Smart Card Technology in U.S. Healthcare: FAQ Series

Smart Cards and Healthcare Providers

In this FAQ

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1. What is a smart card?

A smart card is a small card or similar device with an embedded integrated circuit chip. What makes the card smart is the embedded chip. The chip is a powerful minicomputer that can be programmed for different applications.

The chip enables a smart card to store and access data and applications securely and exchange data securely with readers and other systems. Smart card technology can provide high levels of security and privacy protection, making smart cards ideal for handling sensitive information such as identity and personal health information.

For additional information on smart card technology, see the "About Smart Cards FAQ."

2. How can smart healthcare cards help providers?

Smart card-based systems can support numerous applications and capabilities that are important to healthcare providers:

- Accurate patient identification across organizational and geographic boundaries
- Integration with health information exchange Enterprise Master Patient Index (EMPI) and record locator systems
- Prevention of the issuance of duplicate IDs and ID cards
- Ability to identify all locations (at the healthcare information exchange level) where a patient identifier has been used
- Resistance to counterfeiting
- Risk mitigation for identity theft, data breaches, and fraudulent use
- Support for reporting, quality assurance, and education
- Mitigation of legal and financial liabilities
- Ability to securely store patient identifiers and support deactivation of lost identifiers
- Recording and updating patient demographic data and data copying, data reporting, and interface with other healthcare information systems
- Accurate patient identification across the provider network and different systems and acknowledgement of conflicting medical identifiers nationally
- Integrated verification of patient identity using external sources (such as Lexis Nexis or Veratad)
- Multifactor authentication using photos, PINs, biometrics, and graphical passwords.
- Support for emergency medical services, including providing data to authorized response personnel and tracking patient location during a disaster
- Confirmation of patient identity for Medicaid/Medicare/Children's Health Insurance Program (CHIP) claims
- Verification of insurance, co-pay, deductible, and HSA at time of service
- Payment collection, using the card for a financial transaction
- Automatic check-in at a provider kiosk
- Data audit trails and date stamps at locations used
- Secure, convenient access to patient health information by healthcare providers using smart healthcare cards for identity authentication
- Interoperability with a range of portable devices, allowing healthcare providers to access patient information on mobile platforms/devices or via VPNs

3. How can smart healthcare cards help hospitals?

Smart healthcare cards can significantly reduce hospital administrative costs while maintaining or improving current levels of quality of care and customer service.

Use of a smart healthcare card can benefit hospitals in several ways:

- Improved patient identification
- Increased administrative efficiency
- Improved medical records management
- Improved quality of care
- Increased privacy, security, and confidentiality

Improved patient identification. Real-time verification is a superior method for confirming the identity of an incoming patient, and smart cards can be highly reliable and secure identifiers. The cards can securely store various identity credentials (such as a PIN, photo, or biometric) on the card and make it very difficult to forge or steal the credentials. A smart card can also support digital signatures, which can guarantee that information has not been modified. Smart cards therefore can represent a considerable barrier to medical identity theft and fraud.

Increased administrative efficiency. The time and resources required to admit a patient are critical measurements of hospital efficiency. Busy waiting rooms, thin staffing levels, language barriers, and manual transcription of important data from handwritten forms all create opportunities for error. Smart healthcare cards can decrease the time required for admissions by providing immediate access to accurate, up-to-date patient information. Moreover, the set of information typically provided by the patient can be obtained through an online preregistration process and downloaded onto a smart card. Last, admissions can be streamlined when patients use smart cards at unmanned kiosks, removing the labor element altogether. These efficiency gains can result in lower costs, [1] reduce errors,[2] and improve the patient experience.

Smart cards issued as health provider identifications can provide secure, affordable remote access to patient health information via a range of devices. As a result, health providers can increasingly access information when/where they need it in a convenient, user-friendly manner.

Secure remote authentication for providers. Smart card technology meets or exceeds recommendations being put forth by the Office of the National Coordinator for Health IT Privacy & Security Tiger Team, providing support for both NIST Level 3 and Level 4 assurance.[3]

Improved medical records management. Linking a patient to that patient's medical records seems like a simple process, but human error often prevents the correct match of patient and records. Using a smart healthcare card to tie a patient to a specific medical record can ensure a more comprehensive and accurate patient health record. Smart healthcare cards can significantly decrease the incidence of and expenses associated with duplicate record creation,[4] improving both administrative functions such as billing and registration and continuity of care.

