## Asthma Registry Main

The *Asthma Registry* [1] supports chronic disease care for the Contra Costa County Health Services Asthma Management Program (program) whose asthma care is based upon the approved clinical practice guidelines for the diagnosis and management of asthma [2]. The system supports the program's mission of improved quality of care and program improvement as follows: assisting with identification of new patients and stratification of patients according to severity of condition; automating the outreach function; generating treatment requests to providers for changes in treatment and medications; enabling the identification, tracking, and closure of care plans/interventions; and providing reporting features to track the effectiveness of the program.

Essential to the registry is the ability to leverage off information already available in our data warehouse including patient demographical information, prescriptions and prescription history, influenza vaccinations, hospital and emergency department (ED) visits, encounters and diagnosis information and laboratory results (e.g., allergy tests and pulmonary function testing) from a variety of systems such as Keane, MediTech, RIMS, Immunization Registry, PCIS and external systems.
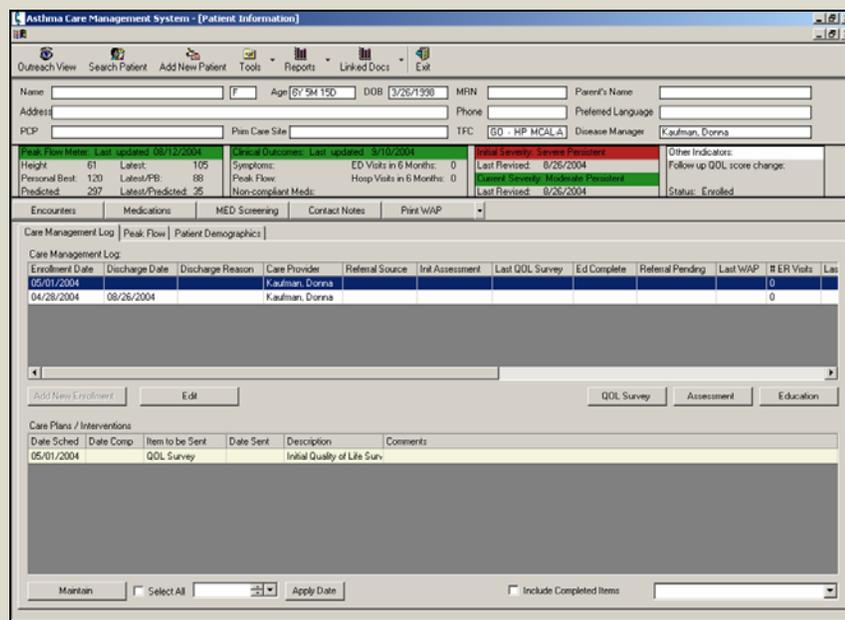
Icon	Description
Add New Patient	Add new patient
Assessment	Maintain Asthma Assessments
Contact Notes	Enter contact notes
Education	Maintain patient self-management skills
Encounters	View past visits and diagnoses
Linked Docs	Display document templates used in the program
MED Screening	Display laboratory results of interest to the program
Medications	Display prescriptions and also enter other medications and supplements reported by the patient
Outreach View	Perform Outreach including Case Finding and Patient Roster
Print WAP	Print an Asthma Written Action Plan
QOL Survey	Maintain Quality of Life Surveys
Reports	Display list of reports and enable reports to be generated and printed
Search Patient	Search for a patient
Tools	Enable user to change their password and other functions

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1 The development of this Asthma Registry was partially supported by a grant from the Robert Woods Johnson Foundation, the largest philanthropy exclusively devoted to health related funding and research.
2 The guidelines include the 2002 National Asthma Care Guidelines for Adults and the May 2003 CCHP Clinical Practice Guidelines for the Diagnosis and Management of Asthma in Children and Adolescents

Overview of Asthma Registry Main

Asthma Registry Main enables a view of the patient's history with particular emphasis on their care in the program. The Asthma Registry Main screen is invoked from Outreach by highlighting a patient and using the right click function "View Patient Record". The principal features of Asthma Registry Main include:

- **Tool bar** – The tool bar includes functions to return to Outreach, search for a specific patient, add a new patient, change the password of the logged on user, generate reports, display program template documents and exit the system

- **Demographical information** - The upper portion of the screen mirrors the Patient Care Information System (PCIS) demographical area and includes additional fields of interest to the program

