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The 12 Criteria for Population Health Management

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INTRODUCTION

Ignoring the complexities of the federal definition, the concept behind Accountable Care Organizations (ACOs) has been practiced for many years by integrated delivery networks, such as Intermountain Healthcare and Kaiser Permanente. Accountable care boils down to a very simple combination of:

(1) Managing fixed-price contracts for the treatment and management of individual patient health (in contrast to fee-for-service, time-and-materials contracts); and

(2) Applying the patient-specific concept of balancing cost-of-care with quality-of-care, to large populations of patients. The Venn diagram looks like the following:

ACCOUNTABLE CARE
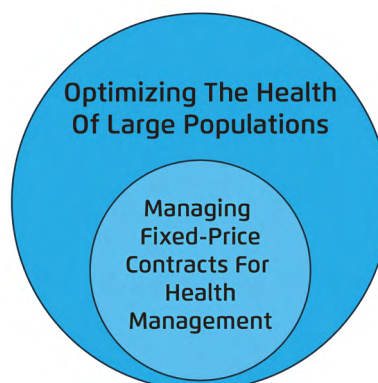
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> The purpose of this paper is to discuss the data management requirements of the outer circle—Population Health Management (PHM)—not the claims processing, detailed cost accounting, and contract management systems of the inner circle—fixed price contracting.
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Optimizing The Health Of Large Populations

Managing Fixed-Price Contracts For Health Management

The purpose of this paper is to discuss the data management requirements of the outer circle—Population Health Management (PHM)—not the claims processing, detailed cost accounting, and contract management systems of the inner circle—fixed price contracting.

In full disclosure, I am associated with a vendor, Health Catalyst, that claims to provide a solution to the requirements in that outer circle of PHM. For 22 of my 30 years as a healthcare professional, I've been a CIO—the person on the other side of the table, looking for vendors that I could trust to provide the products and services that my organization needed, particularly analytics products. I joined Health Catalyst under a contract that guarantees my rights to tenured public opinion, whether the opinions I publicly express expose shortcomings of Health Catalyst or not. My loyalty resides first with the betterment of healthcare for our country. All other loyalties, including those to Health Catalyst, fall to second place.

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Population Health Management

One thing is clear about the future of healthcare: our ability to deliver high-quality, economically sustainable care will depend on how well we can manage the health of populations. For many integrated delivery networks that have been balancing the economics of care with the quality of care for decades, the concept of PHM is embedded in the culture, even though the term "population health management" was not commonly used until recently. At places like Intermountain Healthcare, they were simply delivering what they considered the best care for their patients and community and didn't see the need for a new term to describe their natural tendency. PHM is in its early stages of maturity and, as is normally the case in such early stages, it is suffering from inconsistent definitions and understanding, overhyped by vendors and ill-defined by the industry.

To help organizations understand all that is required to effectively manage populations—I've developed 12 criteria, listed in stepwise order of importance, developed in the context of today's healthcare market. These criteria can be used to develop an organization's PHM strategy, as well as evaluate vendor products. The criteria reflect the following important points:

❯ **Sequence Matters:** The numbered order of the criteria isn't random. It is listed in order of logical progression, similar to a course curriculum. The criteria listed first are foundational. Every subsequent criteria are dependent upon those preceding and can function no better than the design and functionality of the preceding criteria.

❯ **Market Maturity and Evolution:** The latter criteria are the most complicated technically and culturally, but the least developed in the industry. They will require time to evolve. While they evolve, work on the foundation first.

Details of the 12 Criteria

Criteria #1: Precise Patient Registries

Evidence-based definitions of patients to include in population health registries.

Building accurate population registries is the foundation of effective population health management. Precise registries are the gatekeepers to accuracy. Without precise definition of the populations of concern, first, everything else in the strategy suffers.

Traditionally, population cohorts have been defined using billing data, specifically ICD-9 codes. However, relying solely on billing data to define the patients in these cohorts, means organizations will likely miss 30 to 40 percent of the patients that should be included. In a value-based, fixed-price contracting model, that level of inaccuracy will be financially devastating to the ACO.