Improved quality of care. One key benefit of using smart healthcare cards is a potential reduction in the number of medical errors and the quantity of duplicative medical testing. More than 195,000 deaths occur in the United States because of medical error, with 10 out of 17 medical error deaths each year due to "wrong patient" errors.[5] Smart cards can contribute to better care by authenticating the identity of the person receiving medical treatment. The ability to accurately link a patient to an institution's medical records potentially reduces the number of adverse events and medical errors that occur due to lack of patient information.

Increased privacy, security, and confidentiality. Because a smart healthcare card is in the possession of the patient, and because information is supplied by providers in an "approved" network with audit capabilities, smart cards can provide privacy and security well beyond the requirements of HIPAA

[1] J.Pesce, "Staunching Hospitals' Financial Hemorrhage with Information Technology," *Health Management Technology*, August 2003.

[2] Health Grades, "In-Hospital Deaths From Medical Errors at 195,000 per Year, Health Grades Study Finds," July 2004, http://www.medicalnewstoday.com/releases/11856.php

[3] "How to Authenticate Physicians' IDs," HealthcareInfoSecurity, July 26, 2012, http://www.healthcareinfosecurity.com/how-to-authenticate-physicians-ids-a-4984

[4] Smart Card Alliance, "A Healthcare CFO's Guide to Smart Card Technology and Applications," February 2009.

[5] Robin Hess, "Identity Crisis," *For the Record*, January 17, 2005.

regulations. The patient information on a smart card can be encrypted using robust standard cryptography methods that are extremely secure. Smart card technology can also buttress internal hospital security systems. Using smart cards as employee IDs can enable hospitals to limit an employee's physical access to the specific buildings and areas within buildings (including medication cabinets) that are appropriate for that employee's responsibilities. Smart employee IDs can also be used to authenticate employees for access to networks and computers.

4. Are any hospitals or healthcare systems currently using smart cards?

Countries throughout Europe and Asia are providing their citizens with smart cards. Some use the cards in their national healthcare programs. Others have smart card-based national ID programs. Table 1 lists a selection of smart healthcare card deployments.

Table 1. Examples of Smart Healthcare Card Deployments

Country	Card	Number Deployed	Launch Year
Algeria[a]	CNAS	7 million	2007
Austria[b]	e-card	11 million (patient) 24,000 (professional)	2005
Australia[c]	Medicare Smartcard	40,000	2006
Belgium[d]	Social system identity	11 million	1998
France[e]	Sesam Vitale Sesam Vitale-2	60 million (total)	1998 2007
France[f]	Carte DUO (private insurance card)	Over 200,000	2007
Germany[d]	Gesundheitskarte (health card)	80 million 375,000 professional	2006
Hungary[d]	MOK, Hungarian Chamber of Doctors	40,000	2006
Italy[g]	Carta Nazionale dei Servizi (national service card)	3 million	2004
Kenya[l]	MediSmart Card	300,000	2007
Mexico[h]	Seguro	3.7 million	2006
Slovenia[i]	Health insurance card	2 million (patient) 70,000 (professional)	1999
Spain[d]	Carte Santé	5.5 million	1995
Taiwan[j]	National health insurance card	24 million (patient) 150,000 (professional)	2002
United Kingdom[k]	NHS Connection for Health (health professional card)	1.2 million	n/a

In addition to the countries listed in Table 1, smart healthcare card programs are active in China, Finland, Jordan, Poland, and Turkey.[6]

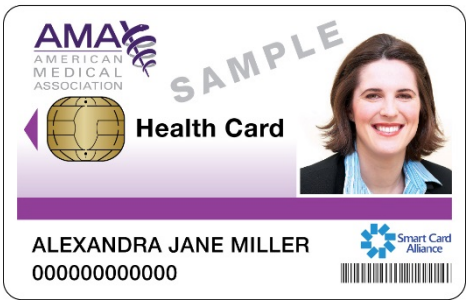
Healthcare organizations in the United States and Canada are also implementing smart healthcare cards to support a variety of features and applications.

- Texas-based Resolute Health Care and Baptist Wellness, both part of Vanguard Health, The Memorial Hospital (North Conway, N.H.), and Santa Rosa Community Health Center (Northern California) are deploying patient smart healthcare cards that use LifeMed ID SecureReg™. In all cases, the cards are used by patients as authenticated identifiers to match them to their individual medical records, store relevant patient information, and pass admissions information into the hospital's admitting software, thereby automating the process.
- Seattle Children's Hospital implemented Gemalto smart healthcare cards for over 4500 clinicians and IT administrators to support portable multi-factor authentication to authorize user access to hospital servers, networks and VPNs.[7]
- The British Columbia government will start issuing the British Columbia Services Card to citizens in December 2012 (total population of 4.4 million).[8] This card will serve as the de facto health card for British Columbia citizens.

