QUOVADX

WhitePaper

Clinical Trial Management Systems

The drive toward operational efficiency, better speed to market and cost control

Synopsis

If you're someone who thinks that clinical trials are taking longer and their costs are getting higher, this paper is for you. It addresses these pains from a sponsor point of view and investigates ways to check the rising costs and timelines of clinical trials. Whether you practice your trade at a pharmaceutical company, biotechnology firm or a Contract Research Organization (CRO), the information here is relevant to you.

First, we examine the current business environment including trends and pressures that decision-makers face today. Then we approach these business issues from a strategic point of view and examine a successful drug development business model. Finally, we offer a solution that directly addresses the double pains C-level executives suffer from – clinical trials that take too long and cost too much.

The Heat Is On to Deliver Earnings

CEOs are under increasing pressure to boost earnings per share to satisfy investor expectations. Rising Research and Development (R&D) costs have made this more difficult. From 1993 to 1999, R&D efforts among the top 20 drug development companies has doubled, yet revenues for the next four years are forecasted to grow by only seven percent.[1] To improve upon this return, executives need to keep R&D expenditures down and lift revenues up.

"The single largest challenge facing drug developers—both pharmaceutical and biotechnology companies—is to contain R&D costs and reduce development times without compromising clinical test design. It's a tall order."

Dr. Kenneth I. Kaitin, Director
Tufts Center for the Study of Drug Development

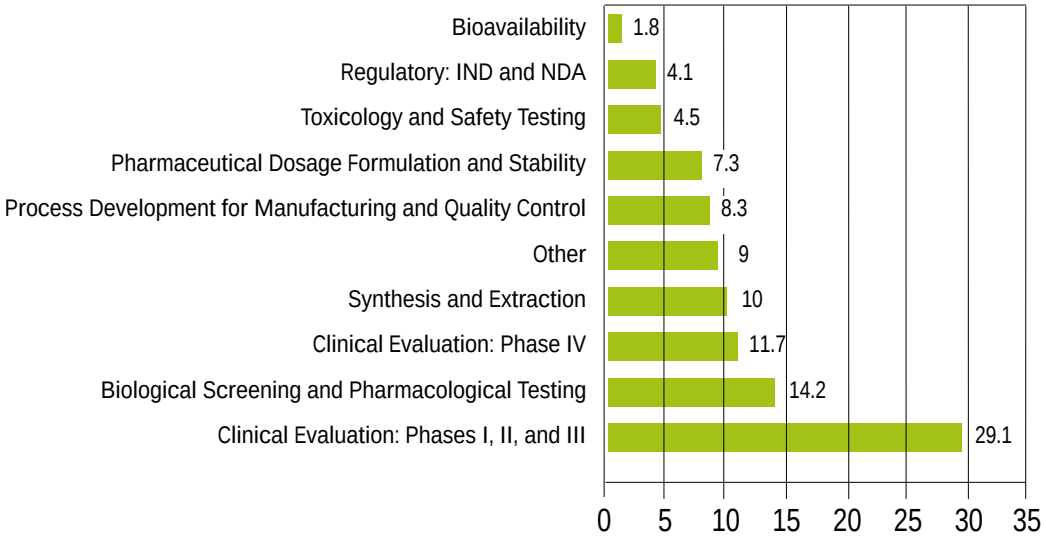
While costs have increased for all R&D phases, the Pharmaceutical Research and Manufacturers of America trade association describes these increases as "...particularly acute for clinical trials."[2] In fact, Phase I-IV trial costs accounted for a sizeable 40.8 percent of 1999 R&D costs. [See Figure 1, Allocation of Domestic U.S. R&D By Function, 1999.] Dr. Joseph A. DiMasi, Director of Economic Analysis at the Tufts Center, attributes rising clinical trial costs primarily to patient recruitment efforts and a greater focus on drug development programs targeting chronic and degenerative diseases.[3]

In This Industry, Time is Millions

Over the last four decades, the time it takes to complete the clinical trial phase has increased by 152 percent. [See Figure 2, Total Drug Development Time From Synthesis To Approval.] Full Time Equivalent (FTE) costs associated with growing trial timelines is only one side of the coin. The other side represents the more substantial opportunity costs pharmaceutical companies pay. For every day a drug spends in development, the pharmaceutical company loses an estimated $500,000 in sales revenue.[4]

Longer trials also mean shortened drug patent-protection windows. With a large number of drug patents expiring over the next decade, projections place the loss in sales by brand-name drugs to generics at around $3 billion.[5] Compared to the average clinical trial cost of $4 million, opportunity costs clearly represent the greater concern to pharmaceutical company executives and those who serve them.