Definitions of populations must be clinically informed. Billing codes represent a first step. Then, registries must take into account such data as:

❯ Lab results
❯ Functional status measurements
❯ Diagnostic imaging results
❯ Medications
❯ Claims data
❯ Procedure codes

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All of this data, extracted and filtered from different data sources in the organization's ecosystem and bound together in an enterprise data warehouse (EDW), is required to build an accurate profile of a disease (or other) patient state. The design of disease and other patient registries is worthy of its own white paper, but for the immediate context, the following diagram illustrates the high-level design of a disease registry that is precise and accurate.
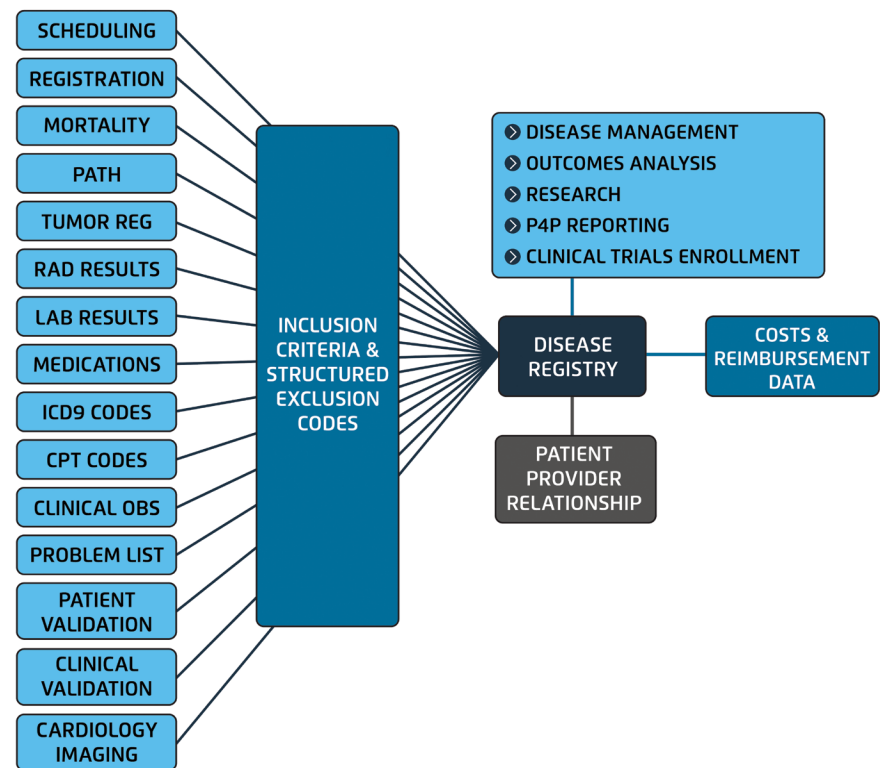
Data flows from left to right, from source systems into the disease registry inference engine, then into the registry itself where it is combined with a vast array of other data about those patients, then associated with the appropriate accountable care clinician, and finally exposed for analysis in the context of population health management.

Criteria #2: Patient-Provider Attribution

Strategies and algorithms to assign patients to accountable physicians/clinicians.

One of the most complicated aspects of population health management (and accountable care) is determining who is really responsible for the patient. Who constitutes the patient's care team and what is their relative involvement in the patient's care? There are a number of different ways to identify the patient relationship of each care team member. Sometimes the patient will explicitly select a physician—a relationship established primarily through the insurance company. However, this formal assignment doesn't always represent the reality of accountability. Even though one doctor is the assigned primary care provider (PCP), the patient might actually visit another doctor more frequently—a specialist for instance, like an OB/GYN or endocrinologist.

A common method for appropriately attributing clinician-patient relationship is developing algorithms that can analyze a patient's visit patterns. This kind of sophisticated attribution work will become even more essential—and

> **Every EMR should be capable of capturing data that reflects the non-medical indicator impacting health.**

challenging—when assigning financial risk and performance incentives back to the physicians that are accountable for the care.

Once again, patient-physician attribution strategy is worthy of a separate white paper, but the generally accepted high-level options for assigning attribution are the following:

- Patient selection of physician during open enrollment
- "Most frequently visited" physician over the past two years
- Random assignment of patients to primary care physicians in the same geographic area
- Random assignment of patients in an employer group to primary care physicians in the PPO or HMO

Criteria #3: Precise Numerators in the Patient Registries
Discrete, evidence-based methods for flagging the patients in the registries that are difficult to manage or should be excluded.

