact: Very Significant	Priority: 4
A key priority in optimizing the configuration of CEHRT is enhancing the preventive maintenance workflows for clinical and other staff that use the functionality.			
ISSUE/OPPORTUNITY The current configuration observed during the November 9, 2015 workflow assessment and interviews with clinical end users indicates a significant opportunity for improvement. Reconfiguring the workflows surrounding CEHRT's preventive maintenance functionality to ensure clinical users are alerted to required procedures and tests, as well as easing the workflow required to access preventive maintenance data is critical.			
RECOMMENDATION Develop PDSA projects to: 1. Institute configuration task forces of IT and clinical end-users to establish new workflows and priorities for preventive maintenance decision support. 2. Consult with other CEHRT users (e.g., , et. al.) to obtain best practice recommendations. 3. Institute training using standardized workflows and best practices. **4.** Institute a mini-charter rapid cycle series of tests of possible new configurations using "test case" users prior to final roll out.			

4	Improving Provider EHR Workflows	Impact: Very Significant	Priority: 4
Optimization of provider workflow in the EHR is critical to insuring all patient care data is collected in the proper format and is entered into the correct location within the EHR. We both observed, and it was reported to us in our interviews that clinical end users, and providers in particular find the current EHR workflows confusing and cumbersome.			
ISSUE/OPPORTUNITY Streamlining and, most of all, standardizing clinical workflows in the EHR will result in enhanced data validity and reliability for reporting and for use by downstream users.			
RECOMMENDATION Develop PDSA projects to optimize configuration of CEHRT and to streamline and standardize visit documentation and data collection: 1. Establish collaborations with other Massachusetts CHCs using CEHRT. 2. Incorporate end-users in projects to reconfigure and optimize the EHR workflows. 3. Utilize an outside subject matter expert to provide guidance in increasing the clinical EHR workflow standardization efficiency. 4. Develop training programs to reinforce the standardized workflows.			

Pre-Visit Planning

5	Pre-Visit Planning	Impact: Moderate	Priority: 2
Pre-visit planning is a highly recommended activity undertaken by the clinical team. This can include ensuring that patient charts are up to date, e.g., test results are entered, and huddling with providers and nurses at the start of a session to plan for the patient visits, e.g., identifying POCT needs. Such chart prep and visit planning can dramatically increase provider and nursing productivity and reduce visit cycle times. Also, as a transition to a managed care is accomplished with outcome-based prospective payment, the ability to manage patients will become more and more important. This will require a move away from reactively seeing patients to proactive care management.			
ISSUE/OPPORTUNITY Pre-visit planning began during the course of this Data QI Phase assessment. Much (if not all) of the chart update and pre-visit planning accomplished by nurses at the time of our observations. A new standardized system has been in place for more than a month.			
RECOMMENDATION Develop PDSA projects to: 1. Continue and complete the implementation phases at both sites. 2. Implement evaluations of the newly implemented processes.			

Data Management

6	Data for Quality Improvement	Impact: Significant	Priority: 3

CHC has established a Quality Improvement function within the health center to monitor and drive efforts to improve patient outcomes. Quality Improvement runs on data. CHC is fortunate to have a reputable EHR as well as DRVS. Both have existing tools which when validated can be powerful instruments in driving QI decision making and monitoring. The key is having data which is valid, and therefore trusted. Secondly, it is important to have data reported out that is actionable. Finally, the reporting tools must be flexible as the need for analytics changes constantly.

ISSUE/OPPORTUNITY

The CEHRT and DRVS have the potential to provide the data requirements necessary to support a powerful QI program. DRVS has undergone an upgrade of its reporting tools with this in mind. QI requires a reliable and flexible information platform to advocate for QI throughout an organization.

RECOMMENDATION

Develop PDSA projects to:

1. Periodically validate data mapping from CEHRT into DRVS to ensure valid data reporting, especially after updates and reconfigurations of the EHR.
2. Establish a regular calendar of QI projects based on agreed upon annual priorities.
3. Examine the ready-made QI tools in CEHRT and DRVS as a point of departure.
4. Align QI efforts with the priorities of the 1422 Grant program.
5. Ensure QI has the flexible reporting tools required.
6. Institute Periodic Data Validations possibly using CEHRT Practice Analytics

7	Incorporating Lab Results	Impact: Significant	Priority: 3

For data to be searchable and reportable it must be entered in the correct format and location in the CEHRT. Data that is not searchable is of extremely limited use for patient care purposes. For laboratory results to populate CEHRT automatically there has to be an interface with the appropriate laboratories. However, not every patient will have access to an interfaced laboratory partner.

ISSUE/OPPORTUNITY

While 90% of ordered lab results are received as electronic functional data and incorporated into the EHR, it was reported that the remaining 10% of labs are scanned into CEHRT and not entered as discrete functional data. Additionally, some consultant reports are received as fax images and are interpretations of imaging with little or no discrete data. Such data is not useable for reporting and care management thus increasing the possibility that provider decision making will be misdirected.

