NefroCard for Dialysis

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Abstract and Objective

This work proposes the implementation of a system for management of patient data in nephrology and dialysis based on smart cards.

Keywords:

Smart cards, EHR, Data mining, Dialysis.

Introduction

Some 20 years after they were first developed, "smart cards" are set to play a crucial part in health care systems. Last year about a billion were supplied, mainly for use in the financial sector, but their special features make them of particular strategic importance for the health sector, where they offer a ready made solution to some key problems of security and confidentiality. With particular reference to the management of renal pathologies, the use of smart cards could be an innovative improvement in the operative health care process.

Methods

Smart card

The selected smart card is the TB1000, which is a microprocessor based card, including 8KB EEPROM which can be used to store patient data. Due to the limited amount of space, it has been necessary to properly identify the most significant data which is required during the various treatments. The data in the card contains, as shown in the diagram reported in Fig. 1, a first block of data which includes the patient's name and first name, basic administrative data, including social security number, social security scheme, fund, and right. The higher security layer includes emergency data (blood, allergy, acute diseases, etc.), the history of treatment, including last five laboratory results, prescriptions, and therapies etc.

Modules

The application can be divided in a set of independent modules, which describe and encapsulate the major features of the system: Patient Identification Module, Emergency Care Module, Health Care Dislocation Module, Dialysis Module, Total Quality Management and Control Module (TQMCM), e-Pharmacy Programme.

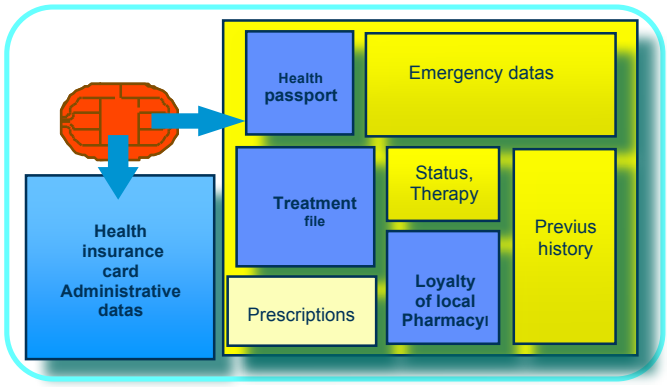

Figure 1-Data organization in the smart card

Results

The results of the trial were encouraging for us. We have used a sample of 100 patients in treatment at the university hospital of Florence, of which 25 with renal transplantation. The patients have correctly used the system to manage by themselves their health care protocol as described in the Fig. 2 below.

Conclusion

Smart cards enable people's identities to be authenticated and communications to be secured and provide mechanisms for implementing strong security, differential access to data, and definitive audit trails. They offer a new mechanism for implementing trust in health care communications.