

INGENIX[®]

Using Evidence-Based Medicine to Improve Health Care

Symmetry[®] EBM Connect

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I. Overview and Background

Measuring and improving the quality of medical care has become an important focus for health care organizations in the United States. There is a well-documented gap between current medical knowledge and actual health care practice.^{1,2,3} Further, a number of studies have shown a correlation between compliance with proven treatments and the outcome and/or cost of care.^{4,5,6} Across geographical regions, there is significant variation in the use of medical services without any evidence of improved outcomes, while health care costs continue to grow at a high rate nationwide.⁷ The increasing push to pay for quality translates into purchasers, consumers, and patients requiring increased transparency into the quality and service delivered by physicians and hospitals.⁸

Measuring health care quality in the United States has historically faced considerable challenges. These challenges include agreement on standards to measure care, determination of valid and available sources of data to support measurement, and tools that incorporate a robust and adaptable set of measurement criteria to assess compliance.

Today, the industry is addressing these challenges head-on. National programs targeting quality measure development have grown, including the American Medical Association Physician Consortium for Performance Improvement (PCPI), CMS Physician Quality Improvement Initiative (PQI), and National Committee for Quality Assurance (NCQA). Further, many physician specialty organizations maintain quality initiatives. Beyond measure development, measure-endorsing organizations such as the National Quality Forum (NQF) play a significant role in setting the standards for quality measurement. Standards of care are available from many sources including peer-reviewed literature, guidelines from medical specialty organizations, and specifications available from the national quality standard organizations.⁹

In addition to a growing set of standards and measures, the information available to support measurement has improved. Administrative or transaction data—medical and pharmacy claims and laboratory results—have increased

in both availability and comprehensiveness, thus providing a rich and convenient information source from which organizations can evaluate health care. Equally important are tools and technology that encode standards of care to provide an efficient and robust way to assess care compliance with these standards.

This paper describes a powerful approach to measuring health care quality from Ingenix called Symmetry EBM Connect. EBM Connect is a health care quality engine that identifies gaps between clinical evidence and health care practice with application for a variety of health care organizations. EBM Connect captures substantial knowledge about quality care measurement and compares actual, observed patient care with care indicated by research-based guidelines. Organizations use the findings to:

- Identify disease and care opportunities, including “gaps” in care for patients and populations.
- Identify both high-performing physicians and areas that need improved physician compliance with prescribed care.
- Identify diagnostic tests or treatments that are unnecessary or potentially harmful, with the ability to determine the pervasiveness of these tests in their populations.
- Identify patients with indications of poor disease control, such as low adherence to prescribed medication regimens.
- Reduce potentially harmful drug-to-drug or drug-to-disease interactions.

EBM Connect addresses the evolving criteria organizations use to apply quality measurement to health plans and providers.¹⁰ Quality measurement within EBM Connect is built around national standard specifications and other solid evidence-based guidelines to provide a robust approach to measuring compliance and the ability to quickly adapt to the changing standards.

EBM Connect is part of a comprehensive suite of information products from Ingenix Symmetry, including Episode Treatment Groups (ETG®), Procedure Episode Groups™ (PEG™),

¹ *Crossing the Quality Chasm: A New Health System for the 21st Century*. Institute of Medicine, Committee on Quality of Health Care in America. Academy Press, 2001.

² Institute of Medicine Committee on Quality of Health Care in America. *To Err is Human: Building a Safer Health System*. The National Academies Press; 1999.

³ McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA. The Quality of Health Care Delivered to Adults in the United States. *N Engl J Med*. 2003;348:2635-45.

⁴ Diring Khan J. Non-compliance with proven treatments increases healthcare costs. *Managed Healthcare Executive*. 2004.

⁵ Osterberg L and Blaschke T. Adherence to medication. *N Engl J Med*. 2005;353:487-97.

⁶ McDonald HP, Garg AG, and Haynes RB. Interventions to Enhance Patient Adherence to Medication Prescriptions. *JAMA*. 2002; 288:2868-2879.

⁷ Wennberg John E and Cooper MM, eds. *The Dartmouth Atlas of Health Care in the United States*. Chicago: American Hospital Publishing, Inc., 1998.

⁸ Institute of Medicine Committee on Quality of Health Care in America. 2001. op cit.

⁹ Examples of these organizations include the National Committee for Quality Assurance, American Medical Association, Centers for Medicare & Medicaid Services, and commercial and academic entities.

¹⁰ National Committee for Quality Assurance, Standards and Guidelines for the Certification of Physician and Hospital Quality, Washington, D.C.: National Committee for Quality Assurance, 2008.