- **Asthma dashboard** - The asthma dashboard provides high visibility of the patient's current asthma condition in terms of their peak flow and initial and current asthma severity score and other alerts and indicators related to the patient's asthma condition

- **Information not linked to an enrollment** - Patient information that is not linked to a particular enrollment (encounters, medications, medical screening, contact notes and written action plans) is accessed using push buttons beneath the asthma dashboard

- **Care Management Log tab** – The Care Management Log tab displays the critical high-level information associated with each enrollment such as enrollment date, discharge date, discharge reason, care provider, referral source, date of initial assessment, last QOL Survey date, date education was completed, number of hospital and ED visits

- **Peak Flow tab** – The Peak Flow tab enables entry of Personal Best Peak Flow and Today's Peak Flow, calculation of Today's Peak Flow/Predicted Peak Flow percent and calculation of Today's Peak Flow/Personal Best percent

- **Patient Demographics** – The Patient Demographics tab enables maintaining patient information

- **Information linked to an enrollment** – Patient information this is linked to a particular enrollment (QOL Surveys, Assessments and asthma-related education) is accessed by highlighting an enrollment in the Care Management Log and clicking on the desired information type (e.g., Education)

- **Care Plans/Interventions** – The Care Plans/Interventions grid enables maintaining the Care Plans/interventions that were entered when performing assessments. Care Plans/Interventions may also be maintained in Outreach.

Outreach

Working with the Case Finding View
Clicking Outreach from Asthma Registry Main displays the Outreach View. Selecting the Case Finding View displays the Case Finding grid. To facilitate outreach, the system includes background functions to identify patients who have visited the hospital or ED in the last twelve months and have a primary or secondary diagnosis of asthma and stratifies the patients according to the severity of their condition. The system enables displaying these patients from the Case Finding view and enables selecting patients for Case Finding. Once patients have been selected for Case Finding, the system enables the patients to be filtered in various ways into groups of patients who need outreach actions to be performed in their behalf (e.g., Patients needing Outreach Letter).
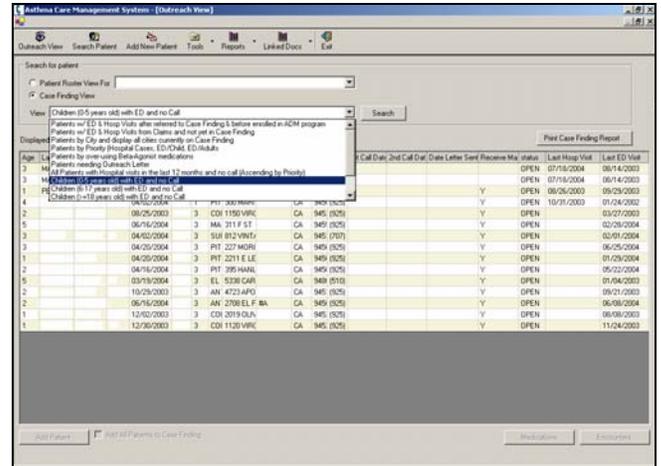
Performing Outreach in the Case Finding View
Once patients are selected for Case Finding, the system enables patients to be managed that were selected for outreach, track/follow-up with eligible patients and enroll patients in the program. Highlighting a patient and right-clicking displays case finding options that are available such as assigning the patient to a Disease Manager (DM), generating an outreach letter, logging a call to the patient, displaying the patient's past encounters (visit and diagnosis history) and displaying the medications prescribed for the patient. Once the patient is assigned to a DM, the patient disappears from the Case Finding View and appears on the DM's Patient Roster View.
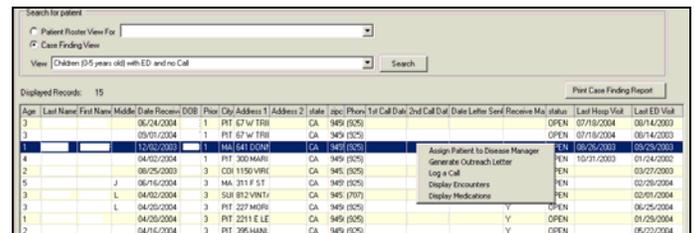
Maintaining Patient Demographical Information

The system enables adding patients to the registry from sources other than within the county system and entering additional patient demographical information. Add New Patient is available from the Outreach views and Asthma Registry Main. Maintaining patient demographic information is available from the Patient Demographics tab of Asthma Registry Main.