RECOMMENDATION

Develop PDSA Projects to:

1. Continue to work with "trading partners" to user HIE or interfaces.
2. Encourage patients at the Site 2 to use the specimen collection site in the health center.
3. Develop processes to manually enter results that cannot be incorporated electronically and scan reports as confirmatory back-up into the CEHRT.
4. Categorize scanned results simplifying the look-up process.
5. Develop protocols for entry of consultant results that are reportable.
6. Implement evaluation processes to monitor and improve new processes.

8	Reporting	Impact: Very Significant	Priority: 4
The ability to extract data from the CEHRT into reporting tools is critical for clinicians and managers to make data-driven decisions. Reporting tools in CEHRTs are constantly upgraded and refined. Data in reports are only as good as the trust that users have in the data. Data managers must periodically review and validate the data, and the mapping of external reporting tools such as DRVS. DRVS will play a prominent role in the 1422 Grant program.			
ISSUE/OPPORTUNITY During our observations it was reported that data validation and mapping efforts with the CEHRT and DRVS reporting tools were still required. Our limited validation studies indicate the level of data reliability is reasonable for DRVS in the short term, but variances were found that require investigation and further mapping of the data flows from CEHRT into DRVS.			
RECOMMENDATION Develop PDSA Projects to: 1. Periodically test and validate data flows from CEHRT into DRVS to assure reliability of reported data results. 2. Develop standardized and periodic data validation processes for both DRVS and CEHRT reporting tools. 3. Conduct periodic benchmarking against other DRVS subscribers to spot anomalies.			

Chronic Disease Management

9	Registries	Impact: Very Significant	Priority: 4
Effective utilization of registries is a critical tool for tracking and managing the clinical care and outcomes of a defined patient population. Registries can be designed so that a specific diagnosis, test result or any other predefined criteria, automatically adds the patient to a registry.			
ISSUE/OPPORTUNITY Registries are key in identifying and managing patients with specific conditions, as well as tracking and reporting. Lack of effective registry functionality requires significant ad hoc manual processes, increasing chances of data error. The care management capabilities of CEHRT and DRVS are underutilized.			
RECOMMENDATION Develop PDSA projects to: 1. Evaluate existing registry functionality in DRVS and CEHRT for comparative effectiveness. 2. Periodically review data mapping between CEHRT and DRVS. 3. Configure and enable registries and train staff appropriately. 4. Test the use of DRVS' Registry functionality for use in clinical processes. 5. Map a standard workflow for chronic disease management with involvement of clinical staff.			

10	Reintegration after Hospital Discharge	Impact: Very Significant	Priority: 4

A key part of chronic disease management is a reliable process to return the patient to primary care management in a timely fashion from other levels of care (e.g., emergency, acute, rehab). When a discharge record is received, (or when it is learned by some other means) it is critical that the discharge record is obtained and the patient integrated back into primary management.

ISSUE/OPPORTUNITY

The performance of CHC's hospital partners is uneven and the management of discharge data in the EHR is uneven. Most times it was reported that discharge data is not incorporated as functional data into the CEHRT. Failure to reconcile hospital discharge data into the CEHRT as functional data can contribute to faults in care management at the primary care level (e.g., reconciliation of problem and medication lists).

RECOMMENDATION

Develop PDSA Projects to:

1. Improve communications with "trading partners" using required transition of care documentation (e.g., CCDA).
2. Validate CCDA functionality in CEHRT.
3. Establish use of MassHiWay and other electronic means of data transmission with trading partners.
4. Implement processes to incorporate and reconcile data into the CEHRT.
5. Evaluate the above processes after implementation.

11	Farmworker Transition of Care	Impact: Very Significant	Priority: 4

CHC is part of a farmworkers, migrant labor health care network of providers in the . This high risk patient population presents with a significant number of chronic diseases requiring coordinated care across this network.

ISSUE/OPPORTUNITY

The mobility of the population requires a highly effective transfer of care coordination process across the network of providers.

RECOMMENDATION

Develop PDSA Projects to:

1. Encourage PCAs to advocate for enhanced cooperation and data sharing amongst the trading partners involved in this program.
2. Implement standardized transition of care management communications protocols (e.g., CCDAs) for record sharing.
3. Seek resources to support infrastructure to enhance coordination of care among the involved trading partners.
4. Continue outreach to the farmworker population to participate in efforts to coordinate care.

