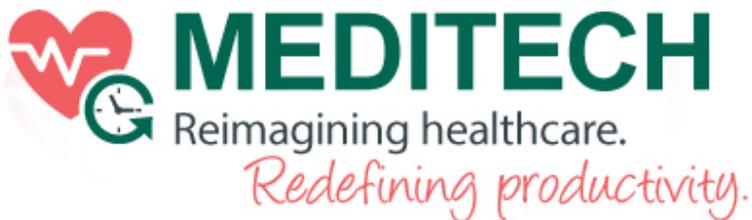


WHITE PAPER

Building a Foundation  
for Population Health:

# Ambulatory Disease Registries



## About MEDITECH

Today, more than 2,400 institutions worldwide use MEDITECH's fully integrated, interoperable EHR to provide healthcare to the communities they serve. Our robust, patient-centered technology spans the healthcare continuum, including unique functional capacity for the following environments: ambulatory care, acute care, long-term care, rehabilitation services, behavioral health, and home care. Learn more at [meditech.com](https://www.meditech.com).

## Process and Technology Change

**As reimbursement continues its shift from volume to value and healthcare organizations take on greater risk for their patient populations, physicians and executives alike need better tools for managing the care and costs of their chronically ill populations.** Today, more than 145 million Americans (nearly half the population) live with a chronic condition, and that number is projected to increase by more than one percent per year moving forward. Moreover, nearly half of all people living with chronic illness have multiple conditions. Given these stark realities, it's clear that chronic disease management — especially the management of patients with multiple chronic conditions — must be the centerpiece of any effective population health strategy.

More than 145 million Americans (nearly half the population) live with a chronic condition, and that number is projected to increase by more than one percent per year. Moreover, nearly half of all people living with chronic illness have multiple conditions.

To be sure, more effective approaches to managing chronic diseases will require process changes as well as technology changes, both of which are well underway and gathering momentum. Spurred by incentives and penalties, healthcare organizations are adapting their processes for managing patients with chronic conditions, and software vendors are responding in kind. Wielding their big stick, CMS fined more than 2,600 hospitals in 2014 for excessive readmissions, and raised the maximum penalty from 2 percent to 3 percent in 2015. On the carrot side, physicians are now being incented to better coordinate the care of their chronically ill patients, with a bonus of \$42 per patient, per month on average for managing Medicare patients with two or more chronic conditions. Furthermore, this reimbursement program covers non-face-to-face care for these patients, opening up opportunities for software solutions that streamline the process of efficiently identifying and communicating with this population.

As always, process and technology changes related to disease management are evolving together in a self-referential fashion. As software developers observe changing practice patterns, they adapt their tools to support these new workflows. Likewise, physicians and administrators see new possibilities in these emerging tools and adjust their processes to fully leverage them. Those software developers that work most closely and collaboratively with physicians and healthcare executives will more rapidly develop the tools necessary to support more efficient and effective care delivery and management of patients with chronic diseases. Moreover, those whose development processes embed end users into all phases of development — from early conception and design, through multiple iterative stages of coding, usability testing, and workflow optimization — will most efficiently deliver effective new disease management tools to their user communities.

What will these new software tools look like? No one knows for sure. But one thing is clear. Software must play a role. It's simply not possible — logistically or financially — for a clinician today (be they a physician, nurse practitioner,

physician assistant, or other caregiver) to manage his or her chronically ill patients one by one, via the traditional patient-provider encounter. Organizations must make intelligent choices about which patients will benefit from which forms of intervention, and higher cost, higher acuity methods must align with those populations most likely to respond — all in the context of financially sustainable practices.

While the details are still coming into focus, we see **ambulatory-based disease registries and patient lists** — which must include tools for stratifying, analyzing, *and taking action* — forming the basis for more efficiently and effectively managing chronic disease patients, and creating a foundation for a sound population health management strategy. Furthermore, they can be used to effectively transition from traditional fee-for-service (FFS) to value-based care (VBC) models. The remainder of this paper explains why.

Ambulatory disease registries and patient lists can form the basis of an effective chronic disease management approach, and the foundation of a population health management strategy.

## FINDING A HOME FOR

# Disease Management

As the setting for the majority of a patient’s routine care, ambulatory practices and their clinicians have been viewed as the “quarterbacks” of patient care. They are typically the first point of contact for undiagnosed health problems. They help coordinate care across other health services and take the lead on care planning and communication. They tend to build the most longitudinal relationships. *And they are often charged with managing their patients’ chronic problems.*

As a result, we expect these clinicians and their support staff to be the primary initial users of tools for managing chronic disease patients. Of course, these providers — especially when part of a larger health network — may have case managers, care coordinators, or nursing staff as front-line communicators with their chronically ill patients, and this must be considered in any software solution; but the ambulatory practice is the ideal home for the disease management function.

