

**Smart Card  
Alliance**

***Smart Card Technology in Healthcare:  
Frequently Asked Questions***

*A Smart Card Alliance Healthcare Council and Identity Council  
Publication*

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## ***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>.

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# Smart Card Technology in Healthcare FAQ

This document was developed to answer questions about how smart cards work and how the technology is used to manage patient identity and protect a healthcare consumer's personal information. Unless specifically noted, the answers are focused on the use and deployment of smart cards in healthcare applications in the United States. In addition, the questions and answers apply only to smart card-based patient identity management systems and **not** to patient identity systems based on magnetic stripe or other ID card technologies.

## 1. What is a smart card?

A smart card looks very much like a typical credit card (see Figure 1), but what makes it "smart" is the small microprocessor chip embedded in the card. The chip is a powerful minicomputer that can be programmed in different ways. Smart cards allow data and applications to be securely stored and accessed on the chip and enable secure data exchange. Smart card technology provides high levels of security and privacy protection, making it ideal for handling sensitive information such as identity and personal health information.

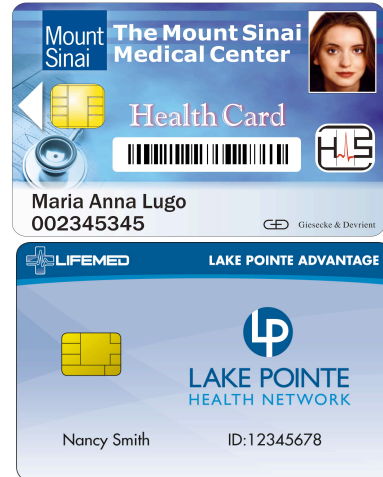


Figure 1: Smart health cards

## 2. How do smart cards work?

A typical smart card has a plastic card body, with a chip embedded in the plastic and a contact plate (usually gold plated) on the surface of the card. (See Figure 2.)

To work, a contact smart card must be inserted into a smart card reader that directly touches the conductive contact plate on the surface of the card. Transmission of commands, data, and card status takes place over these physical contact points.

RF-enabled smart cards are also available that allow the smart card to communicate with a reader through a "contactless" RF interface. To work, these contactless smart cards are held in close proximity to a reader and then transmit commands and data without any contact.

Both contact and contactless smart cards support the same high levels of security that are needed for protecting sensitive information and enabling secure transactions.

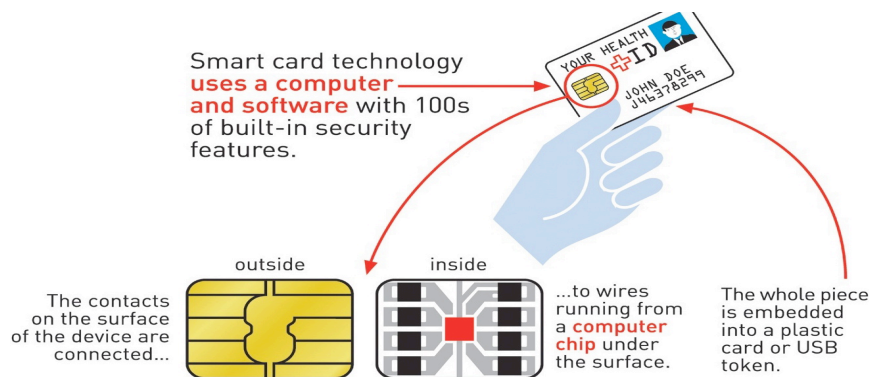


Figure 2: Illustration of contact smart card technology (courtesy of Gemalto)

### 3. **How are smart cards being used?**

Smart cards are used in many applications worldwide, including:

- Secure identity applications - employee ID badges for physical access to buildings and secure computer/network access, citizen ID documents, electronic passports, driver's licenses, online authentication devices
- Healthcare applications - citizen health ID cards, physician ID cards, portable medical records cards
- Payment applications - contact and contactless credit/debit cards, transit payment cards
- Telecommunications applications - GSM Subscriber Identity Modules, pay telephone payment cards

### 4. **Are all smart cards the same? In other words, do smart cards always look like credit cards, or do they come in different shapes and sizes?**

Smart card technology conforms to international standards ISO/IEC 7816<sup>1</sup> and ISO/IEC 14443, which makes them interoperable; however, they do not all look alike. Smart cards are available in a wide variety of form factors (see Figure 3), including plastic cards, key fobs, subscriber identification modules (SIMs) used in GSM mobile phones, and USB-based tokens.