Referrals Management

12	Referral Management	Impact: Moderate	Priority: 2
Managing and tracking patient referrals is a key part of care management. All CEHRTs have capabilities to share transition of care information and manage the referral loop process. In spite of the advances in CEHRT management of the referrals process, much of the workflow requires direct staff management (e.g., telephone work).			
ISSUE/OPPORTUNITY Referrals management is critical in general, and a specific requirement of the 1422 Project. Automating as much of the process as possible will yield significant gains in quality and efficiency.			
RECOMMENDATION Develop PDSA Projects to: 1. Maximize use of transition of care functionality. 2. Explore utilizing DRVS as a tool to support the referrals process. 3. Configure standard CEHRT workflows into CEHRT for referrals management allowing for more tracking and reporting. 4. Resolve the apparent technical barriers in CEHRT CCDA and transition of care functionality. 5. Establish a QI process for referrals management after the workflow is approved and implemented. 6. Incorporate "closing the referral loop" as part of pre-visit planning and the standard workflow.			

CONCLUSIONS

We should point out at the outset that during the course of our assessment, many of the points discussed in this report were either under consideration by CHC, or in some cases projects were begun soon after our preliminary findings were reported out.

A total of 12 Red Stars that impact the collection of good quality clinical and operational data were identified during our assessment of the clinical workflows at CHC. While this assessment focused primarily on data relating to the identification and care of diabetic and hypertensive patients, in reality many of the findings are systemic.

In general, our findings confirmed that data was collected consistently, but, improvements can be made to the workflows to support and improve data integrity: quality data is critical in a chronic disease management environment. Incorrectly recorded data or missing data can have an important effect on patient care. For example, if a diagnosis or the result of a test is not reported, the patient may not appear in reports designed for tracking or identifying patients with specific conditions. In other words, the patient becomes lost to the reporting process, but, more importantly may not be identified for needed care intervention.

Clinical End User Configuration

In our discussion of findings and observations (Red Star 6: End User Configuration) we noted this topic as a high priority. In our observations and discussions with clinical end users, particularly nurses and

providers, points were made that CEHRT's current configuration is thought to be confusing may cause oversights in care management. We heard nurse complaints in particular indicated that pre-visit planning was inefficient due to the manner in which needed data is displayed in care planning, for example. We applaud the efforts of CHC in launching a reconfiguration effort with clinical leadership involvement. We believe this will result in some of the most important data quality improvements of all the priorities listed here.

Scanned Test Results

For data to be searchable and reportable it must be entered in the correct format and in the correct place or data field in CEHRT. Content that is entered as text or scanned as an image is neither searchable nor reportable data. As such, the ability to use the information for care management or trending the results over time to monitor health outcomes is lost. In addition, the ability to retrieve the data in a usable, reportable format is lost.

One major area of concern is the recording of laboratory results. For laboratory results to populate CEHRT automatically there has to be an interface with the appropriate laboratories. However, not every patient will have access to an interfaced laboratory and, where there is no interface results need to be input manually. There are multiple potential workflows to manage this but a typical example would be one where the information is sent to the provider for approval, then manually input into the patient record by a clinical support staff member and then filed for scanning. Approximately 10% of laboratory results are reportedly being received via paper or fax from non-interfaced laboratories. Currently, these results are only scanned into CEHRT as images. As images such results are not reportable. In addition, from a EHR reporting perspective, such data do not exist and as such will be recorded as "No test", thereby, skewing the report.

In order to fully capture a patient's history and progress, it is important that whenever possible that discrete, reportable data values be entered and stored so as to be retrieved and reliably reported when needed. It is highly recommended that, to the extent possible, laboratories above a certain threshold of activity be interfaced. We recognize that reaching 100% electronically resulted labs may not be feasible, so we recommend that a process for manually entering key lab values be studied using a PDSA process improvement protocol. The hope for a universal access data sharing platform as prescribed by CMS still is a far off prospect so interim process are still recommended.

Chronic Disease Care Management

CEHRT has reasonably effective capabilities to facilitate the management of chronic diseases. Effective utilization of registries and other tools available in CEHRT and DRVS is a necessity for tracking and managing the clinical care of patients.

While we are extremely impressed by the success in managing patients with co-morbidities and the level of effort being targeted towards chronic disease management, we found that the work is very labor intensive. A significant amount of time and effort is spent finding information and creating and generating reports that provide the necessary information to manage and track patients. While the effort and results are commendable, the efforts can be made significantly more efficient by more fully utilizing the capabilities of

CEHRT and DRVS. Doing so will only enhance the care management process which may then lead to more effective treatments and positive outcomes.

Finally, many of the issues in this category involve relations with trading partners and interactions with health information exchanges (HIEs) which are years behind schedule. Therefore, it must be acknowledged that some of the opportunities contain elements beyond the control of CHC. Nevertheless, CHC can ensure that when HIE becomes a reality in a few years, it is prepared to participate in the early stages of implementation. We believe this will be a distinguishing feature of advanced population health.

DATA BENCHMARKING

We conducted benchmarking data reviews in order to gain a current snapshot of CHC's relative performance comparison and for a measure of data validity on certain common quality measures. We believe these various studies may be predictive of findings in the DPH report, provide a baseline for improvement in outcomes, as well as indicate areas for data quality improvement.