Even so, it is important to note that specialists will benefit from registries as well. For example, urologists could use registries for risk stratifying their patients for prostate cancer, and pulmonologists for asthma and COPD. A gastroenterology practice might use a registry to keep track of patients who have had colonoscopies and require follow-up, as well as patients with gastritis or irritable bowel syndrome. But primary care providers will be the leading beneficiaries of well-designed, well-implemented disease registry tools, since they bear the burden for the majority of their patients’ ongoing chronic condition management.

## SEGMENTING YOUR

# Patient Population

The task of implementing a population health program today seems like a truly daunting challenge to many healthcare organizations and their providers, but just as with any complex problem, it can be separated into smaller pieces, ordered, and initiated with the first, foundational element. Ambulatory disease registries are arguably the place to start, with the chronically ill — specifically the multiply chronically ill — the first segment to target.

Broadly speaking, each population will inherently have four natural top-level segments:

### The Well

Patients without chronic conditions or major health issues.

Segment Size: ~50%

Costs: Low

### At-Risk

Stable but at risk of deteriorating.

Segment Size: ~25%

Costs: Medium

### Chronically Ill

Patients with one or more conditions requiring ongoing management.

Segment Size: 20%

Costs: High

### Critically Ill

Multiple unstable chronic conditions requiring intensive one-on-one care.

Segment Size: ~5%

Costs: Extremely High

- The Well
- The At-Risk
- The Chronically Ill
- The Critically Ill.

Because patients in each of these segments benefit from different forms of intervention — each entailing a different level of acuity and cost — it is essential to stratify them to help target engagement strategies in a cost-effective manner. Of course, there are many other factors that contribute to the differential in engagement success with patients (such as age, gender, and socioeconomic factors) but it is important to first understand populations by current health status. Disease registries can then be further filtered, sorted, and culled into smaller worklists based on other factors deemed locally relevant.

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**The Well** include those patients without chronic conditions or major health issues. Ideally (though not realistically) healthcare organizations operating under a value-based model would work to keep or move most to all patients into this category. Costs for caring for this population are low, but not zero, as organizations must still focus on prevention, care coordination, and general wellness to prevent their healthy patients from rising up the risk scale. *This segment typically comprises roughly 50 percent of a patient population.*

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**At-Risk patients** are those whose conditions are stable but at risk of deteriorating, resulting in intervention and potentially costly procedures. This population requires a greater degree of care coordination, clinical communication, and patient engagement to prevent the development of chronic conditions. These patients must be monitored more closely and nudged toward not only preventive and routine care, but health-risk behavioral change. *This category typically comprises roughly 25 percent of a patient population.*

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**The Chronically Ill** include those patients with one or more conditions that require ongoing management. These individuals often need assistance in daily living (highlighting the value of family and social engagement strategies). Due to the nature of chronic conditions it is difficult to move these patients back into the fully “well” range, but essential to keep their conditions from becoming critical. This is arguably the most important segment of the population to effectively manage, particularly under value-based programs, because the costs of poor management and the resulting uncontrolled conditions rise exponentially as patients’ conditions worsen. *This category typically comprises roughly 20 percent of a patient population, but with nearly half of all adult Americans presenting one or more chronic conditions and an aging population of ‘baby boomers,’ this category is expected to continue to swell.*

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**The Critically Ill** are the most resource- and cost-intensive segment of the population. *While they constitute only approximately 5 percent of patients, they account for 40-50 percent of costs.* These “super utilizers” are often multiply chronically/critically ill and require intensive nursing care, frequently in the form of one-on-one encounters. Their conditions are no longer stable and they are at high risk for life-threatening episodes.

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Following initial stratification by general health status and risk, organizations must move on to filter and sort registries into smaller, more manageable worklists based on any number of other characteristics (age, gender, BMI, smoking status, insurance, provider, etc.). Provided the right tools, organizations will find the most effective and relevant criteria for segmenting their populations, and then develop engagement strategies uniquely targeted to those groups. For example, an organization’s healthiest segment may be found to respond favorably to wellness messaging, health screenings, preventive care measures, and other strategies aimed at maintaining good health. The younger subgroup within this segment might be engaged via a wellness portal or social media-based approach, while an older healthy population might prefer a newsletter or annual wellness visit. Higher risk populations will no doubt require more intensive forms of engagement, such as telemonitoring and more active case management for chronically ill patients. But these strategies can only be developed and efficiently delivered with the right tools for analysis and action. Historically, when an executive asked to see a list of patients who met a very specific set of criteria, it could take days or even weeks to produce a custom report. Such a task must now be accomplished in seconds or minutes at most. Moreover, any authorized user — physician, nurse, care coordinator, executive, or other — should have the tools and knowledge needed to quickly access this information on their own, without help from analysts or reporting specialists.