Episode Risk Groups (ERG®), Pharmacy Risk Groups™ (PRG™) and PCQ Connect™. These products support a wide array of business needs, leveraging a single methodological platform. This common methodological platform means organizations can apply industry-accepted measurement and assessment standards across a number of dimensions, including cost of care, health risk, and quality of care. EBM Connect, when run in conjunction with its companion product, Symmetry ETG, supports direct comparisons of quality and cost outcomes for a wide array of clinical conditions.

With more than 540 measures covering 68 clinical conditions currently available, EBM Connect provides a solid foundation for quality measurement. Beyond the foundational measures, each quality measurement initiative is unique and populations vary, thus necessitating a process to customize. Three aspects of customization include: 1. the ability to modify the coding and measure criteria, such as diagnosis codes or age/gender criteria used to qualify a member for a condition; 2. determination of the logic to compute compliance; and 3. the ability to create new measures. EBM Connect provides this functionality through the use of the Rules Manager. Rules Manager provides transparency into the aspects of the measures and the flexibility to change or create new measures.

The next section of this paper provides additional details about EBM Connect. The third section provides examples that demonstrate use of the product. The final section summarizes features and describes output files and reports used in supporting quality initiatives.

II. EBM Connect

Symmetry EBM Connect is a software application that uses readily available health plan administrative data and laboratory results to identify members with selected clinical conditions to evaluate their care.

EBM Connect identifies members with conditions using a specified set of criteria including gender, age, diagnoses, and patient's duration of medical and pharmaceutical coverage. Having selected a set of members, EBM Connect assesses each patient's care by applying a series of clinical rule-based measures that define whether the patient was treated in accordance or was in adherence to clinical guidelines for the condition.

EBM Connect Measures and Researching Medical Developments

A primary source for EBM Connect measures are national standard specifications from AMA PCPI, CMS PQRI, and NCQA HEDIS, with priority given to any measure endorsed by NQF. In addition, EBM Connect contains measures derived from national standards but includes enhancements such as additional measurement criteria for measures based solely on Category II codes. The 7.5 version of EBM Connect offers more than 540 quality measures covering more than 68 clinical conditions, with more than 100 measures based on national standard specifications.

EBM Connect also contains measures where a significant care opportunity exists and the evidence clearly supports the measure but the measure has not been developed by one of the national measure development organizations.

Developing the clinical measures for quality decision-making used by EBM Connect involves a rigorous process that identifies care opportunities, documents the evidence, and verifies the validity based on administrative data from tens of millions of patients. Comprehensive research and review yields potential measures for consideration and a medical justification for each measure. We repeat this process on an ongoing basis. We add new conditions and measures based on customer need and the availability of guidelines to assess those conditions.

The measure development process begins with a thorough **review of the evidence**. Clinicians review published literature on evidence-based medicine including (a) guidelines from specialty and professional organizations and clearinghouses; (b) published clinical trials and other relevant articles; and (c) pharmaceutical manufacturer's recommendations for their medications.

Next, we develop **potential measures** based on the supporting literature and the ability to adequately define and measure care using available data. In the **clinical review** stage, the EBM Connect Clinical Expert Panel investigates and discusses the most current treatment guidelines and proposed measures. The Expert Panel includes physicians and advanced degree pharmacologists, coding experts, and clinical business analysts. The physician experts for each particular clinical condition are board-certified in their

primary subspecialty and are practicing physicians with more than 15 years of experience. They practice in a variety of health care settings including federal and state government funded facilities, academic, and private practice.

When the Expert Panel has reached consensus on a measure, it creates a synopsis outlining the summary of the evidence for the measure. The synopsis includes citations for published research and guidelines that support the measure, as well as strength of evidence ratings when these rankings are available. The synopsis is an essential strength of EBM Connect and a key artifact shared with physicians to discuss the basis of the measurement guidelines. The logic and detailed code sets of diagnostic, procedural, pharmaceutical, and laboratory codes used to construct the clinical algorithms within the EBM Connect software are similarly transparent.

Selecting Clinical Conditions

EBM Connect covers a wide array of clinical conditions and categories of measures. The clinical conditions describe both medical problems (e.g., obesity, acute low back pain) and disease states (e.g., congestive heart failure, multiple sclerosis). Categories of measures also focus on prevention activities such as screening or immunization requirements. Table 1 lists the clinical conditions covered by EBM Connect 7.5. We select conditions based on a number of criteria, including:

- Quality of care demonstrated to be an issue
- Prevalence or expense making examination a priority
- Standards of care developed by national organizations
- Customer need