5. How can smart card technology improve critical or emergency care?

A smart card accessed by a portable reader can provide a first responder with vital medical data at the scene or en route to the hospital. Smart cards enable immediate identification of a patient and access to the patient's medical record, even when the patient is unconscious or too flustered to convey the entire medical picture accurately or when language barriers impede effective communication. Patients benefit from more immediate and improved treatment.

Born out of the aftermath of Hurricane Katrina, The American Medical Association was awarded a three-year public health translational research grant by the Centers for Disease Control and Prevention (CDC) Office of Public Health Preparedness & Response that seeks to promote the health, safety, and resilience of populations affected by a disaster or public health emergency. The Health Security Card, a smart card, contains essential information for health care providers, and local, tribal, and state health departments to identify individuals, meet their immediate health needs, improve access critical data, and better obtain surveillance and situational awareness, thereby minimizing morbidity and mortality.



[6] Gemalto and CardLogix.

[7] "Seattle Children's Hospital Deploys Gemalto Strong Authentication Solutions to Protect Network Data," Gemalto press release, February 21, 2011, http://www.businesswire.com/news/home/20110221005486/en/Seattle-Children%E2%80%99s-Hospital-Deploys-Gemalto-Strong-Authentication

[8] http://www.gov.bc.ca/bcservicescard

Figure 1. AMA Health Security Card

The Smart Card Alliance served in an advisory capacity to the AMA during the 3-year project. In April 2012, FEMA led exercises in San Antonio, TX comparing the level of care and throughput of casualties in the event of a disaster for patients carrying a health security card versus not carrying a health security card. Preliminary findings from the pilot exercises show 90% of patients using the smart cards rated the care they received as "good to excellent", with 75% affirming care as "very good" or "excellent". The smart card was proven to overcome language barriers, unconscious patients and other issues typically faced by first responders. In December 2012 the AMA will publish a final report on the smart card pilot.

From a hospital's perspective, smart cards enable effective management and coordination of care, from first responders through the emergency room and the transition to in-patient care. Additional capabilities available from smart card software vendors enable first responders to forward critical historical data to the emergency room (ER) before arrival, allowing the ER to prepare for and triage patients effectively.

6. What are the IT requirements for smart healthcare card support?

As with any IT project, specific requirements for a smart healthcare card system will depend upon the selected product and scope of the implementation. Patient identity software vendors can scale solutions from a simple configuration with a small IT footprint to integration with the provider's full enterprise environment, including registration, ADT, electronic medical record, and heath information exchange. Regardless, the operational concept and architecture of a smart healthcare card system is straightforward, with implementation at any scale including the following common elements:

- **Cards:** A variety of contact and contactless form factors are available including cards, fobs, and NFC enabled smartphones among solutions available today – these may all be generically referred to as "smart cards" (See section I (8) for detailed discussion). Actual card-based solutions incorporating printed individualized labels, branding material, or patient photos will require printers designed to seal and deliver cards appropriately in these formats.
- **Readers:** Many readers capable of reading and updating data stored on smart cards are commercially available. Many have the familiar look of credit card readers and are, in fact, also used in commercial transaction settings. Readers may support contact transactions; contactless transactions; or both. For additional information on the transaction process, see the "About Smart Cards FAQ."
- **Software and Servers:** Middleware and/or application software is deployed at point of interaction to facilitate the secure exchange of data between card and reader and to enable user inspection of card data if required. Transaction data is transmitted securely back to the host application or distributed based on enterprise rules to support operations.

7. Is an in-place electronic medical records system required to benefit from smart healthcare cards?

A smart card system can be self-contained; it does not have to be integrated with other health information systems. The information stored on the smart card can be read and can identify patients correctly and provide information that a hospital might not have in its database (e.g., a recent prescription or record of care at another facility). Of course, efficiency increases when data can flow from the card into a healthcare provider's EMR system.

