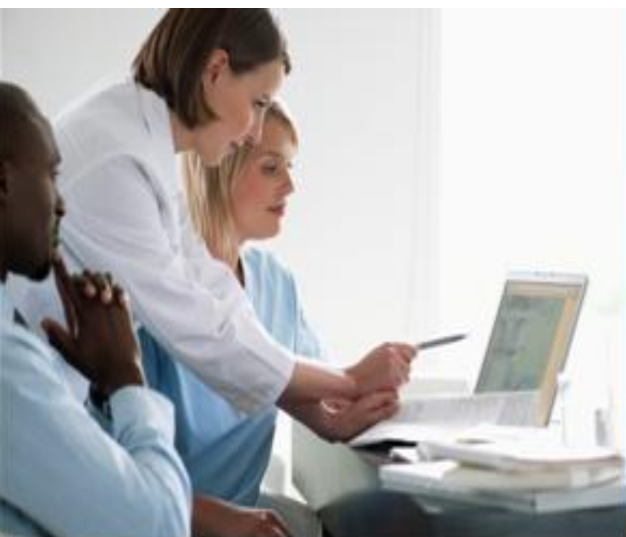
DiagnosisOne™

CLINICAL IT REQUIREMENTS FOR ACOS

Enabling Effective Patient & Population Management



White Paper

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Clinical IT Requirements for ACOS

ENABLING EFFECTIVE PATIENT- & POPULATION-MANAGEMENT

EXECUTIVE SUMMARY

In response to continually rising costs and known quality issues associated with the traditional fee-for-service care model, significant interest is emerging in the formation of Accountable Care Organizations (ACOs). Under this ACO model, providers are financially responsible for the outcomes, as well as the cost of care of their assigned patient panel. To succeed as an ACO, providers will need new technology solutions -- ones that will help them manage a population, as well as individual patients. EMRs and related technologies are critical elements in the ACO's IT landscape, but they are not sufficient in and of themselves. Rather, to realize the vision of the ACO, multi-level clinical analytics and clinical decision support technology must be deployed in parallel. Fortunately, when properly executed, deploying such solutions is certainly manageable, even in the context of other clinical IT projects.

BACKGROUND - WHY ACOS, WHY NOW?

Under the currently used "fee-for-service" healthcare reimbursement system, healthcare providers, hospitals, labs, and imaging centers, are paid a set amount for each service they deliver. While this may promote incentives for hard work and productivity, it fails to reward caregivers for maintaining the health of their patients. It also removes incentive for a team-based coordination of clinical services. To counter this, private payers, and most recently Medicare, have begun to promote a new concept, the Accountable Care Organization, or ACO. The Centers for Medicare & Medicaid Services (CMS) defines an ACO as "an organization of health care providers that agrees to be accountable for the quality, cost, and overall care of Medicare beneficiaries who are enrolled in the traditional fee-for-service program who are assigned to it."[i] An ACO is a group of disparate providers that works to improve a population's health, and is paid for its accomplishments against this goal.

The term ACO is less than a decade old, and first came into common use following Dr. Elliot Fisher's 2006 paper *Creating Accountable Care Organizations: The Extended Hospital Medical Staff*.[ii] The article was based on findings from Dr. Fisher's 30 years of research with the Dartmouth Atlas project, a seminal work on the variability of practice patterns across the country. Interest in ACOs has grown steadily since 2006, with several health systems and private payers successfully experimenting with ACO models.[iii] However, ACO excitement skyrocketed with the passage of the Patient Protection and Affordable Care Act in 2010. The legislation creates mechanisms to fund voluntary pilots and demonstration projects for introduction of accountable/coordinated care delivery models, and requires the Department of Health & Human Services to establish shared savings programs using ACOs by January 2012."[iv] This promotion of ACOs by CMS, along with other initiatives in healthcare reform, such as bundled payments and pay-for-performance initiatives, all have one common feature-- they join providers together to help improve population health.