Table 1: EBM Conditions

NQF/AQA endorsed *, IOM Priority ✓

Chronic Conditions		
Atrial Fibrillation	COPD	Inflammatory Bowel Disease
Asthma – Pediatric & Adult ✓	Depression ✓	Migraine Headache
Breast Cancer	Diabetes Mellitus ✓	Multiple Sclerosis
Coronary Artery Disease ✓	Epilepsy	Obesity and Overweight ✓
Chronic Renal Failure	Hepatitis C	Osteoporosis
Colon Cancer ✓	HIV/AIDS	Prostate Cancer
Congestive Heart Failure ✓	Hyperlipidemia ✓	Rheumatoid Arthritis
Cerebral Vascular Accident/ Transient Cerebral Ischemia ✓	Hypertension ✓	Sickle Cell Anemia

Episodic and Global Conditions		
Adenoidectomy	Monitoring for Patients on Persistent Medications	Pregnancy Management ✓
Cervical Dysplasia	Otitis Externa, Acute	Sinusitis, Acute
Drug Interaction	Otitis Media, Acute	Tonsillectomy
Indications for COX-2 Inhibitor Use	Pneumonia, Community-Acquired Bacterial	Tympanostomy Tube Placement
Knee Replacement	Postmenopausal Bleeding	

National Standards		
Alcohol or Other Drug Dependency Treatment *	Cholesterol Management for Patients with Cardiovascular Conditions * ✓	Low Back Pain, Use of Imaging Studies *
Annual Monitoring for Patients on Persistent Medications *	Colorectal Cancer Screening * ✓	Mental Illness, Follow-up after Hospitalization * ✓
Antidepressant Medication Management * ✓	Congestive Heart Failure * ✓	Osteoporosis Management in Women *
Asthma, Use of Appropriate Medications * ✓	COPD, Use of Spirometry Testing *	Persistence of Beta-Blocker Treatment After a Heart Attack (NS)
Attention Deficit/Hyperactivity Disorder, Follow-up Care for Children * ✓	Coronary Artery Disease * ✓	Pharmacotherapy Management of COPD Exacerbation (NS)
Breast Cancer Screening *	Diabetes Comprehensive Care * ✓	Pharyngitis, Appropriate Testing for Children *
Bronchitis, Acute – Inappropriate Antibiotic Treatment for Adults *	Drugs to be Avoided in the Elderly *	Pneumococcal Vaccination * ✓
Cardiac Surgery * ✓	Emergency Medicine (NS)	Post-Fracture Care (NS)
Cervical Cancer Screening * ✓	Glaucoma Screening in Older Adults *	Potentially Harmful Drug-Disease Interactions in the Elderly * ✓
Childhood Immunizations * ✓	Influenza Vaccination * ✓	Upper Respiratory Infection, Appropriate Treatment for Children *
Chlamydia Screening *	Lead Screening in Children (NS)	

Framework for Clinical Measures

EBM Connect organizes its measures around five broad conceptual categories and 16 measure types. A brief description of the broad categories follows. Table 2 describes each of the 16 measure types.

- 1) **Disease Management** measures assess treatments or patient characteristics that have been shown effective at improving outcomes through controlled clinical trials, other research, or consensus guidelines. The two measure types in this category distinguish the strength of evidence. An example of a typical Disease Management measure, based on the strongest evidence, is that patients with a myocardial infarction in the past should be taking a beta-blocker unless contraindicated or not tolerated.

Table 2: EBM Connect Measure Types

* = COMPLIANCE NOT ASSESSED (provide observational information only)