8. What are the benefits of using smart healthcare cards with an EMR/EHR system?

- EMR users (physicians, physician assistants, pharmacists, nurse practitioners, nurses) are provided with a simple and more efficient logging on process with no need to remember complex passwords.
- Healthcare providers have easy access to all necessary patient health information; therefore, health information is not obtained from the patient's memory, which improves the process of gathering health information.
- The rapid availability of medical information in emergency medicine helps to ensure successful clinical outcomes.
- It provides healthcare providers with a means of sharing integrated patient health information. Therefore, there is no need for transmitting patient health information from one physician to another through phone, fax and mail. Fundamentally smart card use with an EMR/EHR system reduces the risk of leaking confidential patient health records and identity theft, which is possible when using the phone, fax and email as ways to transmit health information.
- Use of smart healthcare cards with EMR/HER systems reduces the incidence of redundant medical testing and unnecessary hospital admissions.

These benefits and processes are important for Health Information Exchanges (HIEs), as well as EMR/EHR systems.

9. Can smart healthcare cards connect multiple medical record numbers for secure ID verification?

With the addition of available identity software, smart cards can connect the multiple medical record numbers assigned to a cardholder by multiple providers.

10. Can smart card application software integrate into current provider software systems?

Smart card solutions can interface into a provider's current software systems, including registration, admissions, discharge and transfer, electronic medical record, electronic health record, and heath information exchange systems, supporting continuity and automation of workflow.

For example, inserting a smart card into a reader can trigger the following events (see Figure 2):

1. The smart card software verifies the identity of the cardholder to the provider and displays a photo on the registration screen.
2. The card optionally prompts for PIN entry or biometric data authentication.
3. The card automatically validates the visit and retrieves the correct medical record with the correct visit requirements, using the provider's current registration software.
4. The card provides an audit trail at all check-in points for reporting to required agencies and for payment or disbursement of funds.

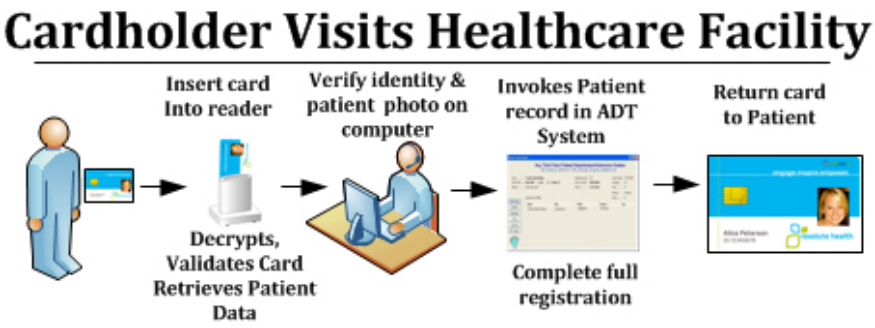


Figure 2. Example Flow for Cardholder Visits to a Healthcare Facility

11. How can patient resistance to a smart card deployment be minimized?

Patients need to know that the smart healthcare card could save their lives. Clear messages should describe to patients the benefits of using smart cards, including the ability of smart card encryption technology to provide high levels of security, support for multifactor authentication, provision of critical medical information in case of an emergency, and personal ownership and control of access to medical records across disparate groups. Other benefits include the security of knowing that each care visit is managed with the most current and accurate data and that records are not duplicated or incorrectly altered due to data entry errors, language barriers, mistaken identity, or fraudulent use of identity. Cardholders will also appreciate the streamlined and expedited registration process.

Process improvements are also critical for providers who want to increase patient satisfaction scores measured using Press-Ganey scores and internal reporting.

12. How can a patient get a treating physician's records into a personal health record if that physician does not have an electronic health record system?

The following describes an example of how this might be done. An identify software provider can enable any physician with a computer and Internet access to read and write to a smart healthcare card, using a standalone interface that relies on bidirectional HL7 communication or health information exchange interfacing . A patient can then give that physician permission to access the information on the card to update the patient's personal health record (PHR). When the patient subsequently goes to a provider with access to an electronic health record/PHR exchange, the patient's information can be automatically updated on that provider's system upon insertion of the card at any reader or point-of-care station.

13. Can one smart healthcare card be used by different providers?

Smart card systems format and exchange data according to accepted healthcare connectivity standards, so there are no technical obstacles preventing adoption of smart healthcare cards by different providers across local or regional healthcare networks. However, as healthcare networks today function at varying levels of technical maturity in adoption and implementation of connectivity, the deployment of smart cards across providers depends most critically upon the goals of the card issuer, business relationships with provider affiliates, and the complexity of provider software systems in the field, not only the card identity system .

The following are three examples of how this might be implemented.