A disease registry cannot be a static list. It must be a dynamic entity that changes as patient conditions and health data change . . . and it must be updated in real time.

## THE RIGHT TOOLS

# Registries and Worklists

While the concept of disease registries has been with us for decades, the implementation of sophisticated and actionable database-driven registries has not. This is so in part because the industry is still transitioning from the phase of the EHR as a passive repository (a filing cabinet, of sorts) to the EHR as an active database (with event-driven, rules-based logic). In other words, collecting the data is just the first step. Turning it into actionable information is the next. Ultimately, certain “events” (changes in state, like important new data entered into a patient’s record) should trigger some of these actions. Of course, doing so without creating “alert fatigue” on the part of both clinicians and administrators is one of our key challenges as software developers.

Needless to say, a disease registry cannot be a static list. It must be a dynamic entity that changes as patient conditions and health data change, and it must be updated in real time. An effective disease registry is not a “report” to be generated monthly, weekly, daily, or even hourly. It is a reflection of the current state of all data in the EHR at the very moment the information is viewed.

We like to make a distinction between what might be called *registries* and *worklists*. Both entities are rules-based lists of patients that meet certain criteria, updated in real time as new data flows into the EHR. Unlike reports that are only accurate the moment they're produced, these dynamic lists are fluid. Just as new patients may appear on a registry or worklist as the result of new information in the EHR (new diagnoses, test results, medications, etc.), other patients may drop off lists as the result of improving conditions.

#### REGISTRIES

Patient registries are more comprehensive groups of patients, typically based on chronic conditions (hypertension, diabetes, COPD, etc.). You might still have multiple registries for a given condition (such as, your Medicare diabetes registry versus private payer diabetes registries) and you might also have registries for items like immunizations and wellness, but registries may generally be viewed as the "wider net."

#### WORKLISTS

Patient worklists are subsets of registries, such as "diabetics with HbA1c levels over 7 percent who have not been seen in 60 days" or "patients with BMI scores above 30 who smoke and have not been contacted in 30 days." Whereas a registry might be maintained at an organizational level, worklists could be created at the individual practice or provider level. Worklists, as we see them, are a tool for further stratifying and segmenting the larger population identified on a registry into smaller, more manageable and actionable subgroups.

Creating registries and worklists is just the first step in a chronic disease management strategy. Taking action directly from these lists comes next. The following characteristics are essential to an effective disease registry or worklist. Registries must be:

#### Usable

Usability across a range of user types is essential. Registries and worklists must be adoptable into the workflow of physicians, nurse practitioners, physician assistants, care managers, and practice managers, among others. They must be intuitive, mobile, and fast, allowing users to rapidly filter, sort, organize, and save new lists within a few clicks. Ideally, they also display (or provide quick access to) other relevant data in the EHR.

#### Dynamic

They must be updated as conditions change in *real time*. Registries and worklists must not be seen as "reports" to be run monthly, weekly, or even daily. They are up-to-the-minute views of all relevant patient data in the EHR — ideally from *all* care settings.

#### Flexible

The tools must be adaptable to a variety of care environments and practice settings, from small 1-2 provider offices to large, multi-specialty physician

## Requirements

To improve the efficiency and effectiveness of DM processes, software-based disease registries must be:

**Usable:** Intuitive, mobile, and fast

**Dynamic:** Updated as conditions change in *real time*

**Flexible:** Adaptable to small practice settings and large multi-specialty groups

**Actionable:** Allow users to take *immediate* action without interrupting workflow

**Interoperable:** Ability to import and interact with government or community-based registries/lists

groups operating within IDNs. Moreover, the ability to add and refine lists as your populations (and their environments) change will be essential.

### Actionable

Users must be able to take action *directly from* the registry or list they are viewing. For example, once they've filtered and sorted their list they must be able to select one or more patients for some form of intervention — letters or emails, patient portal messages, orders, follow-up appointments, etc.

### Interoperable

An effective system must be able to import government or community-based registry data, and export data as standards and requirements evolve.

Finally, these characteristics must work together in the service of allowing organizations to organize groups of patients into more meaningful and manageable subgroups.

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## USE CASES

# Two Scenarios

The scenarios below describe how ambulatory disease registries might be used in practice. They are necessarily simplistic and meant merely to illustrate how an effective registry tool would need to work in disparate environments. They also show how organizations squarely operating in the traditional fee-for-service paradigm could benefit from effectively developed and implemented ambulatory registry tools, thus *servicing as a bridge* from volume-based to value-based care models.