UDS Benchmarking

The first table below compares submitted UDS data from CHC with all Massachusetts FQHCs for 2014 along eight different clinical quality indicators:

Patients	2014	
	MA	
Medical Conditions (% of patients with medical conditions)		
Hypertension [4]	21.10%	30.30%
Diabetes [5]	9.90%	11.00%
Asthma	6.80%	7.40%
HIV	1.00%	0.00%
Chronic Disease Management		
Cholesterol Treatment (Lipid Therapy for Coronary Artery Disease Patients)	79.20%	64.30%
Heart Attack/Stroke Treatment (Aspirin Therapy for Ischemic Vascular Disease Patients)	74.70%	79.60%
Blood Pressure Control (Hypertensive Patients with Blood Pressure < 140/90)	63.40%	85.70%
Diabetes Control (Diabetic Patients with HbA1c <= 9%)	73.60%	68.60%

Footnotes:
4 Hypertensive adults as a percent of estimated adult medical patients of ages 18-85.
5 Diabetic adults as a percent of estimated adult medical patients of ages 18-75

These data, along with other presentations below can be used as baseline indicators measuring changes in performance as the DPH project moves into its later stages with distribution of reports.

A comment on this table is warranted. The results on the eight indicators are mixed, but may provide clues to areas for further monitoring and quality improvement project focus.

DRVS Benchmarking

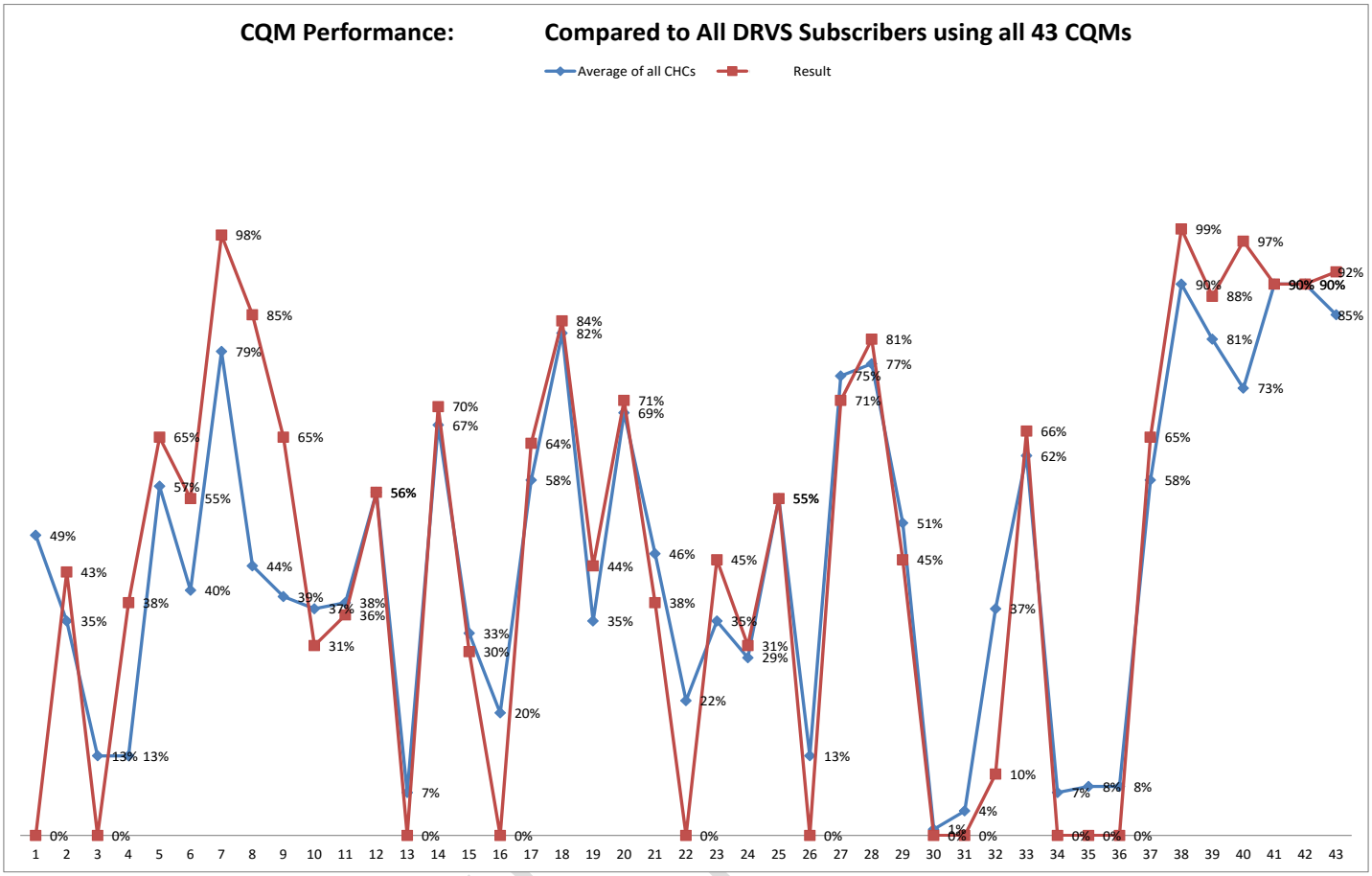
CHC is a subscriber to the Azara DRVS reporting tool sponsored by the Massachusetts League of Community Health Centers. One of the primary value-added features to DRVS is its benchmarking capabilities. This allowed us to develop more specific benchmarks than those provided by the UDS reporting tool.