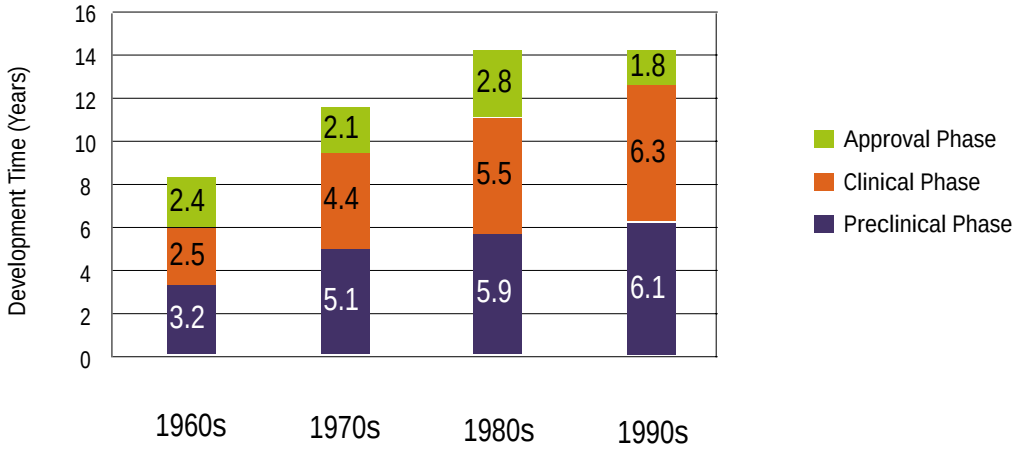
Allocation of Domestic U.S. R&D by Function, 1999



Note: Figures in percent. Totals may not add exactly due to rounding. R&D functions are not exactly sequential in practice. Source: PhRMAS, Annual Survey 2001.

Figure 1

Total Drug Development Time From Synthesis to Approval



Source: DiMasi, J.A., "New Drug Development in U.S. 1963-1999." Clinical Pharmacology & Therapeutics 2001 May, 69(s).

Figure 2

Swelling Pipelines Will Drive Up the Number of Clinical Trials Needed to Bring New Drugs to Market

Many scientific "tributaries" are coming together to create a raging river feeding pharmaceutical company pipelines. First, there's pressure from investors, as Richard Soltero, writing in Pharmaceutical Technology, predicts that "...each of the top 10 pharmaceutical companies needs between 1 and 5 blockbuster drugs per year to meet sales targets and satisfy investors' expectations."[6] In order to meet these expectations, pharmaceutical companies will have to field more successful drugs, and to do that, their pipelines will need to grow significantly to offset failure rates.

A second driver filling pipelines is a broadened approach used by pharmaceutical companies. According to Soltero, "In the 1970s and 1980s, most New Chemical Entities (NCEs) came from the medicinal chemistry departments of major pharmaceutical companies. Today, new discovery techniques fueled by the Human Genome Project, combinatorial chemistry, and high-throughput screening are leading the way."[7]

A third driver fueling an increase in the number of potential NCEs is The Human Genome Project – which alone could produce up to 25,000 new molecular targets.[8] If even one quarter of these were targeted for further study, the number of currently explorable targets by the industry would increase by fourteen times.[9]

These business and technological drivers are combining to swell pipelines. Even assuming that success rates for NCEs reaching subsequent stages remain steady, the demand for clinical trials to test these compounds will skyrocket. Already we've seen the average number of clinical trials needed to bring a compound to market rise by 89 percent from 1991 to 1995.[10] Bioinformatics will only add to this trend as pharmaceutical companies pick more winners that go through all four clinical trial phases.

Drug Development Value Drivers – A Business Model for Commercial Success

In "Speed to value: Delivering on the quest for better medicines," Mary Jo Veverka of Accenture details a proposed business model for pharmaceutical companies.11 Veverka posits that the future successful pharmaceutical companies will use a business model leveraging three "value drivers."

The first driver relies on bioinformatics to make better selections about which NCEs to pursue. Better choices yield greater success rates and ostensibly more drugs to add to a revenue-generating portfolio. The second driver focuses on using drug development strategies that deliver maximum market impact. An example of this would be portfolio management practices to

maximize return on investment. The third driver rests upon companies making significant improvements in their operational efficiencies. This value driver is of interest to us here as it relates directly to clinical trials.