Working with the Patient Roster View

Selecting the Patient Roster View displays the Patient Roster grid with the patients assigned to the DM. From the Patient Roster View, groups of patients currently enrolled in the program who have Care Plans/Interventions yet to be performed may be displayed by dropping down a list of views and selecting a view. The list of views reflects the list of Care Plans/Interventions against which the performance of the program is measured. Grouping patients by Care Plans/Interventions that need to be done can streamline the DM's work in many areas. For example, groups of patients who visited the hospital or ED since enrolled can be identified, contact can be made with the patient and requests for treatment changes can be generated immediately; QOL Survey mailings (initial and follow-up), beta-agonist overuse mailings and incentive mailings can be generated for groups of patients; home trigger assessments can be planned for groups of patients; patients who have completed the program can be identified and discharged, freeing up resources for other patients with more immediate needs.

Performing Outreach in the Patient Roster View

From the Patient Roster View, the system enables patients to be managed that are enrolled in the program, perform intake, track/follow-up with patients and discharge patients when they have completed the program. Highlighting a patient and right-clicking displays the Patient Roster options that are available such as viewing the patient record on Asthma Registry Main, re-assigning the patient to another DM, logging a call to the patient, performing an assessment, sending QOL Surveys, entering QOL Survey responses, generating treatment requests to the patient's primary care provider (PCP), generating the Field Chart, discharging patients, maintaining Care Plans/interventions, logging that an incentive was provided, displaying encounters, displaying medications and maintaining contact notes.

Working With Care Plans/Interventions

Care Plans/Interventions are created during the Assessment/Intake process. These flow over to Asthma Registry Main and can be maintained from Asthma Registry Main or from the Patient Roster View. The system creates certain Care Plans/Interventions when the patient is first enrolled as described in "Performing an Assessment" and automatically updates the date complete upon completion of items in other parts of the system (e.g., education completed). The system also updates date completed for other Care Plans/Interventions. For example, when a treatment request is generated to the patient's PCP (e.g., Generate Fax to Provider is selected in the Patient Roster View), the system updates the Care Plan/Intervention date complete with the date that the treatment request was created

Generating Treatment Requests

During the Assessment process, patient-specific responses influence entry of Care Plan/Interventions that result in treatment requests to be generated to the patient's PCP. For example, if a Care Plan/Intervention is entered for "Script for Controller" or "Medication Review" and/or the patient used eight or more canisters of beta agonist medication in the last twelve months, a request is generated for symptom control and indicates the patient's symptom frequency in the past four weeks and diagnosis history that prompted the request. If a Care Plan is entered for "Script for Albuterol and Flovent" or "Medication Review/Side effects from", a request is generated for medication management and indicates the medication that the patient reports using. Treatment requests are also generated for Care Plans/Interventions related to frequent exacerbations and trigger control. Treatment requests are generated from the Patient Roster View for one or more patients who satisfied the query to display "Patients Needing Fax to Provider" or from the Reports menu.

Working with QOL Surveys

When a patient is initially enrolled, the system creates a Care Plan/Intervention to perform an initial QOL Survey. If the survey is not returned within twenty-one days of the mailing date, another survey is sent along with a reminder letter. The system includes functions in the Patient Roster View and Asthma Registry Main to display a summary of all QOL Surveys performed for the patient. From the summary screen, an existing survey may be edited or a new survey may be entered where the patient's responses are recorded and scored. Functions are included in the Patient Roster View to send a QOL Survey to the patient. When a QOL Survey is sent to the patient, the system updates the Care Plan/Intervention date sent with the date that the survey was sent. The system provides entry and management of adult and child surveys, automated scoring and comparison of previous scores. When the patient's QOL Survey responses are saved, the system updates the Care Plan/Intervention date completed with the date that the responses were entered/saved. QOL Survey scores and QOL Survey response rate by age group are calculated and displayed on performance tracking reports as indicators to evaluate program effectiveness.

Focusing on Patient Self-Management Skills

One of the techniques used by the program to support comprehensive approaches for chronic disease care is to focus on patient self-management skills. By equipping the patient with self-management skills, asthma episodes may be minimized and potentially eliminated thus saving lives and reducing health care costs.