Some questions remain concerning the implementation details of ACOs. Notable uncertainties include, but are not limited to, the following: the specific payment methodology ("shared savings" versus Population Based Payments), the optimal level of clinical service integration, and the specific performance measures. [v] Presumably, as providers bear more of the financial risk of their patient populations going forward, the "winners" will be providers who can improve population health through prevention, and efficiently managing chronic care. Productivity in the traditional sense, such as patients seen per day, Relative Value Units (RVUs), days/1000, and gross charges, will be a means to an end, not the primary financial driver. To support this, structures will be put in place to encourage longer term health maintenance investment. Provider contracts will be multi-year (CMS requires 3 years for ACOs), and quality and satisfaction scores will be measured

aggressively and tied to compensation. With this certainty comes the task of designing a healthcare delivery system that:

- Reduces significant medical errors and avoidable complications,
- Lowers variations in application of evidence-based medicine,
- Standardizes treatment guidelines and resource utilization,
- Encourages investment and consumption of preventative care,
- Improves the management of chronic illnesses, particularly reducing complications associated with inter-provider communication/fragmentation issues

CLINICAL IT NEEDS AT AN ACO

If healthcare systems going forward are to execute on the aforementioned objectives of error reduction, standardization, and improved coordination, additional information technologies (IT) will be required. In general, as described below, two sets of technologies are needed.

First, systems are required to capture, standardize and structure health information and transactions. Representative solutions include Electronic Medical Records (EMRs), Picture Archiving and Communication systems (PACS), and Computerized Physician Order Entry (CPOE). These solutions serve as the informatics backbone, making data available in more places, removing the known errors associated with the absence or miscommunication of information, and increasing clinician productivity, at least somewhat. The second set of solutions is analytics and clinical decision support. These systems interpret longitudinal data to inform care providers and health system planners. Unlike EMRs which help standardize the documentation of care, clinical decision support & analytics aim to standardize the delivery of care. Specifically, they intend to improve patient care by providing clinicians with insight and guidance using known patient histories.

Clinical IT Requirements in an ACO

- ✓Timely access to complete patient info
- ✓Structured workflows aimed at reducing avoidable errors & protocol deviations
- ✓Systems for improving clinician productivity & operational efficiency
- ✓Tools strengthening the patient-caregiver interaction & fostering more impactful dialog
- ✓Analytics to focus resources on patients that can most benefit from intervention
- ✓Support for transformation of the care model, including empowering different provider types and use in non-traditional care settings

[FUNTIONALITY SET 1] Digitize data & standardize transactions

Historically, "clinical IT" has referred first and foremost to documentation systems—software that stores and manages all or parts of the patient health history. These include ancillary systems such as, pharmacy, labs, and radiology, as well as flow sheets, notes, and other heath records. In the HIMSS EMR adoption model (Figure 1 below) these systems are seen in the early stages of hospitals' use of Clinical IT, dominating stages 0-3. In stages 4 and 5, health systems begin to use technology, not only to store and share data, but to also structure workflow and standardize transactions.

FIGURE 1: HIMSS ANALYTICS EMR ADOPTION MODEL

US EMR Adoption Model℠			
Stage	**Cumulative Capabilities**	**2010 Q3**	**2010 Final**
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data Continuity with ED, ambulatory, P	**1.0%**	**1.0%**
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	**2.8%**	**3.2%**
Stage 5	Closed loop medication administration	**3.7%**	**4.5%**
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	**10.3%**	**10.5%**
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	**49.7%**	**49.0%**
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging, HIE capable	**15.4%**	**14.6%**
Stage 1	Ancillaries – Lab, Rad, Pharmacy – All Installed	**6.7%**	**7.1%**
Stage 0	All Three Ancillaries Not Installed	**10.5%**	**10.1%**
Data from HIMSS Analytics™ Datavase © 2011.		N = 5,233	N = 5,281

While much work remains implementing core information capture systems, we as an industry have already made tremendous progress. Per Figure 1, by year-end 2010, over half of all hospitals have achieved Stage 4.[vi] In the outpatient setting, AMA Medical News reported that over 50% of office-based physicians now use some sort of EMR.[vii] This growth is not surprising. The passage of the American Recovery & Reinvestment Act (ARRA) of 2009 included $17B in incentive payments for providers for implementing these technologies.[viii] With information becoming digitized, providers can now focus on the next challenge, analytics.

[FUNTIONALITY SET 2] Arm all decision-makers with actionable insights

Digitization of information does not, in itself, accomplish the key goal of allowing providers in separate organizations to collaborate on patient care. Rather, it is the infrastructure that can be applied alongside analytics & decision support technology to support automated, consistent, evidence-based management over time. Specifically, it can provide insights at five (5) distinct, yet-interrelated levels. DiagnosisOne refers to these levels as the "5Ps of CDS," population-, provider-, panel-, patient-, and problem-analytics.