A report was drawn from DRVS examining 43 NQF Clinical Quality Measures (CQM). These measures are standard measures used in a variety of CMS settings including Meaningful Use, among a variety of others. The data was drawn for Calendar Year 2015 and compares the performance results of 28 other DRVS subscribers on the 43 CQMS.

The following table lists the CQMS and CHC's rank among the 28 other DRVS subscribers.

No.	NQF. No.	Measure	Rank	Average of all CHCs	Result
1	0108	Additional Follow-Up Care for Children Prescribed ADHD Medication (NQF 0108)	21	49%	0%
2	0036	Asthma Influenza Vaccine (NQF 0036 modified)	8	35%	43%
3	0036	Asthma Self Management Plan (NQF 0036 modified)	20	13%	0%
4	0036	Asthma Severity Assessed (NQF 0036 modified)	2	13%	38%
5	0421	BMI Screening and Follow-Up >= 65 Years (NQF 0421)	7	57%	65%
6	0421	BMI Screening and Follow-Up 18 - 64 Years (NQF 0421)	4	40%	55%
7	0024	Child Weight Screening / BMI (NQF 0024)	3	79%	98%
8	0024	Child Weight Screening / Nutritional Counseling (NQF 0024)	1	44%	85%
9	0024	Child Weight Screening / Physical Activity (NQF 0024)	5	39%	65%
10	0033	Chlamydia Screening for Women (NQF 0033)	18	37%	31%
11	0059	Diabetes A1c < 7 (NQF 0059 modified)	18	38%	36%
12	0059	Diabetes A1c < 8 (NQF 0059 modified)	16	56%	56%
13	00601	Diabetes A1c < 8 for Pediatric Patients (NQF 0060 modified)	12	7%	0%
14	0059	Diabetes A1c <= 9 (NQF 0059 modified)	13	67%	70%
15	0059	Diabetes A1c > 9 (NQF 0059)	17	33%	30%
16	0060	Diabetes A1c Test for Pediatric Patients (NQF 0060)	18	20%	0%
17	0059	Diabetes A1c Tested in the past 6 months (NQF 0059 modified)	13	58%	64%
18	0059	Diabetes A1c Tested in the past year (NQF 0059 modified)	15	82%	84%
19	0059	Diabetes BP < 130/80 (NQF 0059 modified)	2	35%	44%
20	0059	Diabetes BP < 140/90 (NQF 0059 modified)	7	69%	71%
21	0059	Diabetes Depression Screening (NQF 0059 modified)	18	46%	38%
22	0055	Diabetes Eye Exam (NQF 0055)	26	22%	0%
23	0056	Diabetes Foot Exam (NQF 0056)	11	35%	45%
24	0064	Diabetes LDL Management - LDL < 100(NQF 0064)	16	29%	31%
25	0064	Diabetes LDL Management - LDL Tested (NQF 0064 modified)	19	55%	55%
26	0059	Diabetes Self Management Goal (NQF 0059 modified)	18	13%	0%
27	0059	Diabetes Tobacco Use Assessment and Cessation (NQF 0059 modified)	20	75%	71%
28	0062	Diabetes Urine Protein Screening (NQF 0062)	13	77%	81%
29	0059	Diabetes with PCV Immunization (NQF 0059 Modified)	23	51%	45%
30	0004	Engagement of AOD Treatment 13-17 Years Old (NQF 0004)	8	1%	0%
31	0004	Engagement of AOD Treatment 18+ Years Old (NQF 0004)	24	4%	0%
32	0108	Follow-Up Care for Children Prescribed ADHD Medication (NQF 0108)	24	37%	10%
33	0018	Hypertension Controlling High Blood Pressure (NQF 0018)	5	62%	66%
34	0018	Hypertension Self Management Goal (NQF 0018 modified)	14	7%	0%
35	0004	Initiation of AOD Treatment 13-17 Years Old (NQF 0004)	12	8%	0%
36	0004	Initiation of AOD Treatment 18+ Years Old (NQF 0004)	25	8%	0%
37	0028	Tobacco Use: Cessation (NQF 0028 Modified)	14	58%	65%
38	0028	Tobacco Use: Screening (NQF 0028 Modified)	4	90%	99%
39	0028	Tobacco Use: Screening and Cessation (NQF 0028)	12	81%	88%
40	0028	Tobacco Use: Screening and Cessation for Adolescents (NQF 0028 modified)	5	73%	97%
41	0036	Use of Appropriate Medications for Asthma (NQF 0036)	21	90%	90%
42	0036	Use of Appropriate Medications for Asthma Ages 18-64 (NQF 0036 modified)	20	90%	90%
43	0036	Use of Appropriate Medications for Asthma Ages 5-17 (NQF 0036 modified)	18	85%	92%

The above results are presented in line-graph format below.