- Healthcare provider issued card

- A government issued card
- HIE implementation

Healthcare provider systems are issuing branded patient smart cards with solution technology providers that connect the smart card across their existing and disparate practice management systems (PMS) and EHRs. The technology also allows qualified first responders remote access to critical patient data in emergencies and natural disasters.

Government and various state agencies are examining ways to increase healthcare's administrative efficiencies and reduce fraud for Medicare and Medicaid, and are proposing pilots that would issue smart cards to replace existing identity cards. Since existing patient smart card technology can seamlessly adapt to existing healthcare provider practice management systems or registration systems, the deployment impact on healthcare providers would be minimal and would noticeably increase the administrative efficiencies, and influence new revenue sources to help establish a sustainable deployment.

As noted, smart card technology and healthcare systems are based on a number of standards that provide interoperability and smart cards can be adjusted electronically as standards may change. HIEs are being implemented across providers and states that standardize data; this may simplify the implementation of smart card technology across providers and existing practice management systems.

The criticality of correct patient identification increases in scenarios involving integration of multiple provider systems and networks. Researchers note that: "As the healthcare industry becomes more computerized and connections are established across multiple disparate systems, challenges increase when matching to a specific and unique person for coordinating that person's healthcare records. The percent of master patient index (MPI) inaccuracies within each entity exponentially increases the number of errors in the HIE environment."[9]

The smart healthcare card can play a critical role in closing this medical information gap for a patient and ensuring the right patient is matched to their current medical record at each provider location.

14. Will using smart healthcare cards change an organization's work flow?

Adopting smart healthcare cards may not require an organization to change its workflow. For additional information on this topic, see the "Smart Cards and the Healthcare Ecosystem FAQ."

15. Can smart healthcare cards be used offline?

Smart cards can be written to and read when a patient is treated in an offline environment. These capabilities are critical in the event of an emergency or in rural locations with no online access. A healthcare provider can read the card and write to the card to include updates such as medical treatment given.

16. Who pays for a smart healthcare card?

The issuer of the health card determines who will ultimately pay for the smart health card deployment. While only one entity should pay for the card, all parties involved must accept the solution. The decision can vary by market and scope of deployment.

[9] Fernandes, Lorraine, and Michele O'Connor. "Future of Patient Identification." *Journal of AHIMA* 77, no. 1 (Jan. 2006): 36–40. Available in the AHIMA Body of Knowledge at www.ahima.org. AHIMA, cited in "Limiting the Use of the Social Security Number in Healthcare." Jeremy Griffin *Journal of AHIMA* 82, no.6 (June 2011): 52-56.

Adopting this technology can add significant value for the provider, not only in terms of improving internal efficiencies, but also for meeting new government requirements and adhering to reimbursement or funding limitations. Providers can achieve an excellent ROI for purchasing and issuing smart healthcare cards to patients.

17. What fixed and variable costs are associated with issuing smart healthcare cards?

The costs associated with issuing smart healthcare cards depend in part on what patient identity software solution is adopted. Additional costs can include the costs of integration, customization, the smart cards, printers, readers, cameras, kiosks, and support.

Providers can select a solution with low entry costs. It is also important for the solution to ensure that HIPAA and security requirements are met and to safeguard patient data.

18. Can smart healthcare cards deliver long-term financial benefits to providers?

Card-based solutions have proven to provide robust solutions across a variety of financial, payment, and identity management scenarios over extended periods of time – decades, in fact. The adoption of card-based personal financial transaction tools and standardized transactions sets were significant contributors to economic growth in the last quarter of the twentieth century. The use of secure, smart patient identity cards would not only be sustainable, but would also significantly contribute to reduced operational costs and medical service errors in the health care system by insuring the identity of the patient at the most critical juncture the point of the initial encounter.

The National Institutes of Health defines four classes of misidentification errors at patient registration: multiple medical record numbers, wrong patient identification, wrong patient address, and fraud. Misidentification can result from two people having the same or similar names, provision of an incorrect birth date, language barriers, data entry errors, or provision of fraudulent information.[10]

Currently, the process by which identity is authenticated varies, depending on the provider, and often registrars must collect several pieces of information for each patient while processing an average of 200 patients a day. Errors can have multiple consequences with significant monetary and human costs, including duplicate medical records, delayed or denied claims, and medical errors.