TABLE 1: 5 levels of clinical analytics required to effectuate ACOs	
Population analytics & CDS	Information to enable development of effective population management strategies, identify system-wide issues, and align clinical service lines against the areas that can reap the greatest system-wide improvement
Provider analytics & CDS	Identify and reward high-achieving provider groups, facilities, and care delivery networks, while developing effective patient steerage strategies
Panel analytics & CDS	Automatically monitor and arm each clinician with the timely alerts they require to ensure ongoing adherence to guidelines and protocols
Patient analytics & CDS	Actionable information on a specific patient that is easily accessible at **any** point-of-care, either the physician exam or elsewhere (e.g., pharmacy, call with health coach, ER, outside provider), and consumable in real-time
Problem area analytics & CDS	Information targeted at improving the management of specific chronic illnesses that cut across provider groups/networks, facilities, etc.

Embedded in each of the levels above are productivity measures, quality scores (e.g., PQRI, HEDIS), gap-in-care warnings, lab-related alerts, along with disease registry information, vaccination, and other third-party data sets.

[FUNTIONALITY SET 3] Translate analytics to patient care & behavior change

Electronic health information, and the analytics that overlay it, represent two informatics investments critical to fulfilling the ACO promise. The third step in the journey is translating the insights into an improved clinical experience at the point-of-care. Tactically, this requirement can translate to several different types of IT investments. Two areas of particular importance are (i) patient-driven order sets and (ii) behavior change support.

Patient-driven order sets use all available patient information, including the complete patient histories, known labs, past procedures, medications, and various other relevant data, to dynamically construct for providers highly targeted patient-specific intervention recommendations. Unlike static diagnosis-based order sets, patient-driven order sets are able to account for co-morbidities, eliminate contra-indications, reduce medication-related conflicts, as well as provide a myriad of other improvements. As an example, consider the traditional order set associated with a new diagnosis of Type II Diabetes Mellitus. A common recommendation is initiating Statin therapy if fasting LDL levels are greater than 100 mg/dl, or greater than 70 mg/dl with a history of cardiovascular disease. While a static order set can present this information, a patient-driven order set, however, can individualize this care recommendation automatically. It can look at existing lab data to assess if a timely LDL value exists, and if so what the value is, to alert the caregiver, accordingly. Furthermore, because a patient-driven order set can use all structured data, a history of cardiovascular disease elsewhere in the EMR could be flagged for the clinician to consider when ordering a lipid control medication. A condition found in the patient's history could be a contra-indication as well, for example, a history of liver disease may preclude Statin use. While the treating clinician will always be the ultimate arbiter of treatment decisions, as this example shows, she can be armed with much more relevant recommendations.