Measure Type	Description
NS-H	National standard HEDIS® (NS-H) measures are authored/owned by the NCOA. Healthcare Effectiveness Data and Information Set (HEDIS®) is a set of nationally recognized performance measures.
NSHA	National standard HEDIS® atypical (NSHA) measures are authored/owned by the NCOA. HEDIS® is a set of nationally recognized performance measures. Typically, a Result Flag of YES identifies <i>appropriate</i> care that is consistent with practice recommendations. For the atypical HEDIS® measure, a Result Flag of YES identifies <i>inappropriate</i> care and a Result Flag of NO identifies <i>appropriate</i> care.
NS-A	National standard AMA (NS-A) measures are authored/owned by the Physician Consortium for Performance Improvement (PCPI), convened by the American Medical Association (AMA). AMA PCPI has developed physician performance measures intended to facilitate quality improvement.
NS-O *	National standard observational (NS-O) measures provide information only and are never assigned an EBM flag of 1 (i.e., never identify a gap in care). They are based on criteria defined by other organizations; many are endorsed by NQF and/or AQA. NS-O measures are not intended to represent compliance issues. However, these measures will provide additional information about the health status of the patient or services provided to the patient.
R-1	Level 1 research-based (R-1) measures are derived from and supported by published professional societies, specialty organizations, or national clearinghouse guidelines with the highest level strength of evidence (e.g., ACC/AHA Class I or ADA Class A) based on published research and demonstrating a beneficial effect of treatment.
R-2	Level 2 research-based (R-2) measures include all other measures derived from and supported by published professional societies, specialty organizations, or national clearinghouse guidelines (e.g., ACC/AHA IIa) or are supported by published research independent of a published guideline.
CP-N	Care pattern national standard (CP-N) measures are similar but not identical to the national standard measures on which they are based. A measure is classified as CP-N if the national standard measure logic can not be replicated due to chart review or hybrid methodology, an incomplete national standard specification document, or other limitation.
CPNA	Care pattern national standard atypical (CPNA) measures are similar but not identical to the national standard measures on which they are based. A measure is classified as CPNA if the national standard measure logic can not be replicated due to chart review or hybrid methodology, an incomplete national standard specification document, or other limitation. Typically, a Result Flag of YES identifies <i>appropriate</i> care that is consistent with practice recommendations. For the atypical care pattern national standard measure, a Result Flag of YES identifies <i>inappropriate</i> care and a Result Flag of NO identifies <i>appropriate</i> care.
CP-I	Care pattern informational (CP-I) measures provide general information about health care services or may identify underutilization of services.
CP-C	Care pattern of concern (CP-C) measures identify services that may be medically unnecessary or potentially harmful.
CP-E	Care pattern end of life (CP-E) measures identify services provided at the end of life.
CP-R	Care pattern patient risk (CP-R) measures identify patients who have clinical markers or use patterns indicative of poor disease control or an increased risk for poor outcomes.
CP-O *	Care pattern observational (CP-O) measures provide information only and are never assigned an EBM flag of 1 (i.e., never identify a gap in care). CP-O measures provide additional information about the health status of the patient or services provided to the patient.
S-M	Safety monitoring (S-M) measures identify safety issues related to monitoring for possible adverse events (e.g., laboratory abnormalities) associated with specific medications.
S-DI	Safety drug/disease interaction (S-DI) measures identify safety issues related to drug-drug interactions and drug-disease interactions.
A	Medication adherence (A) measures assess patient adherence to prescribed medications based on prescription filling patterns.

- 2) **Medication Adherence** measures assess whether the patient is adhering to the prescribed medication treatment regimen. Medication adherence measures typically apply to oral, transdermal, and in some cases, inhaled medications. EBM Connect uses incidence and timing of observed pharmacy prescriptions for a patient to measure adherence. It calculates a “possession ratio” as the number of days a patient was in possession of a medication divided by the number of total days elapsed, excluding time spent during an inpatient stay. It then compares the possession ratio to the threshold set by expert consensus, usually 70% for most medications. Medication Adherence measures are specific to both the condition and the drug, so conditions with multiple pharmaceuticals will have numerous medication adherence measures.
- 3) **National Standards** measures result from the logic of national measure developers, such as AMA PCPI, and NCOA HEDIS. An example of a National Standard measure is the HEDIS guideline that females between ages 40 and 69 should have a breast cancer screening test every two years.
- 4) **Patient Safety** measures examine situations in which a patient’s safety may be affected by the treatment, particularly the medication, they receive. For example, clinicians treating depressive patients taking lithium, a particularly difficult medication to manage, should check their lithium level semiannually, test serum creatinine annually, and perform a urinalysis to detect any effect on renal function, as well as a thyroid-stimulating hormone test to detect hypothyroidism.
- 5) **Care Pattern** measures provide information about various aspects of patient care that are not covered in the preceding clinical categories. There are seven measure types within the Care Pattern clinical category. For many Care Pattern measure types, although published guidelines often mention treatments or services, there is no published research that specifically addresses the measure. In these cases, the EBM Connect Clinical Expert Panel thoroughly reviews the guidelines according to measure-specific criteria. Some Care Pattern measures provide information, but do not determine compliance or judge treatment plans. For example, one measure checks whether adults’ LDL was measured at under 70 mg/dl.

III. Application of Clinical Measures

EBM Connect predicates measures on three rule-specific criteria. In particular, the member must meet appropriate age and gender criteria; have defined medical and, if necessary, pharmaceutical benefit coverage; and confirmation of the relevant medical condition in the specified period of time. Equally important is the determination of exclusion criteria to avoid measuring patients with contraindications or comorbidity ineligibility.

EBM Connect then applies intervention measures for a given clinical condition to all members of the population who meet these criteria. For some members, EBM Connect finds measures “not applicable” because the member does not meet further measure-specific criteria.

EBM Connect reviews three broad types of conditions—chronic, acute/episodic, and preventive. Examples in the following sections demonstrate the process and logic for each.