Achieving Operational Efficiency

Given the coming tidal wave of clinical trials supporting an ever-expanding pipeline, pharmaceutical companies and the CROs that support them, will have to scale up their operations to meet this demand. But simply scaling up relatively inefficient operations won't address the pharmaceutical companies' need to reverse the trend toward longer and more expensive trials. Something else must be done to counter the opportunity costs associated with lengthy clinical trials and subsequently help executives positively impact their bottom lines.

Clinical Trial Management Solutions Software

As recently as July 2001, Dr. Charles Jaffee, Director of Medical Informatics for AstraZeneca stated that, "An unbelievable 95 percent of clinical trials are still paper based."[12] Even so, clinical trials executives are turning to Electronic Data Capture (EDC) solutions to replace an FDA application process that often relies upon tractor-trailers to deliver new drug applications.

The trend seems clear with Kenneth Kleinberg, Analyst for Gartner Research, seeing the move toward electronic clinical trial management becoming standard by 2004, and suggesting an 80 percent probability that the top 20 pharmaceutical and biotechnology firms will have deployed such systems.[13]

Today, the marketplace fields dozens of Clinical Trial Management Solution (CTMS) software applications. There is no doubt that these applications will improve the operational efficiencies of companies performing clinical trials. Overwhelmingly the CTMSs meet sites' needs to more efficiently manage the trials themselves – from recruiting participants to dosages to meeting EDC needs. But who's managing the site managers? Currently, the answer is sponsor clinical trial managers using antiquated "by-hand" systems that vary considerably from manager to manager or "tracking" software that is reactive versus proactive in its approach to problem solving.

What we've found is that the clinical trial process is missing effective, viable solutions whereby clinical study managers can effectively manage multiple trials – using proactive measures to keep things moving along. Pharmaceutical companies need an application that can help them make more money (by cutting time to market for new drugs) and help sponsors reduce clinical trial costs.

A Solution to Cut Clinical Trial Times and Costs

Over the last couple of years, Quovadx interviewed hundreds of people conducting clinical trials to understand the issues they were facing and to learn what the top clinical trial managers do to complete trials sooner than their peers. From trial managers to principle investigators to clinical research and pharmaceutical company VPs, we learned of their "ideal" application concept. We also learned what top trial managers did on a day-to-day basis to post impressive productivity results. With this input we defined development specifications and Quovadx QDX Quick Trials was born to directly address sponsor organizations' primary pains.

QDX Quick Trials at a Glance

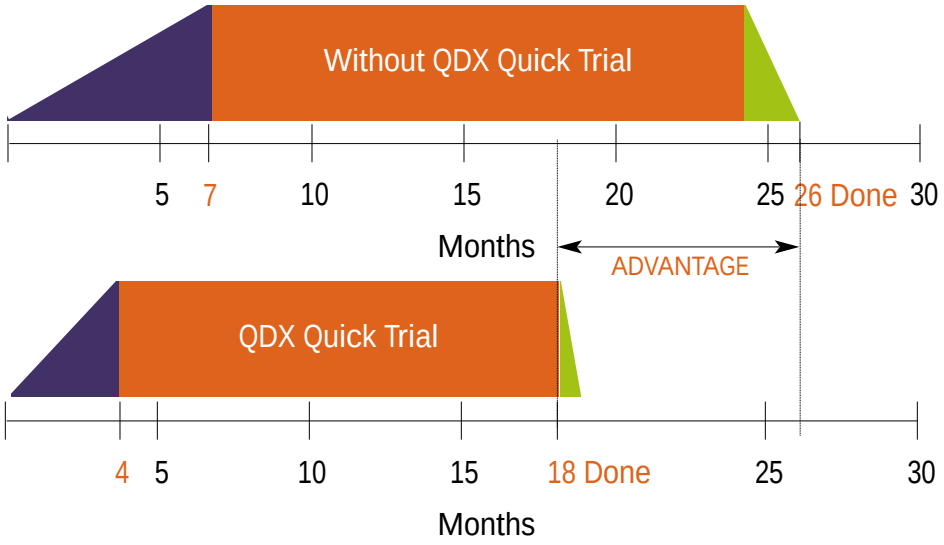
Quick Trials Module	Description
To-Do	Provides the user with a list of all active tasks that need to be completed. This Task List provides the following information about each task: Priority, Task Name, Due Date, Assigned By, and Assignment Date.
Actions	Acts as the central location for performing management tasks including: Document Administration, Patient/Volunteer Administration, User Administration, Site Administration, and Trial Administration. For example, Document Administration allows a user to configure a document, determine the distribution list, create the message, and circulate the document.
Reports	There are two types of reports. Users generate the first type of report using third party tools that access the database via ODBC. The second type of reports are built in and include: 21CFRPart 11, Addenda, Audit, Consent, Enrollment, FDA Form 1572, Fee Schedules, Investigator Brochure by Site or Trial, Lag Time by Site or User, Open Patients/Volunteers, Site Summary, Trial Status, Trials Manager, and View Patients/Volunteers by Site or Trial.
Community	Displays a set of links to general activities that the user may be interested in including chats and forums. Also includes a built-in meeting scheduler.