The system accommodates focusing on patient self-management skills by automatically creating a Care Plan/Intervention for "Provide Education" when the patient is first enrolled and populating the Education grid with the essential asthma-related topics. The DM enters date complete as each topic is discussed with the patient or the patient's caretaker if the patient is a child. When all topics are completed, the system marks the Care Plan/Intervention as completed. The "Provide Education" Care Plan/Intervention is one of the essential items tracked in program performance tracking. For example, the system reports for each patient whether they have completed asthma-related education, one of the requirements for completing the program.

Other features included in the system that allows focusing on patient self-management skills are the capture of asthma triggers and frequency of exposure to the triggers, capture of the efforts taken by the patient to control the triggers and generation of treatment requests for written action plans (new plans and updates to existing plans). Future versions of the software may include maintaining and generating written action plans.
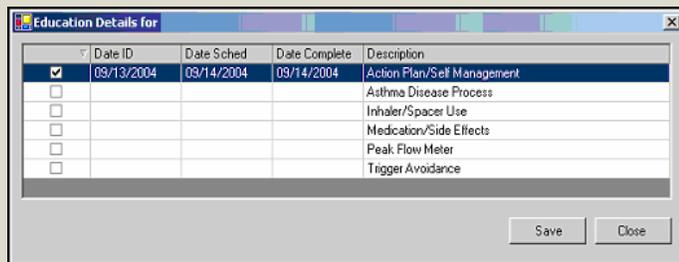

Working with Contact Notes

The system enables access to the patient's contact notes from all areas of the application. Using contact notes, the DM may record notes about the patient and care of the patient.
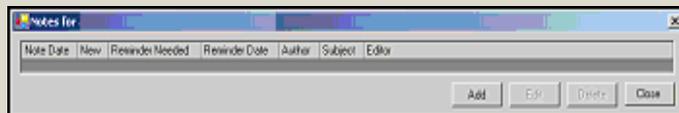

Working with Encounters Information

The system enables encounters information to be worked with from all areas of the system. For example, in Outreach, encounters information is available using the right click functions. In Asthma Registry Main and Assessments, encounters information is available by clicking Encounters. The information in the Summary of Enrollment frame summarizes the hospital and ED visits for the time frame specified in the Encounters History frame. The Encounters History frame lists detail encounters from the data warehouse and allows filtering in various ways (e.g., asthma- related encounters only, all encounters and ED/hospital encounters only). The Other Encounters frame is used to enter encounters that are not found in the data warehouse.
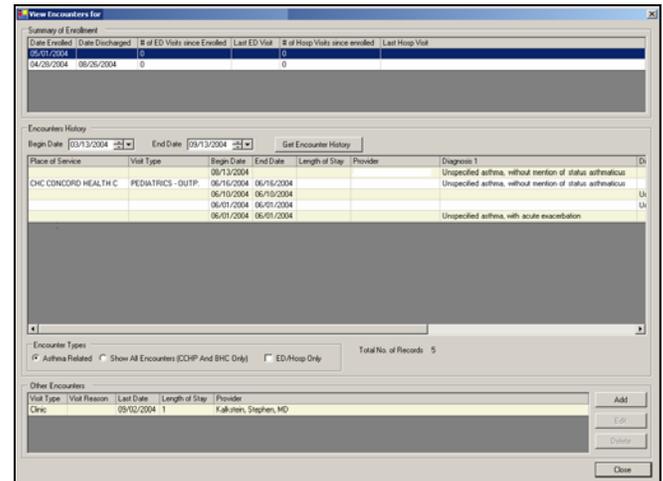
Working with Medications Information

The system enables medications information to be worked with from all areas of the system. For example, in Outreach, medications information is available using the right click functions. In Asthma Registry Main and Assessments, medications information is available by clicking Medications. The information in the Rx History frame lists detail prescriptions from the data warehouse and allows filtering in various ways (e.g., asthma-related prescriptions, take home prescriptions, all medications). The Other Medications frame is used to enter medications and supplements reported by the patient.
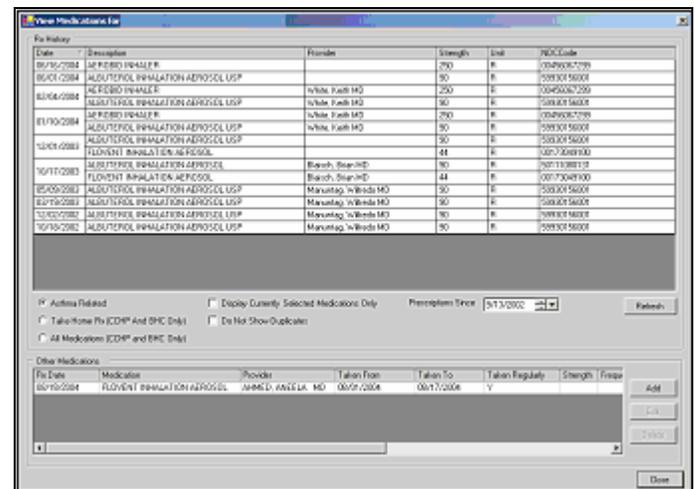
Assessments (Intake)