It is challenging enough to precisely define the patients that should be included in a registry and assigning those patients to accountable physicians. Equally challenging is identifying patients in the registries that will be particularly difficult to manage. There are many reasons a patient may not be able to fully comply with clinical protocols. **Every EMR should be capable of capturing data that reflects the non-medical indicators impacting health, including these:**

- Language barriers
- Cognitive inability to participate in a care protocol
- Physical inability to participate in a care protocol
- Economic inability to participate in a care protocol
- Willing and informed refusal to participate in a care protocol, e.g. religious reasons
- Medication contraindications to participating in a care protocol
- Geographic inability to participate in a care protocol
- Mortality (it can be surprisingly difficult to identify these patients)

An effective population management system must have a method for flagging patients in these categories. The care management processes must be tailored to accommodate these types of patients and the physician's level of accountability for their care adjusted, especially when physician compensation is tied to their patients' adherence to care protocols. Assigning these specific attributes to a patient requires a combination of subjective human judgment and sophisticated analytic technology. For example, it's not always easy to objectively assess whether a patient lacks the necessary cognitive ability to participate in a protocol. A clinician or a care manager familiar with the patient's care processes and personal issues should make this assignment—which requires an IT system that allows them to manually flag the patient with this attribute and triage the patient to a different care management process. At this point, there must be a strategy in place for managing those patients differently, such as home care, financial assistance plans, building outreach clinics in specific geographic areas, or assigning health coaches.

> The ability to account for the large portion of the population with special circumstances is key to achieving both physician buy-in and effective population health management.

The CMS Hierarchical Conditions Category (HCC) risk scores are one technique for assigning health risk scores to large populations so that ACOs are not motivated to prune the most challenging patients from their patient panels, but HCC scores do not accommodate the patient-specific conditions listed above, especially at the individual patient level.

The inability to account for patients' individual requirements in this way will contribute significantly to physicians' dissatisfaction with population health management processes. Physicians resent being penalized for patients that fall outside the boundaries of clinical effectiveness guidelines when the physicians know it is empirically impossible for those patients to meet those guidelines. The ability to account for the large portion of the population with special circumstances is key to achieving both physician buy-in and effective population health management.

Criteria #4: Clinical and Cost Metrics

Monitoring clinical effectiveness and total cost of care to the system and the patient.

The next logical step in developing a system for population health management is to measure the practice of medicine against these protocols and continue to measure the variability in care. This requires organizations to build dashboards not only around specific patients but around populations of patients. Importantly, measurement should not just focus exclusively on clinical quality—it must also track the total cost of care both for specific patients and on a per-capita basis across the population. Ultimately, this kind of measurement prepares an organization for fixed-fee contracting in a true value-based system. These metrics can also be invaluable during contract negotiations with payers—with access to this type of quality data and cost data, healthcare provider organizations are in a strong position to negotiate and retain the best contracts compared to competitors that do not have access to this type of analytics.

It is important to also provide quality, outcome and cost variance feedback to physicians—risk adjusted—at the point of care. A physician who is highly variant in one area of care, may be overall lower in total care for all patients. In other words—spending more in one area is not necessarily bad. Your analytics platform and culture must be capable of looking at these scenarios, holistically.

Criteria #5: Basic Clinical Practice Guidelines

Evidence-based triage and clinical protocols for single disease states.

An effective population health management system defines how it will manage each population cohort. The problem with evidence-based medicine today is the general lack of applicability of that evidence outside the clinical trial that generated the evidence—clinical trials are rarely generalizable. In the future, traditional clinical trials' "evidence" will be displaced by the evidence derived from the analysis of local data sourced from the EDW. Recent achievements using registry-based randomized clinical trials provide a new template for healthcare organizations, enabling them to generate their own evidence at a fraction of the usual cost, and provide more locally relevant results than traditional-randomized clinical trials from academic medicine. Until local data and registry-based trials are more widely used, the industry must make-do with the evidence and guidelines that are available now. Many organizations try to define and develop their best-practice protocols internally, but that isn't a scalable approach in the long run. Based on my experience and observation in several organizations, I

estimate that a single clinical protocol of moderate complexity costs an average of $190,000 in labor to develop internally. There are dozens of external commercial sources for evidence-based protocols and clinical effectiveness guidelines such as the CMS Accountable Care Organization measures and PQRS, AHRQ, National Quality Forum, and others. Commercial vendors such as Zynx, BMJ, Elsevier, PatientOrderSets.com, and Wolters-Kluwer offer clinical practice guidelines, as well. Healthcare provider organizations need to establish a "Clinical Practice Guidelines" governance body and then select their source(s) and processes for implementing and maintaining clinical protocols for managing the patients in the population health management program. If there is a reluctance or other hurdles to the adoption of clinical practice guidelines, organizations can still achieve significant improvements in quality and cost of care by simply measuring and reducing variability in care, then shifting the common practice of that care to the right of the quality curve. Obviously, all of this will entail a long journey. Start that journey by defining clinical practice guidelines for the patient cohorts and clinical process families that offer the highest opportunity for improvement and cost savings. The simple formula for identifying those areas of opportunity is:

