



# The Chester County Hospital

Making a Difference with Workflow and  
Healthcare Process Management Technology

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## Making a Difference with Workflow and Healthcare Process Management Technology

### Challenge

The Chester County Hospital (TCCH), a 238-bed community hospital in the Philadelphia suburbs, is making real progress in addressing the substantial operational and regulatory challenges facing all healthcare institutions today. Its executives have been successful in navigating a challenging confluence of factors: decreasing payor reimbursements, escalating operating costs, and scarcity of skilled clinicians. In addition to its own emphasis on achieving high standards of quality in care delivery, the hospital responds to quality measures defined by regulatory agencies such as Centers for Medicare & Medicaid Services (CMS) and the Joint Commission. TCCH's proactive approach to addressing these challenges positions the hospital to succeed in the pay-for-performance environment.

The hospital's mission, "to provide high quality care, consistent with identifiable healthcare needs of Chester County-area residents and within the constraints of sound fiscal management, as well as the education of healthcare professionals and the community," has been the driving force for the organization, the only remaining independent, not-for-profit healthcare organization in the greater Philadelphia region.

Faced with competition from nationally acclaimed hospitals in nearby Philadelphia, TCCH provides comparable services in a smaller, community hospital setting. Through its affiliation with the Cleveland Clinic, TCCH offers cardiac catheterization and open-heart procedures. While some hospitals shutter their maternal health units, TCCH supports a level III neonatal intensive-care unit (NICU) affiliated with The Children's Hospital of Philadelphia. And in conjunction with the Abramson Cancer Center of the University of Pennsylvania, the hospital formed the Cancer Center of Chester County.

Perry Pepper, CEO, acknowledges that in order to compete in this environment, service expansion must be balanced with sound cost control. "We need to constantly evaluate and redesign processes so that steps we take to handle increased volume or to deliver new services result in effective long-term solutions. As a result, we are able to maintain staffing levels while providing more efficient, higher quality care."



**Perry Pepper,**  
Chief Executive Officer,  
The Chester County Hospital

“The Hospital of Distinction program at TCCH defines specific objectives for achieving clinical excellence, setting new standards that we believe will define best practices for years to come. As we identified strategies for meeting these objectives, it was clear that technology for workflow and Healthcare Process Management must be an integral part of our approach at every point in the continuum of care. As we evaluate our progress, it is increasingly apparent that these technologies are pivotal to our continued success.”

**Michael Barber,**  
Chief Operating Officer,  
The Chester County Hospital



## Development Partnership

While systems that were available were capable of automating tasks, TCCH needed technology to support the reengineering and automation of entire processes. According to Ray Hess, Vice President of Information Technology at TCCH, “We realized that examining and redesigning processes before applying technology – bringing business process management practices and tools to healthcare – was one of the keys to the survival of a healthcare system in the twenty-first century.”

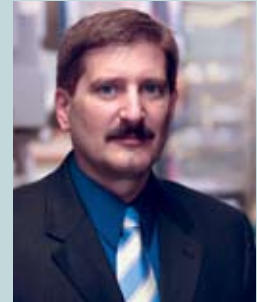
TCCH’s experience with a Siemens Medical Solutions legacy solution coupled with its interest in business process management led Siemens to invite the hospital to become a partner in the development of a new clinical information technology called Soarian®. Key characteristics of the product vision that appealed to the hospital included:

- A flexible infrastructure that would allow the hospital to develop workflows quickly in response to changing clinical needs

- A design that would enable the organization to modify existing processes gradually, rather than changing abruptly in order to adopt new processes defined by the solution vendor
- Tightly integrated clinical functionality with enterprise scope, able to support multiple departments and link people and processes across the organization
- A technology platform that would evolve with changes in the organization and meet its needs for the next 25 years

This development collaboration would enable the hospital to both shape the features of the new solution and take advantage of its advanced design early on to support its organizational goals.

“This is a global approach to running an organization,” says Hess. “You’re talking about identifying, understanding, and optimizing processes before applying a technology solution.”