### Scenario 1: Small Physician Office

Dr. Smith is a family practice physician and partner in a five-physician clinic whose staff also includes two nurse practitioners, three clinical assistants, and front desk support, shared across physicians. Dr. Smith uses ambulatory disease registries and worklists herself, since she does not have care managers or coordinators on staff. Her nurse practitioners are also fluent in the use of registries and worklists, since they typically perform follow-up with patients based on physician recommendations.

Dr. Smith and her partners have a weekly “team huddle” to improve communication across clinicians, including their NPs, and these meetings start with a review of high-level registry data. The group has established separate condition-based registries for diabetes, hypertension, and COPD — the three most prevalent conditions in their community. Each week, during their weekly huddle, they review one of these three registries to discuss strategies for this population. They have also created a “wellness” registry for managing their lower risk patients, which they discuss (along with general business issues) in the fourth meeting each month.



Over the course of the next several years, care managers and coordinators will increasingly focus on population-level care coordination.

- Care coordinators at MHS are the primary users of their ambulatory registries and they've developed registries for all major chronic conditions evident in their ACO population. Each condition-based registry (including COPD, osteoarthritis, cancer, diabetes, hypertension, asthma, and depression) is managed by multiple coordinators, who divide registries into smaller worklists based on risk profile and general health status. These worklists are then sorted and filtered as needed by age, gender, and other demographic characteristics, as well as behavior-based criteria, such as tobacco use, alcohol intake, poor diet, and BMI (among others). The group even filters their worklists by primary language, and has Spanish-speaking care coordinators perform follow-up with their large Hispanic population. They make a concerted effort to bring every ACO patient (regardless of risk profile) in for their annual wellness visit and health risk assessment, a billable visit covered by Medicare at no cost to their patients.
- These visits, typically conducted by a Nurse Practitioner, provide an opportunity for clinical staff to collaborate with patients not only on setting realistic health goals, but also discerning the best way to keep them engaged. If the patient or another family member has access to the Internet, they help the patient enroll in their patient portal during the visit, which supports their ongoing PCMH recognition program and prepares them to meet Meaningful Use Stage 2 requirements.

Since deploying their ambulatory registry tools, MHS has been able to shift their focus "upstream," expanding their wellness, preventive care, and health maintenance programs significantly. They've detected a small but important drop in ED visits among their chronically ill populations and a comparable downtick in acute readmissions. This has helped them free up hospital capacity by keeping lower-margin chronic disease patients out of high-cost acute environments (especially important for their ACO's profitability). Throughout, quality metrics have remained stable and high. The organization attributes much of their savings in years one and two of their ACO participation to these reductions in high acuity, high cost episodes, and they've built enough confidence at the board level in their performance in the MSSP to consider joining a private ACO with one of their larger payers.

## CONCLUSIONS

### Integrating Disease Management

Given the mounting pressure for even greater care coordination and delivery efficiency, it's clear that (all other things being equal) an ambulatory disease registry that is fully integrated into an organization's EHR and user workflows will provide benefits unavailable in standalone products. For starters, it could tap the EHR to access data from *all* care environments, in real time, without the delays inherent in importing data from other sources. Moreover, while housed primarily within an ambulatory environment, providers from any specialty or

setting (including acute, ED, long-term care, and others) could access registries, facilitating the important care team approach. Ambulatory practices owned by or affiliated with integrated care networks — particularly those using a shared EHR across the continuum of care — will be particularly well positioned.

Empowered with the right registry tools for managing their chronically ill patients — tools that are highly usable, dynamic, flexible, actionable, and interoperable — healthcare organizations of all sizes can build the foundation for a larger population health strategy.



Empowered with the right registry tools for managing their chronically ill patients — tools that are highly usable, dynamic, flexible, actionable, and interoperable — healthcare organizations of all sizes can begin today to build the foundation for a larger population health strategy. Moreover, these tools will add value in both the fee-for-service and value-based healthcare environments, serving as a bridge between reimbursement models. This bridge, it should be understood, must allow travel in both directions, since organizations may manage some populations under a value-based system (their ACO patients, for example) while managing other populations more traditionally. Thoughtfully designed Ambulatory Disease Registries will support better-targeted engagement strategies by stratifying, sorting, and filtering patients by locally relevant condition-based and behavior-based criteria. This will bolster the cost-containment efforts necessary for profitably delivering accountable care. Meanwhile, the same tools can be used to more efficiently and proactively identify patients overdue for routine care, screenings, and preventive measures, thus supporting responsible revenue generation under a fee-for-service model.

**These are not tools of the future. Software vendors are beginning to deploy them TODAY.** Admittedly, just like the reimbursement models they're designed to support, disease registry tools (and population health solutions more broadly) will need to evolve based on experience in the field. Those healthcare organizations and vendors who work most closely and collaboratively will succeed at rapidly adapting the software needed to profitably deliver safe, high-quality, effective care in these times of great change.