DRVS Benchmarking Discussion of Results:

These two presentations of the 2015 DRVS benchmarking results of CHC compared with the other 28 FQHCs participating in the Azara DRVS program are useful for at least two reasons:

1. They can be used as baselines to measure changes over time as a variety of data quality interventions are made.
2. Changes in the trend line can be used as indicators of data quality. One conclusion to be drawn from the line graph above is that the variations in the average of all CHCs and the results of CHC form a similar pattern. This indicates that CHC's performance tracks closely with the average and that they data flowing into DRVS from CEHRT is not wildly out of expected ranges. Overtime, (as we have seen with other CHCs) we would expect the individual results to improve, but perhaps the patterns to stay roughly the same.
3. All results with Zero should be reexamined regarding reasons for this value.

NEXT STEPS

The findings and recommendations presented here focus on improving clinical workflows to facilitate appropriate documentation and data capture in the CEHRT. By doing so, CHC will be well prepared to

meet the future demands of data management for clinical quality reporting, care management and improved patient health outcomes. It should also be noted that CHC is already taking steps to improve health outcomes for their patients:

- Efforts are already underway to reconfigure CEHRT to enhance the workflows of clinical staff.
- After reconfiguration efforts have reached the evaluation stages, attention should focus on the data mapping between CEHRT and DRVS. Since DRVS is the source of data for DPH in this project, it is critical to ensure that the data flowing into DRVS is an accurate reflection of what is entered into CEHRT. It must be acknowledged that this is an ongoing process.

Although, the focus of this assessment was on data quality for the 1422 MDPH grant, recommended improvements to the processes identified will help position CHC to compete in a data-driven healthcare environment where healthcare reimbursement will be based more on outcomes and less on volume. As we move through Meaningful Use and PCMH towards payment reform, having ready access to good quality data will be critical for success. Having good quality data requires well designed process to operate efficiently and consistently capture timely accurate data.

We have presented Red Stars to identify processes that warrant attention. But before quickly moving to resolution, the Red Stars should be verified and quantified to fully understand the root cause(s). Resolution of a root cause may well resolve a number of disparate but interdependent issues. We stress, therefore, that it is important to take the posture of breaking down issues into small, well-defined, short-term projects that create rapid results versus trying to resolve everything at once. Additionally, a significant amount of effort must be spent upfront to validate the data captured and reported out of CEHRT and DRVS. Similar reports from both systems should return like results if the data is accurately captured in both systems.

It was a pleasure working with the team at CHC. Everyone we met was very accommodating and willing to share information openly. Because of their openness and availability, we were able to conduct a fairly thorough review within a relatively short time and feel confident we have fairly and accurately represented the organization. We would like to thank all staff for their time, but especially:

- Chief Information Officer
- RN, Medical Practice Manager
- Desktop Support Specialist

We hope and believe the information presented here provides a strong framework for success not only on the 1422 MDPH grant but also in the healthcare reform environment.

ATTACHMENTS

Attachment 1: MLCHC Current Operations Assessment and Recommendations (sample pages)

MLCHC Current Operations Assessment and Recommendations	2015 v4_11/20/2015

Category / Process		Process Overview	Red Star #	Red Star Issues & Opportunities	Recommendation	Impact on Diabetes, HTN or Pre-Diabetes	Priority
CLINIC VISIT							
Pre-Visit Planning							
1	Are there defined clinical teams?					Choose an item.	Choose an item.
2	Are pre-visit huddles occurring? When? What is reviewed? Who participates? Who is responsible for leading the huddles?					Choose an item.	Choose an item.
3	Is there a process for chart prep before the visit?					Choose an item.	Choose an item.
4	What are the key challenges?					Choose an item.	Choose an item.
Chronic Disease Care Management							
1	How does your CHC identify patients with chronic disease(s)? What if any, specific diseases are the focus for your CHC?					Choose an item.	Choose an item.
2	Does your CHC utilize disease registries? If yes, a) who is responsible for keeping them up-to-date and b) how often are they updated?					Choose an item.	Choose an item.
3	What is your process for managing these patients? Who is responsible for managing these patients and how are the patients tracked?					Choose an item.	Choose an item.
4	Do you utilize nurse case managers? If so, how are patients assigned and what is the expected caseload?					Choose an item.	Choose an item.