Figure 3: Smart card form factors

### 5. **How do I know if I have a smart-card based healthcare ID card?**

It is very easy to tell if you have a contact smart card-based healthcare ID card. Just look for a chip on the card! It should be similar to the chip shown to the right.



### 6. **How does a smart card-based healthcare ID card help me as a patient?**

There are a number of ways that smart card technology can help patients, all stemming from the ability to authenticate your identity when you seek medical care. This may seem simple, but it's actually the cornerstone of quality medical care and good health systems management. Accurate identification of each person that receives healthcare:

- Decreases medical errors. Optimal medical care requires that a healthcare provider have access to all relevant medical history and know what medications have been prescribed. This can be challenging as individuals seek care from more than one healthcare organization and fill prescriptions at more than one pharmacy chain. A validated patient identity can be linked to a healthcare organization's medical records. Using a smart card also allows the storage of

patient record numbers across different medical providers in a secure, privacy-sensitive way. Other personal information such as your prescription history, name, address, insurance information, allergies, emergency contact information and other key data elements can also be securely stored on the card.

- **Expedites the admissions process.** Use of a smart card-based healthcare ID card allows patients to bypass the usual lines at inpatient admission offices or ambulatory care admissions stations. Instead, when entering a healthcare facility, registration can be quickly and easily achieved by inserting your ID card in a reader at a kiosk or station. This instantly gives the provider your current information and the link to your medical records, delivering increased convenience, customer service, and accuracy – in record time!
- **Reduces medical identity theft and fraud.** Medical identity theft and fraud is a growing concern to healthcare consumers and providers. Using smart card technology enables the addition of security elements such as a picture, personal identification number (PIN) or biometric (e.g., a fingerprint) so that a lost or stolen healthcare ID card cannot be used or accessed by anyone else. The data kept on the card can also be encrypted so that no one can access your data without your permission.
- **Reduces healthcare costs.** In addition to streamlining administrative procedures for your healthcare provider and reducing the resources dedicated to those functions, the ability to link to and quickly access all of your medical history makes it less likely that your doctor would need to order duplicate tests or procedures. These significant cost savings start during the admissions process and continue all the way through the claims management process.
- **Expedites claims reimbursement.** Providing complete and accurate information during the registration process and removing issues with language barriers or human error greatly reduce the incidence of denied or delayed claims.

In short, smart card-based technology can help you as a patient get better quality healthcare, delivered faster and more cost effectively. And that's good for everybody.

## **7. How does a smart card-based healthcare ID card protect my personal healthcare information?**

The embedded chip in a smart card can hold various types of information in electronic form. The smart card can protect your information with sophisticated encryption algorithms and can allow access only by authorized readers; other smart cards may provide a key that unlocks a particular database on a particular computer. Smart card technology also allows the use of multi-factor authentication, requiring the use of a second security factor such as a personal identification number (PIN), or a biometric (e.g., a fingerprint) in order to allow access to your personal healthcare information. All smart cards have the capability to provide strong authentication, digital signatures, and security through encryption.

## **8. How would I use a smart patient healthcare card?**

There is no single answer to this question. How you use your smart card-based patient healthcare card would depend on the issuer (e.g., your insurance provider, hospital, or government-sponsored medical plan) and the applications that the issuer decides to implement. Example uses could include:

- Using the card to register at a physician's office or hospital, streamlining the registration and admissions process (See Figure 4.)
- Using the card to securely access your personal health record to check or update information
- Updating the card with new personal, insurance, prescription or medical record information to allow faster access to treatment and to provide accurate administrative and clinical information to healthcare providers