QDX Quick Trials is an adaptive software application to better manage clinical trials, faster and less expensively. It enables administrators to set up, run and close out clinical trials significantly faster than processes and methodologies currently in use. It is built upon a proven process management platform developed by Quovadx (the QDX Platform), and is being used by over 3,500 healthcare companies around the world. QDX Quick Trials transforms trial managers from reactive employees to proactive ones – modeling the proven performance of the top-tier trial managers.

The QDX Quick Trials automated trial management process is based on standard operating plans (SOPs) that logically direct a trial manager's work flow from initial set-up to closing out trials. It can easily interface with your legacy, email, finance and IT systems to protect your capital investments.

In the next section, we'll look at how QDX Quick Trials helps you achieve several objectives – cutting trial times and costs chief among them. We'll discuss how QDX Quick Trials positions sponsors to effectively take on the projected increases in the number of clinical trials needed to bring new compounds to market. We'll detail how it helps you stay compliant with 21 CFR Part 11 and HIPAA regulations, and we'll flesh out how QDX Quick Trials boosts your personnel productivity while addressing many of the common staffing issues sponsor executives face. Then we'll illustrate how QDX Quick Trials assists executive decision makers in being more effective, by delivering the information they need to select top-performing sites for future studies as well as revising incentive programs that produce positive results. And finally, we'll touch upon how QDX Quick Trials is easy to deploy and lowers the cost of ownership by incorporating a high level of flexibility.

Time Equals Money: Before and After QDX Quick Trials



Without QDX Quick Trials, the average trial is complete in 26 months. With QDX Quick Trials, the average trial is complete in just 18 months. This eight month time savings yields the multiple benefits of reaping more sales revenues, extending the patent-protection window and lowering the costs of drug development.

Figure 3

Crunching the Numbers: Bringing Drugs to Market Faster and Less Expensively

QDX Quick Trials delivers a one-two punch to boost earnings and cut costs-to positively impact the bottom line. It can help you complete trials faster by as much as 30 percent.[14] [See Figure 3, Time Equals Money: Before and After QDX Quick Trials.] This represents a time savings of 7.8 months for the average clinical trial time, 26 months. With estimated potential losses for delayed clinical trials amounting to $500,000 a day, an almost eight-month extension of sales revenues could tally $78 million. [7.8 months x 20 working days per month = new drug is introduced 156 sooner. At $500,000/day in new potential revenues =$78,000,000.] Applying this boosted revenue across a pharmaceutical companies' new drug portfolio would have a positive multiplier effect on earnings.

QDX Quick Trials' cost-cutting strength is built upon the methodologies of top trial managers and leverages the operational efficiencies such people use naturally — and then improves upon them by automating processes which normally require human intervention. This enables QDX Quick Trials to work the process even while sponsor managers are away. As a result, the person-hours saved and their associated variable costs can cut the average clinical trial cost from $4 million to $3 million.[15]

Positions Sponsors to Take On Swelling Pipelines

As previously discussed, pharmaceutical companies' pipelines are projected to substantially increase. Scaling up current operations will have to happen to meet this increased demand. But scaling up a relatively inefficient trial management process doesn't help pharmaceutical companies meet their investors' rising expectations.

By improving operational efficiencies that allow pharmaceutical companies to complete clinical trials in a shorter time, executives will be positioned to take on the increased number of trials generated by their pipelines. For pharmaceutical companies, this means accelerating the throughput of their pipelines to capitalize on earnings sooner. It also means that pharmaceutical companies may partially offset the costs resulting from the rising number of clinical trials required to bring a drug to market by completing trials sooner.

For CROs and others serving pharmaceutical companies, QDX Quick Trials presents an opportunity to boost revenues by efficiently completing more trials using the same resources. QDX Quick Trials is able to do this through the implementation of industry best practices within the context of process automation. Process automation allows for subsequent tasks to begin automatically as previous tasks are completed. Predefined escalated timeframes and methods ensure tasks which fall behind are quickly identified and resolved. These factors enable organizations to better utilize precious human resources.