Ray Hess,  
Vice President of Information Technology,  
The Chester County Hospital

### Workflow and Healthcare Process Management at TCCH: Adapting Business Process Management to Healthcare

For years, non-healthcare enterprises have applied the principles of business process management (BPM) – reengineering and automating key business processes to address evolving strategic priorities — with success. Until recently, the systems for implementing business process management have been foreign to healthcare organizations, partly due to the extraordinarily dynamic nature of healthcare delivery. Widespread adoption in healthcare has also been hindered by concern over these systems’ ability to address the exceptional level of operational complexity and unique regulatory influence that places special demands on healthcare providers.

TCCH is one of the first hospitals to apply these principles, and the technology for supporting them, in a healthcare setting. The result is workflow and Healthcare Process Management, an adaptation of technology for business process management to the needs of healthcare organizations.

“This is a global approach to running an organization,” says Hess. “You’re talking about identifying, understanding, and optimizing processes before applying a technology solution.”

“One of our major objectives was to avoid fitting our processes to suit the technology. With Soarian Clinicals as the enabler, you have a tool to optimize your processes, rather than adapt them to the information system’s delivered solution.”

The primary reason for lack of BPM adoption in healthcare organizations – namely the complexity of healthcare delivery – is also the most compelling case for its adoption. At its core, healthcare delivery is a team-oriented business, with each team member fulfilling very specific roles. Care coordination mandates extensive communication, oftentimes replete with manual processes that lead to delays, disjointed multitasking, omissions, and errors.

TCCH found in Soarian Clinicals the tools to design, automate, monitor, analyze, and improve entire processes.



## Soarian Clinicals and Healthcare Process Management

Soarian Clinicals allows the user to combine traditional quality process improvement approaches with clinical IT. To bring BPM functionality to the clinical environment, it applies a four-step process for managing and improving complex healthcare workflows:

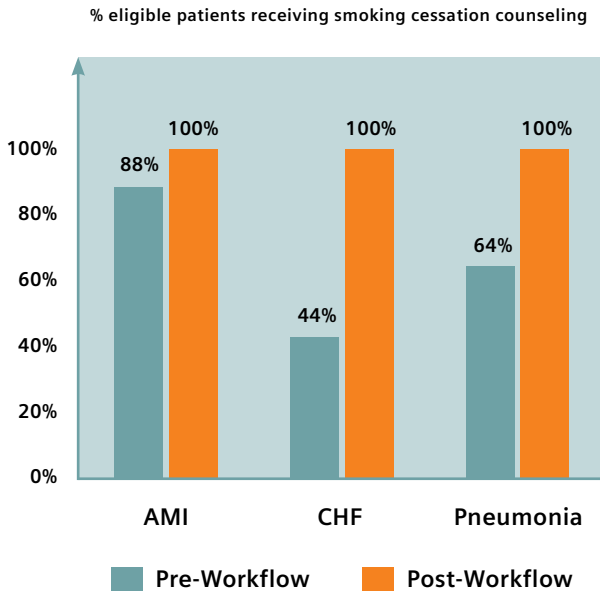
1. **Design:** Process modeling for efficient healthcare workflows
2. **Automate:** Workflow engine tracks and directs processes longitudinally while driving process compliance
3. **Monitor:** Embedded analytics with Business Activity Monitoring
4. **Deliver:** Service-Oriented Architecture (SOA) allows the delivery of benefits throughout the entire healthcare enterprise

It was the unique capability of Soarian Clinicals to manage entire processes, beyond simply triggering or prompting a clinician to perform a specific action, that TCCH found compelling. For Hess, this is the key distinction between the workflow technology in Soarian Clinicals and rules-based engines.

“Capabilities in other clinical information systems may alert a nurse to what needs to be done,” says Hess. “Workflow management technology actually takes extra steps to help guide processes to completion. It says to the nurse, ‘you focus on the patient, we’ll help to take care of the process for you.’”

Hess points to an example. “If the nurse notes that a patient is a smoker, a rule will provide a single prompt to provide smoking cessation education to the patient – and nothing more. Workflow management technology will monitor to see if the education occurred in the time frame defined by the hospital.” If completion of a step is not documented in the system, Soarian Clinicals will escalate the issue to the appropriate members of the clinical team. “It constantly listens and prompts next steps based on the information gathered – whether the information consists of a new result or a missing piece of clinical documentation – and that’s what makes it different,” says Hess.