## How the patient ID card works

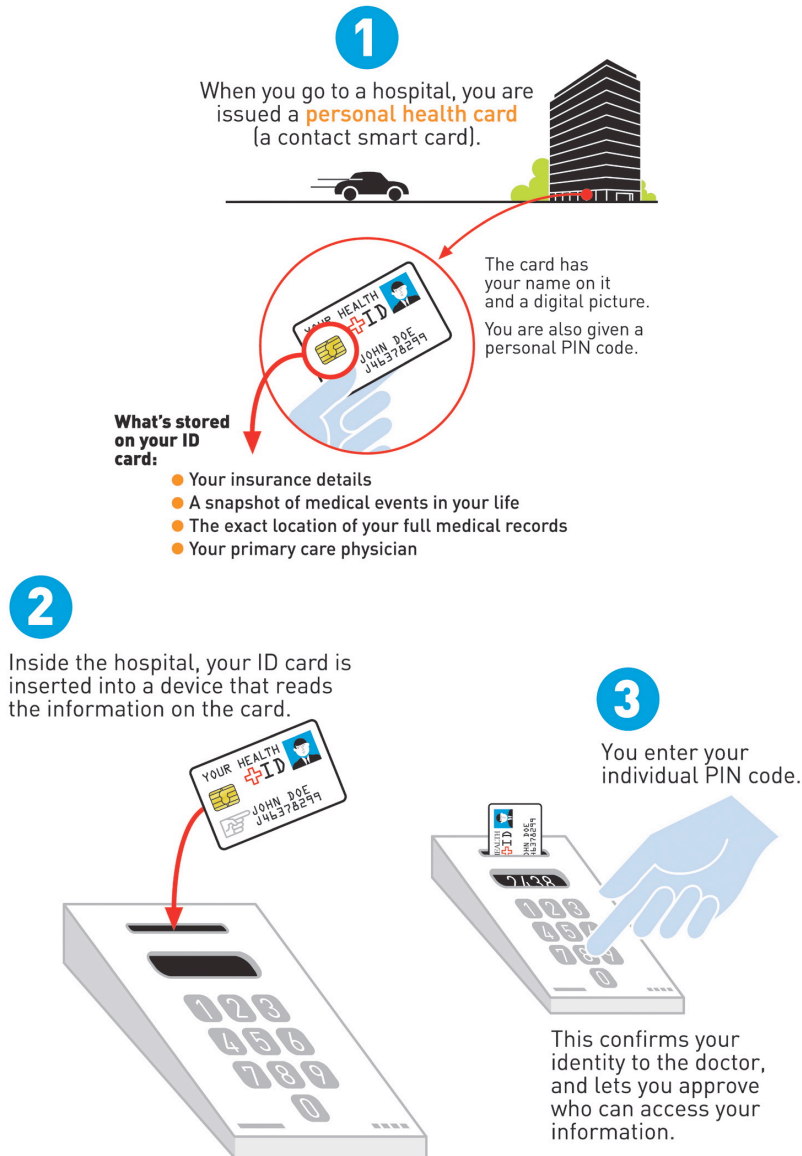


Figure 4: How smart healthcare ID cards can work at a hospital (courtesy of Gemalto)

### 9. How can smart card-based technology help hospitals?

Smart card-based technology offers a way to significantly reduce hospital administrative costs while maintaining or increasing quality of care and customer service. Smart card technology can help hospitals achieve:

- Better patient identification. Smart cards serve as highly reliable and secure identity tokens. The cards can securely store various identity credentials (such as a PIN, photo, or biometric) directly on the card and make it very difficult to forge or steal the credentials on the card. A smart card can also create a digital signature. A digital signature serves as a guarantee that information received has not been modified, as if it were protected by a tamper-proof seal that is broken if the content is altered. Smart cards can present a considerable barrier to medical

identity theft and fraud. Real-time verification is a superior method of confirming the identity of the incoming patient.

- Administrative efficiencies. 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 create many opportunities for error. Smart cards cut down the time for admissions by providing ready access to accurate, up-to-date patient information. Moreover, the standard set of information provided by the patient can be obtained via an online pre-registration process, which can be downloaded onto a smart card. Lastly, admissions can be streamlined when patients use smart cards at unmanned kiosks – taking out the labor element altogether. These efficiency gains lower cost<sup>2,3</sup>, reduce errors and improve the patient experience.
- Better medical records management. Linking a patient to their medical records seems like a simple process, but human errors often lead to many issues with matching the right patient and the right records. Using a smart card to match a patient to a specific medical record ensures a more comprehensive and accurate patient health record. Smart card-based healthcare IDs can significantly decrease the incidence of and expenses associated with duplicate record creation<sup>4</sup>. This improves administrative functions such as billing and registration and also provides for better continuity of care.
- Quality of care. A key benefit for smart patient healthcare cards is the potential reduction of medical errors and duplicative medical testing. More than 195,000 deaths occur in the United States because of medical error, with 10 out of 17<sup>5</sup> medical error deaths each year due to “wrong patient errors.” Smart cards help ensure better quality of 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 due to lack of patient information.
- Privacy, security and confidentiality. Since smart cards are physically held by patients, and because information is supplied by providers in an “approved” network with audit capabilities, smart cards provide privacy and security measures well beyond the HIPAA regulations. Information on smart cards can be encrypted using robust, standard cryptography methods that have been proven to be extremely secure and that are used for government and military security. Thus, a patient’s information is very secure and private.