QDX Quick Trials is Compatible with 21 CFR Part 11 and HIPAA Regulations

Our surveys revealed that executives seek solutions compatible with Federal regulations. As a result, we developed QDX Quick Trials to be compatible with 21 CFR Part 11 and HIPAA (Health Insurance Portability and Accountability Act) guidelines.

Specifically, the HIPAA requirements outlined by law will impact all healthcare organizations that maintain or transmit electronic health information. Since clinical trials transmit these types of data, it is clear that HIPAA-compliant solutions are necessary.

QDX Quick Trials meets these compatibility standards by using digital sign-ins; date-time and user stamps; recording full audit trails of actions, including data updates complete with a comments field and a reason code; and incorporating SOPs into the QDX Platform.

Boosts Your Personnel Performance

Will you be able to find and retain all the top trial managers you're going to need over the next few years? Many executives describe a substantial unevenness in the skills and abilities among their trial managers. QDX Quick Trials is based on the best practices of top trial managers and raises the performance bar for your trial management team. And even seasoned top performers will appreciate the process automation that helps them get more out of their day and lessens their worries over workloads while they're on the road.

In an effort to contain costs, many organizations are starting to create new roles to manage trials such as sub-clinical trial associates, whose salaries are much less than trial managers. QDX Quick Trials allows organizations to leverage this less expensive resource extensively while maintaining most of the performance of top trial managers by electronically capturing your best practices as part of the process flow.

QDX Quick Trials will help you retain good employees because this tool will enable them to handle the larger workloads coming down the pike. It's a natural tendency for executives to ask more and better things of their employees. It's a good strategy to position employees to meet these expectations. Those who don't position their employees for success will find it increasingly difficult to retain good talent.

How QDX Quick Trials Increases Your Personnel's Productivity

Our surveys determined that top trial managers differentiate themselves by acting upon information immediately. QDX Quick Trials incorporates processes that mimic a proactive management style as opposed to other products that merely track past occurrences.

Yet with current products, immediacy is easily thwarted, particularly with the demanding travel schedules trial managers face. They can't always be at their desk to react to situations requiring escalation. For example, as a site's enrollment milestone deadline approaches, QDX Quick Trials automatically sends a reminder to the appropriate person. The timing and content of this reminder may be customized by the sponsor trial manager. As the milestone date passes, QDX Quick Trials automatically escalates using pre-determined parameters including the specific recipient and message content. One reason that trial managers are so much more effective with QDX Quick Trials is because they can be on a plane to Los Angeles and be "following up" with sites automatically.

Another advantage to using an automated escalation process is that it overcomes people's natural tendency to put off unpleasant tasks. For example, calling up a site employee to discuss unacceptable performance is a necessary part of trial management. If a site misses a deadline, QDX Quick Trials follows up automatically by email with a pre-designated person and message. It won't eliminate the need to pick up the phone now and then, but it can significantly reduce the manual process.

When the time does come to pick up the phone to resolve disputes, QDX Quick Trials helps ease this process by focusing on "just the facts." The Adaptive Application keeps a date-time stamped record of all communications. So communications will go more like this, "Here's when we sent you this communication, what it said, when you responded and what you said." By putting the spotlight on documented events, trial managers can resolve disputes faster and spend more time moving trials toward completion.

The data-collection and record-keeping features of QDX Quick Trials also combine to create a standardized system for record keeping. Such a system means that knowledge relating to trials resides with the company versus the employee who may be using a proprietary system. This goes a long way toward combating the "where are we and what's going on with this trial?" phenomenon that strikes whenever the trial manager is out of the loop. This issue is particularly relevant to executives experiencing high turnover rates.

With QDX Quick Trials, it doesn't matter whether an employee moves on, gets sick or goes on vacation because their designee need only log in to view the current status among sites, what has transpired before, who's late and what needs to be done next. This is the power of the QDX Quick Trials SOP-based process that records all the pertinent trial project data and makes it available to all authorized users.

How Does QDX Quick Trials Make Your Life Easier?

QDX Quick Trials is compatible with 21 CFR Part 11 and HIPAA regulations. This means that it has digital sign-in, date-time and user stamping, full audit trails and SOPs. QDX Quick Trials takes the concept of SOPs to the next level by incorporating them in the process engine to ensure that processes are followed. The entire process flows logically, based on the SOPs, moving from project phase to project phase. With integrated start-to-finish relationships, trial managers have no alternative but to follow the SOPs that drive the system. Training costs go down and you can rest easier knowing that you've implemented a solution that follows Federal guidelines.