Chronic Conditions

For each chronic condition, EBM Connect identifies the correct set of members to be measured. As mentioned above, this consists of assessing patient age, gender, eligibility, condition logic, and exclusion logic (if applicable). Examples of chronic conditions include coronary artery disease (CAD), congestive heart failure (CHF), diabetes, and depression. EBM Connect identifies members for a chronic condition based on information from claims data, including the diagnoses assigned and the services provided. Capturing all relevant indicators is essential, as the greater the number of relevant indicators, the more reliable the estimate of the condition and the assessment of appropriate care.¹¹ In addition, if patients have been identified through a disease or care management program, users can submit this information through a **Disease Registry Input File**.

Once EBM Connect identifies a set of members as having a chronic condition, it evaluates care received. Not surprisingly, many chronic conditions have a wide variety of clinical measures. Depression, for example, has 19 measures, covering a range of categories. The eight Medication Adherence measures for depression assess compliance for eight different types of medication, while the five Patient Safety-Monitoring measures include four requirements for patients taking lithium and one for patients

taking nefazodone. Six Care Pattern measures provide further information to support the assessment of members with depression. A Care Pattern measure for members with evidence of severe depression includes assessing whether the member had a recent psychiatric evaluation. EBM Connect evaluates every measure for each member with a given condition.

There are numerous possible results for each clinical measure, as outlined in Table 3. EBM Connect provides this assessment where it can make a definitive assessment of a member’s care versus the guideline. In some cases, insufficient information is available to support an assessment, for example, due to the absence of pharmacy coverage. In these cases, EBM Connect notes this result and the specific data limitation.

Table 3: EBM Connect Result Flags

Result Flag Value	Description
Yes	The answer to the clinical question is yes.
No	The answer to the clinical question is no.
NRX	Indicates that the member did not have any pharmacy benefit during the reporting period. The NRX value is only applicable to certain measures that are pharmacy dependent.
Q	Indicates that the member has no claim record for the particular test or treatment during the time window of the measure, but there may be issues of data incompleteness, including benefit coverage or insufficient time range of input claims data.
NA1	Member did not meet the age or gender criteria.
NA2	Member was not currently taking the medication in question or had not taken it for the required duration.
NA3	Member was taking the medication, but a possession ratio could not be computed [fewer than two prescriptions during the measure time window].
NA4	Member did not meet the measure-specific criteria [e.g., comorbidity, complexity (diagnosis and medication), intervention not warranted].
NA5	No lab result record or insufficient information.
NA6	Member admitted to a hospital or long-term care facility which might cause data incompleteness.
NA7	Member who did not receive treatment or medication had a contraindication or other justification.

Acute/Episodic Conditions

The second type of condition—acute, or episodic—makes a determination that an episode of a condition is new and discrete for a patient. This determination includes ruling out the possibility that the condition is chronic and distinguishes between multiple episodes of the same acute condition.

¹¹ Kerr EA, Hofer TP, Hayward RA, Adams JL, Hogan MM, McGlynn EA, and Asch SM. *Quality by Any Other Name?: A Comparison of Three Profiling Systems for Assessing Health Quality*. Health Services Research.

Figure 1 demonstrates the process of identifying and confirming acute Low Back Pain. EBM Connect reviews both inclusion and exclusion criteria similarly to chronic conditions. EBM Connect configuration defines an End Date, which determines the last date from which it reviews claims. In this example, the date is December 31, 2008. (Claim review actually begins 28 days earlier, as the measure requires reviewing all claims for 28 days after the episode begins.) EBM Connect locates a claim dated September 15, 2008, and begins applying the algorithm for Low Back Pain.

As with chronic conditions, exclusion criteria determine whether there is another possible cause for the pain—specifically whether there are claims for cancer in the prior 24 months or for trauma, drug abuse, or neurological impairment in the prior 12 months. Since acute conditions can, by definition, repeat, EBM Connect applies additional exclusion criteria to the specific episode to ensure that it is a discrete event. For example, it searches for claims for Low Back Pain during the 180 days prior to the episode start. If there are no claims, the patient has satisfied the “clear window” requirement; the episode defines a truly acute condition. EBM Connect will now apply the measures and determine compliance for each.

The measures for Low Back Pain assess whether the patient received an imaging study in the absence of specific indications,

a HEDIS National Standard measure, and provide a snapshot into the patient’s care through three Care Pattern-Observational measures—whether the patient had a spinal radiographic test, CT scan, or MRI.

It is possible to have multiple, distinct episodes of an acute condition such as Sinusitis during a given 12-month period. As seen in Figure 2, EBM Connect distinguishes between the distinct episodes. In this example, the claim review begins on December 10, 2006, 21 days before the user-defined End Date. EBM Connect finds a claim indicating an episode on October 8. There were no claims indicating Acute Sinusitis between 4 and 60 days prior to this episode, the “clear window.” Notably, since EBM Connect reviews claims going back in time, claims within 4 days are included as part of the episode. One such claim is represented in the figure as a red mark in early October. A single episode could include multiple claims, including an office or emergency room visit, specific tests, laboratory results, and prescription fulfillment.

