

User-Friendly Hospital Data Collection with Mi-Forms Technology

Tablet PCs with Mi-Forms Digital Ink Technology Streamline Clinical Decisions, Data Collection, and Communication

Accurate and timely data collection is critical for efficient and effective quality of care and timely research in hospitals. Limited resources and ever-growing demands for high-quality, accessible data require the use of advanced technology to eliminate inefficient and redundant paper processes, allowing healthcare professionals to accomplish their vital missions.

Heart Failure Patient Care Risk Assessments

Sutter Health, a network of 28 acute care hospitals in northern California with over 41,000 employees, uses Mi-Forms on Tablet PCs to collect data for assessing risk in Heart Failure patients. The Point is to impact the rate at which heart failure patients are re-admitted. On the 1st encounter, the clinician enters data into Mi-Forms forms on Tablet PCs detailing how sick the patient is and what their risk of re-admission and mortality is based on an intelligent algorithm built in by Sutter Health. If the patient is very sick (near mortality), they are routed to palliative care, hospice and other appropriate units.

Since September 2008 clinicians assessed 530 patients using Mi-Forms with risk algorithms built in, and this information automatically became a part of patient profiles. As time goes by with patient improvement, they are re-assessed to see if there is a score improvement. This solution helps Sutter to monitor and lower the number of times patients are re-admitted due to Heart Failure. It also often leads to an increased Quality of Life by better coordination of care, made possible by an on-the-spot assessment of their health which can be distributed to other clinicians involved in their care to guide clinical decisions.

Rapid Analysis of Cardiac Surgery Metrics

Previously Sutter would analyze their Cardiac Surgery performance by extracting metrics on these surgeries via chart abstraction of paper forms, a process that would take between 5-7 weeks. This important information is discussed at their quality meetings and provides key guidance for Outcomes Management of the Cardiology department for improvement. Using the Mi-Forms solution on Tablet PC, this process went from 5-7 weeks with paper to 26 minutes! In the words of Kyle Smith, Cardiovascular IS Manager, "Now you can have data from *last week* at the quality meetings, as opposed to the *last quarter!*"

Real-time Stroke Patient Data Collection

Sutter Health also uses Mi-Forms on Tablet PCs for efficient coordination of information on newly admitted Stroke patients. Staff armed with these Tablet PCs meet the ambulance at the Hospital Emergency Department to capture patient information and medication decisions at the point-of-care and transmit that data to the operating room and other areas where the patient will receive care. These other clinicians receive real-time data to prepare them for clinical decisions to ensure the best possible care for the patient.

JCACHO Core Measure Data Collection for Accreditation Requirements & Patient Care

The Joint Commission (JCAHO) accredits 17,000 organizations in the US and also benchmarks the quality of care at different institutions. In today's competitive environment it is even more important that hospitals submit accurate, timely data that demonstrates the superior care they provide. Sutter Health used Mi-Forms on Tablet PC for point-of-care JCACHO core measure

EXECUTIVE SUMMARY Sutter Health-at-a-glance

Challenge: Sutter collected data for various systems using paper forms followed by entry into a web-based system to check accuracy and completeness. Different persons collected data and re-entered it resulting in significant time delays and inaccuracies.

Solution: Adoption of Mi-Forms technology for heart failure patient risk assessments, stroke patient care and collection of data to export to national registries, and the JCAHO accreditation body.

Benefits: 34-38% time savings compared to traditional paper form plus web-based data entry; 100% data accuracy; Ease of use and small learning curve for nurses; real-time edit checks; portability with online & offline modes; and seamless integration to existing database systems. Also, effective real-time coordination of patient care and risk data to improve quality of care.

data collection for AMI, Heart Failure and other core measures. For 1 hospital over a period of just 1 year they conducted AMI core measures data from 703 patients. The main benefit to Sutter of collecting data at the point-of-care was that once they identified a patient as an AMI or Heart Failure patient, they could immediately send that information to their physicians, the pharmacy, plan for their discharge and so on. Core measure patients could also be treated in a rigorous, methodical way to ensure their improved outcomes and the submission of the optimal data to JCAHO. Finally having clinicians collect this data rather than data management personnel allows for the recording of complex medical histories accurately, and appropriately risk adjusting data submitted to registries and JCAHO to accurately reflect the hospital's quality of care relative to the sickness of their patients.

Cardiac Registry Data Collection

Sutter Health has been utilizing Mi-Forms handwriting recognition and data cleaning technology on the Tablet PC platform for over four years to collect and validate clinical data used for local quality improvement and exported to national cardiac data registries (CRUSADE, ACC, STS) for benchmarking outcomes.

In the old process, hospitals participating in these registries collected data using paper forms that were later entered into a website that provided feedback on data accuracy and completeness. Often the person entering data was not the person who collected the data, and significant time was wasted re-accessing charts or other hospital information systems. There was also an increased potential for keyboard data entry errors. Sutter Health needed a system that provided the same functionality and accuracy as the current Web-based data collection systems, but required a more efficient process that would bring the data validations to the point of data collection. In addition, the ability to preload existing patient data from other hospital databases automatically into the electronic data forms was very attractive because it would save more time and reduce errors.

Mi-Forms technology on the Tablet PC allowed Sutter to design smart handwritten e-forms, allow users to handwrite data directly into the e-form, run real-time edit checks to ensure accurate and complete data, and then seamlessly transmit the data to existing databases. Real-time feedback on highly portable technology greatly improved efficiencies, eliminating manual entry of data into the web-based system, while reducing errors and omissions. Mi-Forms on Tablet PC essentially extended Sutter's web-based electronic data collection system all the way to the patient bedside.

When comparing the previous manual paper process used in CRUSADE to the Mi-Forms Tablet PC system, Sutter's analysis showed that Mi-Forms was much faster and more accurate. The paper form plus web-based data entry process on average required 50 minutes, while the Mi-Forms on Tablet PC solution required only 33 minutes without any prefilled data, and 31 minutes with prefilled data. This was a 34-38% time savings, which was considered very significant.

In an analysis of data accuracy, Sutter found that Mi-Forms on Tablet PC delivered a strikingly lower error rate than the paper plus web-based data entry process. The Mi-Forms on Tablet PC system delivered correct data 100% of the time.

In addition, the nurses using Mi-Forms on Tablet PC were very pleased with the technology, reporting that it was very easy to learn and use. They were especially pleased with the time savings, allowing them to spend more time with their patients and less time on data collection and entry.

Another key benefit of Mi-Forms on Tablet PC is portability. Mi-Forms allows both online and offline data collection, so accurate and complete data can be gathered in any setting and later transmitted automatically to backend systems. Edit checks in the e-forms run immediately at the point of data collection, enforcing correct form-filling and resolving errors before form

completion. User help can be built into the forms, accessing electronic reference materials and providing guidance to users at the point of collection.

Finally, Mi-Forms provides secure data collection with strong built-in encryption, audit trails and full HIPAA and 21 CFR Part 11 compliance capabilities, as well as flexible communication including the ability to export the collected data to any existing system.

Time savings, improved data accuracy, reduction of errors, strong user-friendliness and seamless integration into existing electronic data collection systems provide tremendous advantages for research organizations which use Mi-Forms to streamline their data collection processes and eliminate the inefficiencies of paper data collection and documentation.

“The system conforms to the way our time-constrained professionals work”, says Dr. Richard Shaw, Director of Research, Quality and Education for the Sutter Pacific Heart Centers of Sutter Health. “It’s like zapping your paper form right into the database.”