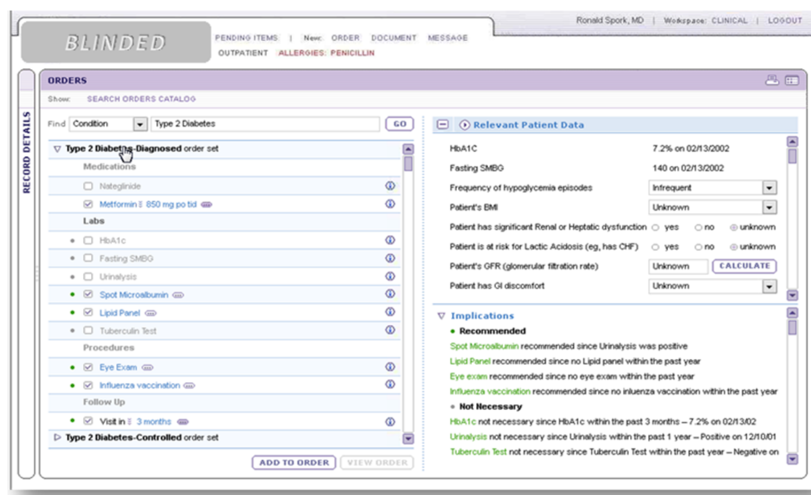


FIGURE 2: EXAMPLE OF PATIENT-DRIVEN ORDER SET

Arming clinicians with timely data, targeted alerts, relevant order sets and care plans is certainly beneficial, but there is even more that can be done. Because the ACO is financially responsible for patient outcomes, they must not only provide patients the right care advice, they must help them remain compliant with the recommendations. Doing so is often challenging and time-consuming. Outside healthcare, many organizations have found that the key to getting individuals to change behavior is "personalization," making the guidance particularly relevant to the individual. Examples abound, including e-commerce, banking & financial planning, and retail. Using clinical analytics, personalized guidance can be automated. Even simple interventions, such as providing data-driven patient-education materials that reflect information such as the specific treatment plan, gaps-in-care, have been shown in clinical trials to be effective.[ix] Added to this can be automated alerts for clinicians to follow-up and reinforce behavior change. A phone call from a nutritionist, nurse, or pharmacist 30 days post visit, can also reap positive benefits when targeted properly.

In conclusion, the IT roadmap for an ACO is clear -- digitize the information, overlay multi-level actionable analytics, and then automate as much as possible, guidance and routine transactions, allowing caregivers to focus their valuable time on the most important considerations.

STRATEGIES TO MEET ACO REQUIREMENTS, START SMALL & GROW QUICKLY

Meeting the three sets of functionality requirements above need not be difficult. It does need to be well-planned, though. As noted earlier, most institutions interested in creating ACOs have already begun implementing EMRs and ancillary documentation solutions. They are required for Stages 1 and 2 of the Meaningful Use requirements under ARRA/HITECH. However, even for Stage 1, providers and hospitals alike are finding they require additional technology to accomplish key objectives around clinical decision support and ancillary reporting. *(See sidebar.)* For establishing an ACO, this path of digitizing should continue, and even be accelerated. At the same time, hospitals and provider groups both need to begin the process of integrating substantive population-, provider-, panel-, patient-, and problem area-analytics into their planning processes and workflows. CIOs must begin to work with clinicians to identify ways analytics can be directly applied to improving patient care, either through patient-driven order sets, automation reminders, and/or personalized patient education materials. In doing so, a three part approach is recommended.

CDS & Analytics for Stage 1 of Meaningful Use

- ✓Real-time, targeted alerts
- ✓Evidence-based order sets
- ✓Patient safety surveillance
- ✓Lab orders & results
- ✓Patient reminders
- ✓Public health reporting

Focus on what's important now

When beginning an ACO, the best way to facilitate a positive experience within an organization is to choose a specific area that needs improvement. Some health systems will focus population management analytics first, while others may pick some high-volume disease states around which to innovate. A third system may choose to close known gaps-in-care using alerts at the point-of-care. While the ideal starting point is institution- and situation-specific, the key is not to try and do everything at once. Selecting one or two issues to focus on, and resolving them, will create a platform on which the ACO will grow.

Make it enjoyable, or at least non-disruptive

Moving to an ACO is challenging, in general. Changing clinical workflows and IT tools as part of that transformation can be particularly intimidating to the organization. Ideally, introduction of analytics & clinical decision support, patient-driven orders, or automated patient-education, should be as non-disruptive to clinicians as possible. From a technology perspective, this includes using existing IT tools and frameworks as much as possible, augmenting them with data and transactions deployed using web-services. When entirely new solutions are needed, an outstanding user experience as well as clinical excellence is paramount in any selection process.

Ensure whatever goes in can change over time

Section 1 above lists the "knowns" and "unknowns" around the creation of ACOs. The knowns were simple -- health systems that coordinated care to improve outcomes, patient safety, increase efficiency, and reduce costs would be the winners. The unknowns were in the details -- what would be the payment model, what are the quality measures, what is the optimal level of integration? As ACOs continue to evolve, the informatics