For Sinusitis, EBM Connect assesses both potential overutilization of care, including receiving a sinus radiographic test without indication, a CT scan or MRI, and underutilization, such as not using a prescription for a first-line antibiotic.

Figure 1: Identification and Confirmation of Acute Condition: Low Back Pain

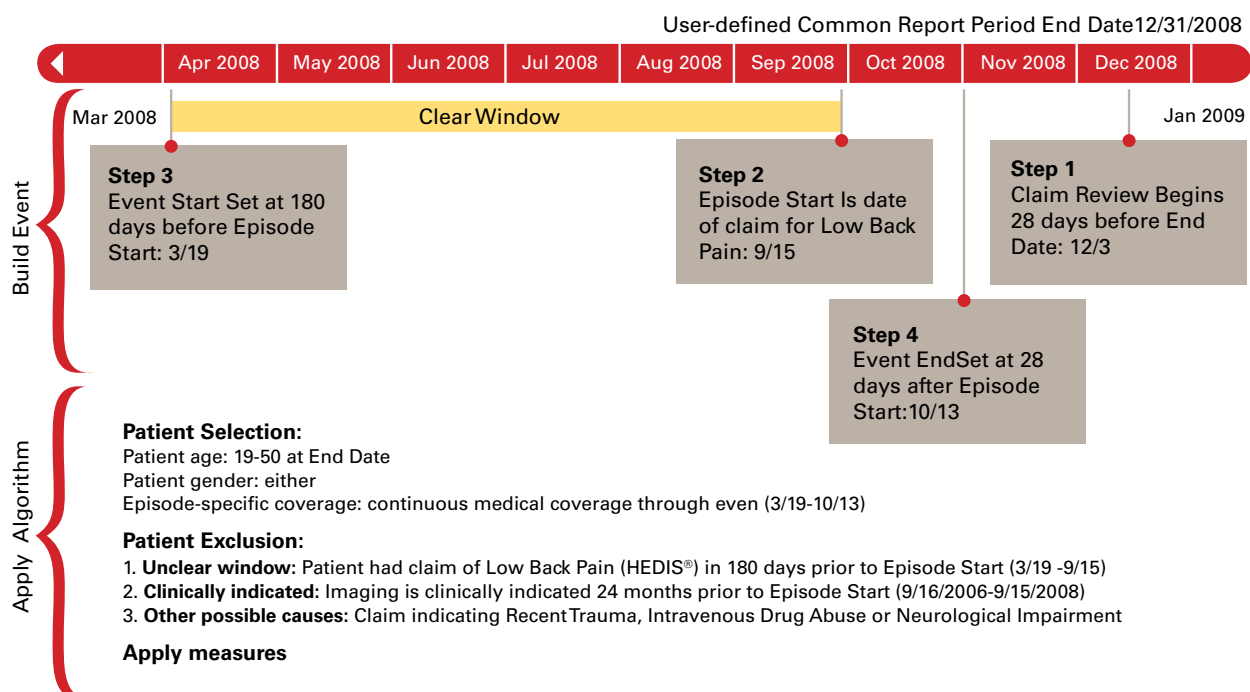
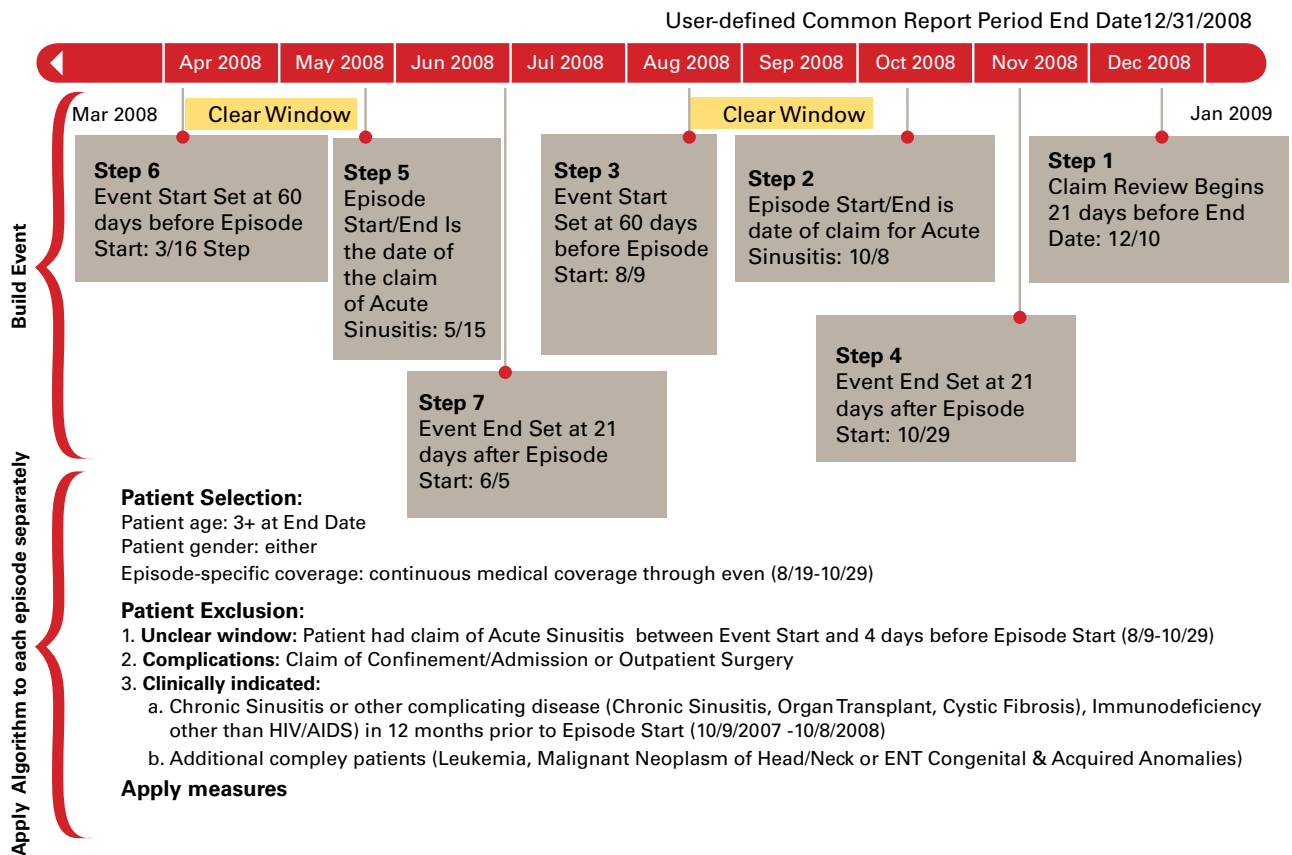