According to the American Medical Informatics Association, the existence of duplicate records in a healthcare system is one of the most critical issues currently facing health information technology departments. An average organization's duplication rate is typically between 5–10 percent for a single hospital.[11] A study conducted at Johns Hopkins Hospital found that 92 percent of the errors resulting in duplicate records over the course of a fiscal year occurred during inpatient registration.[12] The prevalence of these errors continues despite decades of systems implementations and improvements, including Medical Records systems with sophisticated Master Patient Index algorithms. By placing the validated identity in the patient's hands, Smart card technology can diminish duplication, reduce cost

[10] National Institutes of Health, June 7, 2007, 10.1016/j.ijmedinf.2007.04.011.

[11] L.A. Fox and P.T. Sheridan, "EHR preparation: Building your MPI Game Plan," ADVANCE for Health Information Professionals, http://health-information.advanceweb.com/Article/EHR-Preparation-Building-Your-MPI-Game-Plan-1.aspx.

[12] M.J. Bittle, P. Charache, D.M. Wassilchalk, "Registration-associated patient misidentification in an academic medical center: causes and corrections," *Joint Commission Journal on Quality and Patient Safety/Joint Commission Resources,* 2007, Number 33: pp. 25–33.

and inefficiency by eliminating keystroke errors, and tie the current medical record to the correct person, ensuring that the same record is retrieved at every visit.

In addition, care can be dramatically improved. Nearly 60 percent of medical error deaths are reportedly due to patient misidentification; based on this, the Institute of Medicine estimates that in 2004, 114,706 people died as a result of "wrong patient" medical errors.[13] Implementing secure patient identity and medical information connectivity through smart cards can decrease such untenable and unnecessary costs, reduce medical errors, and enhance overall patient outcomes and experiences.

19. What is the ROI for smart healthcare cards?

The ROI will vary based on hospital requirements, the savings that are projected (e.g., reduction of errors, productivity improvements, elimination of duplicate records) and the solutions implemented. Some hospitals have realized an ROI in less than a year for a smart healthcare card implementation.[14] For additional information on this topic and for an example spreadsheet for calculating savings, see the "Smart Cards and the Healthcare Ecosystem FAQ."

20. What are the implications smart healthcare cards for insurance co-payments?

Using a smart healthcare card can automate the processing of the patient and the payment. The card can trigger the back-end payment process electronically at registration and checkout to reduce manual keystrokes and improve information quality.

21. What are some approaches for branding and community engagement?

Healthcare providers are interested in their own brands and identity, so branding the card is important. Adding community merchant alliances helps promote acceptance of the technology.

Smart card surfaces, like any other card, can be branded and personalized by the card issuer. Healthcare providers can leverage the card's message and identity by offering the cardholder additional opportunities to the use the card. Examples include providing cardholders expedited access to targeted health and wellness campaigns, or working with local merchants to create alliances that promote the provider's message and engage members of the community. Local merchants may offer discounts or specials when someone shows the branded smart card.

Accountable Care Organizations (ACO) could use the card to promote and reward healthy behaviors; smart card solutions are available that can track visits across locations. For example, an at-risk patient with a chronic condition could receive points for visiting a wellness clinic or fitness center or keeping a recommended follow-up visit. These patients could redeem these points for "rewards," such as discounts at a gym or a free screening.

Another approach would be an alliance between employers and healthcare providers. The employee's ID badge could also be used as a patient ID and/or insurance card to verify identity at a provider visit, giving the employee automated and expedited service at registration.

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[13] College of American Pathologists, "Identification Errors," www.cap.org/80/apps/docs/cap/today/feature stories/09051DErrors.html.

[14] Source: Lawrence Carbonaro, "Memorial Hospital: A Case Study," 2009, www.lifemedid.com.

About the Health and Human Services Council

The Smart Card Alliance Health & Human Services Council brings together human services organizations, payers, healthcare providers, and technologists to promote the adoption of smart cards in U.S. health and human services organizations and within the national health IT infrastructure. The Health & Human Services Council provides a forum where all stakeholders can collaborate to educate the market on the how smart cards can be used and to work on issues inhibiting the industry.

About the Smart Card Alliance

The Smart Card Alliance is a not-for-profit, multi-industry association working to stimulate the understanding, adoption, use and widespread application of smart card technology.

Through specific projects such as education programs, market research, advocacy, industry relations and open forums, the Alliance keeps its members connected to industry leaders and innovative thought. The Alliance is the single industry voice for smart cards, leading industry discussion on the impact and value of smart cards in the U.S. and Latin America. For more information please visit http://www.smartcardalliance.org.