## Smoking Cessation Counseling Workflow



The Smoking Cessation Workflow implemented at TCCH identifies patients with acute myocardial infarction (AMI), congestive heart failure (CHF), and pneumonia requiring smoking cessation counseling in accordance with the CMS Core Measures. Since implementation of this workflow, TCCH has seen significant improvement, with 100 percent compliance achieved and sustained for three consecutive quarters. This ranks favorably in comparison to Pennsylvania state averages of 88, 82, and 80 percent respectively, and in the top 10 percent across the nation for compliance with these CMS Core Measures.

TCCH uses technology for business activity monitoring, which enables managers to analyze performance on a frequent basis. Administrators and managers can easily monitor activity, providing the basis to make adjustments as needed.

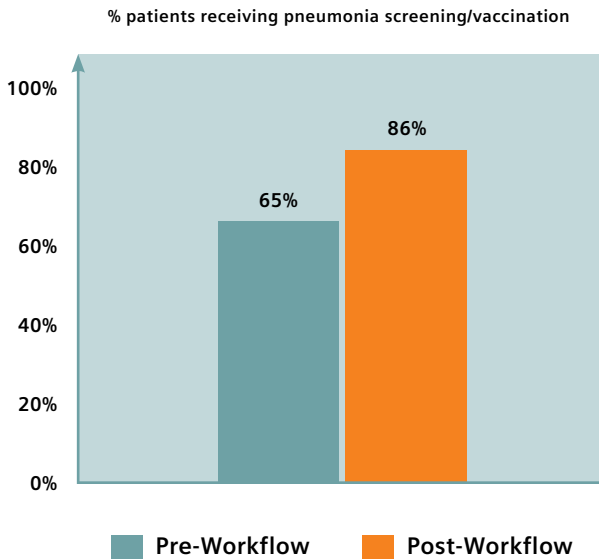
“The monitoring tool provides a continuous feedback loop for measuring results and changing the process as needed,” says Hess.

The ability to drive a process and enable managers to monitor it helps the organization reduce variation in executing a process, which leads to reduced opportunity for error. The workflow for the hospital’s nursing admission assessment process is a good example. An array of compliance requirements adds substantial complexity to the process, which may be unmanageable without automated support.

“The admission assessment process can take 45 minutes, and often requires multiple phone calls to other clinicians and departments,” says Angela R. Coladonato, RN, Chief Nursing Officer. “In addition to routine assessment components such as past medical history and current medications, the process evaluates flu and pneumonia vaccine status, and assesses the risk for falls, skin breakdown, and development of deep-vein thrombosis (DVT).

“However, even if you’ve completed the actual assessment, you still need to capture all of that information to satisfy documentation requirements. The workflow technology helps to facilitate documentation requirements by verifying that necessary steps were taken, such as offering vaccinations to at-risk patients, leaving the nurse more time to focus on the patient while providing explicit assurance that we’ve provided the appropriate standard of care,” says Coladonato.

## Nursing Documentation Manager – Pneumovac Workflow



The Nursing Documentation Manager – Pneumovac Workflow identifies at-risk patients, prompts nursing action, and monitors documentation of vaccine administration or patient decline of the vaccination. In the one calendar quarter since implementation, the outcome score for this CMS Core Measure improved from 65 to 86 percent, surpassing the Pennsylvania state average of 74 percent.

## The Advantages of a Service-Oriented Architecture

An important part of the hospital's selection criteria was the solution's ability to position the organization to meet its evolving needs well into the future. For instance, Soarian Clinicals is built on a web-native architecture, not one that has had web capability added as an afterthought. Just as important, Soarian's Service-Oriented Architecture (SOA) enables the organization's information resources to be available as independent services, regardless of their underlying platform implementation.

The SOA provides the flexibility needed to enable TCCH to build on existing workflows. "We don't talk about one or two specific workflows, we talk about how our work on one enables us to expand from there," Hess says. "It's not 'Look at what we've done on CHF,' but how that workflow has grown and evolved. You can start by automating one process, get immediate return on investment there, and expand."