Figure 2: Identification and Confirmation of Acute Condition: Acute Sinusitis



Preventive Conditions

Preventive conditions include screening for disease and immunizations. EBM Connect uses different patient selection criteria for preventive conditions than for chronic or acute conditions in that it includes all members, not only those with claims, in the analysis.

For example, the national standard measure for breast cancer screening is that females between the ages of 40 and 69 should have a screening test at least every two years. EBM Connect identifies females within this age range and searches for a breast cancer screening diagnosis or procedure during the prior 24 months. It excludes members identified as having had a bilateral mastectomy (or two single mastectomies).

IV. Features and Outputs

EBM Connect provides comprehensive information for insurers, care managers, employers, and consumers to support the analysis of quality of care. It supports quality measurement across a broad range of clinical medicine, including chronic, acute, and preventive conditions and standard guidelines formalized by national organizations. The more than 540 measures available in EBM Connect cover a broad set of clinical conditions and different aspects of clinical medicine, including patient safety, appropriate use of services, and medication adherence.

A key feature of EBM Connect is the documentation describing the evidence behind a specific measure and the methods used in implementing that guideline.

Each clinical measure in EBM Connect has a **synopsis of evidence** that users can access through links in the software.

EBM Connect also provides the sophisticated algorithms used by the measures and files listing all diagnostic, procedural, and laboratory codes used within the measures. This transparency engenders confidence in the validity of the measures—and the resulting findings—particularly among physicians, as they see how the system incorporates national standards and guidelines as well as the high quality current professional expertise.

EBM Connect provides significant flexibility to apply the software in ways that best meet a variety of needs. Users may adjust medical and pharmacy benefit requirements to increase the population available for analysis. Users can also configure measurement time periods to include a greater number of members and to correlate with their fiscal year or with other quality control initiatives.

EBM Connect includes the ability to edit or create measures using **Rules Manager**. With Rules Manager, users create, edit, and manage both user-created new content and the existing content provided by EBM Connect. This powerful tool provides users with significant control and flexibility in applying measures to address business needs and available data.

EBM Connect provides the critical information to support the use of quality results in measurement. For example, the attribution of patient measures to individual providers is a challenging step in physician measurement. For attributing members to primary care providers, EBM Connect applies a progressive, eight-step process, using the evidence on the providers managing the patient for relevant services. These steps include evidence on the services provided by primary care specialists and the PCP assigned based on enrollment. Females age 12 and above can be assigned an Obstetrician/Gynecologist as their PCP.