Meeting Federal guidelines is one way QDX Quick Trials makes your life easier. Another way it makes things easier for you is by capturing performance data to enhance your decision-making ability. After the completion of a few clinical trials, you will have amassed site performance data to paint a picture of who you can count on. Based on this information, you'll be able to tweak your operational efficiency even further by choosing to do business with sites that perform — further reducing your trial completion times and costs.

You'll also be able to use this data to optimize your incentive plans to maximize returns. For example, QDX Quick Trials makes it easy to measure whether a 10 percent increase in the incentive plan leads to completing the trial one week sooner.

The QDX Quick Trials Adaptive Application Difference

Compared to competing products, QDX Quick Trials is very easy to install, configure, test and start using. The Quovadx Professional Services Team can integrate QDX Quick Trials with your legacy systems and have things running smoothly in no time.

But a timely implementation is only part of the picture; QDX Quick Trials was developed to be flexible, extensible and easy. It provides the core 80 percent of the processes every clinical trial uses. The remaining 20 percent of the processes are made up by your company's sole expertise or tricks of the trade to complete trials more efficiently. QDX Quick Trials uses visual tools to both insert your efficiencies into the processes and to continue updating them as needed. So as your company and IT systems grow, QDX Quick Trials grows with them, both protecting and extending your capital budget.

Summary

Pharmaceutical company and CRO executives alike tell us that clinical trials take too long and cost too much. Industry statistics substantiate the claim by showing the growing R&D drug development costs associated with a substantial rise in the length, complexity and number of clinical trials necessary to bring a new drug to market. Moreover, ballooning pipelines will fur-

ther add to the growing number of clinical trials needed to get an NCE to market. The opportunity costs of longer trials alone are staggering in terms of lost revenues and shortened patent protection windows.

A proposed pharmaceutical company business model suggests that future winners will use three value drivers to remake themselves to speed drug portfolios to market. These drivers include "selecting [drug] winners," "doing the right things" and "doing things right," or achieving greater operational efficiency.

Simply scaling up relatively inefficient clinical trial operations won't address pharmaceutical companies' need to boost revenues and cut expenses to meet ever-increasing investor demands. Software applications are needed to address these issues and implement the reality of EDC necessary to help speed trial completion rates.

Such a solution exists in the form of QDX Quick Trials software by Quovadx, which serves the needs of sponsors managing multiple clinical trials and sites. This Adaptive Application meets executives' pain – head on, helping reverse the trend toward longer trials by completing them sooner (i.e. increasing pharmaceutical companies' sales earnings). As an added bonus, this application increases the effectiveness of trial managers and substantially reduces the costs of completing trials.

It's no mistake that QDX Quick Trial benefits map directly to your pain – we developed it to do just that. Its performance helps executives in the boardroom present brighter financial reports and post more favorable employee performance reviews. And let's face it, what the board wants to hear is how revenues were boosted, expenses cut and productivity ratcheted up a few notches.

But let's not forget how QDX Quick Trials reduces many of the staffing headaches you endure. IT staffs will find QDX Quick Trials to be flexible, extensible and interoperable with existing systems. QDX Quick Trials can help you better manage turnover and regulatory issues by being compliant with federal guidelines and giving your employees the tools they need to be successful.

Reduce Trial Completion Times and Cut Costs

Call now to learn more. Our friendly, knowledgeable staff is available to answer your questions and explain exactly how QDX Quick Trials can help you reduce your trial completion times and cut costs. To learn more or to schedule a meeting call us 1-800-723-3033 or +1-303-488-2019 or email us at solutions@quovadx.com.

Endnotes

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About Quovadx, Inc.

Quovadx, Inc. is a trusted provider of Total Business Integration (TBI) products and services. The company provides an end-to-end business infrastructure and integration software suite, as well as end-to-end service capabilities including consulting, transaction hosting, operations management and outsourcing for business-critical applications. Quovadx technology helps more than 1,500 organizations in healthcare and media & entertainment streamline business processes, solve difficult process integration challenges, and unlock the value of legacy system investments to achieve rapid return on investments. The company is headquartered in Englewood, Colorado, and operates nationally with locations in nine major metropolitan cities in the U.S, as well as internationally in London. For more information, please visit http://www.quovadx.com.

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