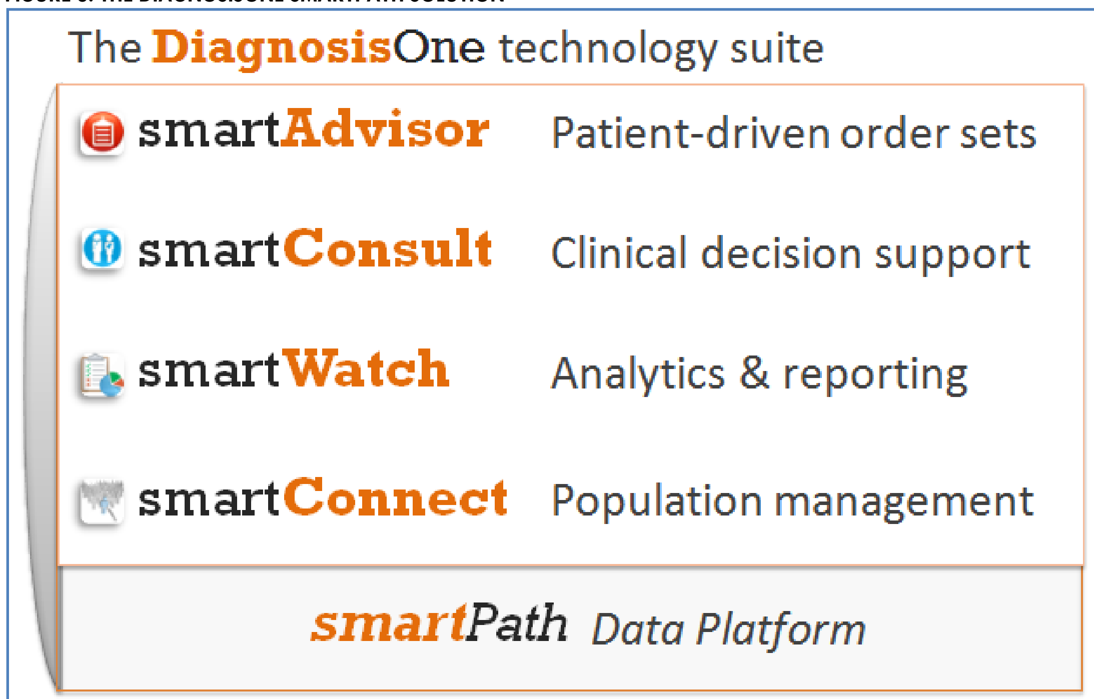
requirements will rightly change as well. Rigid clinical IT solutions may be excellent at accomplishing key tasks specified today in a Request For Proposal (RFP). However, flexibility to grow and adapt to changes in provider needs, clinical priorities, deployment models, and information requests is equally important, if not more so. Any clinical knowledge embedded in a solution must also be flexible when adjusting functionality. The solution provider, whether a vendor or in-house developer, must furnish provider tools and services to manage the content over time, as medical science in general (evidence), and comparative effectiveness research in particular, evolve.

A SINGLE SOLUTION AGAINST MULTIPLE GOALS

An approach to achieving a step-wise, non-disruptive, flexible strategy for ACO-enabling analytics is using a modular system on a common platform. This approach enables the system to be easily implemented initially, and will allow it to grow over time. By employing a common platform architecture, the ACO is assured all data, rules, evidence, and quality measures, will be consistent across the enterprise. Also, data integration requirements are kept to a minimum. At the same time, modular functionality on the platform allows for the addition of new use cases and capabilities in run-time as they become needed. One such solution architected in this way is smartPath™ from DiagnosisOne®.

Listed below (Figure 3) are the various functionality modules of the smartPath platform, including patient-driven order sets, clinical decision support, analytics and population management. In general, smartPath is designed to be the single system through which any organization (e.g. an EMR technology vendor, a physician's practice, an IPA, a hospital system, or a payer) can manage and deliver the clinical policies that they wish to implement throughout their care provider network. Developed and deployed as an HL7 web service, smartPath allows each set of users to access the tools, services, and clinical content through one or more user-specific products.

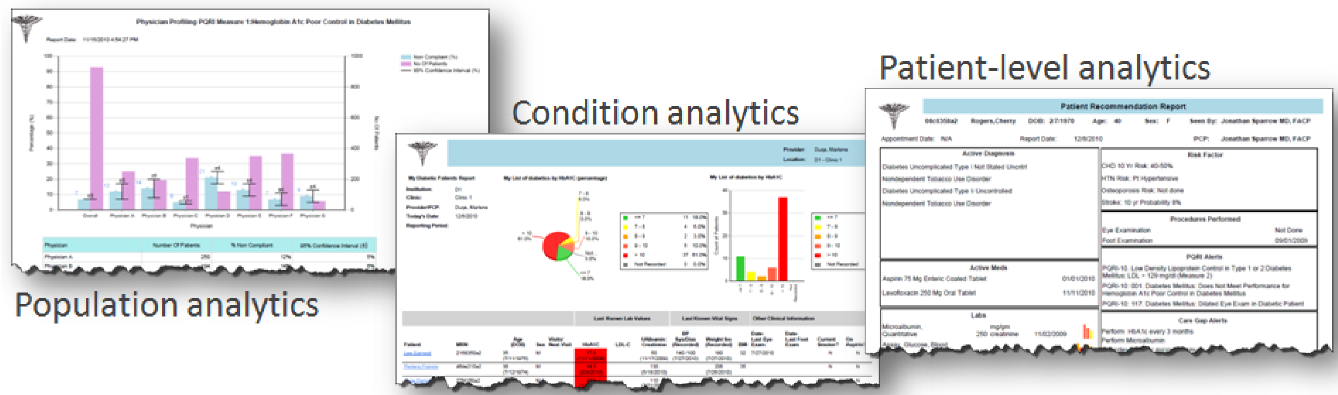
FIGURE 3: THE DIAGNOSISONE SMARTPATH SOLUTION