Attachment 2: Comprehensive Patient Visit Scenario (sample page)

MLCHC 1422 DPH QI **CHC:**
Comprehensive Patient Visit Scenario **Date:**
2015

Component	Scenario (Assume Established Patient)	Reviewed	Notes (Include comments from clinical observations where applicable)
Appointments/ Scheduling	1. An established patient calls in for appointment a. Demonstrate different ways to look up patient (name, date of birth, social security number) b. Demonstrate different views of the schedule to include multiple providers, resources, varied appointment times by provider 2. **Scheduling rules** 3. **List of visit types** 4. Provider has a 20 min. slot, show how the appointment slots are blocked (auto or manually) and how they can be overridden 5. Resource (e.g., translation) and/or room scheduling 6. Block a procedure room or resource at same time 7. Demonstrate how to search for an appointment time for a specific patient 8. Demonstrate how to reschedule a patient with a different provider and how that is documented in the system 9. Demonstrate how to double-book an appointment 10. Demonstrate patient recall/reminder process	____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N	(Obtain blank scheduling template and list of visit types, if available)
Check-In/Check-Out	1. **Demonstrate patient check-in process** 2. Alert medical staff patient has arrived 3. Demonstrate tracking location of patient 4. **Demonstrate patient check-out process**	____Y ____N ____Y ____N ____Y ____N ____Y ____N	
Patient Care – MA	1. **Standard MA workflow** 2. Demonstrate how MA is notified that patient has arrived and ready to be roomed 3. Demonstrate how MA knows provider is ready for next patient and/or if there is an available room 4. **Demonstrate all templates/modules completed by MA**	____Y ____N ____Y ____N ____Y ____N ____Y ____N	
	5. **Demonstrate fulfillment of standing orders, POCT, etc.** 6. **Demonstrate documentation of lab results received on paper, fax, etc., i.e., not via lab results interface** 7. Demonstrate communication with other health care staff from within CEHRT 8. **Review any documentation completed outside of the CEHRT** 9. Demonstrate how MA notifies provider patient is ready to be seen 10. Demonstrate post-provider activities	____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N	
Patient Care – Nurse	1. **Standard Nurse workflow prior to provider exam** 2. Demonstrate all templates/modules completed by Nurse 3. Demonstrate patient education resources are provided to patient 4. **Demonstrate how Nurse receives, documents and fulfills provider orders or by standard protocols** 5. Demonstrate how vaccination inventory and batch numbers are tracked 6. **Review any documentation completed outside of the CEHRT** 7. Demonstrate how Nurse notifies provider patient is ready to be seen 8. Demonstrate post-provider activities	____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N ____Y ____N	

Attachment 3: Rapid Cycle Improvement Process with Example

Insert Name of organization Here

Project Mini Charter

CHARTER NO.		**DUE DATE**	

PROBLEM	
SCOPE	
GOAL	

PROJECT TEAM	Project Leader, (Name, Title)	
	Project Members, (Name(s),Title(s))	

DETAILED TASKS

Task No.	Description	Owner	Due Date	Status
1				
2				
3				
4				

COMMENTS AND RESULTS

MINI CHARTER GUIDELINES

1. No charter lasts more than one month.
2. Problem: Clearly state problem to be solved, be specific and keep it simple.
3. Scope: Clearly define start and end dates of project and what is included in the scope.
4. Goal: Clearly define project goals, e.g., increase BMI capture from 50% to 75%.
5. Team: Implement small teams that are staffed with the "right" people, have a defined Project Lead and meet weekly.
6. Tasks: Implement a rapid cycle process to complete tasks so that no task takes more than one week to complete.

COMMUNITY HEALTH CENTER

Project Mini Charter (Example for BP Data Validation)

CHARTER NO.	1	DUE DATE	November 30, 2015

PROBLEM	CEHRT data for HTN not validated.
SCOPE	Quantification and validation of documented blood pressure readings at each visit.
GOAL	90% of all visits have blood pressure readings documented in the CEHRT as per clinical protocol.

PROJECT TEAM	Project Leader, (Name, Title)	QI Director
	Project Members, (Name(s),Title(s))	Nursing Director Lead MA Data Analyst

DETAILED TASKS

Task No.	Description	Owner	Due Date	Status
1	Define report parameters, e.g., data range, population, provider	QI Director	11/6/2015	
2	Run report of all visits and vitals recorded including null values	Data Analyst	11/13/2015	
3	Reporting data elements: (calculated) Denominator: # of visits Numerator: # of visits where blood pressure reading was recorded	Data Analyst	11/20/2015	
4	Analyze data and compare to clinical goals	Nursing Director	11/27/2015	