The flexibility provided by the underlying infrastructure enables the hospital to continuously expand its set of processes, taking a service created for one part of the organization, combining that service with others, and creating new workflows.

The workflows address operational priorities such as Joint Commission and CMS metric compliance, improved patient safety, efficiency, and quality of care, as well as length-of-stay reduction and service optimization.

TCCH continues to expand its workflow inventory to include workflows for the following processes:

- Tracking the timely completion of admission assessments
- Identifying patients at risk for DVT and promoting better management of patients on prophylactic therapy
- Prompting medication reconciliation at the time of transfer in level of care
- Notifying clinicians to ensure prompt allergy documentation
- Optimizing bed turnaround processes to facilitate patient movement
- Expediently identifying and managing patients with isolation-requiring infections

With fewer than two full-time employees dedicated to supporting workflow initiatives, the hospital has designed, implemented, and provided monitoring capability for more than 15 healthcare processes.

# TCCH was a gold winner of the 2006 North American Global Excellence in BPM and Workflow Award.



## Results and Outcomes

In 2006, TCCH was a gold winner of the 2006 North American Global Excellence in BPM and Workflow Award. This was the first time that a healthcare organization received the award – an indication that the implementation of workflow technology and business process management concepts is indeed fairly new to healthcare. In order to win, Chester County beat the likes of Hasbro, SBC Communications, and Verizon and was distinguished for its positive impact on clinical and business outcomes.

The award submission highlighted TCCH's bed management and infection control workflows – high-volume processes with significant impact on hospital operations, clinical quality, and patient safety – and detailed how these workflows helped reduce manual steps, defined responsibility for steps in the process, tracked status, and escalated issues when necessary.

The bed management workflow helped the hospital reduce the number of manual steps by 50 percent, resulting in increased efficiency and productivity.

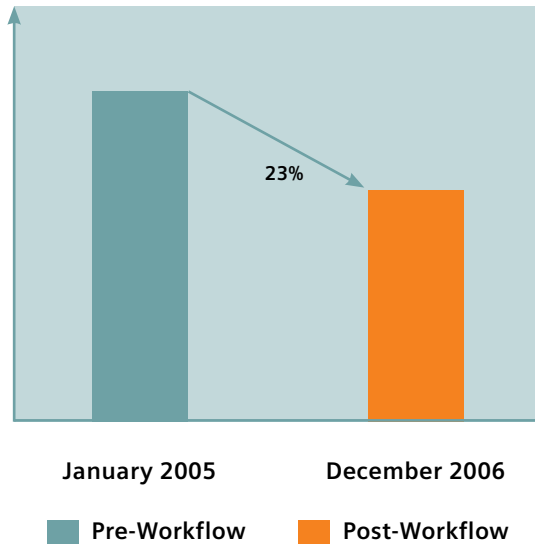
About 4 percent of patients admitted to the hospital have a history of Methicillin Resistant Staphylococcus Aureus (MRSA), accounting for 8 percent of patient

days. Before the use of Soarian Clinicals, it was estimated that nurses were unaware at the time of bed placement of a patient's positive history of MRSA up to 25 percent of the time, which necessitated an immediate transfer of the patient when the condition was discovered. TCCH's infection control workflow automatically triggers processes to identify and manage patients at admission who have a positive history of contagious infections, including MRSA, which can spread to other patients. Since implementing the infection control/isolation workflow, nurses now receive notification on 100 percent of all known patients. Use of the infection control workflow, in conjunction with conventional measures such as vigilant attention to hand washing, led to a significant reduction in MRSA infections. This improvement compares favorably to nationwide statistics: Hospital stays for MRSA infection have more than tripled since 2000, and since 1995 have increased nearly 10-fold, according a study published in July 2007 by the Agency for Healthcare Research and Quality.

"In light of the recent announcement that, starting in 2009, Medicare will stop paying for the extra costs of treating preventable errors, injuries, and infections that occur in hospitals, our success in this area was particularly gratifying," says Charleen Faucette, Director, Infection Prevention and Control.

