



**FACTS**

**Customer:** Solano County Public Health is part of Solano County’s Health and Social Services Department, US. Solano County Public Health’s mission is to improve health and quality of life for people in the county.

**Challenge:** To reduce the time that the county’s 160 plus paramedics, private Emergency Medical Technicians (EMTs) and fire fighters spend on the routine administration associated with document creation, processing of patient care forms, and manual data entry. Additionally, there was a significant need to improve data accuracy and meet the compliance standards set by the county’s compliance and data integrity group.

**Solution:** A customized digital pen and paper solution provided by IS2BE, based on Anoto technology.

**Benefits:** Significant time savings, almost 100% data accuracy. The time from when a call occurs, to when the data is transmitted electronically has been significantly reduced. There is now an ability to meet the needs of the county’s compliance and data integrity group.

# Digital Pen and Paper to the rescue

*“Digital pen and paper made a lot of sense for us. It was foremost accurate, quick in providing us with the patient information we needed, portable and easy to use.”*

**Michael Frenn, the EMS agency administrator for Solano County**

Michael Frenn is the Emergency Medical Services (EMS) agency administrator for Solano County and also the president-elect of the Emergency Medical Services Administrators Associations of California. He was tasked with the goal of reducing the time that Solano County’s 160 plus paramedics, private Emergency Medical Technicians (EMTs) and fire fighters spent on the routine administration associated with document creation, processing of patient care forms, and manual data entry. Additionally, data accuracy in the patient records needed to be significantly improved.

Medic Ambulance is by far Solano County’s largest paramedic service provider with the greatest number of patient transports for the county, operating some 12–16 units and responding to about 24,000 calls a year. The next largest volume of calls

the Solano County community service team responds to is from the fire department’s dispatcher services that responds to approximately 6,000–7,000 calls a year. Solano County needed a data collection tool that would be 95%–100% accurate, especially since the paramedics transport such a large volume of patients.

Prior to the implementation of Digital Pen and Paper technology, paramedics would fill out a patient care form and provide a paper copy to the hospital, and to Solano County’s Emergency Medical Services (EMS) station respectively. A clerk at the EMS station would take that paper form and manually enter the patient data into the station’s patient records database.

“There were significant delays from the time when a paramedic would document a patient’s condition to the time when the

patient data would be entered into our database. Additionally, we found that there were numerous discrepancies in the data accuracy, which was partly because a non medical person would be trying interpret the information on the form and partly just due to human error while manually entering the data”, said Michael Frenn.

**Price the key factor**

The EMS station chose Anoto Digital Pen and Paper technology for creating electronic patient records for the approximately 30,000 calls that occur annually.

At first, a solution with tablet PC:s was also considered, but the digital pen and paper solution was found to be more affordable. Price was the key factor involved in choosing the digital pen and paper solution.

The digital pen and paper system was configured by Anoto's partner IS2BE and customized to be integrated with the electronic patient records database used at the EMS station.

"Digital pen and paper made a lot of sense for us. It was foremost accurate, quick in providing us with the patient information we needed, portable and easy to use", said Michael Frenn.

### The solution

The solution consists of a digital pen and a patient care form with Anoto's dot pattern. The paramedics fill out the patient care form with the digital pen at the emergency location and during the ambulance ride to the hospital. The pen looks and feels like any standard ink pen, but contains a tiny infrared camera and processor which enables it to "read" and digitise words as they are written on the patient care forms.

When the paramedics return to the EMS station, they dock the digital pen to a USB port on the computer. The patient data is then uploaded to the patient records database in a matter of seconds.

"Now, the timeframe from when a call occurs to the time when the data is transmitted electronically is significantly shorter", said Michael Frenn.

### Performing statistical analysis

The patient care form includes various types of fields, such as check boxes, free text and boxed fields. Examples of data registered on the form: a yes/no answer to whether the patient was unconscious or not, if he/she experienced chest pains and details of what occurred during the ambulance ride. The station performs statistical analysis on the data, to evaluate how well they are servicing their community.

Some non digital data is also documented on the patient care form. This information tends to be notations describing additional details about the incident.

"The digital pen is extremely good at replicating what a paramedic writes as a narrative on a patient and can store it as

part of the electronic record which can be referred to later. This information is not included as part of our statistical data nor interpreted as such", said Michael Frenn.

### Meeting compliance standards

Data integrity and accuracy has always been emphasized at Solano County, and periodic audits are conducted on pen and paper efficiency. To verify data, the county's compliance and data integrity group cross references random records with the actual health assessments that the paramedics make on-site.

"I liked how Digital Pen and Paper technology allowed us to quickly create an electronic record that could easily be e-mailed to our compliance and data integrity group. It saved us time", said Michael Frenn.

### Vision for the future

The EMS station has concluded that IS2BE's solution based on Anoto technology provides an attractive solution for all emergency service organizations that have to struggle with balancing service delivery and technology supporting these initiatives with resource constrained budgets.

Whereas the EMS station in Solano County now can have a digital version of the patient data nearly instantly, the hospitals still only receive a paper version. In the future, Michael Frenn would like to see an integrated solution, enabling electronic records to be instantly created at the hospitals as well. He visions having a completely autonomous patient care environment, where the emergency, fire and ambulatory systems are seamlessly integrated with their hospitals' electronic health record systems.

### Partner profile:

*IS2BE was founded in 2001 by the founders of Zoxbox, Inc. (a device vendor & system integrator) & NgnCom, Inc. (a network & system integrator), and incorporated in Nevada, USA in April 2004. The company is headquartered in San Jose, California. The seasoned management team from Vodafone AirTouch, Verizon Wireless, Bank of America, TIAA-CREF and LifeScan successfully made IS2BE the leader in the global digital data market. The company provides Intelligent Pen Solutions™ primarily for the unique worldwide business and professional form automation market segment. IS2BE successfully conducted a first-in-the-market friendly user trial in Silicon Valley, California in Q4 2003.*

[www.is2be.com](http://www.is2be.com)

### Customer profile:

*Solano County Health and Social Services Department was created by the Board of Supervisors in 1992. The Department employs over 1,262 employees working in offices throughout Solano County, US, and is organized by seven program service areas. Public Health Services was founded in 1872 and became part of Solano County's Health and Social Services Department in 1991. The mission of Solano County Public Health is to improve the health and quality of life for people in our community. The organization promotes health and safety, and prevents disease, injury, and premature death through individual and population-based services.*

### Anoto Digital Pen and Paper technology

*An Anoto Digital Pen looks and feels like a normal ballpoint pen. However, it contains an integrated digital camera, an advanced image microprocessor and a Bluetooth® transmitter. Any paper can be used with a digital pen, if the Anoto dot pattern is added to the layout before printing the paper. The Anoto dot pattern consists of numerous black dots that can be read by the digital pen, but are almost invisible to the naked eye. The pen reads the pattern and registers what and where the user writes.*