The smartPath knowledge base consists of over 25,000 evidence-based care rules, and can incorporate triggers that are based on patient demographics, age, sex, vital signs, state (e.g. pregnant, post-partum),

status (hospitalized or not) as well as previous and present test results, diagnoses and medications. DiagnosisOne physicians rigorously review hundreds of medical journals, texts, and physician associations, to develop clinical summaries and distill evidence-based guidelines. The integrated patient data is combined with guidelines to create order sets with smartAdvisor™, create alerts with smartConsult™, generate multi-level reports with smartWatch™, or identify and report on problem areas with smartConnect™.

FIGURE 4: SCREENSHOT OF SMARTWATCH



The smartWatch solution (Figure 4 above) is designed to meet the clinical analytics needs of all stakeholders. The solution aggregates real-time data to identify quality and cost improvement opportunities at the population-, provider-, panel-, patient-, and problem-levels. It is role-specific, and is configurable to the specific needs of the deploying health system. Furthermore, the workflow, content, guidelines, and access points are all flexible enough to evolve over time. smartWatch was specifically designed with ACO enablement in mind.

THERE'S NO TIME TO LOSE, AND NO REASON TO WAIT

In addition to capturing Meaningful Use incentive payments for 2011-2015, any ACO being formed will need significant analytics and clinical decision support infrastructure going forward. Because there are implementation lag times that need to be accounted for, planning should begin immediately, regardless of which technology suite is chosen. Fortunately, deploying CDS & analytic solutions like smartConsult and smartWatch are relatively easy. In contrast to EMRs, ePrescribing, and CPOE, clinical decision support & analytics requires minimal implementation resources, limited training, and has minimal, if any, disruption in clinician workflow. Thus, they are easily implemented and incorporated in parallel with other Clinical IT initiatives.

If you are interested in learning more about how DiagnosisOne and the smartPath platform can help meet your ACO formation requirements, please contact us at:

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About this report & its author
This report was authored by DiagnosisOne, a leading provider of clinical IT solutions to health systems, managed care organizations, and healthcare technology companies.

About DiagnosisOne

DiagnosisOne provides an unparalleled breadth and depth of analytics and clinical decision support solutions based on template and patient-specific order sets to the healthcare industry. Leveraging the world's largest library of evidence-based medical knowledge, DiagnosisOne's standards-based solutions integrate seamlessly with existing hospital and laboratory information systems to deliver actionable information that result in better patient care, reduced errors and better clinical outcomes. DiagnosisOne's customers include healthcare providers, payers, EMR companies, systems integrators and government entities, including the Centers for Disease Control (CDC), Massachusetts Department of Public Health, Greenway Medical and Blue Cross Blue Shield. Based in Lowell, Mass., DiagnosisOne was formed in late 2003 by a team of physicians and healthcare IT professionals.

About the author

Fauzia Khan, MD, FCAP, currently serves as chief medical officer of DiagnosisOne, where she is responsible for the development of the Company's content and rules that power the order sets, clinical decision support, analytics, and public health reporting. Prior to forming DiagnosisOne, Dr. Khan was the Director of Informatics at UMassMemorial Medical Center with ten years of experience practicing pathology. She is the author, editor, and primary visionary of the "Guide to Diagnostic Medicine", Lippincott Williams & Wilkins, 2002. Dr. Khan is a diplomate of the American Academy of Pathology and Anatomic and Clinical Pathology.

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