## Isolation Manager Workflow

Nosocomial infection cases

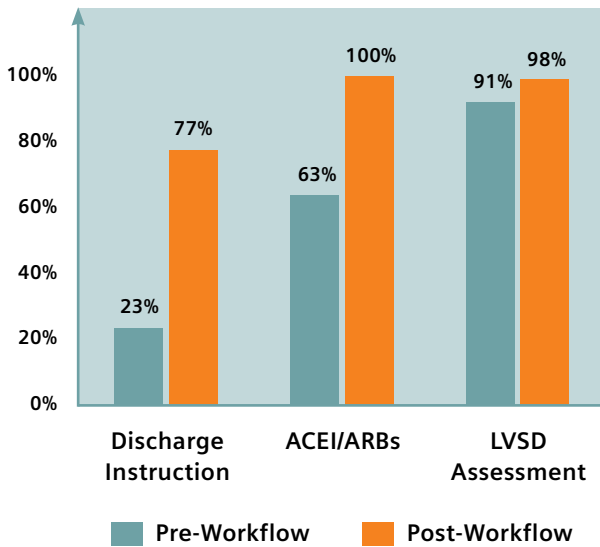


The Isolation Manager Workflow automatically triggers processes to identify and manage, at the time of admission, patients with a positive history of contagious infections, including MRSA, which can spread to other patients. The workflow helps to support an internal performance improvement initiative, "Holding the Line on Infections." In conjunction with other measures, it helped to decrease nosocomial MRSA infection cases by 23 percent. Given the absence of a national benchmark specific to MRSA infections, TCCCH trends its progress against its historical internal data.

Soarian Clinicals has had a positive impact on staff as well. Because the system automates and coordinates activities among team members, it is seen as an investment in clinician productivity. For example, the solution even facilitates the completion of documentation by providing automated nursing notes, defined by TCCCH nursing leadership, in response to specific triggers in the solution. Hospital staff members focus more time on direct patient interaction and less time on systems and procedures.

"Patients receive optimal care when members of the healthcare team work in concert," Karen Pinsky, MD, Chief Medical Information Officer, says. "As care becomes more complex, it's clear that manual processes lead to delays, disjointed multitasking, omissions, and errors. Soarian Clinicals workflow technology has helped us increase productivity, streamline care delivery, avoid unnecessary costs, and improve patient safety at The Chester County Hospital. In doing so, it helps to ensure that each patient receives the highest quality care and helps us maintain our hospital's outstanding reputation in this community."

## Congestive Heart Failure Manager Workflow



The Congestive Heart Failure workflow targets several key aspects of compliance with the CMS Core Measure for CHF patients. Following implementation of this workflow, the percentage of hospitalized CHF patients receiving discharge instructions more than tripled, from 23 to 77 percent.

Dramatic improvement also resulted in the number of eligible (i.e., not contraindicated) patients who received an Angiotensin Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) increasing from 63 to 100 percent, surpassing the Pennsylvania state average of 80 percent.

The workflow also helped TCCH achieve even greater compliance in assessing CHF patients for left ventricular systolic dysfunction (LVSD), increasing from 91 to 98 percent.

## The Future

Since healthcare delivery is in constant flux, Soarian Clinicals is designed with continual evolution in mind. As the organization continues its efforts to achieve the objectives of its Hospital of Distinction program, TCCH continues to expand its workflow inventory. It also has the flexibility to incorporate new CMS/Joint Commission core measures, and position TCCH well for Medicare pay-for-performance initiatives. Next steps will include embedding evidence-based medicine with computerized physician order entry (CPOE) to align ordering behaviors with clinical best practices.

The work that Hess and his team have done to show the real-world impact that workflow and Healthcare Process Management technology can have has led him to become a thought leader and expert on the topic.

Ray Hess shares his expertise on workflow technology and Healthcare Process Management as a speaker at relevant industry meetings, and is a member of the Management Engineering and Process Improvement Task Force of The Healthcare Information and Management Systems Society (HIMSS). He also serves as leader of the Siemens Soarian Workflow User Group, a forum comprising 78 customer representatives from 29 sites in which participants exchange ideas and information on optimizing Soarian workflow management capabilities.

“Healthcare Process Management has allowed us to move competitive goalposts, challenging other hospitals to stay in the game by following suit with efficient workflow management processes,” says Hess.



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