(Number of Patients in the Population) x *(The Average Total Medical Expenditure (TME) per Capita)*

Criteria #6: Risk Management Outreach

Stratified work queues that feed care management teams and processes.

Risk stratification enables an organization to analyze and minimize the progression of a disease and the development of comorbidities. This ability to stratify and then to set in motion the processes for outreach are important aspects of managing a population effectively. Once patients in the registry are stratified and monitored, organizations must develop strategies to identify and intervene with those patients that are on a high-risk trajectory. Also, over time, as the data becomes more rich, profiling and proactively treating patients before they become members of the registry is the ultimate goal of healthcare—avoiding disease altogether, not reactively treating for it. Referring back to criteria #3 at this point, healthcare organizations will also be able to stratify patients associated with social and other barriers to participation, thereby customizing their care management strategy.

Criteria #7: Acquiring External Data

Access to clinical encounter data, cost data, laboratory test results, and pharmacy data outside the core healthcare delivery organization.

Contrary to current national strategy and focus, acquiring external data should not be a high priority in the current context of the market, hence I list this criteria in the #7 position. It is geometrically more complicated to manage a patient population beyond the four walls of the core healthcare delivery organization. Taking care of in-house processes and data quality first—an environment easier to influence and control—is a critical tactic to getting started on the right trajectory. Then, carefully and deliberately expand the boundaries of the care delivery ecosystem from those patients within the immediate influence of the organization to those at a regional level. Start locally, plan regionally. Defining the business processes, governance structures, clinical relationships, and data-sharing agreements among ACO participants makes this criteria a complex and lengthy feature of a population health management strategy.

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Health Information Exchanges (HIEs) are the most visible technology associated with external data exchange in an ACO. However, an HIE addresses only a small portion of the data puzzle required for population health management.
The data that is exchanged by an HIE is the most simplistic, basic exchange of clinical data in the ecosystem—for example, no financial or cost data is shared to enable the Triple Aim—and the business failure rate of HIEs is notoriously high. Enterprise data warehouses are a fundamental requirement for population health management. HIEs are not enough.

Mergers, acquisitions, and partnerships (M&As) with hospitals in the past were driven by the procurement of complementary business and clinical services, along with hospitals and clinics in new geographies. As the center of geography for healthcare shifts from hospitals and clinics to the home, local pharmacies, and workplaces; the traditional bricks-and-mortar of healthcare will become less and less the focus of M&As. The "A" in M&A will be about data acquisition, not bricks-and-mortar acquisition. As I watch the break neck race for healthcare M&As to create larger patient populations bigger risk pools, and volume efficiencies of services, I am constantly amazed that healthcare executives continue to dismiss or overlook the acquisition of care delivery data in their new company and ACO strategies. The early pioneers in the accountable care M&A land grab are now experiencing the pain of this oversight in data management.

The future grounds of competition in healthcare will be in data and optimal execution on the analytics of that data—not bricks and mortar and care delivery sites.

Criteria #8: Communication with Patients
Engaging patients and establishing a communication system about their care.

The current information technology options for this criteria are fragmented and immature but will improve dramatically in the next three years. In today's industry, our typical solution for engaging patients is through a personal health record (PHR) tightly associated with a vendor's and healthcare delivery organization's EMR. The patient engagement platform of the future will be owned completely by the patient and be decoupled from a dependency on an EMR vendor and a single healthcare organization. Also, with the exception of secure email, the current PHR paradigm is a one-way push of information from a 1970s-era EMR to the patient. To effectively engage patients, we need to think much more broadly than the PHR. The PHR needs to evolve into a personal health project management system—imagine a system that combines the features of cloud-based project management programs like BaseCamp (milestones, goals, budgets, file and image sharing, and teamwork) with knowledge management tools like Zite (personalized health content, advice, suggestions and prompts), and social support like PatientsLikeMe. We need to embrace the technology platforms and methods that patients use in their everyday lives and make them part of the healthcare delivery process. This is going to require some adjustments to the industry's application of HIPAA. For example, as a patient, if I want to exchange unencrypted email, text messages, and posts with members of my care delivery team, I should be allowed to do that. Today, as a result of misplaced HIPAA risk management, healthcare delivery systems regularly prohibit this sort of communication, taking the decision away from the patient, while at the same time allowing massive amounts of clinical data to be exposed on unencrypted laptops and thumb drives. New forums for human engagement are prevalent in our world, and we must be more liberal, risk tolerant, and flexible about how to use them.