Smart card technology offers solutions to a number of challenges that healthcare organizations are looking to address. Smart card technology offers the ability to automate much of the admissions process, eliminate costly duplicate and overlaid records, and enable the creation of and access to a comprehensive medical record across a broad spectrum of healthcare providers.

Smart card technology can also buttress internal hospital security systems. Use of smart cards for employee IDs enable hospital security to limit a hospital employee’s physical access to those specific buildings and areas within the facilities that are appropriate for their immediate set of responsibilities, including access to medication cabinets. Smart employee IDs can also be used for strong authentication to networks and computers.

### **10. Does a hospital need to have an electronic medical record (EMR) system in place to benefit from smart card-based patient ID cards?**

Not necessarily. Information on smart cards can be read and used to correctly identify patients, as well as to provide information that a hospital might not have in its database (e.g., a recent prescription or record of care at another facility). A smart card system can be self-contained and does not have to be integrated with other health information systems. That stated, greater efficiencies are gained when data can flow from the card into an electronic medical records system.



## 11. How can smart card technology improve critical / emergency care?

Smart cards enable the immediate identification of a patient and access to the patient's medical record, regardless of whether or not the patient is conscious or too flustered to accurately convey the entire medical picture, or if language barriers impede effective communication. Overall, patients can benefit from improved and faster treatment and medical care.

From the hospital's perspective, smart cards offer additional value, as they enable effective management and coordination of care from the first responders through the emergency room department and potential transition to inpatient care. A smart card, accessed by a portable reader, can provide vital medical data to a first responder at the scene or en route to the hospital.

## 12. Are smart cards being used in any hospital / healthcare system today?

Yes. Countries throughout Europe and Asia are providing their citizens with smart cards. Some use smart cards as part of their national healthcare programs. Others have smart card-based national ID programs. Table 1 lists examples of national smart health card deployments worldwide; in addition to the countries listed, smart health card programs are also active in other countries, including China, Finland, Jordan, Poland, and Turkey.<sup>6</sup>

**Table 1. Examples of National Health Smart Card Deployments Worldwide**

| Country                | Card Type                                | Number of Cards                                | Launch Year  |
|------------------------|--|--|--------------|
| Algeria <sup>7</sup>   | CNAS                                     | 7 million                                      | 2007         |
| Austria <sup>8</sup>   | e-card                                   | 11 million patient<br>24,000 professional      | 2005         |
| Australia <sup>9</sup> | Medicare Smartcard                       | 40,000 patient                                 | 2006         |
| Belgium <sup>10</sup>  | Social system identity                   | 11 million                                     | 1998         |
| France <sup>11</sup>   | Sesam Vitale<br>Sesam Vitale-2           | 60 million (combined)                          | 1998<br>2007 |
| France <sup>12</sup>   | Carte DUO                                | Over 200,000 cards (private<br>insurance card) | 2007         |
| Germany <sup>13</sup>  | Gesundheitskarte                         | 80 million<br>375,000 professional             | 2006         |
| Hungary <sup>14</sup>  | MOK, Hungarian Chamber<br>of Doctors     | 40,000 professional                            | 2006         |
| Italy <sup>15</sup>    | Carta Nazionale dei<br>Servizi           | 3 million (national services<br>card)          | 2004         |
| Mexico <sup>16</sup>   | Seguro Popular health<br>insurance cards | 3.7 million                                    | 2006         |
| Slovenia <sup>17</sup> | Health insurance card                    | 2 million patient<br>70,000 professional       | 1999         |
| Spain <sup>18</sup>    | Carte Santé                              | 5.5 million                                    | 1995         |

| Country                      | Card Type   | Number of Cards                            | Launch Year |
|------------------------------|---|--|-------------|
| Taiwan <sup>19</sup>         | National health insurance card                        | 24 million patient<br>150,000 professional | 2002        |
| United Kingdom <sup>20</sup> | NHS Connection for Health (health professional cards) | 1.2 million                                | n/a         |