For specific conditions, EBM Connect identifies all physicians involved with treating a patient and the number of visits and cost of services for each physician by member/condition—supporting flexible and valid approaches to measure attribution.

Quality measures, medical technology, and the coding used in administrative data evolve over time, creating a need to maintain and update EBM Connect measures and the diagnostic, procedural, and pharmacy codes underlying the measure algorithms. EBM Connect applies a robust process to meet these needs, including:

- Clinical experts review EBM Connect measures on an ongoing basis, including the EBM Connect Clinical Expert Panel.
- As national standards become available, new releases of EBM Connect incorporate those standards.
- Ingenix provides periodic updates for diagnostic and procedural codes to EBM Connect, monthly updates for drugs, and semiannual product releases to reflect the most recent technologies and coding standards. We deliver coding updates electronically for automatic installation.

EBM Connect Output

Symmetry EBM Connect provides insight into members' disease states, treatment intensity, and adherence to treatment guidelines. EBM Connect provides this information both as reports and as flexible output files. Users can link the files, using common variables, into a relational database which can produce reports combining data elements that meet their individual interests and requirements.

EBM Connect produces two primary output files that provide essential information about members' compliance with treatment guidelines. Six secondary files provide detailed information about an aspect of health status or care:

- An unduplicated list of each members' clinical conditions, indicating overall disease burden.
- A list of all inpatient admissions, emergency department visits, and outpatient surgeries for each member, indicating treatment intensity.
- A list of medications taken by each member to treat chronic conditions, and adherence to each.
- A list of all members who are identified as having each EBM Connect condition.
- A list of all physicians who participated in the care of each member (by condition).
- For users of Symmetry ETG, a crosswalk between the EBM Connect quality results and the ETG resource consumption results, allows for direct analysis of cost and quality results for the same member and condition.

Three support files enable the user to “drill down” to the claims-level data, supporting both internal validation and external transparency into the information and logic behind the findings, engendering confidence in the results among various audiences.



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Standard reports provide statistics used to assess the validity of the results, including prevalence of patients identified with a particular condition and the observed compliance rate for each condition and measure.

The output from EBM Connect supports analysis at a plan, physician, or patient level.

At the **plan level**, reports identify your plan's best opportunities for quality and cost improvement by highlighting the areas of lowest guideline compliance. Specific reports:

- Provide the prevalence of disease among the plan membership.
- Assess opportunities for intervention by identifying the rate of missed opportunities for care—or insufficient compliance with care—for each medical condition.

Health care organizations are continually challenged to identify ways to improve the quality of care delivered by **physicians** to members and populations. Evidence suggests that, on average, it takes 17 years for physicians to implement clinical research results in daily practice.¹² Payers who wish to improve compliance with evidence-based medicine require innovative ways to identify physicians who are not yet implementing—or not yet aware of—clinical developments. Results from EBM Connect provide a powerful foundation to support that need.

At the **patient level**, outputs from EBM Connect can help case managers identify patient care opportunities and provide invaluable insight for patient education. EBM Connect highlights definitive compliance or noncompliance with a clinical measure by a specific member with a specific condition. Further outputs allow identification of members that warrant additional analysis, such as those who have not had time to fill a prescription, or whose data are missing or inaccurate (see Table 3).

V. Summary

Concerns about health care quality, safety, and cost drive the need to measure, compare, and improve health care performance. Research continues to point to major gaps between current medical knowledge and actual health care practice. Meanwhile, health care costs have increased at a high rate without the same progression of improved medical outcomes for members, including quality indicators. A tremendous opportunity exists to improve clinical outcomes, decrease health care costs, and positively impact worker productivity by improving compliance with evidence-based medicine and other standards.

Valid and actionable approaches to measurement play a critical role in improving health care. Health care organizations can only make progress where they identify improvement opportunities, support approaches to target those opportunities, and gauge success using accurate metrics. EBM Connect meets this need. It is a solution that captures the breadth of knowledge in measuring care quality and supports the application of that knowledge in an accurate and robust way.

EBM Connect combines measures based on extensive clinical review and research findings with national standard measures to offer a comprehensive information platform for health care quality measurement. It supports both a flexible approach to assessing quality and results that drive key insights around performance, including high-performing physicians and specific opportunities at the patient, provider, and population level. Complete transparency around the methods and evidence basis for each measure promotes understanding by all stakeholders and actionable steps for improvement.

¹² Balas EA, Boren SA. *Managing Clinical Knowledge for Health Care Improvement*. Yearbook of Medical Informatics 2000: Patient-centered Systems. Stuttgart, Germany: Schattauer, 2000:65–70.

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