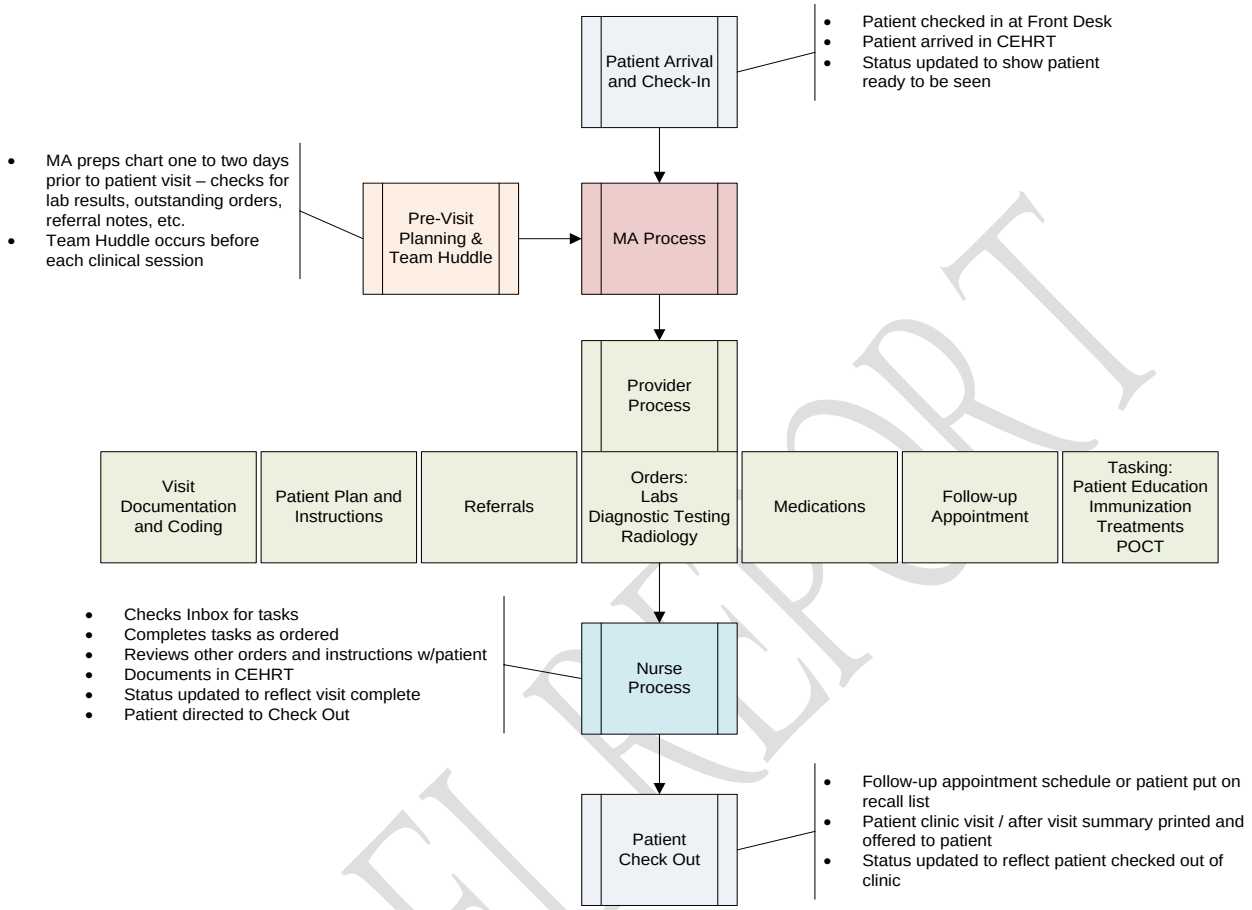
COMMENTS AND RESULTS

The purpose is to ensure that data is recorded and captured appropriately per protocol. If analysis shows that results are below expected, conduct another rapid cycle improvement process to identify issues; then create a process to improve recording and implement process to regularly review and validate data.

MINI CHARTER GUIDELINES

1. No charter lasts more than one month.
2. Problem: Clearly state problem to be solved, be specific and keep it simple.
3. Scope: Clearly define start and end dates of project and what is included in the scope.
4. Goal: Clearly define project goals, e.g., increase BMI capture from 50% to 75%.
5. Team: Implement small teams that are staffed with the "right" people, have a defined Project Lead and meet weekly.
6. Tasks: Implement a rapid cycle process to complete tasks so that no task takes more than one week to complete

Attachment 4: Sample best practice workflow



Attachment 5: Persons Interviewed or Participating During the Data QI Phase

1. Referrals
2. Front Desk
3. Community Health Worker
4. Medical Assistant
5. CIO
6. FNP, Interim Chief Medical Officer
7. Desktop Support Specialist
8. Front Desk, Site 1
9. RN, Site 1
10. Front Desk, Site 2
11. RN
12. FNP, Site 1
13. CEO
14. RN, QI Coordinator

Attachment 6: Making Data Driven Systems Work