Healthcare organizations in the United States are implementing smart healthcare cards to support a variety of features and applications. Prominent programs include the following:

- New York's Mount Sinai Hospital, one of the oldest and largest voluntary teaching hospitals in the United States, has led the trend towards smart healthcare cards. Mount Sinai has created a regional network of institutions in the greater New York City area (HealthSmart Network) that accepts a common smart card-based Personal Health Card (PHC). Elmhurst Hospital (part of the Health and Hospitals Corporation, New York City's public hospital system) is one of the member organizations and a collaborator in the development of the PHC system. The cards can be read and updated across all institutions in the network.
- Texas-based Lake Pointe Medical Center, one of 55 Tenet hospital locations, and The Memorial Hospital of North Conway, NH, are deploying smart patient health cards using the SMART Association, Inc., LifeMed™ Personal Health Smart Card Platform. LifeMed™ smart cards are issued to patients to more accurately identify the patients, grant them a more streamlined admission, and connect and synchronize patient medical information from sources outside the hospital. Patients with the LifeMed™ card have the ability to view and contribute to their overall medical records, giving the provider a more complete medical picture.

In each case, smart cards are used by patients as authenticated identifiers to match the patient to his or her individual medical record, to store relevant patient information, and to pass admissions information into the hospital's admitting software, thereby automating the process.

### **13. How can smart card-based patient ID cards help with HIPAA compliance?**

Smart card-based patient ID cards offer covered entities under the Health Insurance Portability and Accountability Act (HIPAA) an effective tool to facilitate compliance with the HIPAA Privacy Rule. One of the key provisions of the HIPAA Privacy Rule is to assure that an individual's health information is properly protected and that individuals can control how their health information is accessed and used.

The HIPAA Privacy Rule applies to specific covered entities such as health care providers (e.g., doctors, dentists, pharmacies, nursing homes), health plans (e.g., HMOs, health insurance companies, company health plans) and health clearinghouses. Putting smart cards in the hands of employees of covered entities as well as patients will ensure that health information is accessed only by those with the appropriate credentials.

Many high profile breaches of protected health information have occurred when employees at covered entities have accessed medical records that they were not authorized to access. Smart card credentials could minimize or eliminate such breaches by allowing only authorized personnel with a smart card credential to access patient medical records.

With the issuance of smart card-based ID cards for patients, personal medical information can be securely and accurately linked across multiple institutions and care providers. Patients will have better control of their personal health information, a key privacy principle. And accurate patient

identification, a critical issue in healthcare today, will ensure the safety and confidentiality of protected health information.

#### **14. Can smart cards help with compliance with the enhanced privacy standards created under the new American Recovery and Reinvestment Act (ARRA)?**

Yes. Smart card-based patient ID cards answer a key ARRA policy concern regarding access to health information. ARRA establishes a Policy Committee to examine methods to facilitate secure access by an individual to an individual's protected health information as well as methods, guidelines and safeguards to facilitate secure access by caregivers, family members or a guardian.

The HIPAA Privacy Rule protects all individually identifiable health information held or transmitted by a covered entity. ARRA has expanded those protections beyond the HIPAA rule to include additional entities, such as vendors of personal health records. A major goal of the Privacy Rule is to define and limit how and when protected health information is used or disclosed by covered entities. Smart cards can help covered entities and ARRA-stipulated entities comply with both the HIPAA Privacy Rule and the security and privacy mandates under ARRA.

#### **15. What are the benefits of smart cards versus magnetic stripe-based cards?**

Smart cards have significant benefits versus magnetic stripe ("mag stripe") cards for healthcare applications.

First, smart cards are highly secure and are used worldwide in applications where the security and privacy of information are critical requirements.

- Smart cards embedded with microprocessors can encrypt and securely store information, protecting the patient's personal health information.
- Smart cards can allow access to stored information only to authorized readers. For example, all or portions of the patient's personal health information can be protected so that only authorized doctors, hospitals and medical staff can access it. The rules for accessing medical information can be enforced by the smart card, even when used offline.
- Smart cards support strong authentication for accessing personal health information. Patients and providers can use smart health ID cards as a second factor when logging in to access information. In addition, smart cards support personal identification numbers and biometrics (e.g., a fingerprint) to further protect access.
- Smart cards support digital signatures which can be used to determine that the card was issued by a valid organization and that the data on the card has not changed since issuance.
- Smart cards use secure chip technology and are designed and manufactured with features that help to deter counterfeiting and thwart tampering. Smart cards include a variety of built-in hardware and software capabilities that detect and react to tampering attempts and help counter possible attacks.