### Performing an Assessment

Highlighting a patient from the Patient Roster View and choosing "Perform Assessment" displays the Assessments screen. This functionality is also available by highlighting an enrollment in the Care Management Log of Asthma Registry Main and clicking Assessment. The principal features of the Assessments screen include:

- **Care Plans/Interventions frame and asthma dashboard frame remain docked** as the DM uses the tabs in the lower portion of the screen to request and record information from the patient or the patient's caretaker if the patient is a child

- **Care Plans/Interventions** - When the patient is first enrolled, the system creates the following care plans: "Initial Asses/Initial Severity", "Initial Quality of Life Survey", "Provide Education" and "Provide Incentive". The DM enters the remaining Care Plans/Interventions based on approved guidelines for the management and treatment of care for asthma patients and in light of patient-specific responses.

- **Asthma dashboard** - The asthma dashboard (carried over from Asthma Registry Main) shows the patient's current peak flow trend and provides a list of alerts related to the patient's condition. In future versions of the software, the asthma dashboard will also include the patient's initial and current asthma severity.

- **Information not linked to an enrollment** – Patient information that is not linked to a particular enrollment (encounters, medications, medical screening, contact notes and current appointments via the Appointment Lookup System (ALUS) is accessed using push buttons beneath the docked area as the DM navigates in the lower portion of the Assessments screen.
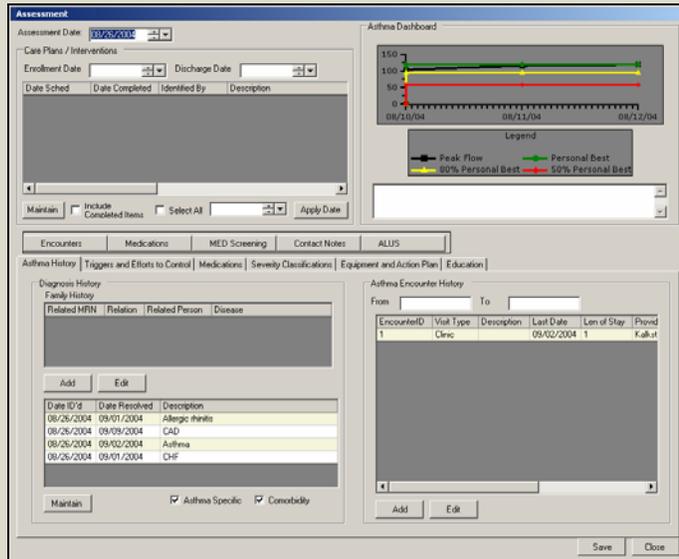

Entering/Editing Asthma History

From the Assessments/Asthma History tab, family history of asthma and other conditions (e.g., asthma-related and co-morbid conditions) that the patient has may be entered. Any asthma-related visits that the patient had outside the county system (and thus not in registry data structures) may also be entered.
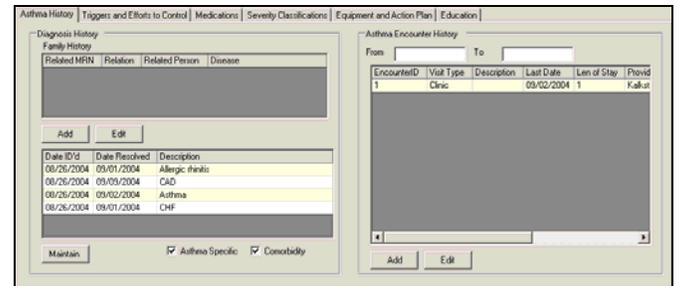