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Criteria #9: Educating and Engaging Patients

Patient education material and distribution system, tailored to the patient's status and protocol.

This is, of course, closely related to criteria #8, but is significantly more complicated than exchanging information with the care management project team. Our current system for patient education is hampered by the lack of well-vetted, highly personalized materials and an ineffective distribution system. Quite often, today's patients receive no education material about their condition—more likely, the extent of the educational material comes from the pharmacist about a medication. We have a long way to go.

As I mentioned above, the de facto solution for patient engagement today is the PHR. PHRs tend to present generic educational information, at best presenting general information about a patient's chronic disease. This means that a low-income, preteen girl with type 1 diabetes is likely to receive the same education material as a middle-aged executive man with a completely different background. Comorbidities are something else that today's educational materials aren't tailored enough to address. If a patient has diabetes and cardiovascular disease, they can receive educational materials about each condition but nothing that blends the two together.

Our industry also needs to improve the quality of the information. Educational materials come from third-party libraries, and there is no certified, widely available method of evaluating the quality of this material. Furthermore, most patient educational materials—even if the information is accurate—fail to take into account the educational level and cognitive abilities of their audience. Recent studies by the Kaiser Family Foundation indicate that only 10 percent of patients are capable of being fully engaged in their own healthcare, due to education level and our industry's inability to communicate with them in a way that's meaningful and actionable.

The final challenge to patient education that I will raise here is related to a point discussed in criteria #8. We have yet to embrace the most effective methods for distributing educational materials to patients. PHRs have not been widely adopted. Distribution involving methods that patients embrace, such as email and text messaging can positively affect their willingness to engage with educational materials. Using a publish and subscribe model—that patients control—ACOs will someday be capable of integrating with highly personalized patient educational materials and pushing these through existing channels of human engagement such as Twitter, Facebook, Zite, and Amazon.

Criteria #10: Complex Clinical Practice Guidelines

Evidence-based triage and clinical protocols for comorbid patients.

Establishing protocols for comorbid patients is much more complicated than applying protocols for single disease states. Frankly, there aren't many sources in the industry for clinical protocols that can account for comorbid patients. More often than not, physicians are left to build their own guidelines, or chain individual disease treatment protocols together. Unfortunately, the reality of healthcare is that a large percentage of the patients which population health management should target are comorbid. In particular, Medicare patients, on average, are affected by at least three chronic diseases at the same time. As an industry, we have yet to develop effective comorbid treatment protocols (worth noting that the American College of Physicians is attempting to address this need). Instead, we

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rely on multiple single-disease protocols applied to a single patient. These single-disease protocols are linear and don't interact well. Developing comorbid protocols must be a significant focus of our healthcare agenda over the next several years. Organizations that optimize comorbid care will be in a strong position to differentiate themselves in the market, both financially and clinically.

Criteria #11: Care Team Coordination

Inter-clinician communication and project management system.

An effective system for managing populations requires a more automated way for communicating among members of the care team. Relying on faxes, referral letters, the EMR Inbox, and telephones just won't suffice anymore.

We need to treat every patient as if they are at the center of a project plan. If they've had an acute encounter, we should present them with recovery milestones and assign someone to them to help them reach these milestones. For a chronic disease like diabetes, we should present them with a lifetime project plan for health. If they start falling out of the expected trajectory for health, we need to intervene to get them back on that path.

All members of a patient's care management team should be able to quickly and easily see the patient's overall project plan, next milestones, and the responsibilities of each member.

It should be no surprise, then, that the ideal system for care team coordination would function like a project management tool, like BaseCamp. Today's EMRs are designed as encounter management tools (and aren't even particularly good at that). Tomorrow's EMRs will incorporate project management concepts into their functionality. A truly effective EMR user interface would still display the individual encounter, but it would also display the project plan for chronic condition management or health maintenance for that patient, as well as the cost of care for the patient and the patient's population. Every member of the care team—including the patient or a designated family member—would be able to monitor what everyone else was doing along the care plan.