The use of secure smart chip technology, encryption and other cryptography measures makes it extremely difficult for unauthorized users to access or use information on a smart card or to create duplicate cards. These capabilities help to protect patients from identity theft, protect healthcare institutions from medical fraud, and help healthcare providers meet HIPAA privacy and security requirements.

Second, smart cards provide the flexibility for securely adding information to a patient healthcare card after issuance. For healthcare applications, this can deliver several benefits.

- Patient prescriptions can be written to the card, providing up-to-date information when a patient is receiving medical care from multiple providers or in an emergency situation.

- Multiple patient identification or patient record identification numbers can be written to the smart card, facilitating record exchange and assisting with coordination of care among multiple healthcare providers.
- Patient healthcare information can be written to and updated on the card by authorized healthcare providers, with updated information then available for both the patient and other healthcare providers (if authorized) to access.

Magnetic stripe cards, by contrast, have minimal security and functionality. Because data is very easily read from and written to a magnetic stripe card, information can be easily stolen and a duplicate magnetic stripe card can be created. It is straightforward for a thief to "swipe" a magnetic stripe card and to collect all of the information from the card; the thief simply needs a magnetic stripe reader that has the ability to capture the information from the card (which all readers do). The thief can then either use that information directly or create a duplicate magnetic stripe card.

In addition, magnetic stripe cards store only a limited amount of data and are not updated after issuance, providing no ability to securely update or store additional healthcare information.

Magnetic stripe cards have had a well-established position in the marketplace for over 30 years. However, many industries and government organizations are becoming more sensitive to the limitations of magnetic stripe technology. A case is being made for smart card technology to replace or augment magnetic stripe technology. Smart card technology has the ability to incorporate a magnetic stripe on a smart patient healthcare card in order to be able to support legacy applications.

As the costs for smart cards and smart card readers have dropped dramatically, and as the reader infrastructure is replaced or upgraded, smart card technology is poised to capture market share in financial services, personal identification and healthcare markets – where security, privacy and information portability are crucial.

## **16. Is contactless smart card technology the same as RFID?**

No. There is often confusion in discussions of RF-enabled applications, with contactless smart card technology often incorrectly categorized as 'RFID.' There is a wide range of RF technologies used for a variety of applications – each with different operational parameters, frequencies, read ranges and capabilities to support security and privacy features. For example, the RFID technologies that are used to track objects in inventory operate over long ranges (e.g., 25 feet) and have minimal built-in support for security and privacy.

Contactless smart cards, on the other hand, use RF technology, but, by design, operate at a short range (less than 4 inches) and are highly secure. Contactless smart cards are currently being used for secure identity applications worldwide.

## **17. Do you need a unique patient ID in order to use a smart card-based healthcare ID card?**

There are a lot of reasons that have led to active discussion of establishing a unique patient ID for healthcare services. Without a unique personal identifier, it's challenging to make sure that all of a person's relevant medical record information is kept safely across that individual's experiences over time with multiple pharmacies, physician offices, hospitals, urgent care centers and other medical providers. The task grows more complex as individuals change employers, insurance carriers, insurance plans within a carrier, or last names as their marital status changes. Some countries have chosen to address this by issuing national health ID cards, with each citizen having a unique identifier.

Smart cards can be effective in supporting healthcare applications with or without a unique patient identifier. Smart cards can serve as a secure way to aggregate multiple identifiers across many different systems or organizations, linking them all on the smart card.

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### About the Smart Card Alliance Healthcare and Identity Councils

The Smart Card Alliance [Healthcare Council](#) brings together payers, providers, and technologists to promote the adoption of smart cards in U.S. healthcare organizations. The Healthcare 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.

The [Identity Council](#) is focused on promoting the need for technologies and usage solutions regarding human identity information to address the challenges of securing identity information and reducing identity fraud and to help organizations realize the benefits that secure identity information delivers. The Council engages a broad set of participants and takes an industry perspective, bringing careful thought, joint planning, and multiple organization resources to bear on addressing the challenges of securing identity information for proper use.