Entering/Editing Asthma Triggers and Efforts to Control Asthma Triggers

From the Assessments/Triggers and Efforts to Control tab, the other risk factors (e.g., patient moved recently or changed jobs) related to the patient, the patient's use of tobacco, asthma triggers along with frequency of exposure and efforts to control the triggers may be entered. If available from the Immunization Registry, the last flu shot date will be displayed or may be entered by DM.
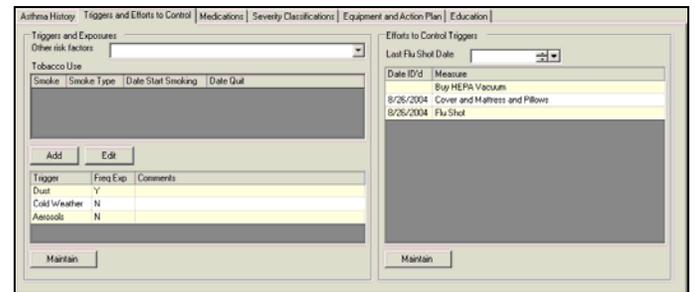
Entering/Editing Medications

From the Assessments/Medications tab, the patient's preferred pharmacy contact information can be entered as well as medications that the patient is currently taking.
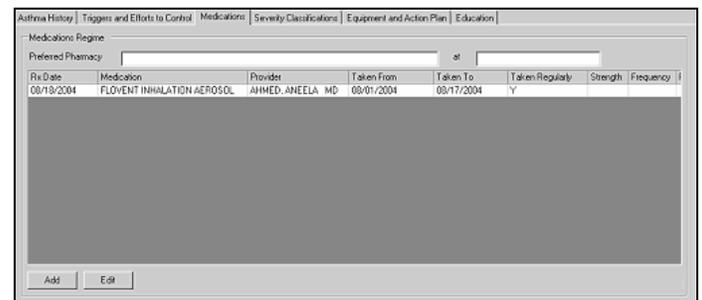
Entering/Editing Severity Classifications
From the Assessments/Severity Classifications tab, new initial and/or current asthma severity readings may be added or existing readings may be edited.

Using the Peak Flow Calculator
From the Severity Classifications/Initial Severity tab or Current Severity tab, the patient's height, weight and Today's Peak Flow reading may be entered. The patient's Personal Best Peak flow reading defaults to patient's highest peak flow score with override ability. The system displays Predicted Peak Flow from embedded predicted peak flow tables based on the patient's gender and height, calculates Today's Peak Flow/Personal Best percent and Today's Peak Flow/Predicted percent. The system generates a graphic display of the peak flow trend to depict the patient's improvement as a result of being enrolled and participating in the program.

Entering/Editing Initial Severity
From the Severity Classifications/Initial Severity tab, answers to several questions related to the patient's initial condition may be entered. The system calculates initial severity based on the patient-specific responses and the approved embedded guidelines for the management and treatment of asthma.

Entering/Editing Current Severity
From the Severity Classifications/Current Severity tab, the patient's daytime symptoms, nighttime symptoms, albuterol use and impact on activity may be entered. The system populates peak flow/predicted based on the peak flow calculations that were entered in the above area of the screen. The system calculates current asthma severity based on the patient-specific responses and the approved embedded guidelines for the management and treatment of asthma, which specifies that the presence of one of the features of severity is sufficient to place a patient in that category. An individual will be assigned to the most severe grade in which any feature occurs.

Entering/Editing Equipment and Action Plan
From the Assessments/Equipment and Action Plan tab, the equipment and written action plans that the patient currently has and/or needs may be entered.

Entering/Editing Education
In an effort to focus on patient self-management skills in the care of asthma patients, when a patient is enrolled in the program, the system creates a list of the asthma-related educational topics that are to be discussed with the patient and these are listed in the Education tab. In addition, the system creates a Care Plan/Intervention to "Provide Education". When all educational topics have been completed, the system marks the Care Plan/Intervention as completed. Completing the asthma-related education is one of the prerequisites to completing the program.

ADM Program Performance Tracking

Care Plans Report
For each patient enrolled in the program, the system tracks the interventions that are required, the progress that has been made in completing the intervention as well as the results of the intervention.

Monthly Report
The system provides a recap of essential interventions that have been completed for enrolled patients for the specified time period in terms of the total number of patients and percentage by age group for the specified period.

Utilization Reports
Utilization reports are available that report by age group indicators such as prevalence, severity, hospital admissions, ED visits, percent that received education, percent who have action plans as well as ITG score performance.