Criteria #12: Tracking Specific Outcomes

Patient-reported outcomes measurement system, tailored to the patient's status and protocol.

This is the last criteria because it is one of the most difficult culturally and technically to implement; and organizations can make significant progress on population health while this criteria develops and evolves in the industry. When organizations have multiple methods in-place for engaging and communicating with patients, the next step will be to gather outcomes data from patients, using those various methods of communication. Patient-reported outcomes data is one of the most important pieces of data missing from our ecosystem today. The best we have been able to do so far is assess patient satisfaction, but that data falls far short as an aid for measuring actual clinical outcomes. Unfortunately, the industry presently has no reasonable options for addressing this need. In order to be effective, a patient-reported outcomes system must have a closed-loop data relationship with the EMR. The clinician must have the ability to initiate an outcomes survey automatically, tailored for the patient based upon the patient's diagnosis and treatment plan. The outcomes data that is collected must be integrated back into the patient's record in the EMR and then exported to the EDW for analytic purposes.

Asset Allocation and Timing

As the market evolves and the healthcare organization matures in its implementation of population health, the diagram below depicts the recommended allocation of assets:
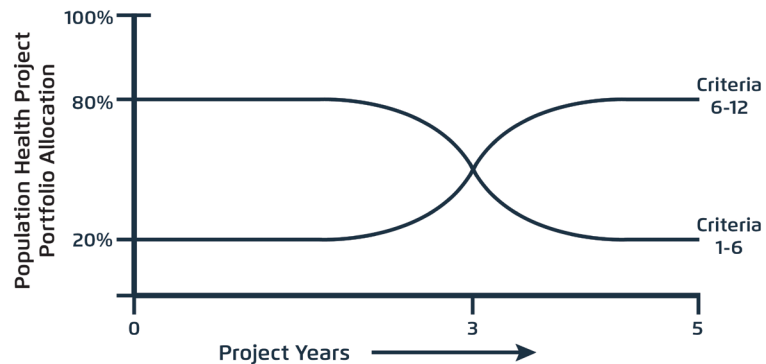
Use the criteria to build a roadmap toward population health management and to evaluate progress. Get started as soon as possible with the first six criteria while the latter six continue to develop in the market. By the time the organization is operating effectively according to criteria #6, the market will have matured, business models will have developed, and better products will be available. Tilting these 12 criteria on their side, as an X-axis, gives a reasonable, yet aggressive, organizational roadmap and timeline:
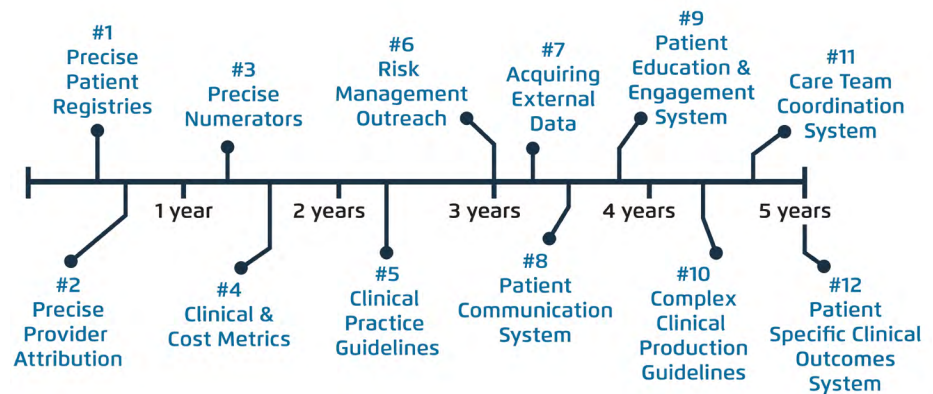
In Conclusion

The key points to remember are:

> The integrated delivery networks have been practicing population health management for a number of years. Follow their lead.

> There is no single vendor that can provide a complete PHM solution today.

> The sequence of these criteria is important. Of the 12 criteria listed, and given the current state of the vendor market and industry trends, organizations should focus on the first criteria over the next three years, while the context evolves.

Beyond encouraging organizations to get started with the basics today, the most important piece of advice I could offer is to take care when selecting a vendor to build the foundational technology infrastructure. That vendor must be able to deliver an infrastructure that is flexible and scaleable over the next few years, as the market evolves.